Specifications for

Beaufort EMS

Beaufort,
North Carolina

Issue Date:

January 30, 2026

Coastal Architecture
4206 Bridges Street, Suite C
Morehead City, North Carolina 28557
Phone: 252-247-2127
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www.coastalarchitecture.net

Project No.
25003

Project Manual

Including

Contract Documents & Specifications

for the Construction of

BEAUFORT EMS
BEAUFORT, NORTH CAROLINA

PREPARED BY:

Coastal Architecture
4206 Bridges Street, Suite C
Morehead City, NC 28557
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Architect's Project Number: 25003
Date of Issue: January 30, 2026

TABLE OF CONTENTS

SPECIFICATIONS
FOR

BEAUFORT EMS
PROJECT # 25003

SPECIFICATIONS

INVITATION TO BIDS

BIDS for the construction of the Beaufort EMS, will be received by the Owner from prequalified bidders only, until 3:00PM on May 19, 2026 in the office of the Architect, 4206 Bridges Street, Suite C, Morehead City.

A nonmandatory meeting will be held by Teams on Tuesday May 11, 2026 at 2:00PM.

The CONTRACT DOCUMENTS may be obtained from Architects website, www.coastalarchitecture.net or purchased from the Architect for a sum of $300.00 per set. (Non Refundable)

The Owner reserves the unqualified right to reject any and/or all bids.

Bids are to be delivered to:

Coastal Architecture, pllc.
4206 Bridges Street, Suite C
Morehead City, NC 28557

A 5% Bid Bond will as part of the base bid be required, and a 100% Performance and Payment Bond will be required.

Prequalification must be done prior to May 4, 2026 and approved to be eligible to bid. The prequalification package is available at www.coastalarchitecture.net under the ‘Projects to Bid’ tab.

SINGLE PRIME
FORM OF PROPOSAL FOR:

Date: _____
Bid: **Single Prime**
Contractor: _____
License #: _____
Addenda Received: _____

Beaufort EMS

Indicate your firm's name and date by filling in the above blanks and note the same items on your Proposal envelope or email transmittal.

The undersigned, as Bidder, hereby declares that the only person or persons interested in this Proposal as Principal or Principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and informed himself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined the Specifications for the work and the Contract Documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The Bidder proposes and agrees if this Proposal is accepted to contract with the Owner in the form of Contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Beaufort EMS building as defined in these Contract Documents, in full and in complete accordance with the plans and specifications of the Owner and the Architect/Engineer, with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and Contract Documents for the sum of:

Base Bid: **SINGLE PRIME CONTRACT:**

_____ Dollars $_____
(Written Amount) (Number Amount)

Add Alternate 1:
Owner Preferred Kohler Generator

_____ Dollars $_____
(Written Amount) (Number Amount)

Add Alternate 2:
Wet Tap

_____ Dollars $_____
(Written Amount) (Number Amount)

Unit Price (Unsuitable Soils)
For Additional Cut and Fill Add $_____ C.Y.

****

The Bidder further proposes and agrees hereby to commence work under his Contract on a date to be specified in a written order of the Architect/Engineer and shall fully complete all work within 365 consecutive calendar days from and including said date. Applicable liquidated damages shall be as stated in Supplementary General Conditions.

The Bidder furthermore agrees to hold all prices for a period of 60 days from bid date.

Respectfully submitted this _____ day of _____, 2026.

WITNESS:

_____
(Name of Firm or Corporation Making Bid)

By: _____

_____
(Proprietorship or Partnership)

Title: _____
(Owner, Partner, or Corporate President or Vice President only)

ATTEST:

Address: _____

By: _____

Title: _____ License No.: _____
(Corporate Secretary or Assistant Secretary Only)

(Corporate Seal)

Addenda Received and Used in Computing Bids: (Initial as Appropriate)

Addendum No. 1 _____ Addendum No.5 _____

Addendum No.2 _____ Addendum No.6 _____

Addendum No.3 _____

Addendum No.4 _____

End of Proposal Form

MINORITY BUSINESS PARTICIPATION

If the project cost is $300,000.00 or more, the following forms will be utilized.

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.

APPENDIX E

MBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor/Architect: _____

Address & Phone: _____

Project Name: _____

Pay Application #: _____ Period: _____

The following is a list of payments made to Minority Business Enterprises on this project for the above-mentioned period.

MBE FIRM NAME	* INDICATE TYPE OF MBE	AMOUNT PAID THIS MONTH	TOTAL PAYMENTS TO DATE	TOTAL AMOUNT COMMITTED

*Minority categories: Black, African American (B), Hispanic (H), Asian American (A), American Indian (I), Female (F), Social and Economically Disadvantage (D)

Date: _____ Approved/Certified By: _____
Name

_____
Title

_____
Signature

SUBMIT WITH EACH PAY REQUEST & FINAL PAYMENT

(Revised on 3/14/2003)

Identification of HUB Certified/ Minority Business Participation

I,_____,
(Name of Bidder)
do hereby certify that on this project, we will use the following HUB Certified/ minority business as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work Type	*Minority Category	**HUB Certified (Y/N)

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

The total value of minority business contracting will be ($)_____.

State of North Carolina AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of_____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- ❑ **1 – (10 pts)** Contacted 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 date and notified them of the nature and scope of the work to be performed.
- ❑ **2 --(10 pts)** Made 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 bids are due.
- ❑ **3** – **(15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- ❑ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- ❑ **5** – **(10 pts)** Attended prebid meetings scheduled by the public owner.
- ❑ **6** – **(20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- ❑ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject 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** – **(25 pts)** Provided 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. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- ❑ **9** – **(20 pts)** Negotiated 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** - **(20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of_____, County of_____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

State of North Carolina --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____ contract.
(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____

SEAL

State of _____, County of _____

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

Notary Public _____

My commission expires _____

State of North Carolina - AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g) and 128.4(a),(b),(e) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit.
This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. Attach additional sheets if required

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

SEAL

Signature:_____

Title:_____

State of _____, County of _____
Subscribed and sworn to before me this _____day of _____20____
Notary Public_____
My commission expires_____

State of North Carolina AFFIDAVIT D – Good Faith Efforts

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 10% participation by HUB Certified/ minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with HUB certified/ minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

***Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

****** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Examples of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

Ground Truth Soil Consulting, PLLC
1302 Roberts Road
Newport, NC 28570
(252) 725-1320

SOIL & SITE EVALUATION

Beaufort Rescue & EMS Inc.
110 Steel Tank Road
Beaufort, NC
PIN: 539419528080000
Ground Truth Job # 24-180

William Willis
PO Box 950
Beaufort, NC 28516

INTRODUCTION

A Soil & Site Evaluation was completed within the above referenced lot located in Carteret County, NC. The evaluation was completed to describe the current soil characteristics within the lot in regard to depth to the seasonal high water table (SHWT) and infiltration rate. The study area consisted of a vacant lot and encompassed ~1.17 acres. The property corners and property lines were not visibly marked on the day of the evaluation.

INVESTIGATION METHODOLOGY

Soil Evaluation

The Web Soil Survey was referenced prior to the field investigation to get an overview of the possible soil series located at the study area. The Augusta, Hobucken, and Tomotley soil series are mapped at the project site and information for these series is listed in Table 1.

Table 1. Map Unit Symbol, Soil Series, and Taxonomic Classification

Map Unit Symbol	*Soil Series*	*Taxonomic Class*
Ag	Augusta loamy fine sand	Fine-loamy, mixed, semiactive, thermic Aeric Endoaquults
HB	Hobucken mucky fine sandy loam	Coarse-loamy, mixed, active, nonacid, thermic Typic Hydraquents
To	Tomotley fine sandy loam	Fine-loamy, mixed, semiactive, thermic Typic Endoaquults

The field investigation was performed in September 2024 by John C. Roberts, LSS. Soil borings were conducted at three predetermined locations provided and marked in the field by Stroud Engineering. Borings were evaluated via a hand auger under moist conditions using procedures listed in the *Field book for Describing and Sampling Soils, Version 3.0*. Observations of the landscape (slope, drainage patterns, etc.) as well as soil properties (depth, texture, seasonal wetness, restrictive horizons, etc.) were recorded. Soil color was determined with a Munsell Soil Color Chart.

Saturated Hydraulic Conductivity Testing and Reporting

Saturated hydraulic conductivity (K_{SAT}) measurements were performed with a compact constant-head permeameter (Amoozemeter). An Amoozemeter was used in lieu of a double-ring infiltrometer because of the need to conduct the tests below current grade. K_{SAT} test values were generated using the published calculations and formulas found in the corresponding User's Manual (Amoozegar). The Glover solution was chosen as the most appropriate method for calculating K_{SAT} values. The Glover solution is recommended when the distance between the bottom of the auger hole and any impermeable layer(s) is greater than 2 times the head (H), or constant water level in the hole.

The Glover solution is given by: $K_{SAT} = AQ$

Where: A= {sinh-1(H/r)-[(r/H)2+1] 1/2+r/H} / (2πH2)

And: Q is the steady-state rate of water flow from the Amoozemeter into the auger hole.

To solve for A: H is the head in the hole (i.e., total water depth), and r is the radius of the hole. Values for H and r can be found on the attached K_{SAT} data sheets.

RESULTS

Soil Type and Depth to SHWT

A soil series determination was made by comparing the soil boring descriptions to the NRCS Official Series Description (OSD) and the determinations listed in Table 2. Soil profile descriptions are attached. The depth to the SHWT was determined by presence of redoximorphic soil features, particularly low chroma colors (chroma 2 or less) occurring with iron oxide concentrations.

Table 2. Soil Series Determination and Depth to SHWT.

Boring	*Soil Series Determination*	*SHWT Depth from existing surface (in)*	*Apparent Water Table (AWT) (in)*
B1	HTM over Manipulated Augusta	34	None observed
B2	HTM over Manipulated Augusta	22	None observed
B3	HTM over Manipulated Augusta	36	None observed

Saturated Hydraulic Conductivity Testing Results

Infiltration tests were conducted at each soil boring in the most limiting soil texture >8 inches in thickness within 24 inches of the natural soil surface. Depths and results of the tests are listed in Table 3. Full data sheets are attached.

Table 3. K_{SAT} Testing Parameters and Results.

Test Location & Horizon	*Test Depth from Soil Surface (in)*	*Infiltration Rate (in/hr)*
B1/K1: Bt/Btg	41	0.08
B2/K2: Bt/Btg	22	0.06
B3/K3: Bt/Btg	40	0.04
	Geometric Mean of Tests K1-K3:	**0.06**

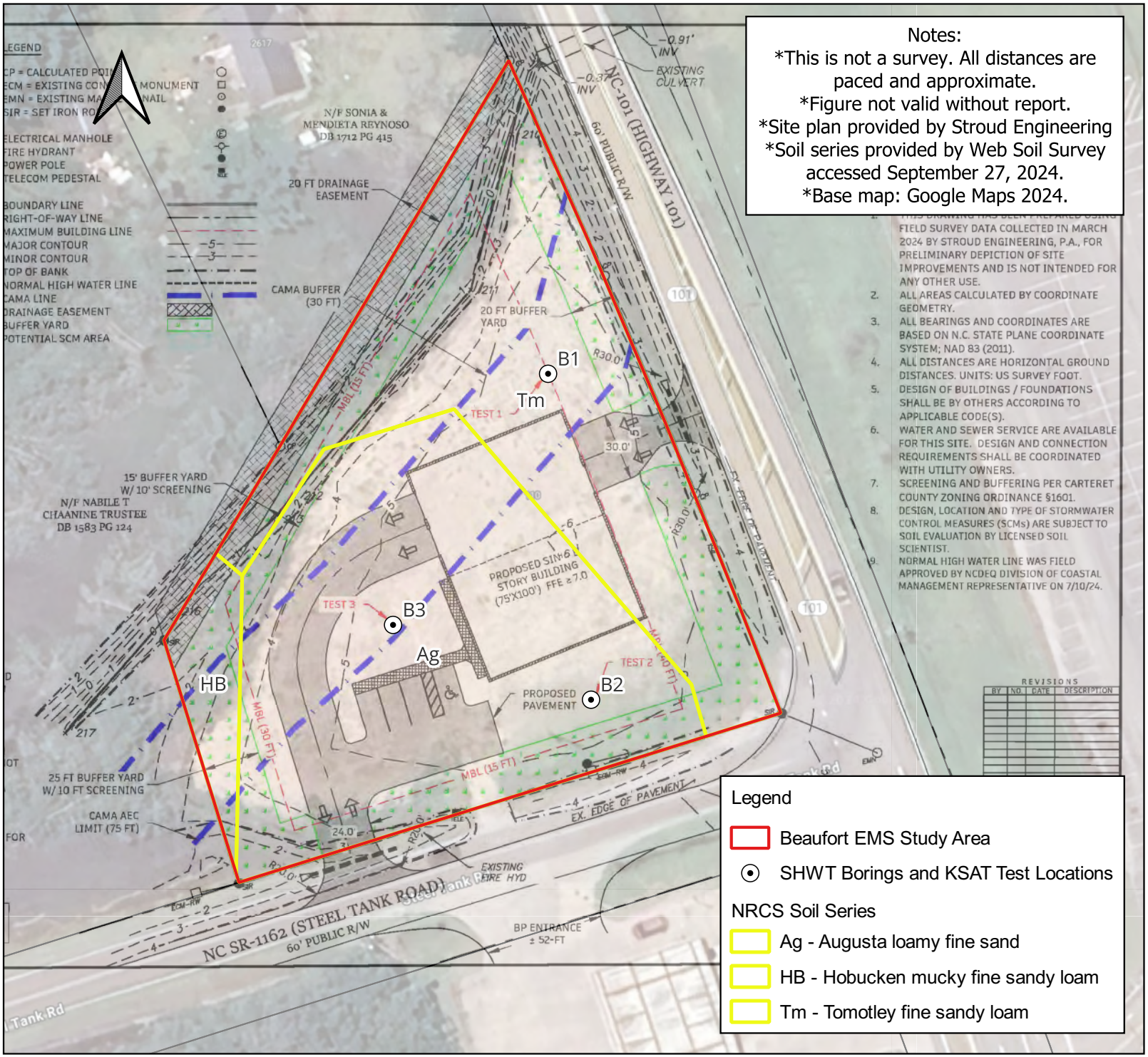
CONCLUSIONS

The findings presented herein represent Ground Truth's professional opinion based on our soil investigation. Soil characteristics indicative of a SHWT were observed at depths ranging from 22 to 36 inches from the existing surface. Infiltration tests performed in natural subsurface soil

layers resulted in a calculated geometric mean of 0.06 in/hr. This report is to assist in providing information on the existing soil characteristics.

Sincerely,

John C Roberts, LSS



Ground Truth Soil Consulting, PLLC

Beaufort Rescue & EMS Inc.
110 Steel Tank Road
Beaufort, NC
PIN: 539419528080000

SOIL & SITE EVALUATION

Carteret County

Scale:
0 30 60 ft

Figure 1

Date: September 27, 2024

GT Job No. 24-180

LICENSED SOIL SCIENTIST
JOHN C. ROBERTS
1292
STATE OF NORTH CAROLINA

SOIL EVALUATION FORM

Ground Truth Soil Consulting, PLLC
1302 Roberts Road
Newport, NC 28570
252.725.1320

Job: 24-180 Beaufort EMS
County: Carteret
Date: 9-26-24
Sheet: 1 of 1

Profile #	Horizon	Horizon Depth (In)	Structure / Texture	Consistence / Mineralogy	Matrix Color	Mottle Colors (Quantity, Size, Contrast, Color)
B1	HTM	30	- / SL + C	— / —	VA	
	Ab	34	1 m SBK / SL	FR / SS. SP	10YR 4/3	
	Bt	38	1m SBK / SCL	FI / SS, P	10YR 6/3	C, 2, F 10YR 6/2
	Btg	50	1M SBK / SCL	FI / SS. P	10YR 6/2	C, 2, F 10YR 6/3 ; C, 2, D 10YR 5/6
			SHWT @ 34" ; slope 0-2 %, No apparent water table to 50"			
			Manipulated Augusta Soil series			
B2	HTM	18	- / SL + C	- / -	VA	
	Ab	22	1m SBK / SL	FR / SS, SP	10YR 4/3	
	Btg	36	1m SBK / SCL	FI / SS, P	10YR 6/2	C, 2, F 10YR 6/3 ; C, 2, D 10YR 5/6
			SHWT @ 22" ; slope 0-2 %, No apparent water table to 36"			
			Manipulated Augusta Soil Series			
B3	HTM	26	- / SL + C	- / -	VA	
	Ab	30	1 M SBK / SL	FR / SS. SP	10YR 4/3	
	Bt	36	1m SBK / SCL	FI / SS, P	10YR 6/3	
	Btg	48	1m SBK / SCL	FI / SS, P	10YR 6/2	C, 2, D 10YR 5/6
			SHWT @ 36" Slope 0-2 %, No apparent water table to 48"			
			Manipulated Augusta soil series			

Evaluated by: JCR

SATURATED HYDRAULIC CONDUCTIVITY STUDY
110 Steel Tank Rd

Date: 9/26/2024
Location: B1
Number: 1
Horizon: Bt/Btg
Depth(inches): 41.0

Weather Condition: Sunny
Temperature (F): 78 F

SET UP

		cm	in
Hole Depth:		104.1	41.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	99.1	39.0

Valve Setting: x (1-ON, 2-ON)

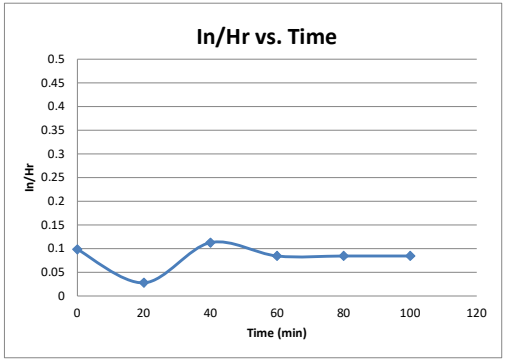
Coversion Factor (C.F.): 105.0

	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0
Hole diameter (d):	5.0	cm
Hole radius (r):	2.5	cm
coefficient A:	0.001136	

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)
46.5		105.0	0.0	0.00				
45.8	0.7	105.0	20.0	20.00	73.500	220.5	0.2505	0.0986
45.6	0.2	105.0	40.0	20.00	21.000	63.0	0.0716	0.0282
44.8	0.8	105.0	60.0	20.00	84.000	252.0	0.2863	0.1127
44.2	0.6	105.0	80.0	20.00	63.000	189.0	0.2147	0.0845
43.6	0.6	105.0	100.0	20.00	63.000	189.0	0.2147	0.0845
43	0.6	105.0	120.0	20.00	63.000	189.0	0.2147	0.0845
						Final Ksat	**0.215**	**0.085**

*Note: 10L of water run through meter before taking readings.



SATURATED HYDRAULIC CONDUCTIVITY STUDY
110 Steel Tank Rd

Date: 9/26/2024
Location: B2
Number: 2
Horizon: Bt/Btg
Depth(inches): 28.0

Weather Condition: Sunny
Temperature (F): 78 F

SET UP

		cm	in
Hole Depth:		71.1	28.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	66.0	26.0

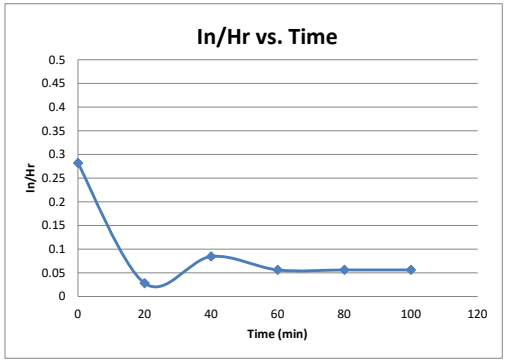
Valve Setting: x (1-ON, 2-ON)

Coversion Factor (C.F.): 105.0

	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0
Hole diameter (d):	5.0	cm
Hole radius (r):	2.5	cm
coefficient A:	0.001136	

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)
41		105.0	0.0	0.00				
39	2.0	105.0	20.0	20.00	210.000	630.0	0.7158	0.2818
38.8	0.2	105.0	40.0	20.00	21.000	63.0	0.0716	0.0282
38.2	0.6	105.0	60.0	20.00	63.000	189.0	0.2147	0.0845
37.8	0.4	105.0	80.0	20.00	42.000	126.0	0.1432	0.0564
37.4	0.4	105.0	100.0	20.00	42.000	126.0	0.1432	0.0564
37	0.4	105.0	120.0	20.00	42.000	126.0	0.1432	0.0564
						Final Ksat	**0.143**	**0.056**



SATURATED HYDRAULIC CONDUCTIVITY STUDY
110 Steel Tank Rd

Date: 9/26/2024
Location: B3
Number: 3
Horizon: Bt/Btg
Depth(inches): 40.0

Weather Condition: Sunny
Temperature (F): 78 F

SET UP

		cm	in
Hole Depth:		101.6	40.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	96.5	38.0

Valve Setting: x
1-ON 2-ON

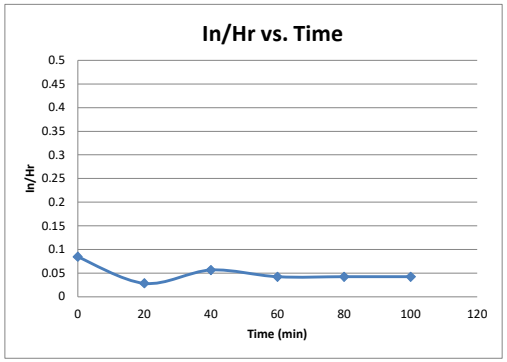
Coversion Factor (C.F.): 105.0

	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0

Hole diameter (d): 5.0 cm
Hole radius (r): 2.5 cm
coefficient A: 0.001136

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)
44		105.0	0.0	0.00				
43.4	0.6	105.0	20.0	20.00	63.000	189.0	0.2147	0.0845
43.2	0.2	105.0	40.0	20.00	21.000	63.0	0.0716	0.0282
42.8	0.4	105.0	60.0	20.00	42.000	126.0	0.1432	0.0564
42.5	0.3	105.0	80.0	20.00	31.500	94.5	0.1074	0.0423
42.2	0.3	105.0	100.0	20.00	31.500	94.5	0.1074	0.0423
41.9	0.3	105.0	120.0	20.00	31.500	94.5	0.1074	0.0423
						Final Ksat	**0.107**	**0.042**



GENERAL CONDITIONS

AIA Document A201 – 2017 – General Conditions of the Contract for Construction is referenced in these contract documents and is to be part of this contract.

This document can be obtained by contacting:

AIA North Carolina
115 West Morgan Street
Raleigh, North Carolina 27601
919-833-6656 phone
919-833-2015 fax order line

SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS AND GENERAL REQUIREMENTS

SUPPLEMENTS TO AIA DOCUMENT A-201: 2007 Edition

The following supplements modify, delete from or add to the "General Conditions of the Contract for Construction", AIA Document A-201, 2007. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect. If in the event any articles of the Construction Contract are in direct conflict with Articles of the General Conditions, the Contract shall override for that portion that may be in conflict.

ARTICLE 1:

Add the following definitions:

- ”Product” includes materials, systems, and equipment.
- "Provide" shall mean furnish and install complete in place, operational and ready for use.
- “Building Code” and “Code” refer to regulations of governmental agencies having jurisdiction
- "Or approved equal" and "equal to" shall mean substitute products by manufacturers other than those specified in the project manual, addenda, and on the drawings and which may be incorporated in the work after review and concurrence by the designer and the Owner.
- “Approved”, “required”, and “as directed” refer to and indicate the work or materials that may be approved, required or directed by the Architect acting as the agent for the “Owner
- "Indicated" and "shown" shall mean as detailed or called for and reasonably implied in the contract documents.
- "Latest edition" shall mean the current printed document issued up to 30 calendar days prior to date of receipt of bids, unless specified otherwise.
- "Drawings" or "plans" mean the drawings enumerated in the contract documents, as well as all the information in the detail manual when applicable, addenda, and designer prepared field drawings and clarification drawings.
- "Specifications" mean this project manual and addenda thereto.
- “Similar” means in its general sense and not necessarily identical.
- “Shown”, “indicated”, “detailed”, “noted”, “scheduled” and terms of similar import, refer to the requirements contained in the Contract Documents.

ARTICLE 2:

2.2.5 Add: Drawings and Specification furnished to contractors:

Final Plans, Specifications and any Addendum will be posted on the Architect’s website.

ARTICLE 3:

3.1.1 Add: The General Contractor shall be the “Project Expediter” and shall be responsible for proper coordination of all work.

3.12.11 Add: Product Data, and Samples - Each contractor shall submit electronic copies of all shop drawings, and any required samples for approval.

3.12.12 Add: The contractor shall make any corrections required by the Architect and file with him electronic) copies, when requested. Additional copies shall be furnished to other trades and prime contractors where necessary to coordinate their work.

3.12.13 Add: The Contractor shall keep at the site a current set of shop drawings that bear the stamped approval of the Architect or Engineer.

3.15.1 Add: Prior to final inspection and acceptance of the building, the General Contractor shall clean the building, including but not limited to, glass, hardware, fixtures, equipment, masonry, clean floors as specified, and completely prepare the building for use by the Owner with no cleaning required by the Owner.

Article 5:

ARTICLE 7:

7.2.1 Add: The allowances for overhead and profit combined shall not exceed fifteen (15)% of net cost except where the change involves a subcontractor; allowances shall not exceed fifteen (15)% for the subcontractor and five (5)% for the prime contractor. No allowances shall be made for overhead and profit. In the case of deductible change orders, the contractor shall include not less than seven (7)% profit, but no allowance for overhead.

At the time of signing a change order, the contractor shall certify as follows, "I certify that my bonding company will be notified forthwith that my contract has been increased or decreased 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".

All requests for Change Orders must be in writing and be supported by a breakdown showing method of arriving at net costs. Breakdown shall include materials, labor, taxes, profit & overhead.

ARTICLE 8:

8.1.2 Add: The Contractor shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed and shall fully complete work hereunder within **180** consecutive calendar days from said date. For each day in excess of the above number of days, the Contractor(s) shall pay to the Owner the sum of as $250.00 per consecutive calendar day liquidated damages, reasonably estimated in advance to cover losses to be incurred by the Owner by reason of failure of said Contractor(s) to complete work within the time specified, such time being in the essence of this Contract and a material consideration thereof.

8.2.1 Add: In planning his construction schedule within the agreed Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions will be considered by the Architect, which affects the critical path schedule. (14 weather days are part of this contract).

ARTICLE 9:

9.2 Add: Schedule of Values shall separate labor and material for each phase of the work.

The phases of work shall be broken down per each section of the specifications. Where a section includes two or more major items of work, they shall also be broken out separately including labor and material.

Each item in the Schedule of Values and Application for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

At the 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.

Submit five (5) copies, within 10 days of Notice to Proceed.

9.3.1 Add: Type of Form: Application and Certificate for Payment AIA Document G 702 and Continuation Sheet G 702A, latest edition. (The contractor may purchase these certificates from the American Institute of Architects, 1735 New York Avenue, NW, Washington, D.C.).

Number of copies: Five (5) unless otherwise noted. Must have original signatures.

Cut off for each application shall be the 25th of each month.

Application shall be in Architect's office no later than the last day of each month and shall be signed and notarized.

Retainage: Each certificate shall show, and the Owner will retain 10% of the amount of each estimate until final completion and acceptance of all work covered by the contract.

9.6.1 Add: The Owner shall make payment of each certificate no later than the last day of the following month.

ARTICLE 11:

Add: All Certificates of Insurance required by the Contract Documents shall contain a provision that coverage's afforded under the policies will not be canceled, reduced in amount or coverage's 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.

Full contract amount shall appear on each document as necessary.

Effective date on each document shall be the same as the contract document date.

Expiration date shall be sufficient to complete the project.

An authorized individual agent, licensed to do business in North Carolina, shall countersign each policy.

The title "Licensed Resident Agent" shall appear after the signature.

11.1 Add:

Shall be furnished and maintained by contractor as outlined with the following adjustments and additions.

General Liability shall include: Comprehensive forms, premises- operations, independent contractor's protective, products and completed operations broad form property damaged, and explosion and collapse hazard.

Automobile liability shall include: Comprehensive form, owned, hired, and non-owned.

Worker's Compensation and Employer's Liability in accordance with North Carolina Statutory requirements.

11.1.2 Limits shall be as follows:

Combined Single Limit
General Liability - For Bodily Injury and Property Damage
Each Occurrence = $1,000,000
General Aggregate = $2,000,000

Auto Liability - For Bodily Injury and Property Damage
Combined Single Limit = $300,000

Employer Liability for each accident = $100,000

Subcontractor's Insurance Coverage - The Contractor shall either:

1. Require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Comprehensive General Liability, Automobile Liability, and Property Insurance of the type and the same amount as specified in paragraph above; or

2. Insure the activity of his subcontractors in his own policy.

11.4.1

Performance bond and payment bond will be required for 100% of the contract price.

ARTICLE 13: MISCELLANOUS PROVISIONS

The Project Expediter shall provide temporary power required for construction for all trades and disciplines unless otherwise stated in the specifications.

The Contractor will pay for electricity and water usage. The Contractor shall assure that temporary power and water are used in a responsible manner.

ARTICLE 15:

15.1.5.1 Add: When Contract Time has been extended, as provided under this Paragraph 4.3.7.1, such extension of time shall not be considered as justifying extra compensation to the Contractor for Administrative costs or other such reasons.

15.1.5.2 Add: In planning his construction schedule within the agreed Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions will be considered by the Architect if critical path of schedule is affected. A five year average will be used for calculating adverse weather. The Newport Weather Station will be used as a reporting station.

15.1.2 Add: Mediation will be the first step in solving claims. Arbitration shall be used to settle disputes or claims only if both parties agree to arbitration, otherwise, all disputes and claims shall be settled by normal legal means.

If arbitration is agreed by both parties, then after appointment of the arbitrator or arbitrators, the parties to the arbitration shall have the right to take depositions and to obtain discovery regarding the subject matter of the arbitration and, to that end, to use and exercise all of the same rights, remedies, and procedures, and be subject to all of

the same duties, liabilities, and obligations in the arbitration with respect to the subject matter thereof, as if the matter of the arbitration were pending in a civil action before a Superior Court of the State.

END OF SECTION 00800

SECTION 00820 – SPECIAL CONDITIONS

1. **General:** Preliminary site work has been done. All contractors shall conduct their operations so as to cause the least possible interference with the normal reminder of the site. All contractors shall limit use of the site for access and storage of materials to those areas approved by the Owner. All access to the area of work must be through designated areas approved by the Owner.

2. **On Site Parking:** Parking is not permitted on the Owner's property except for construction vehicles used in the performance of the work and only where approved by the Owner.

3. **Site Security:** The present level of security for the existing site shall not be reduced in any way, due to work of this contract.

4. **Personnel Safety:** Contractor shall provide barricades and similar types of safety items required to protect anyone in the area of work from the hazards of construction activities. Roadways, walks, paths, entrances, exits, etc. shall remain unobstructed and shall be maintained in a safe and satisfactory manner.

5. **Site Protection**: Contractor shall be responsible for and shall protect adjacent site features. Any damage shall be fully corrected to the satisfaction of the Architect.

6. Access to the building site shall be only between the hours of 7:00 am – 8:00 pm, Monday through Saturday unless otherwise approved in advance.

7. The Contractor shall be responsible for obtaining all building permit fees, impact fees, development fees, etc. as required by The Town of Beaufort.

8. The Contractor shall be responsible for fire sprinkler design and installation by accredited sprinkler designers.

END OF SECTION 00820

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall, unless otherwise specified, supply all labor, transportation, materials, apparatus, fuel, water, energy, light and tools necessary for entire, proper and substantial completion of his work and shall install, maintain, and remove all equipment for the construction, other utensils or things and shall 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 structure and everything properly incidental thereto as shown on plans, stated in specifications or reasonably implied there from, all in accordance with the Contract Documents.

B. Contract type

The work will be accomplished under:

1. A single lump sum prime general contract covering general, finish sitework, mechanical, plumbing and electrical construction contract.

C. Scope of Work - scope of the work is, but not limited to as follows:

1. General Construction
2. Plumbing System
3. HVAC System
4. Electrical work
5. Site Work – Including Clearing
6. All related work
7. Fire Sprinkler Design and Installation

PART 2 & 3 - NOT USED.

END OF SECTION 01010

SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: All allowances considered in the Contract Price shall be clearly identified in the Contract and approved before signing. If the actual cost is more than, or less than the allowance, the Contract Price will be adjusted up or down accordingly when the actual cost is determined. Adjustments in the Allowances will be made by Change Order. Unless specified otherwise, the allowance amounts include the net cost of materials, and shipping charges.

B. Cash Allowance: The Contractor's overhead, profit and taxes shall be included in the Contract Price, but not in the allowance. All allowances agreed upon shall clearly indicate materials only or materials and labor included as the case may be. For allowance listed as materials only, the Contractor shall include labor and installation in his base bid price. The contractor shall submit to the Architect for approval all bills for materials under Cash Allowances.

1.2 SCHEDULE OF CASH ALLOWANCES

The Respective Bidder shall clearly identify allowances within the contract.

A.	Contingency Allowance:	$ 50,000.00 (Note: taxes, overhead, and profit are in base bid and are not part of the contingency allowance figure.)
B.	Exterior Signage	$ 2,000.00 (materials only)
C.	Hardware	$ 25,000.00 (materials only)
D.	Interior Signage	$ 2,000.00 (materials only)
E.	Tile	$ 10.00/SF (materials only)
F.	Appliances	$ 7,500.00 (materials only)
G.	Landscaping	$ 25,000.00 (materials and labor) (Note: seeding to be part of Base Bid and not part of the allowance.)

PARTS 2 & 3 - NOT USED.

END OF SECTION 01020

SECTION 01027 – APPLICATIONS FOR PAYMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included: Comply with procedures described in this Section when applying for progress payment and final payment under the Contract.

B. Related work
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Prior to start of construction, secure the Architect's approval of the Schedule of Values required to be submitted under Paragraph 9.2 of the General conditions, and further described in Section 01370 of these Specifications.

B. During progress of the work the Schedule of Value are to remain unchanged as approved by the Architect. Changes in the Contract Sum due to Change Orders or other modifications of the Contract shall be added to the Schedule of Values as Change Orders.

C. Base requests for payment on the approved schedule of values.

1.3 SUBMITTALS

1. Make submittal of request for payment by filling in the agreed data on AIA Document G702, "Application and Certificate for Payment," plus continuation sheet or sheets.
2. Sign and notarize the Application and Certificate for Payment.
3. Submit (5) originals of the Application and Certificate for Payment (Electronic copies if agreed upon by all parties.)
4. Cut off period is the 25th of the month.
5. Submittals are due in Architect's office by the last day of each month.

END OF SECTION 01027

SECTION 01045 – CUTTING AND PATCHING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included: This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the work required to:
   1. Make the several parts fit properly.
   2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
   3. Remove and replace work not conforming to requirements of the Contract Documents.
   4. Remove and replace defective work.

B. Related work
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing.
   3. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Request for Architect's consent
   1. Prior to cutting which effects structural safety, submit written request to the Architect for permission to proceed with cutting.
   2. Should conditions of the work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and any required Change Order prior to proceeding.

B. Notices to the Architect
   1. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
   2. Submit written notice to the Architect designating the time the work will be uncovered, to provide for the Architect's observation.

PART 2 – PRODUCTS

2.1 MATERIALS

A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection
   1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
   2. After uncovering the work, inspect conditions affecting installation of new work.

B. Discrepancies
   1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.
   2. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION PRIOR TO CUTTING

A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the work.

3.3 PERFORMANCE

A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications.
   1. Perform cutting and demolition by methods, which will prevent damage to other portions of the work and provide proper surfaces to receive installation of repair and new work.
   2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

END OF SECTION 01045

SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide such field engineering services as are required for proper completion of the Work including, but not necessarily limited to:
   1. Establishing and maintaining lines and levels.
   2. Structural design of shores, forms, and similar items provided by the Contractor as a part of his means and methods of construction.
   3. Geotechnical Engineering Including Footings, Slabs, and Pavement subgrade compaction.

B. Related work:
   1. Additional requirements for field engineering also may be described in other Section of these Specifications.
   2. See also General Conditions.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Upon request of the Architect, submit:
   1. Certification, signed by the Contractor's retained field engineer, certifying that elevations and locations of improvements are in conformance or non-conformance with requirements of the Contract Documents.

1.3 PROCEDURES

A. In addition to procedures directed by the Contractor for proper performance of the Contractor's responsibilities:
   1. Locate and protect control points before starting work on the site.
   2. Preserve permanent reference points during progress of the Work.
   3. Do not change or relocate reference points or items of the Work without specific approval from the Architect.
   4. Promptly advise the Architect when a reference point is lost or destroyed or requires relocation because of other changes in the Work.
      a. Upon direction of the Architect, require the field engineer to replace reference stakes or markers.
      b. Locate such replacements according to the original survey control.

B. The General Contractor shall employ a locator service to locate and mark all underground utilities as required.

PART 2 & 3 - NOT USED.

END OF SECTION 01050

SECTION 01090 - ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.1 REFERENCE TO APPLICABLE STANDARDS

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

B. Abbreviations and symbols used in the Specifications can be grouped into three (3) basic categories:
1. Abbreviations of reference symbols.
2. Abbreviations of words and phrases.
3. Symbols.

C. Among those, which may be used in the Contract Documents, are the following (with respective abbreviation used):

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACRI	Air Conditioning and Refrigeration Institute
ADC	Air Diffusion Council
AFI	Air Filter Institute
AGA	American Gas Association
AGCA	Associated General Contractors of America, Inc.
AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALS	American Lumber Standards
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for testing and Materials
ATI	Asphalt Tile Institute
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America
BRI	Building Research Institute
CABRA	Copper and Brass Research Association
CAGI	Compressed Air and Gas Institute
CE	Corps of Engineers (Army)

CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
CTI	Cooling Tower Institute
DFPA	Douglas Fir Plywood Association
ETL	Electrical Testing Laboratories
FGMA	Flat Glass Marketing Association
FHA	Federal Housing Administration
FM	Factory Mutual Engineering Division, Association of Factory Mutual Fire Insurance Companies
FPL	Forest Products Laboratory
FS	Federal Specifications
FTI	Facing Tile Institute
GA	Gypsum Association
GTA	Glass Tempering Association
HPMA	Hardwood Plywood Manufacturers Association
IBRM	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineering
IES	Illuminating Engineering Society
JAN	Joint Army-Navy Specifications
MAC	Masonry Advisory Council
MIA	Marble Institute of America
MLMA	Metal Lath Manufacturers Association
MS	Military Specifications
MSS	Manufacturers Standardization Society of the Valves and Fitting Industries
MSTD	Military Standard
NAAMM	National Association of Architectural Metal Manufacturers
NAFM	National Association of Fan Manufacturers
NAPF	National Association of Plastic Manufacturers
NBHA	National Builders Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electric Code (NFPA Pamphlet No. 70)
NEMA	National Electric Manufacturers Association
NEMI	National Elevator Manufacturing Industry, Inc.
NFC	National Fire Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NHLA	National Hardwood Lumber Association
NHPMA	Northern Hardwood and Pine Manufacturers Association
NPA	National Particleboard Association
NPCA	National Paint and Coatings Association
NRMCA	National Ready Mixed Concrete Association
NSC	National Safety Council
NSF	National Sanitation Foundation
NTMA	The National Terrazzo and Mosaic Association, Inc.
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PEI	Porcelain Enamel Institute, Inc.
PS	Product Standard, U.S. Department of Commerce
RIS	Redwood Inspection Service
RTI	Resilient Tile Institute
SAE	Society of Automotive Engineers
SBI	Steel Boiler Institute
SCMA	Southern Cypress Manufacturers Association
SDI	Steel Deck Institute
SDI	Steel Door Institute
SJI	Steel Joint Institute

SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SMFMA	Sprayed Mineral Fiber Manufacturers Association, Inc.
SPIB	Southern Pine Inspection Bureau
SSPC	Steel Structures Painting Council
SWFPA	Structural Wood Fiber Products Association
TCA	Tile Council of America
TEMA	Tubular Exchange Manufacturing Association
TIMA	Thermal Insulation Manufacturers Association
TPI	Truss Plate Institute
UL	Underwriter's Laboratories, Inc.
UPC	Uniform Plumbing Code
WRI	Wire Reinforcement Institute
WWPA	Western Wood Products Association

1.2 ABBREVIATIONS OF WORDS AND PHRASES

A. Abbreviations of words and phrases applicable to this Project; other than listed above for reference standards, shall be as shown on the Drawings.

1.3 SYMBOLS

A. Symbols representing construction materials and the equipment applicable to this Project shall be as shown on the Drawings.

PART 2 & 3 - NOT USED.

END OF SECTION 01090

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Architect will conduct project meetings throughout the construction period.

B. Related work:
1. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content. If subcontractor's issues are of a concern, it can be communicated at this meeting, but management of the subcontractor will remain the responsibility of the Contractor.

1.2 SUBMITTALS

A. Agenda items: To the maximum extent practicable, advise the Architect at least 24 hours in advance of project meetings regarding items to be included in or added to the agenda.

B. Minutes:
1. The Architect or Owner's representative will compile minutes of each project meeting, and will furnish one copy to Contractor and required copies to the Owner.
2. Recipients of copies may make and distribute such other copies as they wish.

1.3 QUALITY ASSURANCE

A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

PART 2 - PRODUCTS

(No products are required in this Section)

PART 3 - EXECUTION

3.1 GENERAL

A. Except as noted below for Pre-Construction Meeting, project meetings will be held monthly, unless project dictates differently.

B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.2 PRECONSTRUCTION MEETING

A. Pre-construction Meeting will be held as soon as possible after the written Notice to Proceed.
1. Provide attendance by authorized representatives of the Contractors and major subcontractors.
2. The Architect or Owner's representative will advise other interested parties, including the Owner, and request their attendance.

B. Minimum agenda: Data will be distributed and discussed on at least the following items:
   1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Architect.
   2. Channels and procedures for communication.
   3. Construction schedule, including sequence of critical work.
   4. Contract Documents, including distribution of required copies of original Documents and revisions.
   5. Processing of Shop Drawings and revisions.
   6. Processing of Bulletins, field decisions, and Change Orders.
   7. Rules and regulations governing performance of the Work
   8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

3.3 PROJECT MEETINGS

A. Attendance:
   1. To the maximum extent practical, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
   2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

B. Minimum agenda:
   1. Review progress of the Work since last meeting, including status of submittals for approval.
   2. Identify problems, which impede planned progress.
   3. Develop corrective measures and procedures to regain planned schedule.
   4. Complete other current business.

END OF SECTION 01200

SECTION 01310 - SCHEDULES AND REPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and other Division 1 specifications sections, apply to work of this section.

1.2 DESCRIPTION

A. Post Award Requirements
1. Draft of Construction Schedule: Within two weeks of Date of Commencement of the Work, Contractor shall complete draft of time-scaled CPM Construction Schedule. (Bar chart is acceptable.)
2. Level of Detail: Except for procurement and General Conditions requirements, differentiate activities on schedule so that no single activity shown requires more than twenty-one (21) calendar days to complete.

B. Schedule of Values
1. Within seven (7) days after completion of CPM Construction Schedule and before first pay request, Contractor shall submit Schedule of Values (see Section 01370) for review by the Architect allocating a dollar value for each activity on Construction Schedule. Dollar value for each activity will include cost broken into labor, materials, and pro rata contribution to overhead and profit. Subcontract sums will be identified on the Schedule of Values and broken down as described above.

C. Approval
1. Approval of Construction Schedule and Schedule of Values will be signified by the Architect and Contractor's joint signatures on one copy of each document. Thereafter, Project will be monitored with Construction Schedule, which Contractor shall use in planning, organizing, directing, coordinating, and executing the Work and which shall be the basis for evaluating the progress of the Work.

D. Schedule Revisions
1. General: Revisions to approved Construction Schedule must be approved in writing by Architect and Contractor.
2. Contractor: Submit requests for revisions to schedule to Architect together with written rationale and description of logic for rescheduling work to maintain Specific Contractual Milestone Dates.
a.Proposed revisions acceptable to the Architect will be incorporated into next update of Construction Schedule by the Contractor.
3. Owner: Changes initiated by Owner and implemented by Change Orders which potential to affect critical dates will require Contractor to prepare revised schedule for the Architect's concurrence. The Architect's approved revisions will be incorporated into the Construction Schedule. Adjustments in scheduled completion dates, either for intermediate activities or for Contract as a whole, will be considered only to extent that there is not sufficient float to absorb the revisions accepted.

E. Recovery Schedule
1. General: Should updated Construction Schedule show Contractor to be four-teen (14) or more days behind schedule at any time during construction, the Architect may require Contractor to prepare Recovery Schedule, displayed in CPM format, which will display Contractor's plan for returning to schedule within subsequent pay period.

2. Schedule Preparation: Within seven (7) days after notice from the Architect, prepare and submit to the Architect a Recovery Schedule, incorporating best available information from Subcontractors and others which will permit return to Construction Schedule within subsequent pay period. Prepare Recovery Schedule to same level of detail as Construction Schedule.
3. Schedule Assessment: Seven (7) days prior to expiration of Recovery Schedule, confer with the Architect to assess effectiveness of Recovery Schedule. As a result of this conference, the Architect will direct Contractor as follows:
4. Behind Schedule: If the Architect determines Contractor is still behindschedule, the Architect will direct Contractor to prepare another Recovery Schedule for subsequent pay period.
5. On Schedule: If the Architect determines Contractor has successfully complied with provisions of Recovery Schedule, the Architect will direct Contractor to return to use of Construction Schedule.

PARTS 2 & 3 - NOT USED.

END OF SECTION 01310

SECTION 01340 - SUBMITTALS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to General Conditions Amendments to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Individual requirements for submittals also may be deceived in pertinent Sections of these Specifications.

C. Work not included:
1. Unrequired submittals will not be reviewed by the Architect.
2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Architect.

1.2 SUBMITTALS

A. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.

B. Coordination of Submittals:
1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
2. Verify that each item and the submittal for it CONFORMS IN ALL RESPECTS to the specified requirements.
3. By affixing his signature to each submittal, the Contractor certifies that THIS COORDINATION HAS BEEN PERFORMED.
4. The Contractor shall stamp the shop drawings as "Approved" or "Approved as Noted" before submitting to Architect or Owner’s representative for review.

1.3 QUALITY ASSURANCE

A. "Equals" and "Substitutions"
1. The Contract is based on the standards of quality established in the Contract Documents. Requests for substitutions will be considered when submitted according to the procedures set forth below.
a. Particularly with regard to MAJOR materials, equipment or methods proposed for the Work as set forth in the Contract Documents, Contractor's request(s) for approvals of "equals" not specifically named in the Contract Documents MUST BE SUBMITTED IN WRITING with supporting documentation, and in the hands of the Architect prior to contract award. Telephone requests for consideration of proposed "equals" will not be accepted.

b. On other items of Work, Contractor may request consideration of substitution, when submitted in writing with supporting documentation within thirty (30) days following the Notice to Proceed.

B. Where the phrase "or equal" or "equal as approved by Architect" occurs in the Contract Documents, do not assume that the Contractor's choice of materials, equipment, or methods will be approved as equal unless the item has been specifically approved for this Work by the Architect.

C. Do not substitute materials, equipment, or methods unless such substitution has be specifically approved in writing for this Work by the Architect.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS

A. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its methods of connection to the Work.

B. Types of prints required:
   1. Submit Shop Drawings in electronic format.

C. Review comments of the Architect will be shown in red on prints and returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

2.2 MANUFACTURER'S LITERATURE

A. Where contents of submitted literature from the manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.

B. Submit three copies of each which are required to be returned, plus one copy which will be retained by the Architect.

2.3 SAMPLES

A. Provide Sample or Samples identical to the precise article proposed to be provided. Identify as described under "Identification of Submittals" below.

B. Number of Samples required:
   1. Unless otherwise specified, submit one sample in the quantity, which is required to be returned, plus on which will be retained by the Architect.
   2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Architect.
   3. Except as noted in 2.3.B.2 above, no selections of color, texture or finish will be approved by the Architect until ALL substitutions have been approved by the Architect, and ALL necessary samples and color, texture, finish proposals have been submitted in their entirety by the Contractor, in order that a coordinated, total scheme may be developed by the Architect.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals. (ie: G-1, G-2.....etc. for General Construction, P-1, P-2, ... etc. for Plumbing; M-1, M-2, ...etc. for Mechanical (HVAC); E-1, E-2, ...etc. for Electrical; SP-1, SP-2....etc for Sprinkler System; SU-1, SU-2, ... etc. for Site/Utilities.

1. When material is resubmitted of any reason, transmit under a new letter of transmittal and with a shop drawing number. (G-1r)
2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Architect for his review upon request.

3.2 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
1. Partial submittals may be rejected as not complying with the provisions of the Contract.

3.3 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of schedule dated for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery. All submittals shall be submitted within ninety (90) days of the notice to proceed.

3.4 ARCHITECT'S REVIEW

A. Review by the Architect or Owner’s representative does not relieve the Contractor from responsibility for errors, which may exist in the submitted data.

B. Revisions
1. Make revisions required by Architect or Owner’s representative.
2. If the Contractor considers any required revision to be a change, he shall so notify the Architect or Owner’s representative as provided in the General Conditions.
3. Make only those revisions directed or approved by the Architect.

END OF SECTION 01340

SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide a detailed breakdown of the agreed Contract sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Amendments to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Schedule of values may be described on the continuation sheet of AIA document G702 accompanying applications for payment.
3. Schedule of values is required under Paragraph 9.2 of the General Conditions.

1.2 QUALITY ASSURANCE

A. Use required means to assure arithmetical accuracy of the sums described.

B. When so required by the Architect or Owner's representative, provide copies of the subcontracts or other data acceptable to the Architect or Owner's representative, substantiating the sums described.

1.3 SUBMITTALS

A. Prior to first application for payment, submit a proposed schedule of values to the Architect. See Section 01310.
1. Meet with the Architect and determine additional data, if any, required to be submitted.
a. Mobilization, Submittal Review, Material Delivery, Execution of the Work, and Punchlisting shall be included in the schedule.
b. Mobilization shall be billed on a monthly basis equally distributed throughout construction contract time.
c. Materials and Labor breakdowns should be provided for each portion of work.
d. All General Conditions items shall be broken out separately.
e. All labor and materials are to be broken out separately.

2. Secure the Architect or Owner's representative's approval of the schedule of values prior to submitting first application for payment.

PART 2 & 3 - NOT USED.

END OF SECTION 01370

SECTION 01410 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall select a testing laboratory qualified in accordance with ASTM E329.

B. The Contractor shall pay for all testing and inspection services as are specified in this Section and/or elsewhere in the Contract Documents, except as otherwise noted.

C. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Amendments to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Requirements for testing may be described in various Sections of these Specifications.
3. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.

D. Work not included:
1. Selection of testing laboratory: The Contractor will select a prequalified independent testing laboratory.
   a. ECS
   b. SM&E
2. Payment for initial testing: The Contractor will pay for all initial services of the testing laboratory as further described in Artcle 2.1 of this Section.

1.2 QUALITY ASSURANCE

A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.

1.3 PRODUCT HANDLING

A. Promptly process and distribute required copies of test reports and related instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

PART 2 - PRODUCTS

2.1 PAYMENT FOR TESTING

A. The Contractor will pay for initial testing services required.

B. When initial tests indicate non-compliance with the Contract Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency, and costs shall be the sole responsibility of the Contractor.

C. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing be performed under current pertinent

standards for testing. If testing reveals the work to be in compliance with Contract requirements, Owner will pay for these testing services. If work is found to be in non-compliance with Contract requirements, Contractor shall pay for these testing services.

D. Inspections and tests required by codes or ordinances, or by a plan approval authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

2.2 CONTRACTOR'S CONVENIENCE TESTING

A. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 3 - EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY

A. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its function properly. All testing shall be coordinated by the Architect.

3.2 TAKING SPECIMENS

A. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

3.3 SCHEDULES FOR TESTING

A. Establishing schedule: (Contractor shall be responsible for scheduling Testing Laboratory.)
   1. By advance discussion with the testing laboratory approved by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
   2. Provide all required time within the construction schedule.

B. Revising schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule: When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

END OF SECTION 01410

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:

1. Temporary utilities such as heat, water, electricity, facsimile machine and telephone
2. Sanitary facilities
3. Enclosures such as tarpaulins, barricades, and canopies
4. Project sign
5. Field office for the Contractor's personnel
6. Temporary fencing of the construction site

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Amendments to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work are not part of this Section.

3. Permanent installation and hookup of the various utility lines are described in other Sections.

1.2 PRODUCT HANDLING

A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

1.3 LOCAL REGULATIONS

A. Comply with all local ordinances including local and temporary facilities, parking and storage.

PART 2 - PRODUCTS

2.1 UTILITIES

A. Water:

1. The Contractor and his Plumbing Subcontractor to provide necessary temporary piping and water supply and, upon completion, remove such temporary facilities.

2. Contractor will pay for water used in construction.

B. Electricity:

1. The Contractor and his Electrical Subcontractor to provide necessary temporary

wiring and, upon completion of the Work, remove such temporary facility.

2. Provide area distribution boxes so located that the individual trades may furnish and use 100’ maximum length extension cords to obtain power and lighting at points where needed for work, inspection, and safety.

3. Amounts of electricity during the construction will be paid for by the Contractor.

C. Heating: Provide and maintain temporary heat necessary for proper conduct of operations needed in the Work.

D. Telephone:

1. Make necessary arrangements and pay costs for installation and operation of telephone service to the Contractor's office at the site.

2. Make the telephone available to the Architect or Owner’s representative for use in connection with the Work.

E. Document Scanner

1. Make necessary arrangements and pay costs for installation and operation of document scanner machine to the Contractors office at the site.

2. Make the document scanner machine available to the Architect or Owner’s representative for use in connection with the Work.

F. E-MAIL:

1. Make necessary arrangements and pay costs for installation and operation of email to the contractor’s office at the site.
2. Contractor shall maintain a digital camera at the site for progress photos to be emailed to Architect or Owner’s representative. Photos to be submitted on at least a weekly basis.

G. Temporary Fire Protection:

1. Contractor to provide any and all temporary construction fire extinguishers and standpipes required for the duration construction.

2.2 FIELD OFFICES AND SHEDS

A. Contractors facilities:

1. Provide a field office building and sheds adequate in size and accommodation for Contractors offices, supply and storage.

2. Within the Contractor's facilities, provide enclosed space adequate for holding project meetings. Furnish with table, chairs, and utilities.

B. Sanitary facilities:

1. Provide temporary sanitary facilities in the quantity required for use by all personnel.

2. Maintain in a sanitary condition at all times.

2.3 ENCLOSURES

A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

1. All apparatus, equipment, temporary and permanent construction shall meet all local and State labor laws and safety regulations applicable thereto.

2.4 TEMPORARY FENCING

A. Owner will provide a temporary fence of design and type needed to prevent entry onto the Work by the public. Contractor shall coordinate installation and location. It shall be the Contractor's responsibility to maintain the fence for the duration of the construction.

2.5 PROJECT SIGN

A. Project signs shall only be installed where approved by Owner.
B. Upon completion of the Work, demount the project signs.
C. Except as otherwise specifically approved by the Architect, do not permit other signs or advertising on the job site.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Architect or Owner's representative.

3.2 TRAFFIC COORDINATION

A. Any construction related activities, such as receiving, loading, unloading, or other activities which may be an interruption to normal vehicular traffic flow on the site shall be coordinated in advance by the Contractor with the Owner or public authority having jurisdiction.

END OF SECTION 01500

SECTION 01620 - PRODUCT HANDLING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to the General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Include within the Contractor’s quality assurance program such procedures as are required to assure full protection of work and materials.

1.3 MANUFACTURER'S RECOMMENDATIONS

A. Except as otherwise approved by the Architect, determine and comply with manufacturer's recommendations on product handling, storage and protection.

1.4 PACKAGING

A. Deliver products to the job site in the manufacturer's original containers with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.
2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements at no additional cost to the Owner.

B. The Architect may reject as non-complying, material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

B. Provide protection for finished floor surfaces in traffic are prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 REPAIRS AND REPLACEMENTS

A. In the event of damage, promptly make replacement sand repairs to the approval of the Architect, and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION 01620

SECTION 01710 - CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Throughout the construction period, maintain the building and site in a standard of cleanliness as described in this Section.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Amendments to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section. Comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPATIBILITY

A. Use only the cleaning materials and equipment, which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:
1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.
5. The building shall be cleaned daily of all debris and waste material resulting from the construction operations.

END OF SECTION 01710

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RECORD DRAWINGS

A. Contractors shall maintain a set of Record Drawings at the project site. These shall be kept legible and current, and shall be available at all times for the inspection of the Architect. All differences or changes in the contract work, or work added, shall be recorded daily on these Record Drawings in a contrasting color.
B. The Architect or Owner's representative shall approve the Record Drawings.
C. Receipt and approval of Record Drawings are prerequisites for final payment.

1.2 MANUALS

A. Each Contractor shall submit to the Architect or Owner's representative before final acceptance three copies of all installation, operating instructions, and maintenance instructions on the equipment and materials furnished under his contract. Each set of copies shall be bound in a 3-ring, loose-leaf binder for 8-1/2" x 11 " paper. Label binder designating the name of the project, the names of the Owner, the name of the Contractor, and the equipment or materials included in the manual.

1.3 GUARANTEES AND WARRANTIES

A. Contractors shall submit to the Architect or Owner's representative before final acceptance three originals of all warranties, guarantees, and surety bonds. All such documents shall show the name and location of the project and the name of the Owner.

PART 2 & 3 - NOT USED.

END OF SECTION 01720

SECTION 02982 - TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

A. Work included but not limited to:
1. Furnish and install a complete "preconstruction" soils treatment under and adjacent to building to provide uniform toxic barrier in all routes of termite entry.

1.3 PROTECTION

A. Allow no disturbance of treated soil between application of poison and pouring of concrete, including protection against rain or snow.

1.4 GUARANTEE

A. Upon completion of soil treatment and as a condition of its final acceptance, furnish Owner written guarantee against subterranean termite infestation for a period of at least five years from acceptance date of project. Treat evidence of infestation within guarantee period at no cost to Owner.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT SOLUTION

A. Use only termiticides, which bear a Federal registration number of the U.S. Environmental Protection Agency.

B. Soil Treatment Solution: Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a dilutent. Provide a solution as recommended by Applicator if also acceptable to Architect and approved for intended application by Environmental Protection Agency and NC Department of Agriculture, Structural Pest Control Division.

PART 3 - EXECUTION

3.1 Application shall be in strict accordance with manufacturer's label recommendations and as permitted by the Environmental Protection Agency and N.C. Department of Agriculture, Structural Pest Control Division.

END OF SECTION 02982

SECTION 31 2200
GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of topsoil.

B. Rough grading the site for site structures and parking lot..

C. Finish grading.

1.02 RELATED REQUIREMENTS

A. Section 31 2323 - Fill: Filling and compaction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: See Section 31 2323.

B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

E. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

F. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL REMOVAL

A. Stockpile topsoil to be re-used on site; remove remainder from site.

B. Stockpile subsoil to be re-used on site; remove remainder from site.

C. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.

3.05 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.

2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. Where topsoil is to be placed, scarify surface to depth of 3 inches.

D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

E. Place topsoil in areas where seeding are indicated.

F. Place topsoil during dry weather.

G. Remove roots, weeds, rocks, and foreign material while spreading.

H. Near plants spread topsoil manually to prevent damage.

I. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

J. Lightly compact placed topsoil.

3.06 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

B. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.07 CLEANING

A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 31 2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for paving and site structures.

B. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Site grading.

1.03 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

1.04 REFERENCE STANDARDS

1.05 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where indicated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill - Fill Type 1: Imported borrow or on site subsoil complying with ASTM D 2487, Types SW, SP, SM, SC.

B. General Fill - Fill Type 2: Subsoil excavated on-site.

C. Structural Fill - Fill Type 3: Conforming to State of North Carolina Highway Department standard.

D. Sand - Fill Type 4: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.

2.02 SOURCE QUALITY CONTROL

A. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 2200 for additional requirements.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.
   1. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving and similar construction: 97 percent of maximum dry density.

H. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Backfill for Undercut Areas: Sand Type 4.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

3.06 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 32 1216

ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Single course bituminous concrete paving.

C. Double course bituminous concrete paving.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Preparation of site for paving and base.

B. Section 31 2323 - Fill: Compacted subgrade for paving.

1.03 REFERENCE STANDARDS

A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; 1997.

B. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

C. NCDOT Standard Specifications for Roads and Structures, latest edition

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with State of North Carolina Highways standard.

B. Mixing Plant: Conform to State of North Carolina Highways standard.

C. Obtain materials from same source throughout.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: ASTM D946.

B. Aggregate for Base Course: In accordance with State of North Carolina Highways standards.

C. Aggregate for Wearing Course: In accordance with State of North Carolina Highways standards.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Wearing Course: Type SF 9.5A State of North Carolina Highways standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 PLACING BASE COURSE

A. Under Bituminous Concrete Paving:
   1. Place coarse aggregate to a total compacted thickness of 6 inches.
   2. Compact to 95 percent of maximum dry density.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

D. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.03 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with State of North Carolina Highways standards.

B. Place asphalt within 24 hours of applying primer or tack coat.

C. Place to 1 inch compacted thickness.

D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.04 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place wearing course within two hours of placing and compacting binder course.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.05 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 1313
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks.

1.02 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

B. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.

C. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.

D. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.

E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

F. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.

G. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

H. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

A. Concrete Sidewalks and Median Barrier: 3,000 psi 28 day concrete, 4 inches thick, buff color Portland cement, exposed aggregate finish.

2.02 FORM MATERIALS

A. Wood form material, profiled to suit conditions.

2.03 REINFORCEMENT

2.04 CONCRETE MATERIALS

A. Obtain cementitious materials from same source throughout.

B. Cement: ASTM C150/C150M, Normal - Type I Portland cement, gray color.

C. Fine and Coarse Mix Aggregates: ASTM C33/C33M, uniformly graded.

D. Air-Entraining Admixtures: ASTM C260/C260M.

E. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing.

2.05 ACCESSORIES

2.06 CONCRETE MIX DESIGN

A. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

B. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 3000 psi.
   2. Water-Cement Ratio: Maximum 45 percent by weight.

2.07 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

3.02 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.03 JOINTS

A. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other rigid structures.

B. Provide grooved joints, 1/8 inch wide at an optimum time after finishing. Cut 1" into depth of slab with 1/8 inch radii
   1. At 5 feet intervals.

3.04 FINISHING

A. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

3.05 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION

SECTION 32 1723.13
PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Parking lot markings, including parking bays.

1.02 RELATED REQUIREMENTS

A. Section 32 1216 - Asphalt Paving.

1.03 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

B. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.05 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

A. Line and Zone Marking Paint: MPI (APL) No. 97 Latex Traffic Marking Paint; color(s) as indicated.
   1. Parking Lots: White.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Clean surfaces thoroughly prior to installation.
   1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.

D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

3.03 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.

C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.

D. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.

E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.

F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
   1. Apply paint in one coat only.
   2. Wet Film Thickness: 0.015 inch, minimum.
   3. Width Tolerance: Plus or minus 1/8 inch.

G. Parking Lots: Apply parking space lines indicated on drawings.
   1. Mark the International Handicapped Symbol at indicated parking spaces.
   2. Hand application by pneumatic spray is acceptable.

3.04 DRYING, PROTECTION, AND REPLACEMENT

A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.

B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.

C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.

D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.

E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.

F. Replace removed markings at no additional cost to Owner.

END OF SECTION

SECTION 32 9219

SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Placing topsoil.

C. Seeding, mulching and fertilizer.

D. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

B. Section 31 2323 - Fill: Topsoil material.

1.03 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.06 MAINTENANCE SERVICE

A. Furnish maintenance of seeded areas for three months from Date of Substantial Completion.

B. Maintain seded areas immediattely after plaement until grass is well established and exhibits a vigorous growing condition.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. Seed Mixture: All rates are in pounds per acre.

1. March 1-August 31
    a. 18 lbs. Creeping Red Fescue
    b. 6 lbs. Indiangrass
    c. 8 lbs. Little Bluestem
    d. 4 lbs. Switchgrass
    e. 25 lbs. Browntop Millet
    f. 500 lbs. Fertilizer
    g. 4000 lbs. Limestone
2. Semptember 1 - February 28
    a. 18 lbs. Creeping Red Fescue
    b. 6 lbs. Indiangrass
    c. 8 lbs. Little Bluestem
    d. 4 lbs. Switchgrass

e. 35 lbs. Rye Grain
f. 500 lbs. Fertilizer
g. 4000 lbs. Limestone

2.02 SOIL MATERIALS

A. Respread from stockpile.

2.03 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Fertilizer: recommended for grass, with fifty percent of the elements derived from orgainc sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated by analysis.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

A. Prepare subgrade in accordance with Section 31 2200.

B. Place topsoil in accordance with Section 31 2200.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil and prior to roller compaction.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 SEEDING

A. Apply seed evenly in two intersecting directions. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Do not sow immediately following rain, when ground is too dry, or during windy periods.

D. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

E. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 HYDROSEEDING

A. Apply seeded slurry with a hydraulic seeder at a rate of recommended rate lbs per 1000 sq ft evenly in two intersecting directions.

B. Do not hydroseed area in excess of that which can be mulched on same day.

C. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

E. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.06 MAINTENANCE

A. Water to prevent grass and soil from drying out.

B. Roll surface to remove minor depressions or irregularities.

C. Immediately reseed areas that show bare spots.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.
B. Concrete paving and walks are specified in Division 2.
C. Finishes and concrete floor toppings are specified in Division 9.
D. Post-tensioned slabs and beams are specified in Section 03365.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
   1. Shop drawings for reinforcement, showing bending, and placement of concrete reinforcement. Comply with ACI 315 “Manual of Standard Practice for detailing Reinforced Concrete Structures” showing bar schedules, bar spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Copies of the contract drawings shall not be marked and submitted as shop drawings.
   2. Concrete Mix Design for each type and strength of concrete shown on the plans.
   3. Laboratory test reports for the following:
      a. Aggregate gradation tests
      b. Concrete mix design tests - Submit test records in accordance with the requirements of ACI 301 and the provisions of this specification.
   4. Materials certificates or manufacturer’s literature signed by manufacturer and Contractor, certifying that each material item complies with the provisions of this specification for the following:
      a. Aggregates
      b. Admixtures
      c. Reinforcement
      d. Cement
      e. Waterstops
   5. Product data for embedded and drilled in place anchors.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with the applicable provisions of the following standards except as modified by the supplemental requirements specified in this section:
   1. ACI 318, "Building Code Requirements for Reinforced Concrete."
   2. ACI 301, “Standard Specification for Structural Concrete”
   3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."

B. Concrete Testing Service: The independent testing agency, including branch office used, referred to in this section shall meet the requirements of ASTM E 329 and shall have been inspected within the past 3 years by the Cement and Concrete Reference Laboratory of the NBS and shall have corrected any deficiencies noted.

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

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on 4 edges. Structural design of formwork is contractor's responsibility.

B. Form Coatings: Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
   1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
   2. Where concrete will be exposed to view in the finished structure, the portions of all bar supports within 1/2 inch of the concrete surface shall be non-corrosive or protected against corrosion.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I. Use one brand of cement throughout project unless otherwise acceptable to the Engineer.

B. Fly Ash: If used, it shall conform to the following requirements:
   1. Maximum substitution of fly ash for Portland cement shall not exceed 20 percent of cement content by weight.
   2. Fly ash shall meet the requirements of ASTM C 618, Type F, except loss on ignition shall not exceed 4 percent.
   3. Use of fly ash shall be indicated on the mix design submittal.
   4. Submit a Materials Certification to the Engineer indicating the fly ash meets the stated requirements.

C. Aggregates:
   1. General:
      a. Provide hardrock aggregate complying with ASTM C33, with additional attributes as specified herein.
      b. For making grading tests of fine and coarse aggregate, use square mesh wire cloth complying with ASTM E11.
   2. Fine aggregate:
      a. Provide washed natural sand having strong, hard, durable particles, and containing not more than 2% by weight of deleterious matter such as clay lumps, mica, shale, or schist.
      b. Grade from coarse to fine within the following limits for percentage by weight passing sieve:

Sieve Size:	Minimum:	Maximum:
3/8"	100	----
No. 4	95	100
No. 8	65	95

No. 16	45	75
No. 30	30	50
No. 50	10	22
No. 100	2	8

3. Coarse Aggregate:

a. Provide coarse aggregate consisting of clean, hard, fine grained, sound crushed rock or washed gravel, or a combination of both, containing not more than 5% by weight flat, chip-like, thin, elongated, friable, or laminated pieces, not more than 2% by weight of shale or cherty material. Any piece having a length in excess of five times the average thickness shall be considered flat or elongated.

b. Use coarse aggregate of the largest practicable size for each condition of placement, except: Do not exceed ¾ of the clear distance between reinforcing bars, 1/5th of the narrowest dimension between sides of forms, of 1/3rd the depth of any slab section.

c. Grade combined aggregate within the following limits for percentage by weight passing sieve:

Sieve	1-1/2" Aggr.		1" Aggr.		3/4" Aggr.	
Size:	Min	Max	Min	Max	Min	Max
1-1/2"	95	---	---	---	---	---
1"	75	90	90	100	---	---
3/4"	55	77	70	90	90	100
3/8"	40	55	45	65	60	80
No. 4	30	40	31	47	40	60
No. 8	22	35	23	40	30	45
No. 16	16	30	17	35	20	35
No. 30	10	20	10	23	13	23
No. 50	2	8	2	10	5	15
No. 100	0	3	0	3	0	5

D. Water: Drinkable, clean and free from deleterious amounts of acid alkali, salts, and organic materials.

E. Admixtures: Provide admixtures for concrete that contain not more than 0.1 percent chloride ions.
1. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G.
4. The use of set control additives may only be used with the prior approval of the Engineer. The additives shall only be added at the point of batching.

2.4 OTHER MATERIALS

A. Waterstops: Provide flat, dumbbell-type or centerbulb-type waterstops at all construction joints and other joints as required. Size to suit joints.
1. Rubber Waterstops: Corps of Engineers CRD-C 513.
2. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.

B. Vapor Barrier: Moistop reinforced or equal (Poly or VisQueen will not be acceptable).

C. Liquid Membrane-Forming Curing Compound: Liquid-type membrane- forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. Ft./gal.

D. Expansion Joint Material: Self-expanding, non-extruding, 1/2”, cork complying with ASTM D 1751.

E. Isolation Joint Material: Shall be the thickness shown on the drawings and shall comply with ASTM D 1751.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

B. Submit written reports to Engineer of each proposed mix for each type and strength of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by the Engineer.

C. Design mixes to provide normal weight concrete with the following properties, unless otherwise indicated on drawings and schedules:
1. Floor Slabs: 5000-psi, 28-day compressive strength; W/C ratio, 0.40 maximum.
2. Footings and grade beams; 3000-psi, 28-day compressive strength.
3. Post-tension slabs, cast-in-place walls, columns; 5000psi, 28 day compressive strength.

2.6 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 (HRWR) in pumped concrete, concrete for 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 all concrete exposed to freezing and thawing. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 5 percent with a tolerance of plus or minus 1-1/2 percent. Other concrete not exposed to freezing, thawing, or hydraulic pressure or to receive a surface hardener shall have 2 percent to 4 percent air content.

D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Footings and slabs on grade: Not more than 3 inches.

4. Concrete containing HRWR admixture (Superplasticizer): Not more than 6 inches after addition of HRWR to site-verified 2-inch slump concrete.
3. Other concrete: Not more than 4 inches.

2.7 CONCRETE MIXING

A. Job-Site Mixing: not allowed for this project
B. Ready-Mix Concrete:
1. Comply with requirements of ASTM C 94, and as specified.
2. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
3. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity.

PART 3 - EXECUTION

3.1 GENERAL

A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.2 FORMS

A. General: Design, erect, support, brace, and maintain formwork to support vertical and 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 complying with ACI 347.

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, sinkages, keyways, recesses, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

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.

D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. 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.

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

3.3 VAPOR BARRIER INSTALLATION

A. General: Following leveling and tamping of granular base for slabs on grade, place vapor barrier sheeting with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal vapor barrier joints with manufacturers' recommended mastic and pressure-sensitive tape.

C. After placement of vapor barrier, cover with sand cushion and compact to depth as hown on drawings.

3.4 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, required. Avoiding cutting or puncturing vapor barrier during reinforcement placement and concreting operations.

D. Place reinforcement to obtain at least minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Welding of bar reinforcement will not be permitted unless otherwise indicated on the drawings.

F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to the Engineer.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated.

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

E. Waterstops: Provide waterstops in all construction joints and/or as required. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Field-fabricate joints in waterstops in accordance with manufacturer's printed instructions.

F. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated.

G. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 1/8 inch wide by 1/4 slab depth or inserts 1/4 inch wide by 1/4 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. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
5. Joint sealant material is specified in Division 7 Sections of these specifications.

3.6 INSTALLATION OF EMBEDDED ITEMS

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

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

3.7 CONCRETE PLACEMENT

A. Changes in the approved mix design including the addition of mix water at the job site is prohibited.

B. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.

C. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.

D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Bring slab surfaces to correct level with 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 during concrete placement.

E. Cold-Weather Placing: 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.

F. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
1. Do not use-frozen materials or materials containing ice or snow. Do not place concrete on frozen sub grade or on sub grade containing frozen materials.
2. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators.

G. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). 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. Use of 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 embedment in concrete.
3. Fog spray forms, reinforcing steel, and sub grade just before concrete is placed.

3.8 FINISH ING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces to receive a rubbed finish, and to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where exposed to public view.

D. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 SLAB FINISHES

A. Trowel Finish: 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 with surface leveled to tolerances of Ff 20 - Fl 17. Grind smooth surface defects that would telegraph through applied floor covering system.

B. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

C. Non-Slip Broom Finish: Apply to exterior concrete ramps, platforms and steps, and elsewhere as indicated. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to the main traffic route. Coordinate required final finish with Architect before application.

3.10 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply

in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting; keep continuously moist for not less than 7 days.

C. Curing Methods: Perform curing of concrete by moisture retaining cover. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

D. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

3.12 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer.
   1. Cut out honeycomb, 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 of 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 specified bonding agent. Place patching mortar before bonding compound has dried.
   2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Repair of Slab Surfaces: Test surfaces for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.
   1. Repair finished surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.

2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Engineer.
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 to sound concrete 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 compound. 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.

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

3.13 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Concrete testing services will be performed and paid for by the Contractor. Testing services shall be performed by an independent testing agency approved by the Engineer. The testing agency shall be responsible for making, handling and curing the specimens in addition to testing the concrete.

B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Engineer, for Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
1. Slump: ASTM C 143; one test at point of discharge for each truck delivered to the job site
2. 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.
3. Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and each time a set of compression test specimens is made.
4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
5. Compressive Strength Tests: ASTM C 39; one set for each 50 cubic yards (or each day's pour if less than 50 cubic yards placed during a day) of each type and strength of concrete; two specimens tested at 7 days and two specimens tested at 28 days.

C. Test results will be reported in writing to Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

D. If additional testing, curing, or other measures are required to confirm or verify the strength of any concrete in question, cost shall be paid by the contractor.

END OF SECTION 03300

SECTION 04100 - MORTAR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions, Amendments to General Conditions, and Supplementary Conditions and Sections in Division 1 of the Specifications apply to work of this Section.

1.2 DESCRIPTION

A. Work included in this Section:

1. The work required under this specification consists of all Mortar and Grout for the masonry work under various sections of the specifications.

1.3 QUALITY ASSURANCE

A. A representative sample of the sand shall be obtained for each job and tested as specified herein below by an independent testing laboratory selected by the Architect, and paid for by the Owner.

1.4 DELIVERY AND STORAGE OF MATERIALS

A. Portland Cement, lime, and/or pre-packaged mortar cement mixes shall be delivered to the site and stored in unbroken bags or other approved containers. These materials shall be stored in dry, weather tight sheds or enclosures with elevated floors, which will prevent the inclusion of foreign materials and damage by water or dampness. Masonry sand shall be delivered and stored in a manner to prevent inclusion of foreign materials. Concrete masonry which is chipped, cracked, broken, or marred in other manner shall not be used where exposed to view.

1.5 ENVIRONMENTAL CONDITIONS

A. Hot Weather Installation: The following precautions shall be taken if masonry is erected when the ambient air temperature is more than 37 degrees C (99 degrees F) in the shade and the relative humidity is less than 50 percent.

1. All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 1.2 m (4 feet) ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

B. Cold Weather Installation: Before erecting masonry when ambient temperature or mean daily air temperature falls below 4 degrees C, (40 degrees F,) a written statement of proposed cold weather construction procedures shall be submitted for approval. The following precautions shall be taken during all cold weather erection.

1. Preparation: Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

2. Air Temperature 4 to 0 degrees C (40 to 32 Degrees F): Sand or mixing water shall be heated to produce mortar temperatures between 4 degrees C and 49 degrees C. (40 degrees F and 120 degrees F).

3. Air Temperature 0 to minus 4 degrees C (32 to 25 Degrees F): Sand and mixing water shall be heated to produce mortar temperatures between 4 degrees C and 49 degrees C. (40 degrees F and 120 degrees F.) Temperature of mortar on boards shall be maintained above freezing.

4. Air Temperature minus 4 to minus 7 degrees C (25 to 20 Degrees F): Sand and mixing water shall be heated to provide mortar temperatures between 4 degrees C and 49 degrees C. (40 degrees F and 120 degrees F.) Temperature of mortar on boards shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 24 km/hour. (15 mph.)

5. Air Temperature minus 7 degrees C (20 Degrees F) and Below: Sand and mixing water shall be heated to provide mortar temperatures between 4 degrees C and 49 degrees C. (40 degrees F and 120 degrees F.) Enclosure and auxiliary heat shall be provided to maintain air temperature above 0 degrees C. (32 degrees F.) Temperature of units when laid shall not be less than minus 7 degrees C. (20 degrees F.)

6. Completed Masonry and Masonry Not Being Worked On:

   a. Mean daily air temperature 4 degrees C to 0 degrees C. (40 degrees F to 32 degrees F.) Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.

   b. Mean daily air temperature 0 degrees C to minus 4 degrees C. (32 degrees F to 25 degrees F.) Masonry shall be completely covered with weather-resistive membrane for 24 hours.

   c. Mean daily air temperature minus 4 degrees C to minus 7 degrees C. (25 degrees F to 20 degrees F.) Masonry shall be completely covered with insulating blankets or equally protected for 24 hours.

   d. Mean daily temperature minus 7 degrees C (20 degrees F) and below. Masonry temperature shall be maintained above 0 degrees C (32 degrees F) for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement shall be Portland Cement, Type I or II, meeting Standard Specifications for Portland Cement (ASTM C-150).

B. Sand shall meet the requirements of Standard Specifications for Aggregate for Masonry Mortar (ASTM C-144-81), with the gradation to satisfy paragraph 3, Grading, and with the omission of subparagraph 3.4.

C. Hydrated Lime shall meet the requirements of the Standard Specifications for Hydrated Lime for Masonry Purposes (ASTM C-207), Type S.

D. Hydraulic Hydrated Lime shall meet the requirements of the Standard Specifications for Hydraulic Hydrated Lime for Structural Purposed (ASTM C-141).

E. Water shall be potable.

F. Air-entraining admixtures may be utilized and shall conform to ASTM C-260, as shall admixture workability.

G. Provide water resistant admixture.

2.2 PRE-PACKAGED MORTAR MIXES

A. Pre-packaged mortar cements may be used with prior approval of the Architect. To be considered, the mortar cement manufacturer shall submit a request to the Architect in sufficient time for the proposed material to be tested and evaluated prior to its approval for a specific project. The mortar cement shall be in accordance with ASTM C-91-83, and meet the following minimum requirements:

1. Type S Mortar Cement. The masonry mortar made from the mortar cement shall have a compressive strength of 1800 psi minimum at 28 days when tested in accordance with ASTM C-270, with maximum air volume of 16%.
2. The mortar cement shall contain Portland Cement, hydrated lime, plasticizing admixtures, and/or hydraulic hydrated lime. Mortar cement mixes that contain other materials, including ground limestone, ground slag or other cementitious or non-cementitious materials, are not acceptable.

B. Instructions for mixing the mortar mix shall be published and accompany all shipments. The instructions shall be volumetric measurements, and shall be developed to show proper proportions of sand to one (1) bag of the prepackaged mortar cement with volume of water to produce a flow of the proper consistency.

C. Freeze-thaw Resistance: The mortar cement shall comply with the following requirements when subjected to 50 cycles of the freeze-thaw test:

1. Loss of compressive strength: 35% maximum
2. Loss in dry weight: 1.0% maximum

D. The test specimen shall be made in accordance with ASTM C-91, Paragraph 18, 19 and 20 and be tested in accordance with ASTM C-01, Paragraphs 22.1 and 22.2.1 and ASTM C-67, Paragraph 8.1, 8.3 and 8.4.

1. Colored mortar will be required for all split face concrete masonry. Colored mortar shall be field batched mortar with coloring agent added in field. Tests will be required to insure the coloring agent does not affect properties of the mortar. No pre-packaged mortar with coloring agents is acceptable. Colored mortar is to match spilt face CMU.

2.3 ON-THE-JOB-MORTAR CEMENT

A. Type S. mortar shall have a compressive strength of 1800 psi minimum at 28 days. The mortar shall be proportioned within the following volumetric limits:

1. 1 part Portland Cement
2. 1/2 part Hydrated Lime
3. Masonry sand measured in a damp loose condition is to be not less than 2-1/4 and not more than 3 times the sum of the volumes of cement plus lime used.
4. Plasticizer per instructions of the manufacturer, the quantity of which is not to exceed 2% by volume of the cement and lime combination.

2.4 MEASUREMENT AND MIXING

A. The method of measuring material 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 project. Measurement of sand by shovel will not be permitted.

B. Mortar Mixer shall be paddle-type mechanical mixer. It shall be of such design and size to accommodate the mix without overloading, and be adequately powered to vigorously mix the ingredients.

C. The mortar mixer shall be charged in this order: add approximately one-half the water required, one-half the sand, the cement and lime (or prepackaged mortar cement), the remaining amount of sand, and then sufficient water to bring the mix to desired consistency. Mortar shall be mixed for a minimum of five minutes after all materials have been charged into the mixer with all batches being mixed to the same consistency.

D. 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 of mixing. Mortar not used within these time periods shall be discarded.

2.5 COLORED MORTAR

A. Mortar color to be selected by owner. Contractor to prepare samples for approval.

2.6 WATER RESISTANT ADMIXTURE: All exterior mortar to have water resistant admixture.

END OF SECTION 04100

SECTION 04150 - MASONRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Amendments to General Conditions, and Supplementary Conditions and Sections in Division 1 of the Specifications apply to work of this section.

1.2 DESCRIPTION

A. Work Included in this Section:
   1. Metal joint-reinforcement and anchors as specified herein.
B. Related Work Specified Elsewhere:
   1. Mortar (Section 04100)
   2. Concrete Unit Masonry (Section 04220)

1.3 SUBMITTALS

A. Samples: Submit samples of the following:
   1. Joint Reinforcement:
      a. Submit one piece of joint-reinforcement for wall intersections.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials for work of this Section in Manufacturer's original packaging and protection. Labels shall be intact and legible.
B. Store materials under cover, and off the ground to protect from wetting, dirt and physical damage.
C. For joint-reinforcement, anchors and ties, remove any loose rust, scale, dirt and other coatings that would reduce the bond to mortar. Remove by wire brushing prior to installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Masonry Joint Reinforcement:
   1. Types specified herein are as manufactured by AA Wire Products Co., Chicago, Illinois. Equivalent reinforcement will be acceptable as manufactured by Dayton Sur-Grip and Shore Co.; Conover Steel and Wire Co., Inc.; Dur-O-Wal, Inc., or approved equal.
   2. Reinforcement for concrete-unit-masonry walls and partitions of single thickness of masonry units shall be Blok-Lok (AS500), Extra Heavy, hot-dipped galvanized after fabrication.
   3. Width of reinforcement shall be 2" less than the nominal wall thickness.
   4. Provide prefabricated "Tees" at all abutting walls.

PART 3 - EXECUTION

3.1 ACCESSORY INSTALLATION

A. Installation of masonry accessories shall be as specified in Section of the Project Manual on unit masonry.

END OF SECTION 04150

SECTION 04220 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Amendments to General Conditions, and Supplementary Conditions and Sections in Division 1 of the Specifications apply to work of this section.

1.2 DESCRIPTION

A. The work required under this Section consists of all concrete masonry.

B. Related Work

1. Mortar is specified under Section 04100.
2. Masonry accessories are specified under Section 04150.
3. Insulation is specified in Division 7.

1.3 SUBMITTALS

A. The Contractor shall submit a certificate signed by the concrete unit masonry manufacturer of compliance with the ASTM C 90 and Non Load Bearing C 129.

B. When requested by the Architect, the Contractor shall submit to the Architect for approval duplicate samples of each and every kind and/or size of structural concrete block the proposes to use. Each sample shall bear a label indicating the size, kind and quality of the product and the name of the manufacturer.

1.4 QUALITY ASSURANCE

A. The manufacturer of the structural concrete block shall be subject to the approval of the Architect.

B. Certificates:

1. Prior to delivery of the concrete masonry units to Project Site, submit certificates from manufacturer of concrete masonry units stating compliance with requirements of the Contract Documents. Certificate shall be on firm's letterhead, signed by an officer of the company.

2. At the completion of the job, the Contractor shall furnish a certificate acceptable to the North Carolina Fire Insurance Rating Bureau, certifying that these units meet their requirements.

1.5 ENVIRONMENTAL CONDITIONS

A. Cold Weather and Hot Weather Installations: Comply with requirements specified in Section 04100, "Mortar".

PART 2 - PRODUCTS

2.1 CONCRETE BLOCK

A. Units for "Regular Unit Masonry" shall be 2-cell and designed for stacked cells to allow for filling of cores where required on the drawings, except where other shapes, or solid masonry units are called for. See Drawings for size and specific cell arrangement where such is required.

1. ASTM C-90

B. Deliver concrete-masonry-units on pallets. Handle at Project Site on flat-bed wheelbarrows or pallets and forklift.

C. See drawings for Architectural CMU locations. Architectural block to be Echelon Ground Face CMU/Lintel Block.

2.2 WALL REINFORCEMENT

A. All exterior walls, foundations and back-up walls shall be reinforced with Dur-O-Wal, American or Wal-Lock truss-design deformed reinforcement hot-dip galvanized after fabrication with zinc coating ASTM A 116, Class 3. It shall be installed in every other course of block. Use corner and tee sections around corners and at intersections with other walls.

B. Reinforcing Bars: ASTM A 615, Grade 60 deformed.

2.3 EMBEDDED ITEMS

A. The Contractor shall furnish and install all bolts, anchors, etc., which are to be built into masonry. Coordinate all conduits, pipes etc. with other trades.

PART 3 - EXECUTION

3.1 LAYING

A. All masonry shall be laid true to dimensions, plumb, square, in bond and properly anchored. All courses shall be level with joints of uniform width. No joints shall exceed the size specified. Faces of walls shall be laid to a line. All masonry shall be laid uniformly one scaffold-height at a time except when otherwise specially approved. Whether masonry is laid from an outside or an inside scaffold rests with the Contractor, but the governing requirement shall be a first class job of masonry in every respect.

B. Work required to be built into the masonry including loose lintels, angles, special metal work, flashings, anchors, wall plugs, grounds blocking, and other accessories shall be built in as the masonry work progresses. Unless otherwise shown all spaces about built-in work shall be completely and solidly filled in with masonry. Bucks, frames, and similar built-in items shall be maintained in their proper positions, and no braces or stays shall be removed from same until they are securely supported and fastened by the masonry.

C. Carefully cover all walls each night during inclement weather or during delays in the work to prevent water from rains getting into the masonry. When starting work at a new level, the existing masonry shall be cleaned of all loose mortar, or other materials, and shall be thoroughly welded.

D. Pickets, chases, recesses and other breaks in masonry shall be constructed where and as shown on the drawings or in accordance with instructions given prior to the laying of the masonry.

E. Cutting of Units: Where cuffing is necessary, make all cuts with a motor driven masonry saw. Units with chips or irregular cuts will not be accepted.

F. Coursing: Masonry work is laid out on a nominal 3/8" wide joint for concrete-unit-masonry work.

G. Where masonry units are disturbed, or must be moved after the mortar has begun to lose its moisture, the masonry unit and all adjacent mortar shall be removed and reset completely.

3.2 EXPANSION MATERIAL

A. Install as masonry work proceeds, and as shown on drawings. Joints are to be kept clean and free of all mortar as work progresses.

3.3 BUILT-IN WORK

A. Consult other trades in advance and make provisions for installation of their work in order to avoid cutting and patching. Build in work specified under other sections of the specifications as the work progresses.

B. Set steel lintels in beds of mortar.

C. Grout heads and jambs of hollow metal frames fully. Observe requirements of UL for grouting frames in Fire-Rated opening assemblies.

3.4 BOND AND JOINTS

A. All blocks, unless otherwise shown on the Drawings or herein excepted, shall be laid in running bond with all intersections of walls bonded every second course or keyed every course with galvanized corrugated steel wall ties. Blocks shall be cut accurately to fit around all pipe, ducts, openings, etc., and all voids slushed full. Unless otherwise shown or directed, all blocks shall be laid with the cells vertical. All walls and webs of blocks shall be carefully buttered, full-joint, with mortar. All solid blocks shall be laid in full beds of mortar. All blocks shall be laid with 3/8" bed and head joints. Except where plaster occurs, as shown on details and in Finish Schedule masonry block walls shall have concave mortar joints. Where plaster is to be applied, mortar joints shall not be tooled, but shall be flush with face of block. Wherever concentrated loads occur, all cells of blocks shall be carefully and solidly filled with concrete or mortar. Units shall be set tightly against the inside of bucks and all voids slushed full.

3.5 DISTURBED UNITS

A. Where concrete masonry units are disturbed or must be moved after the mortar has begun to lose its moisture, the masonry units and all adjacent mortar shall be removed and reset completely.

3.6 TOOLING

A. Where joints are to be tooled they shall be tooled to a uniform concave, head joints first and 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.

3.7 CONSTRUCTION TOLERANCES

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

B. Variations from Level: For grades shown for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines do not exceed 1/4" in any bay of 20' maximum, nor 3/4" in 40' or more.

3.8 POINTING OF MASONRY

A. At the completion of the masonry work, all holes in the exposed masonry shall be pointed. Defective joints shall be cut out and tuck-pointed solidly with mortar. Pointing and tuck-pointing shall be done with a pre-hydrated mortar. The mortar cement shall be controlled so that after curing of the mortar no difference in texture or color exists with that of adjacent masonry.

3.9 COLD WEATHER

A. No laying of masonry units shall be performed unless the temperature of the surrounding air is 40 degrees F and rising. The use of "anti-freeze" or accelerating admixtures is not permitted. Provide temporary protection of masonry to ensure a minimum 48 hours curing at a minimum 40 degrees F.

3.10 MASONRY CLEANING

A. While laying the concrete masonry, good workmanship and job housekeeping practices shall be used so as to minimize the need for cleaning the concrete masonry. Protect the base of the wall from mud splashes and mortar droppings, protect the wall by setting scaffolding boards so that mortar is not deflected on the wall, and at end of each day set the scaffolding boards so they do not deflect rainfall onto newly laid masonry. The concrete masonry technique shall be such that mortar does not run down the face of the wall, or smear the mortar onto the brick face. After the joints are tooled, cut off mortar tailings with the trowel and brush excess mortar burrs and dust from the face of concrete masonry. Do not bag or sack the wall, but use a bricklayer's brush made with medium soft hair.

B. Remove all large mortar particles with a hardwood scraper.

C. If, after using the above outlined techniques, additional cleaning of the walls is found necessary, allow the walls to cure one month prior to initiating further cleaning processes.

D. Saturate the wall with clean water. The wall shall be thoroughly saturated prior to and at the time the cleaning solution is applied.

E. Clean the wall only with an approved cleaning solution applied with a brush, starting at the top of the wall. Approved cleaning solutions are: Sure-Klean 600, Vanatrol, Superior 800, or approved equal. Approved cleaners shall be composed primarily of detergents, wetting agents, buffering agents, and a maximum of 10% muriatic acid. The use of any of the above cleaning agents shall first be approved in writing by the manufacturer of the concrete masonry being cleaned, and by the Architect. The concentration, method of application of the cleaning solution, and method of scraping shall be as outlined on the container by the manufacturer.

F. High pressure water and sandblasting shall not be used for cleaning except with the recommendations of the concrete masonry manufacturer, and the written approval of the Architect.

G. Immediately after cleaning a small area, the wall shall be rinsed thoroughly with quantities of water.

H. Protect adjacent surfaces and materials during brick cleaning operations.

1. After the walls are cleaned, take necessary precautions to ensure that other contractors and subcontractors do not damage or soil the walls. Mud protection around the base of walls shall be left in place until the final grading work is done.

END OF SECTION 04220

SECTION 04222 QUIK-BRIK

PART 1 - GENERAL

1.01. SUMMARY

A. Section Includes:
1. Custom concrete masonry units (CMU), Quik-Brik.
2. Reinforcement, anchorages, and accessories
3. Masonry fill insulation

B. Work Installed but Not Furnished Under This Section:
1. Support plates and angles with anchor studs.
2. Sleeve anchors.
3. Expansion bolts.
4. Adhesive anchors.
5. Anchor bolts which are embedded in masonry for supporting structural members.

C. Related Sections:
1. Section 04060 - Masonry Mortar.
2. Section 04070 - Masonry Grout.
3. Section 04220 - Concrete Masonry Units.
4. Section 05120 - Structural Steel: Support plates and angles with anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in masonry for supporting structural members.
5. Section 05500 - Metal Fabrications: Loose steel lintels and other metal components embedded in masonry.
6. Section 07900 - Joint Sealer: Rod and sealant at control joints.

1.02. REFERENCES

A. American Concrete Institute (ACI):
1. ACI 117-90 - Standard Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 530-99 - Building Code Requirements for Masonry Structures.
3. ACI 530.1-99 - Specification for Masonry Structures.

B. American Society for Testing and Materials (ASTM):
1. ASTM A 82 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A 153 - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.
4. ASTM A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
5. ASTM A 951 - Specification for Masonry Joint Reinforcement.
6. ASTM C 90 - Specification for Loadbearing Concrete Masonry Units.
7. ASTM C 129 - Specification for Non-Load-Bearing Concrete Masonry Units.
8. ASTM C 140 - Methods of Sampling and Testing Concrete Masonry Units.

9. ASTM C 516 - Specification for Vermiculite Loose Fill Thermal Insulation.
10. ASTM C 549 - Specification for Perlite Loose Fill Insulation.
11. ASTM C 920 - Specification for Elastomeric Joint Sealants.
12. ASTM D 994 - Specification for Preformed Expansion Joint Filler for Concrete (Bituminous).
13. ASTM D 1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
14. ASTM D 2000 - Classification System for Rubber Products in Automotive Applications.
15. ASTM D 2287 - Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds.

C. Masonry Industry Council (MIC): Hot and Cold Weather Masonry Construction.

1.03. SUBMITTALS

A. Section 01330 -Submittal Requirements: Procedures for submittals.

1.04. QUALITY ASSURANCE

A. Construction: Construct masonry in accordance with requirements of ACI 530 and 530.1.

B. Special Inspection and Testing: Provide inspection and testing in accordance with the Building Code and as noted on Drawings and will be performed under provisions of Section 01450.

C. Mock-up: Construct a masonry wall panel to represent the exterior masonry wall.
1. Construct wall at least 4 feet long by 4 feet high.
2. Locate where directed by Architect/Owner's Representative.
3. Include reinforcing and minimum of one control joint and one outside corner.
4. Include joint profile and mortar color.
5. Erect entire mock-up with methods representative of daily construction and in-progress cleaning practices.
6. Clean one-half of mock-up to represent final clean down using methods and materials in accordance with the cleaning requirements herein and leave remainder without final cleaning for comparison purposes.
7. Receive acceptance of mock-up by Architect/Owner's Representative before proceeding with masonry installation.
8. When accepted, mock-up will be used as standard of quality for masonry Work.
9. Leave field sample in place until project completion.
10. Mock-up may not remain as part of the Work.
11. Provide on-site inspection by Oldcastle Architectural Products Group (APG) representative of mock-up construction and cleaning and submit manufacturer's letter of approval of the work procedures and the completed mock-up.

1.05. DELIVERY STORAGE AND HANDLING

A. Damaged Components:
1. Do not use damaged masonry units
2. Do not use damaged components of structure

3. Do not use damaged packaged materials.
4. Do not use masonry units that are contaminated.

B. Storage:
1. Store different aggregates separately.
2. Protect reinforcement, ties, and metal accessories from permanent distortions.
3. Store reinforcement, ties, and metal accessories off the ground.

C. Cleaning Reinforcement: Before being placed, remove loose rust, ice, and other deleterious coatings from reinforcement.

1.06. PROJECT CONDITIONS

A. Environmental Requirements (Cold Weather): Follow the requirements of the MIC Hot and Cold Weather Construction. Include the following construction requirements for cold weather procedures:
1. When ambient air temperatures are above 40oF cover tops of walls and masonry elements with plastic or canvas at end of workday to prevent water from entering masonry.
2. When ambient air temperatures are below 40oF and above 32oF or temperature of masonry units is below 40oF:
a. Remove visible ice on masonry units before units are placed in the wall.
b. Do not lay masonry units having a temperature below 20oF.
c. Heat sand and mixing water to produce mortar temperatures between 40oF and 120oF at the time of mixing.
d. Maintain mortar and grout temperatures above freezing until used in masonry.
e. Cover tops of walls and masonry elements with weather resistive membrane at end of workday to prevent water from entering masonry.
3. When ambient air temperatures are below 32oF and above 25oF or temperature of masonry units is below 40oF:
a. Remove visible ice on masonry units before units are placed in the wall.
b. Do not lay masonry units having a temperature below 20oF.
c. Heat sand and mixing water to produce mortar temperatures between 40oF and 120oF at the time of mixing.
d. Maintain mortar and grout temperatures above freezing until used in masonry.
e. Completely cover walls and masonry elements with weather resistive membrane at end of work day and keep covers in place for 24 hours.
4. When ambient air temperature is below 25oF and above 20oF:
a. Remove visible ice on masonry units before units are placed in the wall.
b. Do not lay masonry units having a temperature below 20oF.

c. Heat sand and mixing water to produce mortar temperatures between 40oF and 120oF at the time of mixing.
d. Maintain mortar and grout temperatures above freezing until used in masonry.
e. Use heat source on both sides of masonry under construction.
f. Install wind breaks when wind velocity is in excess of 15 mph.
g. Completely cover walls and masonry elements with insulated blankets or equivalent protection at end of workday and keep covers in place for 24 hours.

5. When ambient temperature is below 20oF:
a. Remove visible ice on masonry units before units are placed in the wall.
b. Do not lay masonry units having a temperature below 20oF.
c. Heat sand and mixing water to produce mortar temperatures between 40oF and 120oF at the time of mixing.
d. Maintain mortar and grout temperatures above freezing until used in masonry.
e. Provide an enclosure for the masonry under construction.
f. Use heat sources to maintain temperatures above 32oF within the enclosure.
g. Maintain masonry temperature above 32oF for 24 hours after construction by enclosure with supplementary heat, electric heating blankets, infrared heat lamps, or other acceptable methods.

B. Environmental Requirements (Hot Weather): Follow the requirements of the MIC Hot and Cold Weather Construction. Include the following construction requirements for hot weather procedures:

1. When ambient temperature is above 115oF or ambient air temperature is above 105oF and wind velocity exceeds 8 mph:
a. Shade materials and mixing equipment from direct sunlight.
b. Maintain sand piles in damp loose condition.
c. Provide necessary conditions and equipment to produce mortar and grout having temperatures below 120oF.
d. Use cool mixing water for mortar and grout.
e. Maintain temperatures of mortar and grout below 120oF.
f. Flush mixer, mortar and grout transport container, and mortarboards with cool water before the come in contact with mortar or grout.
g. Maintain mortar consistency by re-tempering with cool water.
h. Use mortar within 2 hours of initial mixing.
i. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is 3-days old.

2. When ambient temperature is above 100oF or ambient air temperature is above 90oF and wind velocity exceeds 8 mph:
a. Maintain sand piles in damp loose condition.
b. Provide necessary conditions and equipment to produce and maintain mortar and grout having temperatures below 120oF.
c. Maintain mortar and grout temperatures below 120oF.
d. Flush mixer, mortar and grout transport container, and mortarboards with cool water before the come in contact with mortar or grout.
e. Maintain mortar consistency by re-tempering with cool water.
f. Use mortar within 2 hours of initial mixing.

g. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is three days old.

PART 2 - PRODUCTS

2.01. QUIK-BRIK (CONCRETE MASONRY UNITS)

A. Integrally Pigmented Loadbearing Units: ASTM C 90.
1. Stretcher unit dimensions:
a. Nominal 4 inch high.
b. Nominal 16 inch long.
2. Normal weight
3. Integral metallic oxide pigments.
4. Integral polymer water repellent.
a. Manufacturers:
i. Rainbloc by ACM Chemistries
ii. Substitution approval per the manufacturing location only.
5. Manufacturers and Suppliers:
a. Manufacturer by an Oldcastle Company; contact National Accounts at (602-513-6692)
b. Colors: Choose from manufacturers color selection.
6. Substitutions: Not permitted.

B. Unit Design: Modular two core units sized as indicated and scheduled. Provide special units for bond beams, control and expansion joints, and lintels.
1. Provide units as required for indicated construction including sill units and solid cap units.
2. Provide units with exposed faces, which are uniform in appearance.

2.02 REINFORCEMENT AND ANCHORAGES

A. Horizontal Joint Reinforcement: ASTM A 951.
1. Minimum wire size W1.7 (9 gage) and maximum wire size W2.8 (3/16 inch wire).
2. Width 1-1/2 to 2 inches less than wall thickness.
3. Hot-dipped galvanized 1.5 oz. ASTM A 153, Class B2.
4. Contractor's option to use truss or ladder type.

B. Masonry Veneer Anchors: ASTM A 82.
1. Rectangular adjustable tie system with wall eyelet sections welded to horizontal joint reinforcement 16 inches on center maximum.
2. Minimum wire size W2.8 (3/16 inch wire).
3. Hot dipped galvanized 1.5 oz. ASTM A 153, Class B2.
4. Provide wall tie pintle sections, at least two, that fit into eyelet sections with maximum clearance of 1/16 inch.
5. Maximum offset for pintle anchors 1-1/4 inch.
6. Provide pintle anchors of sufficient length to extend a distance at least ½ inch onto the outer face shell of the masonry unit.

C. Deformed Bars: ASTM A 615, Grade 60.
1. Shop fabricate reinforcement shown as bent or hooked.
2. Field bending not allowed.

D. Anchor Bolts and Threaded Rods: ASTM A 307. Embed in masonry as shown in Structural Drawings.

E. Bar Positioners for Vertical Wall Reinforcing Bars:
1. Minimum W.17 (9 gage) galvanized wire.

2.03. ACCESSORIES

A. Joint Filler: Closed cell foam, oversized 50 percent, self-expanding.

B. Preformed Control Joint Filler
1. Materials:
a. ASTM D2000 rubber.
b. ASTM D 2287 PVC.
2. Provide 2-5/8 inch by 1-1/2 inch for regular joint.
3. Provide 2-5/8 inch by 1 inch for tee joint.

C. Preformed Expansion Joint Filler: [Reference to appropriate ASTM specifications should be added per joint filler manufacturers' recommendations: ASTM C 920, ASTM D 994, or ASTM D 1056, Class 2A1].
1. One Inch Expansion Joint: Secondary compression seal.
2. Materials
a. ASTM D 994 - Bituminous.
b. ASTM D 1056 - Cellular.

D. Through Wall Flashing:

E. Adhesive: As Recommended by flashing material manufacturer.

F. Block Flash: Flashing pan w/ weep spouts, connector bridges, insect guards and drainage mat by mortar net solutions.

2.04. MASONRY FILL INSULATION

A. Foamed-In-Place: Subject to compliance with project requirements and local jurisdictional restrictions, manufacturers offering Foam-In-place Insulation tested and found compatible and non-detrimental within the indicated Underwriters Laboratory fire resistance assemblies which may be incorporated into the Work include:
1. Manufacturers:
2. Manufacturers - as approved by the architect.

PART 3 - EXECUTION

3.01. INSPECTION

A. Verification: Prior to the start of masonry construction, the Contractor shall verify:
1. Foundations are constructed with tolerances conforming to ACI 117.
2. Reinforcing dowels are positioned in accordance with Project Drawings.
3. Verify items provided by other Sections of the Work are properly sized and located.

B. Notification: If conditions are not met notify the Architect/Owners Representative.

3.02. PREPARATION

A. Establish Lines, Levels, and Coursing:
   1. Protect lines from disturbance.
   2. Use non-corrosive materials in contact with masonry.
B. Surface Preparation: Prior to placing Quik-Brik remove laitance, loose aggregate or other materials that would prevent mortar from bonding to the foundation.

3.03. COURSING

A. Placement: Place Quik-Brik to lines and levels indicated.

B. Uniformity: Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

C. Bond Patterns: Place Quik-Brik in ½ running bond unless otherwise noted.

D. Course Height: Course one Quik-Brik and one mortar joint equal to 4 inches.

3.04. PLACING AND BONDING

A. Bed and Head Joints:
   1. Joint Thickness:
      a. Construct 3/8-inch bed and head joints unless otherwise indicated.
      b. Construct bed joint at starting course on foundation not less than ¼ inch and not more than ¾ inch.
   2. Fill holes not specified in exposed and below grade masonry with mortar.
   3. Tool head and bed joints concave unless below grade or above ceiling height and to be concealed.
      a. Use tool with large enough radius that joint is not raked free of mortar.
   4. Remove masonry protrusions extending ½ inch or more into cells or cavities to be grouted.

B. Unit Placement:
   1. Quik-Brik: Lay units with bed and head joints filled from the faces of the units to a distance in not less than the thickness of the face shell.
      a. Webs are fully mortared in all courses of piers, columns, pilasters, starting course on footings or foundations, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
      b. Spread out full mortar bed, including areas under cells, for starting course on footings where cells are not to be grouted.
      c. Vertical cells to be grouted are aligned and unobstructed openings for grout are provided in accordance with drawings.
   2. Keep cavity airspace and weep holes clean or mortar, clean out promptly if mortar falls into cavity airspace or plugs weep holes.
   3. In-Progress Cleaning:
      a. Remove excess mortar.
      b. Dry brush exposed masonry prior to the end of each workday.

c. Protect wall from mud splatter and mortar droppings.
i. Set scaffolds and scaffold boards so that mortar is not deflected onto masonry.
ii. At end of each workday turn scaffold boards so that rainwater is not deflected onto masonry.
d. Place Quik-Brik such that mortar does not run down the face of the wall or smear the masonry face.

4. Adjustments:
a. Do not shift or tap Quik-Brik after mortar has taken initial set.
b. Remove unit and mortar and replace.

5. After joints are tooled, cut off mortar tailings with trowel and dry brush excess mortar burrs and dust from the face of the masonry.

6. Fully bond external and internal corners and properly anchor intersecting walls.

7. Termination of Wall Height:
a. For fire-rated walls, construct walls to finish against bottom of roof or floor deck and fill voids with firestopping.
b. For other than fire-rated walls, cut units to match the slope of the roof deck and finish construction to within 2-inches of an parallel to roof deck.

8. Isolate masonry partitions from vertical structural framing members with a control joint.

3.05. TOLERANCES: Erect masonry within the following tolerances from specified dimensions:

A. Dimension of Elements:
1. In cross-section or elevation: -1/4 inch, + 1/2 inch.
2. Mortar joint thickness:
a. Bed: plus or minus 1/8 inch or plus 1/8 inch.
b. Head: plus 3/8 inch or minus 1/4 inch.
c. Collar: plus 3/8 inch or minus 1/4 inch.
3. Grout space or cavity airspace except where passing framed construction: plus 3/8 inch or minus 1/4 inch.

B. Elements:
1. Variation from level:
a. Bed joints: plus or minus1/4 inch in 10 feet; plus or minus 1/2 inch maximum.
b. Top of bearing walls: plus or minus1/4 inch in 10 feet; plus or minus ½ inch maximum.
2. Variation from plumb: plus or minus 1/4 inch in 10 feet; plus or minus 3/8 inch in 20 feet; plus or minus 1/2 inch max.
3. True to line: plus or minus 1/4 inch in 10 feet; plus or minus 3/8 inch in 20 feet; plus or minus 1/2 inch maximum.
4. Alignment of columns and walls (bottom versus top):
a. Bearing: plus or minus 1/2 inch.
b. Non-bearing: plus or minus 3/4 inch.

C. Location of Elements:

1. Indicated in plan: plus or minus 1/2 inch in 20 feet; plus or minus 3/4 inch maximum.
2. Indicated in elevation: plus or minus 1/4 inch in story height; plus or minus 3/4 inch maximum.

D. Notification: If the above conditions cannot be met due to previous construction notify Architect/Owner's Representative.

3.06. CUTTING AND FITTING

A. Coordination: Cut and fit for bearing plates, chases, pipes, conduits, sleeves, and grounds. Coordinate with other Sections of Work to provide correct size and shape.

B. Notification: Prior to cutting and fitting any area not indicated or where appearance or strength of masonry work may be impaired, obtain approval from Architect/Owner's Representative.

C. Cutting Method: Perform jobsite cutting with proper tools to provide straight un-chipped edges and take care to prevent breaking masonry unit corners or edges.

3.07. REINFORCEMENT AND ANCHORAGES

A. Basic Requirements:
1. Place reinforcement and anchorages in accordance with the sizes, types, and locations indicated on the Drawings, and as specified.
2. Do not Place dissimilar metals in contact with each other.

B. Details of Reinforcement:
1. Completely embed reinforcement in grout in accordance with Article 3.08.
2. Maintain clear distance between reinforcing bars and any face of masonry unit or formed surface:
    a. Not less than 1/4 inch for fine grout.
    b. Not less than 1/2 inch for coarse grout.
3. Splice only where indicated on Drawings, unless otherwise specified.
4. Do not bend reinforcing bars after embedded in grout.
5. Place vertical reinforcing bars supported and secured against displacement by means of bar positioners.
6. Support bars other than vertical bars and tie to prevent displacement.
7. Placement tolerances:
    a. Tolerances for the placement of reinforcing bars:
        i. 1/2 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry, d, is 8 inches or less.
        ii. 1 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry, d, is 24 inches or less but more than 8 inches.
        iii. 1-1/4 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry is more than 24 inches.
    b. Place vertical reinforcing bars within 2 inches of required location along the length of the wall.

c. If it is necessary to move bars more than one bar diameter or a distance exceeding the tolerances provided in Section 3.06.C.7.a. to avoid interference with other reinforcing bars, conduit, or embedded items, notify the Architect/Owner's Representative for the acceptance of the resulting arrangement of bars.

C. Joint Reinforcement:
1. Placement:
a. Install joint reinforcement at 16 inches on center vertically, except space at 8 inches on center in parapet walls and below finished floor unless otherwise indicated on Drawings.
b. Place joint reinforcement continuous in first bed joints below top of masonry wall and bed joint 8 inches below first bed joint below top of wall.
c. Place joint reinforcement so that longitudinal wire are embedded in mortar:
i. Minimum cover of 1/2 inch when not exposed to weather.
ii. Minimum cover of 5/8 inch when exposed to weather or earth.
d. Lap joint reinforcement ends minimum 6 inches.
e. Do not extend joint reinforcement through control joints.

D. Wall Ties:
1. Embed ends of wall ties in mortar joints at least 1/2 inch into outer face shell of hollow masonry construction.
2. Unless otherwise required, install adjustable wall ties in accordance with the following:
a. One tie for each 1.77 sq. ft. of wall area.
b. Do not exceed 16 in. on center horizontally or vertically.
3. Install wire ties perpendicular to a vertical line on the face of the wythe from which they protrude.
4. Unless otherwise provided, install additional unit ties around all openings larger than 16 inches in either dimension. Space ties around the opening at a maximum of 3 feet on center and place ties within 12 inches of the opening.

3.08. BUILT-IN AND EMBEDDED ITEMS AND ACCESSORIES

A. Incorporation: As work progresses build in metal doorframes, fabricated metal frames, window frames, anchor bolts, diaphragm anchors, embedded plates, and other items in the work supplied in other Sections.

B. Metal Door and Glazed Frames:
1. Embed anchors in mortar joints.
2. Fill frame void solid with grout.
3. Fill masonry cores with grout minimum 12 inches from framed openings.

C. Chases: Construct chases as masonry units are laid.

D. Pipes and Conduits: When required, place pipes and conduits passing horizontally through masonry beams or walls in steel sleeves or cored holes.
1. Place pipes and conduits passing horizontally through non-load-bearing partitions piers, pilasters, or columns.

2. When required, place horizontal pipes and conduits in and parallel to the plane of the masonry wall.

E. Accessories: Install and secure connectors, flashing, weep holes, nailing blocks, reglets and other accessories.
1. Install reglet level and parallel to building lines. Set reglet as indicated on Drawings to coordinate with sloped roof surface.

F. Organic Materials: Do not build in organic materials subject to deterioration.

3.09. GROUT PLACEMENT

A. Placement:
1. Place grout within 1-1/2 hours of introducing mixing water and prior to initial set.
2. Prevent grout from flowing onto or otherwise staining faces of CMU intended to be exposed.

B. Confinement: Confine grout to the areas indicated on the Drawings.

C. Grout Pour Height: Use fine or coarse grout in accordance with requirements in Section 04070.

D. Grout Lift Height: Place grout in lifts not to exceed 5 feet.

E. Consolidation: Consolidate grout at the time of placement.
1. Consolidate grout pours 12 inches or less in height by mechanical vibration or puddling.
2. Consolidate grout pours exceeding 12 inches in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

3.10. BRACING

A. Design and Installation: Design, provide and install bracing for walls, lintels, and other masonry work that will assure stability of masonry during construction.

B. Duration: Maintain bracing in place until roof or other structural elements are complete and provide permanent support.

3.11. MASONRY FILL INSULATION

A. Install insulation in masonry unit cells of exterior walls.

B. Foamed-In-place Insulation:
1. Confirm that selected foam insulation material is compatible and non-detrimental to referenced fire resistance assemblies before use.
2. Installer shall be certified and/or approved by manufacturer of insulation. Install foam insulation in strict accordance with manufacturer's published instructions.

3. Pump foam insulation bored into mortar joints around entire wall area 3 feet from floor level. Repeat at height no greater than 10 feet until completion of wall area.
4. Plug holes with mortar after completion.

3.12. LINTELS

A. Steel Lintels:
1. Install loose steel lintels as scheduled.
2. Provide 9 gage Z-ties at each vertical joint of soap units covering steel lintels. Weld Z-ties to web of steel lintel.

B. Concrete Masonry Lintels:
1. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled.
2. Construct lintels using grout fill and reinforcing.
a. Maintain minimum 8 inch bearing on each side of opening unless otherwise noted on Drawings.
b. Use reinforcing bars of one-piece lengths only.
c. Place and consolidate grout without disturbing reinforcing.
3. Allow lintels to reach strength before removing temporary supports.

3.13. MOVEMENT JOINTS

A. Control Joints:
1. Do not continue bond beams or joint reinforcing across control joints.
2. Install preformed control joint filler at locations indicated on Drawings.
3. Use proper size material to create sealant joint space.
4. Backer rod and sealant installed in accordance with Section 07900.

B. Expansion Joints:
1. Install expansion joint filler material on centerline of wall at locations indicated on Drawings or as recommended by Manufacturer.
2. Backer rod and sealant installed in accordance with section 07900.

C. Seismic Joints:
1. Provide seal and cover at both faces of joint, as indicate don Drawings.
2. Secure seal to face of wall.
3. Provide un-faced batt insulation in cavity between exterior and interior seal.
4. Provide fire barrier blanket in cavity between exterior and interior seals of fire-rated separation wall.

3.14. CLEANING

A. In-Progress Cleaning: Clean unit masonry as Work progresses by dry brushing to remove mortar fins and smears before tooling joints as described in Article 3.04.B.3.

B. Final Cleaning:
1. After mortar has set, reached initial curing; within 7 days of completion of work for custom masonry units, clean exposed masonry as follows:

2. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
3. Cut out any defective mortar joints and holes and re-point with mortar.
4. Protect non-masonry surfaces from contact with cleaning solution by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
5. Clean Quik-Brik and Harvard Brik with proprietary masonry cleaner.
    a. Materials:
        i. Light Duty Concrete Cleaner by Prosoco
        ii. Alternate Approved Cleaner by Manufacturer
    b. Thoroughly wet surface of masonry.
    c. Scrub using non-metallic brushes:
    d. Immediately rinse with water.
    e. Do small sections at a time.
    f. Work from top to bottom.
6. Do not use high pressure cleaning methods.
    a. Do not exceed nozzle pressure of 500 psi.
    b. Use water flow of at least 4 gallons per minute.
    c. Use at least 40o fan nozzle.
    d. Keep nozzle at least 18-inches from face Quik-Brik.
7. Cleaned surfaces shall appear as represented by mockup wall panel.

3.16. PROTECTIONS

A. External Corners: Maintain protective boards at exposed external corners that may be damaged by construction activities.
    1. Provide protection without damaging work.

B. Base of Walls: Protect the base of walls from rain-splashed mud and mortar droppings.

C. Environmental: At end of day, cover completed masonry to prevent moisture infiltration. Use the following provisions unless otherwise required for environmental conditions, Section 106:

D. Load Application:
    1. Do not apply uniform floor or roof loading for at least 12 hours after building masonry columns or walls
    2. Do not apply concentrated loads for at least three days after building masonry columns or walls

3.17. FIELD QUALITY CONTROL

A. Masonry: Required testing will be in accordance with Section 01450.

END OF SECTION

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Steel lintels and shelf angles.
   2. Pipe and tube railings.
   3. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.3 SUBMITTALS

A. Shop Drawings: For each fabricated item, show the following:
   1. Plans and elevations.
   2. Jointing and connections. Indicate welded connections using standard AWS symbols; indicate net weld length.
   3. Profiles of sections and reinforcing.
   4. Fasteners and anchors.
   5. Accessories.
   6. Location of each finish.

B. Product Data: Manufacturer's specifications and installation instructions. Submit for:
   1. All manufactured products used in fabrications.

C. Samples of products and materials when requested.

1.4 QUALITY ASSURANCE

A. Definitions in ASTM E 985 for railing-related terms apply to this section.

B. Structural Performance of Handrails and Railing Systems: Comply with ASTM E 985 based on testing per ASTM E 894 and E 935.

C. Structural Performance of Handrails and Railing Systems: Provide handrails and railing systems capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved.
   1. Top Rail of Guardrail Systems: Concentrated load of 200 lbf (890 N) applied at any point and in any direction and a uniform load of 50 lbf per linear foot (730 N/m) applied horizontally and concurrently with a uniform load of 100 lbf per linear foot (1460 N/m) applied vertically downward. Concentrated and uniform loads need not be assumed to act concurrently.
   2. Handrails Not Serving as Top Rails: Concentrated load of 200 lbf (890 N) applied at any point and in any direction and a uniform load of 50 lbf per linear foot (730 N/m) applied in any direction. Concentrated and uniform loads need not be assumed to act concurrently.
   3. Infill Area of Guardrail Systems: Horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in the system including panels, intermediate rails, balusters, or other elements composing the infill area. Loads on infill area need not be assumed to act concurrently with loads on top rails.

D. Where fabrications are specified to comply with specific structural performance

requirements, provide design sealed by a professional engineer registered in the state in which the project is located.

1.5 PROJECT CONDITIONS

A. Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinated fabrication schedule with construction progress to avoid delaying the Work.

B. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1. MATERIALS - METALS

A. Steel Shapes:
1. Plates, bars, angles, channels, and H-sections: ASTM A 36.
2. Grating bars: ASTM A 36 or ASTM A 569.
3. Galvanizing: Hot-dip galvanizing after fabrication in accordance with ASTM A 123.
4. Tube: Cold-formed: ASTM A 500, Grade B.
5. Pipe: ASTM A 53, standard weight.

B. Steel Sheet:
1. For structural uses: Hot-rolled, ASTM A 570; cold-rolled, ASTM A 611.
2. For nonstructural uses: Cold-rolled, ASTM A 366; hot-rolled, ASTM A 569.

C. Galvanized Steel Sheet:
1. For structural uses: ASTM A 446.
2. For nonstructural uses: ASTM A 526.
3. Galvanizing: In accordance with ASTM A 525, G90, unless otherwise indicated.

D. For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 MANUFACTURED COMPONENTS

A. Bar Gratings: Manufacture in accordance with "Standard Specifications for Metal Bar Grating and Metal Bar Grating Treads" (part of NAAMM MBG 531), except for specific requirements specified here.
1. Where load and deflection requirements are indicated, select member sizes and materials using manufacturer's published load tables.
2. Spacing: 1-1/2 inches
3. Cross bar spacing: 4 inches.
4. Top surface: Plain.

2.3 MATERIALS - MISCELLANEOUS

A. Grout: Nonmetallic, noncorrodible, nonshrink, factory blended and packaged; complying with ASTM C 1107. Use type recommended by manufacturer for exterior use where required.

B. Fasteners: Use fasteners suitable for the material being fastened and for the type of connection required.

1. For exterior use or built into exterior walls: Nonferrous stainless steel, zinc coated or cadmium plated.
2. Use fasteners of same material as items being fastened unless otherwise indicated.
3. Bolts and studs: ASTM A 307.
4. Nuts: ASTM A 563.
5. Plain washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).
6. Lock washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21M).
7. Expansion shields: FS FF-S-325.

C. Galvanizing Repair Paint: Zinc dust paint complying with SSPC-Paint 20 or MIL P-21035B, Type I or II.

D. Shop Primer: Fabricator's standard, fast-curing, lead-free, universal modified alkyd primer; resistant to normal atmospheric corrosion, compatible with finish paint systems indicated, capable of providing a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.

2.4 FABRICATION - GENERAL

A. Fabricate and shop-assemble in largest practical sections for delivery to site.
1. Prepare and reinforce fabrications as required to receive applied items.
2. Fabricate items with joints tightly fitted and secured.
3. Make exposed joints tight, flush, and hairline.

B. Fasteners: Use concealed fasteners if possible.
1. Exposed fasteners: Flathead, countersunk type unless otherwise indicated.

C. Anchors: Fabricate to suit conditions indicated; use anchors of same material and finish as item except where specifically indicated otherwise.

D. Welding:
1. Welding of steel: Comply with AWS D1.1 recommendations.
2. Provide continuous welds at welded corners and seams.
3. Exposed welds: Grind flush and smooth.

E. Joints Exposed to Weather: Fabricate to keep water out, or provide adequate drainage of water that penetrates.

2.5 FABRICATION - SHEET METAL

A. Comply with general fabrication requirements.

B. Bend sheet metal corners to smallest practical radius.

C. Welding Steel Sheet: Comply with AWS D1.3 recommendations.

2.6 FABRICATION - GRATINGS

A. Metal Bar Gratings: Produce metal bar gratings indicated per NAAMM marking system that comply with the following:
1. Metal Bar Grating Standard "Standard Specifications for Metal Bar Grating and Metal Bar Grating Treads" published in ANSI/NAAMM A202.1 "Metal Bar Grating Manual."

2. Heavy Duty Metal Bar Grating Standard: "Guide Specifications for Heavy Duty Metal Bar Grating" published in NAAMM "Heavy Duty Metal Bar Grating Manual."

3. Welded Steel Gratings: W-15-4 (welded with bearing bars 15/16 inch o.c. and cross bars 4 inches o.c.)/bearing bar sizes as indicated.
4. Welded Heavy Duty Steel Gratings: W-19-4 (welded with bearing bars 1-3/16 inch o.c. and cross bars 4 inches o.c.)/bearing bar sizes as indicated.
5. Traffic Surface for Steel Bar Gratings: As follows:
    a. Plain.
    b. Serrated.
    c. Knurled.
    d. Applied abrasive finish consisting of aluminum oxide aggregate in an epoxy resin adhesive.
6. Steel Finish: As follows:
    a. Shop prime paint applied in accordance with manufacturer's standard practice.
    b. Hot-dip galvanized with a coating weight of not less than 1.8 oz. per sq. ft. of coated surface.

2.7 FABRICATION - SHOP COATINGS

A. Hot-dip galvanize steel and iron assemblies set in concrete and masonry.

B. Shop prime all iron and steel fabrications.

C. Prepare surfaces to be coated as follows:
1. Solvent-clean in accordance with SSPC-SP 1.
2. Exterior fabrications: Clean in accordance with SSPC-SP 5.
3. Interior fabrications: Clean in accordance with SSPC-SP 5.

D. Shop Priming: Comply with SSPC-PA 1.
1. Apply primer immediately following surface preparation.
2. Do not prime surfaces to be welded.
3. Do not prime surfaces in direct contact bond with concrete.
4. Apply extra coat to corners, welds, edges, and fasteners.

E. Shop Painting: Apply shop primer to surface of metal fabrications except those embedded in concrete or galvanized; comply with SSPC-PA1 and requirements indicated below:
1. Surface Preparation: Comply with SSPC-SP6 "Commercial Blast Cleaning" for exterior work, and with SSPC-SP3 "Power Tool Cleaning" for interior work.
2. Stripe paint edges, corners, crevices, bolts, welds and sharp edges.

F. Galvanizing: ASTM A 123 for fabricated and unfabricated steel products made of uncoated rolled, pressed and forged steel shapes, plates, bars and strip 0.0229 inch and thicker.

2.8 FABRICATION - MISCELLANEOUS

A. Loose Bearing and Leveling Plates: Provide for steel items bearing on masonry or concrete, as indicated. Drill plates to receive anchor bolts.

B. Loose Steel Lintels: Fabricate from shapes and to sizes indicated. Galvanize after fabrication.

C. Miscellaneous Framing and Supports: Provide as required to complete work and not included with structural steel framework. Fabricate of welded construction in as large units as possible; drill and tap as required to receive hardware and similar items. Include required anchors for building into other work.

D. Miscellaneous Steel Trim: Fabricate to shapes and sizes as required for profiles shown; continuous welded joints and smooth exposed edges. Use concealed field splices

wherever possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.

E. Nosings: Fabricate of shapes as indicated; miter corners and weld joints. Provide anchors 6 inches from ends of corners and 24 inches o.c.

F. Shelf and Relieving Angles: Fabricate to sizes indicated for attachment to support framing. Provide slotted holes to receive anchor bolts, spaced not more than 6 inches from ends and 24 inches o.c. Galvanize shelf angles to be installed on exterior concrete.

G. Steel Pipe Railings: Fabricate to dimensions shown, with smooth bends and welded joints using steel pipe of diameter and finish indicated. Secure posts and rail ends to building construction as indicated.
   1. Galvanize exterior steel railings, including pipe, fittings, brackets, fasteners and other ferrous metal components.
   2. Provide steel pipe with black finish for interior railings, primed after fabrication.

H. Cast Treads and Thresholds: Cast-iron units with integral abrasive finish, of size and configuration indicated; with manufacturers's standard anchors for type of application indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Perform cutting, drilling and fitting required for installation; set work accurately in location, alignment and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other work.

B. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar, consisting of 1-part portland cement to 3-parts sand and only enough water for packing and hydration, or use commercial non-shrink grout material.

C. Touch-up shop paint after installation. Clean field welds, bolted connections and abraded areas, and apply same type paint as used in shop. Use galvanizing repair paint on damaged galvanized surfaces.

D. Perform all welding in accordance with AWS requirements and procedures for appearance, quality of welds, and correction of welding work.

E. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

G. Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

H. Coordinate installation fo anchorages for handrails and railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Anchor posts in concrete by inserting into preset sleeves or core-drilled holes and grouting space between post and sleeve.

J. Secure handrails to wall with wall brackets and end fittings.
   1. Use brackets with flange tapped for concealed hanger bolt.
   2. Use brackets with predrilled hole for exposed bolt anchorage.

END OF SECTION 05500

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Carpentry work not specified as part of other sections and which generally is not exposed, except as otherwise indicated.
2. Rough carpentry for:
a) Miscellaneous lumber for attachment and support of other work.
b) Construction panels for miscellaneous uses.
3. Preservative treatment.

1.2 SUBMITTALS

A. Treated Wood: Treating plant's instructions for use, including storage, cutting, and finishing.
1. Pressure preservative treatment
a) Treating plant's certification of compliance with specified standards and stating process employed and preservative retention values.
b) Treatment for above-ground use
c) Certification of kiln drying after treatment.

1.3 QUALITY ASSURANCE

A. Lumber
1. Comply with NIST PS 20 and approved grading rules and inspection agencies.

B. Grade Stamps for Concealed Lumber
1. Each piece of lumber, applied by inspection agency and showing compliance with each specified requirement. (All lumber/blocking, etc. concealed in wall or partition construction shall be fire retardant.

C. Construction Panels
1. Comply with NBS PS 1 where veneer plywood is specified; comply with APA PRP-108 where APA rated panels are specified; bearing APA trademark showing compliance with each specified requirement.

1.4 DELIVERY STORAGE AND HANDLING

A. Protect wood products against moisture and dimensional changes. Support stacks at several uniformly spaced points to prevent deformation. Store stacks raised above ground. Cover to protect from rain and snow. Select and arrange cover to allow air circulation under and all around stacks to prevent condensation. Maintain and restore displaced coverings. Remove from the site any wood products that have been subjected to moisture or that do not comply with the specified moisture requirements.

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

A. Size
1. Provide nominal sizes indicated, complying with NIST PS 20 except where actual sizes are specifically required.

B. Miscellaneous Lumber

1. Provide dimension lumber and boards necessary for the support of work specified in other sections, whether or not specifically indicated, and including but not limited to blocking, nailers, etc.
   a) Moisture content: 19 percent maximum (kiln-dry).
   b) Lumber: S4S, No. 2 or standard grade.
   c) Boards: Standard, 3 common, or No. 3 grade.

2.2 CONSTRUCTION PANELS

A. Construction Panels/Plywood:
   1. Miscellaneous uses
      a) C-C Plugged exterior.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners
   1. Provide as required by applicable codes and as otherwise indicated.

2.4 WOOD TREATMENT BY PRESSURE PROCESS

A. Aboveground Lumber: AWPB LP-2 (waterborne preservatives).
   1. Kiln dried after treatment to 19 percent maximum moisture content.
   2. Treat the following:
      a) Wood in contact with roofing or flashing.
      b) Wood in contact with masonry or concrete.
      c) Other members indicated.

B. Fasteners for Preservative Treated Wood: Hot-dip galvanized steel (ASTM A153).

PART 2 - EXECUTION

2.1 INSTALLATION - GENERAL

A. Arrange work to use full-length pieces except where lengths would exceed commercially available lengths. Discard pieces with defects that would lower the required strength or appearance of the work.

B. Cut and fit members accurately. Install plumb and true to line and level.

C. Fasten carpentry in accordance with applicable codes and recognized standards.

D. Where exposed, countersink nails and fill flush with suitable wood filler.

E. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

2.2 MISCELLANEOUS CARPENTRY

A. Provide miscellaneous blocking, nailers, and framing as shown and as required for support of facing materials, fixtures, specialty items, and trim. Cut and shape to the required size. Provide in locations required by other work.

B. Use countersunk fasteners appropriate to applied loading.

END OF SECTION 06100

SECTION 06200 - FINISH CARPENTRY

PART 1 - PUBLICATIONS:

1.1 Applicable publications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

A. Federal Specification (Fed.Spec.):
   1. FF-N-105B; Nails, Brads, Staples and Spikes: Notice 1 Wire, Cut and Wrought

B. U. S. Department of Commerce, National Bureau of Standards, Product Standards (Prod. Std.):
   1. PS 20-70 American Softwood Lumber Standard Amended 1986

C. Architectural Woodwork Institute (AWI) Publication:
   1. Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program (1984)

D. Northern Hardwood and Pine Manufacturers Association, Inc. (NHPMA) Publication:
   1. Standard Grading Rules for Northern and Eastern Lumber (Dec 1978: Rev Mar 10, 1982)

E. Southern Pine Inspection Bureau (SPIB) Publication:
   1. Grading Rules (Mar 15,1977; including Suppl. 1 through 12)

1.2 GENERAL REQUIREMENTS:

A. Grading and Marking: Materials shall bear the grade mark, stamp or other identifying marks indicating grades of material and rules or standards under which produced. Such identifying marks on a material shall be in accordance with the rule or standard under which the material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification. The inspection agency for lumber shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Except for plywood and lumber, bundle marking or certificates will be permitted in lieu of marking each individual piece.

B. Sizes and Patterns: Lumber sizes and patterns shall conform to Prod. Std. PS 20, and unless otherwise specified, shall be surfaced on four sides. Sizes and patterns for materials other than lumber shall conform to requirements of the rules or standards under which produced. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

C. Moisture Content: The maximum moisture content of trim shall be 8% to 12% at the time of delivery to the job site and when installed. Moisture content of all other materials shall be in accordance with the standard under which the product is produced.

1.3 SUBMTTALS:

A. Samples: Samples of each design of wood trim shall be submitted for approval. Samples shall be of sufficient size to show pattern, as applicable.

1.4 DELIVERY AND STORAGE:

A. Materials shall be delivered to the site in undamaged condition, stored in fully covered, well-ventilated areas, and protected from extreme changes in temperature and humidity.

1.5 MATERIALS:

A. Nails: Nails shall be the size and type best suited for the project requirements, hot-dip galvanized or aluminum for exterior use, in accordance with Fed. Spec. FF-N-105B when applicable. Screws for use where nailing is impracticable shall be size best suited for purpose.

B. Trim: Trim shall be species and grade in accordance with paragraph 1.6. Design shall be as shown on the drawings. Trim shall be assembled and sanded at the mill in so far as practicable in maximum practicable lengths. Finger joints are permitted when finish is paint.

1.6 INSTALLATION OF TRIM:

A. Interior Trim: Trim shall be installed straight, plumb, level and with closely fitted joints. Exposed surfaces shall be machine sanded at the mill. Molded work shall be coped at returns and interior angles and mitered at external corners. Provide all miscellaneous blocking or attachments. Note: non-combustible or fire retardant block required within all partitions.
Trim to be: No. 1 Popular.

B. Contractor shall be responsible for field measurements of all dimensions required.

C. Any chipped, split or damaged trim to be replaced at no additional cost to the Owner.

D. Install trim with respect to adjoining finishes so no gaps result.

END OF SECTION 06200

SECTION 06400 - ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior architectural woodwork.
      a. Cabinets.
      b. Cabinet hardware.
      c. Countertops.
      d. Shelving.

1.2 REFERENCES

A. Architectural Woodwork Quality Standards; Architectural Woodwork Institute; 1994.

1.3 SUBMITTALS

A. Shop Drawings: Plans and elevations; details at a large scale; show location of each item, identify components used, and indicate method of attachment.

B. Factory Finishes:
   1. Samples: 8- by 10-inch step samples, finished, for each finish and color, showing each coat required.

C. Solid Surfacing and Cultured:
   1. Product data.
   2. Samples for selection: Approximately 2- by 3-inch pieces of manufacturer's full type, pattern, and color range.

D. Cabinet Hardware:
   1. Product data.
   2. Samples showing each finish on each item of hardware exposed to view.

E. Fabricator Qualifications: For information only.

1.4 QUALITY ASSURANCE

A. Quality of Materials and Workmanship: Provide woodwork that complies with requirements of "Architectural Woodwork Quality Standards," published by Architectural Woodwork Institute (AWI) (hereinafter referred to as "woodworking standard").

B. Quality of Factory Finishing: Provide factory finishes that comply with Section 01500, "Architectural Woodwork Quality Standards."

C. Where contract documents indicate requirements, which are less restrictive than the woodworking standard, comply with the minimum requirements of the woodworking standard.

D. Fabricator Qualifications:
   1. A single firm shall fabricate all work of this section.

E. Installer Qualifications: Experienced in installing woodwork of similar quality.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials for interior woodwork indoors in air-conditioned spaces maintained within design temperature and humidity range.

1.6 PROJECT CONDITIONS

A. Maintain final design temperature and humidity in areas where woodwork is installed.

B. Fit woodwork to actual construction. Take field measurements before fabricating.

C. Coordinate installation of woodwork with other work to avoid damage.

PART 2 - PRODUCTS

2.1 WOOD MATERIALS

A. Lumber - General: Species and grade as specified in woodworking standard, unless otherwise indicated.
   1. Comply with applicable requirements of AWI Section 100.
   2. Moisture content at time of fabrication: Not greater than optimum moisture content as specified in woodworking standard.
   3. Provide lumber dressed on all exposed faces, unless otherwise indicated.
   4. Do not use twisted, warped, bowed, or otherwise defective lumber.
   5. Sizes indicated are nominal, unless otherwise indicated.
   6. Do not mark or color lumber, except where such marking will be concealed in finish work.

B. Trim, Molding and Finish Lumber: No. 1 Popular or approved substitution. Exposed edges of boards shall be eased. Trim to receive opaque finish may be finger jointed.

C. Plywood: Types, grades, and cores as specified in the woodworking standard, except as otherwise specified in this section.
   1. Comply with applicable requirements of AWI Section 200.
   2. Face grade for plywood to receive laminates: Grade A, minimum.
   3. Plywood for Shelving: A-B or B-B Grade, Exterior.

2.2 MISCELLANEOUS MATERIALS

A. Laminate Wilsonart or equal for fronts, countertops and splashes..

B. Fasteners: Style, size, material, and finish as required for the purpose.

2.3 CABINET HARDWARE

A. Cabinet Hardware: Provide hardware and accessories.
   1. Finishes on exposed hardware: Comply with BHMA A156.18.
   2. Concealed hardware: Manufacturer's standard finish, complying with applicable requirements of BHMA A156.9.
   3. Hinges: Totally concealed style, self-closing, and opening 180 degrees.
   4. Pulls: As selected.
   5. Catches: Heavy duty.
   6. Drawer slides: Side-mounted, 75-pound capacity, full extension, with nylon ball-bearing rollers; positive pullout stop, self-closing, lift-out feature.
   7. Cabinet-mounted adjustable shelf supports: Full height of cabinet, with adjustable shelf support clips.

B. Hardware Quantities:

1. Hinges: Two per door up to 36 inches high; three per door over 36 inches high.
2. Pulls: One per door, drawer.
3. Catches: One per door.
4. Drawer slides, side mounted: Two per drawer.
5. Locks: Where requested by Owner.
6. Cabinet-mounted adjustable shelf supports: Four standards for each cabinet to receive adjustable shelving and four shelf support clips for each shelf.

2.4 FABRICATION

A. Wall and Base Cabinets: See Drawings.

2.5 FACTORY FINISHING

A. Factory Finish: As specified for individual item.

B. Apply entire finish in shop; touch-up and cleaning only may be performed after installation.

C. Prepare for finishing in accordance with the woodworking standard.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that blocking and backings have been installed at appropriate locations for anchorage.

B. If shop-fabricated items are not fully fabricated, complete fabrication.

3.2 INSTALLATION - GENERAL

A. Do not begin installation of interior woodwork until potentially damaging construction operations are complete in the installation area.

B. Field Joinery: Comply with requirements of the woodworking standard for shop joinery.

C. Make joints neatly, with uniform appearance.

D. Install woodwork in correct location, plumb and level, without rack or warp.
1. Install with no variation in flushness of adjoining surfaces.

E. Shim as required with concealed shims.

F. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips and moldings as indicated or required for a complete finished installation.

G. Touch-up shop finishes at field cuts.

H. Secure woodwork to structural support members or use anchors required.
1. Where anchorage method is not indicated, conceal all fasteners where possible.
2. Where exposed nailing is required or indicated, use finishing nails, countersink, and fill.

I. Repair damaged and defective woodwork to eliminate visual and functional defects; where repair is not possible, replace woodwork.

J. Touch up shop-applied finishes where damaged or soiled.

K. Cabinets:
   1. Install so drawers operate smoothly.
   2. Install all hardware not installed in shop.
   3. Anchor tops securely.
   4. Install tops level, within 1/8 inch in 8 feet.

L. Countertops: Attach countertops securely to base units. Conceal fastenings where practicable, fit the counter level, install in a rigid manner, and scribe to adjoining surfaces. Provide counter sections in the longest lengths practicable; keep joints in tops to a minimum. Provide cutouts for fixtures and appliances; drill pilot holes at corners before making cutouts.

   Install back and end splashes with concealed fastening.

M. Adjustable Shelving: Set standards at 32 inches on-center maximum and not greater than 6 inches from each end of shelf. Set top of standards at 7.5 feet above floor, unless otherwise indicated.

N. Anchorage of Millwork: Anchor securely in place with appropriate fasteners, anchored into structural support members of wall construction.

3.3 ADJUSTING

A. Adjust and lubricate cabinet hardware for smooth operation.

3.4 CLEANING

A. Clean exposed and semi-exposed surfaces.

3.5 PROTECTION

A. Protect woodwork from damage and maintain design environmental conditions.

END OF SECTION 06400

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. EXT. wall insulation.
2. Sound Insulation
3. Roof insulation.
4. See also drawings for other requirements.

1.2 DEFINITIONS

A. Thermal Resistance (R-value): The temperature difference in degrees F between the two surfaces of a material of given thickness, required to make 1 BTU of energy flow through 1 square foot of the material in 1 hour.

1.3 SUBMITTALS

A. Product Data: Submit for each product specified in this section.

1.4 DELIVERIES, STORAGE, AND HANDLING

A. Insulation: Minimize period between product delivery and actual installation. Protect against exposure to flame, sparks, or excessive heat. Minimize exposure to sunlight.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide manufacturer's standard preformed insulation units, sized for proper fit in indicated applications.

B. Exterior Wall Insulation:
1. Exterior Walls foam all exterior masonry cells and R-15 batt insulation w/ vapor barrier in perimeter stud walls.

C. Unfaced Sound Insulation Batts
1. Provide unfaced sound batt insulation in all interior partitions floor to ceiling, and toilet ceiling.

D. Roof Insulation:
1. To be R-34 close cell foam insulation.

2.2 ACCESSORIES

A. Provide accessories as necessary to properly install specified products.
1. Adhesive: Insulation manufacturer’s recommended adhesive, complying with fire performance requirements.
1. Clips: Attachments as required to support the insulation as required.

PART 3- EXECUTION

3.1 EXAMINATION

A. Verify that conditions conform to requirements of contract documents.

B. Verify that related work to be performed within indicated spaces before installation of insulation has been completed.

C. Verify that substrates are in satisfactory condition to receive insulation.

D. Do not proceed until unsatisfactory conditions have been corrected. Commencement of installation indicates acceptance of conditions.

3.2 PREPARATION

A. Clean substrates of any substances, which might damage materials to be installed.

B. Remove harmful projections capable of puncturing vapor retarder.

3.3 INSTALLATION

A. Do not install insulation which is damaged, wet, soiled, or which has been covered at any time with ice or snow.

B. Comply with insulation manufacturer's recommendations and installation sequence. Provide permanent placement and support of insulation.

C. Install materials in a manner, which will maximize continuity of thermal or sound attenuation envelope, as applicable. Use a single layer of insulation wherever possible to achieve indicated requirements, unless otherwise indicated.

D. Insulation Blankets/Batts:
1. Unfaced Sound Attenuation Insulation, Stud Partitions: Friction-fit blanket insulation between partition framing members and extended from floor slab to ceiling. Stuff pieces of insulation into cracks between framing and into miscellaneous voids and cavity spaces (e.g., perimeter of wall openings).

3.4 PROTECTION

A. Protect installed materials from damage until permanent concealing work is completed.

B. Where concealing work is not performed immediately after installation work of this section is completed, erect suitable temporary coverings or enclosures to prevent damage.

END OF SECTION 07210

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Amendments to General Conditions, and Supplementary Conditions and Sections in Division I of the Specifications apply to work of this section.

1.2 DESCRIPTION

A. Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this Section.

B. Types of work specified in this Section include the following:

1. Metal counter flashing and base flashing.
2. Exposed metal trim.
3. Miscellaneous sheet metal accessories.

C. Related Work:

1. Section 07900 - Joint Sealants

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01620.

B. Product Data; Sheet Metal, Accessories: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

C. Samples; Flashing, Sheet Metal, Accessories: Submit 8" square samples of specified sheet materials to be exposed as finished surfaces.

1. Submit 12" long, completely finished units of specified factory-fabricated products exposed as finished work.

D. Shop Drawings; Flashing, Sheet Metal, Accessories: Submit shop drawings showing layout, joining, profiles, and anchorages of fabricated work, including major counter flashing, trim/fascia units, etc.; layouts at 1/4" scale, detail at 3" scale.

1.4 QUALITY ASSURANCE

A. Comply with industry standards and recommendations of SMACNA Architectural Sheet Metal Manual except as specifically indicated otherwise.

1.5 JOB CONDITIONS

A. Coordinate work of this Section with interfacing and adjoining work for proper sequencing of each installation. Insure best possible weather resistance and durability of work and protection of materials and finishes.

B. Surfaces to which flashing and sheet metal are applied shall be even, smooth, sound, thoroughly clean and dry and free from all defects that might affect the application. Report any unsatisfactory surfaces to the General Contractor.

C. Do not proceed with installation of sheet metal work until curb and substrate

construction, blocking, roofing, regrets, and other construction that will receive the work are completed. Proceeding with application of sheet metal work will be evidence of substrate acceptance by Installer.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01620.

B. Materials furnished by this Section, which are to be built-in by other trades, shall be delivered to the Site in time to avoid delays in construction schedule.

PART 2 - PRODUCTS

2.1 FLASHING AND SHEET METAL MATERIALS

A. .032 Aluminum minimum
B. Flashing exposed to view, color to be selected to match surrounding conditions.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Same metal as flashing/sheet metal or other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

B. Bituminous Coating: SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

C. Mastic Sealant: Polyisobutylene; nonhardening nonskinning, noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

D. Adhesives: Type recommended by flashing sheet manufacturer for waterproof weather-resistant seaming and adhesive application of flashing sheet.

E. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation work, matching or comparable with material being installed. They shall be noncorrosive, in sizes and gauges required for proper performance.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

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. Provide 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, which will be permanently watertight and weatherproof.

B. Underlayment: Where aluminum is to be installed directly on cementitious or wood substrates, apply a coating or other permanent separation as recommended by manufacturer/fabricator to concealed aluminum surfaces.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances, which might cause corrosion of metal or deterioration of finishes.

B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashing and sheet metal work during construction, to ensure that work be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

SECTION 07840 - FIRE STOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Fire Stopping Materials.

B. Related Documents: Division 0 - Bidding & General Conditions; Division 1, General Requirements, all applicable provisions in the Technical Sections of Division 2 through 16 and applicable drawings apply to this Section.

C. Related Sections:
1. Section 07900 - Joint Sealants.
2. Section 09260 - Gypsum Wallboard Systems.

D. Description of Work in this Section: Only tested fire stop systems shall be used in specific locations as follows:
1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical bus ways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
2. Safing slot gaps between edge of floor slabs and curtain walls.
3. Openings between structurally separate sections of wall or floors.
4. Gaps between the top of walls and ceilings or roof assemblies.
5. Expansion joints in walls and floors.
6. Openings and penetrations in fire-rated partitions or walls containing fire doors.
7. Openings around structural members which penetrate floors or walls.

1.2 SUBMITTALS

A. Product Data: Manufacturer's Specifications and Technical Data for each material including the composition and limitations, documentation of UL Fire Stop Systems to be submitted.

1.3 QUALITY ASSURANCE

A. Engage an experienced installer who is certified, licensed, or otherwise qualified by the fire stopping manufacturer as having been provided the necessary training to install the manufacturer's products per requirements.

1.4 REFERENCE STANDARDS

A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops". (July 1997).

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:
    a. Firestop Devices (XHJI).
    b. Fire Resistance Ratings (BXUV).
    c. Through-Penetration Firestop Systems (XHEZ).
    d. Fill, Voids or Cavity Material (XHHW).
    e. Forming Materials (XHKU).

2. Alternate “Omega Point Laboratories Directory” (updated annually).

C. Test Requirements: UL 2079, “Tests for Fire Resistance of Building Joint Systems” (July 1998.)

D. Test Requirements: ASTM E 1966, “Standard test method for Fire Resistive Joint Systems” (July 2000).

E. Inspection Requirements: ASTM E 2174 – 01, “Standard Practice for On-site Inspection of Installed Fire Stops”.

F. International Fire Stop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

G. ASTM E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.

H. All major building codes: ICBO, SBCCI, BOCA, and IBC. (Note to Specifier: Retain or delete building codes listed above as applicable)

I. NFPA 101 - Life Safety Code

J. NFPA 70 - National Electric Code

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.6 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.1 FIRE STOPPING - GENERAL

A. Provide fire stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the fire stopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed”. Provide cast-in-place fire stop devices prior to concrete placement.

2.2 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ) and joint systems (XHBN) listed in Volume 2 of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma 1-800-879-8000.
2. STI Fire Protection Products.
3. Approved equal.

2.3 MATERIALS

A. Use only fire stop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Cast-in place fire stop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
1. Hilti CP 680 Cast-In Place Firestop Device.

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant.
2. Hilti CP 604 Self-leveling Firestop Sealant.
3. Hilti CP 620 Fire Foam.

D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

1. Hilti CP 601s Elastomeric Firestop Sealant.
2. Hilti CP 606 Flexible Firestop Sealant.
3. Hilti FS-ONE Intumescent Firestop Sealant.
4. Hilti CP 604 Self-leveling Firestop Sealant.

E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

1. Hilti CP 672 Speed Spray.
2. Hilti CP 601s Elastomeric Firestop Sealant.
3. Hilti CP 606 Flexible Firestop Sealant.
4. Hilti CP 604 Self-leveling Firestop Sealant.

F. Pre-formed mineral wool designed to fit flutes of metal profile deck; as a backer for spray material.
1. Hilti CP 677 Speed Plugs.

G. Intumesent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
1. Hilti FS-ONE Intumescent Firestop Sealant.

H. Foams, intumesent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti FS-ONE Intumescent Fire Stop Sealant.
2. Hilti CP 618 Fire Stop Putty Stick.
3. Hilti CP 620 Fire Foam.

I. Non-curing, re-penetrable intumesent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti CP 618 Fire Stop Putty Stick.

J. Wall opening protective materials for use with U.L. listed metallic and specified non-metallic outlet boxes, the following products are acceptable:

1. Hilti CP 617 Firestop Putty Pad.

K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti CP 642 Firestop Collar.
2. Hilti CP 643 Firestop Collar.
3. Hilti CP 645 Wrap Strips.

L. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti CP 637 Trowelable Fire Stop Compound.
2. Hilti FS 657 FIRE BLOCK.
3. Hilti CP 620 Fire Foam.

M. Non-curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK.

N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

1. Hilti CP 672 Speed Spray.
2. Hilti CP 601s Elastomeric Fire Stop Sealant.
3. Hilti CP 606 Flexible Fire Stop Sealant.
4. Hilti CP 604 Self-Leveling Fire Stop Sealant.

O. Provide a fire stop system with an "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

P. Provide a fire stop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.
2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 COORDINATION

A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

B. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

3.3 INSTALLATION

A. Regulatory Requirements: Install fire stop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

3. Protect materials from damage on surfaces subjected to traffic.

3.4 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration fire stopping shall be performed in accordance with ASTM:

1. E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops” or other recognized standard.

D. Perform under this section patching and repairing of fire stopping caused by cutting or penetrating of existing fire stop systems already installed by other trades.

3.5 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

END OF SECTION 07840

SECTION 07900 - JOINT SEALANTS

PART 1- GENERAL

1.1 SUMMARY

A. Section Includes:
1. The sealing of exterior and interior joints.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data on each joint sealer, with instructions for substrate preparation and installation.

B. Samples for Color Selection: Cured samples of actual products showing manufacturer's full range of colors.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original containers or bundles with labels showing manufacturer, product name or designation, color, shelf life, and installation instructions.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not install sealers if any of the following conditions exist:
1. Air or substrate temperature exceeds the range recommended by sealer manufacturer or is below 40 degrees F (4.4 degrees C).
2. Substrate is wet, damp, or covered with snow, ice, or frost.

B. Dimensional Limitations: Do not install sealers if joint dimensions are less than or greater than that recommended by sealer manufacturer; notify the architect and get sealer manufacturer's recommendations for alternative procedures.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

A. General: Provide only products which are recommended and approved by their manufacturer for the specific use to which they are put and which comply with all requirements of the contract documents.
1. For each generic product, use only materials from one manufacturer.
2. Provide only materials which are compatible with each other and with joint substrates.
3. Colors of exposed sealers: As selected by the Architect from manufacturer's standard colors.

2.2 ELASTOMERIC SEALANTS

A. Elastomeric Sealants - General: Chemically curing elastomeric sealants of types indicated, complying with ASTM C 920, including specific Type, Grade, Class, and Uses indicated, as well as all other requirements specified.
1. Exterior, Non-Traffic Areas: Type S, Grade NS, Class 25, Use NT. Provide one of the following Polyurethane or Silicone Sealants or an approved substitution:
a. Polyurethane:
(1) Bostik/Chem-Calk 900.
(2) Pecora Corp./Dynatrol I.
(3) Sonneborn-ChemRex, Inc./Sonolast NPI.
(4) Tremco, Inc./Dymonic.
b. Silicone:

(1) Bostik/Chem-calk 2200.
(2) Pecora Corp./895 Silicone.
(3) Sonneborn-ChemRex, Inc./Sonolastic Omniseal.
(4) Tremco, Inc./Spectrum 2.

2. Exterior, Traffic Areas: Type S, Grade P, Class 25, Use T. Provide one of the following silicone sealants or an approved substitution:
   a. Silicone:
      (1) Bostik/Chem-calk 950.
      (2) Pecora Corp./NR-201 Urexpan.
      (3) Sonneborn-ChemRex, Inc./Sonolastic SLI.

3. Interior, Non-Traffic Areas: Type S, Grade NS, Class 12.5 or 25, Use NT. Provide one of the following polyurethane or silicone sealants or an approved substitution:
   a. Polyurethane:
      (1) Bostic/Chem-calk 915.
      (2) Pecora Corp./Dynatrol I.
      (3) Sonneborn-ChemRex, Inc./Sonolast NPI.
      (4) Tremco, Inc./Dymonic.
   b. Silicone:
      (1) Bostik/Chem-calk 2200.
      (2) Pecora Corp./895 Silicone.
      (3) Sonneborn-ChemRex, Inc./Sonolastic Omniseal.
      (4) Tremco, Inc./Spectrum 2.

4. Interior, Traffic Areas: Type S, Grade P, Class 25, Use T. Provide one of the following silicone sealants or an approved substitution:
   a. Silicone:
      (1) Bostik/Chem-calk 950.
      (2) Pecora Corp./NR-201 Urexpan.
      (3) Sonneborn-ChemRex, Inc./Sonolastic SLI.

5. Expansion/ Control Joints in Concrete walls: Pecora 890

2.2 LATEX SEALANTS

A. Latex Sealant - General: One-part, nonsag, mildew-resistant, paintable latex sealant complying with ASTM C 834.
   1. Exterior: Do not use for exterior applications.
   2. Interior: Use only on non-working joints. Provide one of the following or an approved substitution:
      a. Pecora Corp./AC-20.
      b. Sonneborn-ChemRex, Inc./Sonolac.
      c. Tremco, Inc./Acrylic Latex 834.

2.3 SEALANT BACKERS

A. Backers - General: Nonstaining; recommended or approved by sealant manufacturer for specific use.

B. Backer Rods: Flexible, nonabsorbent, compressible polyurethane foam, either open-cell or non-gassing closed-cell, unless otherwise restricted by sealant manufacturer; preformed to appropriate size and shape.

C. Bond-Breaker Tape: Self-adhesive, polyethylene or other plastic tape, unless otherwise electricted by sealant manufacturer; suitable for preventing sealant adhesion.

2.4 MISCELLANEOUS MATERIALS

A. Primers: As recommended by sealer manufacturer.

B. Cleaners: As recommended by sealer manufacturer and not damaging to substrates.

C. Masking Tape: Nonabsorbent, nonstaining.

D. Tooling Agents: Approved by sealant manufacturer; nonstaining to sealant and substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints for characteristics that may affect sealer performance, including configuration and dimensions.

B. Do not begin joint sealer work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Cleaning: Just before starting sealer installation, clean out joints in accord with recommendations of sealer manufacturers and as follows:
1. Remove all material that could impair adhesion, including dust, dirt, coatings, paint, oil, and grease. Exception: Materials tested to show acceptable adhesion and compatibility.
2. Dry out damp and wet substrates thoroughly.
3. Remove loose particles by vacuuming or by blowing with oil-free compressed air.
4. Concrete: Remove laitance and form-release coatings.
5. Clean substrates with methods recommended by sealant manufacturer which will not damage the substrate.
6. Use methods which will not leave residues that will impair adhesion.

B. Priming: Prime substrates as recommended by sealer manufacturer.

C. Masking Tape: Use masking tape to keep primers and sealers off of adjacent surfaces which would be damaged by contact or by cleanup. Remove tape as soon as practical.

D. Install fillers where needed to provide proper joint depth or support for sealant backers.

E. Provide caulk joints at all exterior exposed concrete construction/pour joints.

3.3 INSTALLATION

A. Comply with sealer manufacturers' installation instructions and recommendations, except where more restrictive requirements are specified.

B. Gunnable and Pourable Sealants: Comply with recommendations of ASTM C 1193.

C. Backers:
1. Install backers at depth required to result in shape and depth of installed sealant which allows the most joint movement without failure.
a. Make backers continuous, without gaps, tears, or punctures.
b. Do not stretch or twist backers.
2. If backers become wet or damp before installation of sealant, dry out thoroughly before proceeding.
3. Use bond-breaker tape where indicated and wherever it is necessary to keep sealant from adhering to back or third side of joint.

D. Sealants: Use methods recommended by manufacturer; completely fill the joint; make full contact with bond surfaces; tool nonsag sealants to smooth surface eliminating air pockets.

1. Use concave joint shape shown in Figure 5A in ASTM C 1193, where not otherwise indicated.

3.4 PROTECTION AND CLEANING

A. Clean surfaces adjacent to joints as work progresses and before sealants set using methods and materials approved by manufacturers of sealers and of surfaces to be cleaned.

B. Protect joint sealers from contamination and damage.

C. Remove and replace damaged sealers.

3.5 WARRANTY

A. Provide 20 year caulking warranty.

END OF SECTION 07900

SECTION 07 41 13 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Mechanically-seamed, standing seam metal roof panels, with related metal trim and accessories.

1.2 REFERENCES

A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:

1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.

B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM): www.astm.org:

1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. ASTM A 980 - Standard Specification for Steel, Sheet, Carbon, Ultra High Strength Cold Rolled.
5. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
6. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
7. ASTM D 1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
10. ASTM E 1514 - Standard Specification for Structural Standing Seam Steel Roof Panel Systems.
11. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
12. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
13. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
14. ASTM E 1980 - Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. Cool Roof Rating Council (CRRC): www.coolroofs.org/productratingprogram.html:

1. CRRC-1-2008 - CRRC Product Rating Program.

E. FM Global (FM): www.fmglobal.com:

1. ANSI/FM 4471 - Approval Standard for Class 1 Panel Roofs.

F. International Accreditation Service (IAS):

1. IAS AC 472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

G. Underwriters Laboratories, Inc. (UL): www.ul.com:

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies

H. US Environmental Protection Agency: www.energystar.gov/index.cfm:

1. Energy Star Reflective Roof Products.

I. US Green Building Council (USGBC): www.usgbc.org:

1. LEED - Leadership in Energy and Environmental Design (LEED) Green Building Rating Systems.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.

1. Coordinate building framing in relation to metal panel system.
2. Coordinate openings and penetrations of metal panel system.
3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.4 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.
b. Samples of each component.
c. Sample submittal from similar project.
d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
e. Sample warranty.
f. IAS AC 472 certificate.

C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years experience with successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

1.5 ACTION SUBMITTALS

A. Product Data: Manufacturer’s data sheets for specified products.

B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.

1. Indicate points of supporting structure that must coordinate with metal panel system installation.
2. Include data indicating compliance with performance requirements.
3. Include structural data indicating compliance with requirements of authorities having jurisdiction.

C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.

D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.

B. Qualification Information: For Installer firm and Installer’s field supervisor.

C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.

D. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.

1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

1.9 COORDINATION

A. Coordinate sizes, profiles, and locations of roof curbs and other roof-mounted equipment and roof penetrations, based upon sizes of actual selected equipment.

1.10 WARRANTY

A. Special Manufacturer’s Warranty: On manufacturer’s standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.

B. **Special Weathertightness Warranty**: On manufacturer’s standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail to remain weathertight, including leaks, without monetary limitation.

C. Special Panel Finish Warranty: On Manufacturer’s standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within 25 years from date of Substantial Completion, including:

a. Color fading in excess of 5 Hunter units per ASTM D 2244.
b. Chalking in excess of No. 8 rating per ASTM D 4214.
c. Failure of adhesion, peeling, checking, or cracking.

2. Modified Silicone-Polyester Two-Coat System:

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer: **MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.**; Houston TX. Tel: (877)713-6224; Email: info@mbci.com; Web: www.mbci.com.

1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.2 PERFORMANCE REQUIREMENTS

A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.

B. System Performance: Comply with ASTM E 1514 and requirements of this Section.

C. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses required:

1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings. (156mph)

a. Wind Uplift Testing: Certify capacity of metal panels by actual testing of proposed assembly per ASTM E 1592.

2. Snow Loads: 10 lbf/sq. ft.
3. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code.
4. Seismic Performance: Comply with ASCE 7, Section 9, "Earthquake Loads."

D. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-90.

E. **FM Approvals Listing**: Comply with FM Approvals 4471 as part of a panel roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 construction. Identify materials with FM Approvals markings.

F. Air Infiltration, ASTM E 1680: Maximum 0.09 cfm/sq. ft. (0.457 L/s per sq. m) at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).

G. Water Penetration Static Pressure, ASTM E 1646: No uncontrolled water penetration at a static pressure of 12 lbf/sq. ft. (575 Pa).

H. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.3 METAL ROOF PANELS

A. Mechanically-seamed, Concealed Fastener, Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with vertical ribs at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.

1. Basis of Design: **MBCI, SuperLok,** www.mbci.com/superlok.html.

a. Nominal Coated Thickness: 24 gage.

b. Panel Surface: Smooth with striations in pan
c. Color: As selected by Architect from manufacturer's standard colors**.**

2. Panel Width: 16 inches (406 mm).
3. Panel Seam Height: 2 inch (50.8 mm).
4. Joint Type: Mechanically seamed.

2.4 METAL ROOF PANEL ACCESSORIES

A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in manufacturer's standard profiles profiles as indicated. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.

B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

C. Panel Clips: Provide panel clip of type specified, at spacing indicated on approved shop drawings.

D. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply long life fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.

E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.

F. **Steel Sheet Miscellaneous Framing Components**: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

G. **Roof Accessories**: Approved by metal roof panel manufacturer. Refer to Section 07 72 00 "Roof Accessories" for requirements for curbs, equipment supports, roof hatches, heat and smoke vents, ventilators, and preformed flashing sleeves.

2.5 FABRICATION

A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.

B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.

C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.6 FINISHES

A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

B. **Fluoropolymer Two-Coat System**: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621, meeting solar reflectance index requirements.

1. Basis of Design: **MBCI, Signature 300**.

C. Interior Finish: 0.5 mil total dry film thickness consisting of primer coat and wash coat of manufacturer's standard light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.

1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:

    a. 1/4 inch (6 mm) in 20 foot (6.1 m) in any direction.
    b. 3/8 inch (9 mm) over any single roof plane.

B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal roof panel system installation.

3.2 PREPARATION

A. **Miscellaneous Supports**: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.

B. Flashings: Install flashings to cover exposed underlayment per Section 07 62 00 "Sheet Metal Flashing and Trim."

3.3 METAL PANEL INSTALLATION

A. Mechanically-Seamed, Standing Seam Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.

B. Attach panels to supports using clips, screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.

1. Fasten metal panels to supports with concealed clips at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
3. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
4. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

3.4 ACCESSORY INSTALLATION

A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
3. Provide concealed fasteners except where noted on approved shop drawings.
4. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency acceptable to Architect to perform field tests and inspections and to prepare test reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.

B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION

SECTION 08100 - FIBERGLASS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

A. This section applies to fiberglass reinforced plastic (FRP) doors, frames, or approved equal.

1.3 SUBMITTALS

A. Shop Drawings shall provide pertinent dimensions, hardware locations, transom and lite sizes, louver locations and dimensions, and door elevations. Mortises for hardware must be molded in at the factory as the door is built. Mortises shall not be routed or cut out of the stile structure or the jambs.

1.4 PRODUCT HANDLING

A. All materials shall be delivered to thee site in sealed, undamaged containers fully identified with the manufacturer's name, project number, the tag location, the door type, color and weight. The doors and frames must be shipped in wood crates with wood perimeters. Store materials in original cartons, on edge in such a way to prevent falling or damage to face, corners or edges.

PART 2 - PRODUCTS

2.1 DOORS

A. Door shall be made of fiberglass reinforced plastic (FRP) using resins tailored to a specific corrosive environment (stated by the purchaser at the time the order is placed) and have a fiberglass content of 25% by weight. The doors shall be flush construction, having no seams or cracks. All mortises shall be molded in at the factory. The doors shall be 1-3/4" thick with a 15mil (plus or minus 3 mil) color gelcoat and have an R-factor of 12. Secondary painting over pultrusions to achieve color is not acceptable.

B. Rated/labeled fiberglass door required where called for on plans and schedules.

C. STILES AND RAILS

1. Shall be constructed starting from the outside toward the inside of a 15-20 mil gel coat of the color specified followed by a matrix of at least three layers of 1.5 ounce per square foot of fiberglass mat. The tile and rail shall be molded in one continuous piece to a U-shaped configuration and to the exact dimensions of the door (patented). In this manner there will be no miter joints or disparate materials used to form the one-piece stile and rail. Pultrusions will not be acceptable for stiles and rails as (1) the color gel coat is not an integral part of the structure (it must of necessity be applied as paint when the structure is assembled), and (2) mortises must be cut into the pultrusions, thus weakening by removing as much as two-thirds of its thickness and (3) the practice of mitered joints in pultrusions leaves access areas for penetration of contaminants to the inside of the door.

D. DOOR PLATES

1. Shall be molded in one continuous piece, starting with a 15-20 mil gel coat of the color specified, integrally molded with at least two layers of 1.5 ounce per square foot fiberglass mat and layer of 16 ounce per square yard unidirectional glass roving.

E. REINFORCEMENT

1. Adequate reinforcing and compression members shall be used to accommodate surface hinges, closers, locksets, kickplates, or push or pull plates. When engineering considerations dictate, mild steel is buried in the fiberglass matrix to provide enhanced screw holding power. In no case should screws be used into fiberglass matrix to provide holding for hinges, locks or closers or any structured attachment.
2. Thrubolting is recommended for attachment of hinges, and closers in as much as the strength of thrubolting is five to six times as great as edge attaching with screws. When thrubolting is to occur, a compression member is to be located which will provide memory and resistance to the torquing of thrubolts.
3. All voids between the door plates shall be completely filled with the equivalent of 4-6 pounds expanded polyurethane foam, having a flame spread of 25 or less per ASTM E-84. A phenolic-coated kraft honeycomb may be substituted for urethane foam where engineering requirements dictate.

F. FLAME SPREAD

1. All reinforcing resins shall contain a halogenated additive or coreactant plus Antimony Trioxide to achieve a flame spread of 25 or less per ASTM E-84 and shall be self-extinguishing per ASTM D-635.

G. COLOR:

1. The color of the door or frame shall be integrally molded as the part is made.
2. The color is to be as selected by the Architect. White and grey and tan are standard colors.
3. The deposit of 15-20 mils of gel coat is the equivalent of 50 to 60 coats of paint applied by spray.

2.2 FRAMES

A. Frames shall be similar to the doors in construction and materials except the frames shall be solid fiberglass. The stop and frame will be molded all in one piece. The frame shall be integrally gelcoated to the customer's color when molded. Mortises will be molded in. It is not permitted to rout in mortises or remove any material from the head or jambs, to provide mortises.

B. Reinforcement for mounting hinges, closers, etc., shall be of mild steel plates strategically located and buried in the resin-glass matrix so they will not be exposed to the elements.

C. The jamb shall be flat on the backside (against the openings) and uniform in thickness so as to provide a solid, uniform surface against the wall opening. No wood blocks or spacers are permitted.

D. Rated/labeled fiberglass door frame required where indicated on plans and schedules.

2.3 HARDWARE

A. See section 08710 for hardware

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be in strict compliance with manufacturer's written instructions using non-corrosive materials and methods.

3.2 GUARANTEE

A. Door Company shall unconditionally guarantee it's registered doors for ten years against failure due to corrosion from the specific environment named at the time of purchase.

END OF SECTION 08100

SECTION 08111 - STANDARD STEEL DOOR FRAMES

PART 1 - GENERAL:

1.1 SUMMARY:

A. Work in this section includes:

1. Hollow Metal Frames

B. Related work includes:

1. Flush wood doors (section 08211)
2. Glazing (section 08800)
3. Joint sealers (section 07900)

1.2 SUBMITTALS: With manufacturer's standard details and specifications for steel doors and frames, submit shop drawings showing application to project, as required.

1.3 STANDARDS: In addition to other specified requirements, comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" ANSI/SDI-100.

PART 2 - PRODUCTS

2.1 MANUFACTURER: One of the following:

A. Ceco Corp.
B. Curries
C. Steelcraft Manufacturing Co.
D. Amweld
E. Or approved equal.

2.2 MATERIALS

A. Supports and Anchors: Fabricate of not less than 14-gage sheet steel.

B. Fire-Rated Assemblies: Provide units that display appropriate UL or FM labels for fire-rating indicated.

C. Fabrication: Fabricate units to be rigid, neat in appearance, and free from defects, warp or buckle. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible.

D. Prepare steel door frames to receive finish hardware, including cutouts, reinforcing, drilling and tapping, complying with ANSI A 115 "Specifications for Door and Frame Preparation for Hardware."

E. Frames: Comply with ANSI/SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details.

1. Provide galvanized frames – Typical all exterior doors.
2. Fabricate frames with mitered, coped, or welded corners.
3. Prepare frames to receive 3 silencers on strike jambs of single-door frames and on heads of double-door frames.
4. Provide 26-gage steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings.
5. Protect inside faces of frames in plaster or masonry wall construction, which are placed with anti-freeze additives, using high-build fibered asphalt emulsion coating.
6. See plans for Fire Ratings required.

PART 3 - EXECUTION

3.1 INSTALLATION: Install hollow-metal units in accordance with manufacturer's instructions and final shop drawings. Fit doors to frames and floors with clearances specified in ANSI/SDI-100.

A. Install frames in accordance with SDI 105.
B. Doors and frames shall be installed plumb, true and in alignment with each other. Frames shall be securely anchored, filled solid with grout and completely rigid in walls.
C. Install fire-rated units in accordance with NFPA Std. No. 80.
D. Finish hardware is specified in another Division 8 section. Coordinate all hardware requirements with shop drawings.

END OF SECTION 08111

SECTION 08120 - ALUMINUM DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Glazed aluminum swinging doors.
2. Aluminum door frames.

B. Related work includes:
1. Glazing (08800)

1.2 PERFORMANCE REQUIREMENTS

A. Exterior Assemblies: Design to comply with the D.P. Ratings as required and air infiltration requirements. Wind load required 150 mph.

1.3 SUBMITTALS

A. Product Data: Manufacturer's material specifications, drawings of standard components, and installation recommendations.

B. Shop Drawings: Show elevations, field measurements, composite members, reinforcement, anchorages, flashing, attachments, expansion provisions, hardware mounting, and glazing. Shop drawings should be approved by the manufacturer. Provides engineering calculations to meet 150 mph wind load.

C. Samples for Verification of Anodized Finishes: For each type and color of anodized finish, submit 12-inch-long sections of extrusions and formed sections and 6-inch-square sheets. Submit at least 2 pieces for each color showing full range of color variation.

1.4 QUALITY ASSURANCE

A. Standard for Air Infiltration Testing: ASTM E 283; report result as cubic feet per minute per unit of measurement indicated, at pressure differential indicated.

B. Standard for Condensation Resistance Testing: AAMA 1503.1; report result as CRF.

C. Standard for Thermal Transmission Testing: AAMA 1503.1; report result as U-value (Btu per hour per square foot per degree F).

D. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum entrance and storefront work required and are based on the specific types and models indicated. Aluminum entrance by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.5 PROJECT CONDITIONS

A. Take field measurements as required for correct fit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Aluminum Doors and Frames:
1. Provide products complying with requirements of the contract documents and made by one of the following or and approved equal:
a. Kawneer Company, Inc. (TRIFAB 451T)

2.2 FRAMING SYSTEMS

A. Aluminum Door and Fames: Extruded tube or channel frames with either mechanical or welded joints.
   1. Finish:
      a. Dark Bronze Anodized finish.

2.3 SWINGING DOORS

A. Stile and Rail Doors: Glazed doors with tubular extruded aluminum frame members.
   1. Frame joints: Either concealed mechanically fastened, using tie rods or j-bolts and reinforcing plates; or welded.
   2. Thickness: 1-3/4 inches.
   3. Stile width: 3-1/2 inches nominal.
   4. Full glazed, with no intermediate mullions.
   5. Gllazing stops: Snap-on extruded aluminum, designed to allow replacement of glazing without disassembly of frame. Provide nonremovable exterior stops.
   6. Glaze doors in factory.
   7. Finish:
      a. Dark Bronze Anodized finish.

B. Weatherstripping:
   1. At fixed stops: Replaceable, compression type molded gaskets of neoprene or EPDM rubber complying with ASTM C 864 or of polyvinyl chloride complying with ASTM D 2287.
   2. At other edges: Replaceable woven polypropylene, wool, or nylon pile, with aluminum or nylon fabric backing, complying with AAMA 701.
   3. At door bottom: Adjustable molded EPDM or vinyl sweep, continuously contacting threshold; concealed mounting.
   4. Provide weatherstripping on all exterior doors.

C. Silencers: Neoprene bumpers.
   1. Provide on all interior doors.

D. Hardware for Aluminum Doors: Provide all hardware as required for proper operation, in accordance with the schedule located at the end of this section.
   1. Finish: Match doors.

E. Hardware: Closer required.

F. Thresholds: Extruded aluminum thresholds in mill finish, complete with anchors and clips. Verify type and size with field conditions prior to ordering. Threshold to be ADA accessible.

2.4 MATERIALS - GENERAL

A. Aluminum Members: Kawneer TriFab 451T – Dark Bronze Anodized Finish.

B. Fasteners: Compatible with aluminum; aluminum, nonmagnetic stainless steel, or other noncorrosive, noncorrodible material.
   1. Do not use exposed fasteners.

C. Concealed Flashing: Fully annealed, soft stainless steel, 26 gage minimum; or extruded aluminum, 0.032 inch minimum.

D. Miscellaneous Concealed Metal Members: High-strength aluminum or nonmagnetic stainless steel; hot-dip galvanized steel complying with ASTM A 123 may be used for members which are not exposed to weather or abrasion.

E. Concrete Inserts: Cast iron, malleable iron, or steel hot-dip galvanized in accordance with ASTM A 123.

F. Dissimilar Metal Coating: Cold-applied asphalt mastic, or other nonconductive, nonabsorptive material.

G. Glass and Glazing Accessories: Provide products specified elsewhere in Division 8.
   1. Use 1” insulated glass as specified in section 08800 at all locations, impacted glazing required. All exterior glazing to be impact rated.

H. Joint Sealers: Provide products specified in Division 7.

J. Provide muntins/mullions as shown on drawing.

2.5 FABRICATION

A. Framing System: Pre-cut and perform all finishing in factory or shop.
   1. When it is necessary to begin fabrication without actual field measurements, provide adequate fabrication tolerances for correct fit.
   2. Fit joints tightly with adjacent members in correct relationship.
   3. Select members for fabrication so that adjacent anodized extruded aluminum members do not have color or texture variation greater than half of the range indicated in the submitted samples.

B. Doors: Factory-fabricate doors and factory-install all hardware except surface-mounted items.
   1. Perform fabrication required for hardware before finishing.

C. Welding: Perform welding before finishing; use methods which do not discolor metal; grind exposed welds flush; match original finish.

D. Reinforcing: Provide as required to comply with performance requirements for rigidity and to support hardware; isolate dissimilar metals as specified in "Installation."

E. Avoid damage to finishes.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine structures; report conditions in writing, which will adversely affect installation.

3.2 INSTALLATION

A. Install in accordance with manufacturer's recommendations and instructions.

B. Install plumb and level, square and true, in correct location; support adequately and securely anchor.

C. Separate aluminum exposed to weather from dissimilar metals; coat dissimilar metals that are in drainage cavities using one of the materials specified. Aluminum, stainless steel, zinc, cadmium, and small areas of white bronze are not considered dissimilar from each other.

D. Coat all metals that come into contact with masonry, concrete, and treated wood, using one of the materials specified.

E. Install surface-mounted hardware in accordance with hardware manufacturer's instructions.

F. Install glass using methods specified elsewhere in Division 8. Factory install to greatest extent possible.

G. Set threshold units level and accurately in seal strip of butyl rubber sealant or polyisobutylene mastic sealant. Cope and align with frames and doors, and at proper elevation for door operation. Shim, if necessary, for full continuous support of threshold at each edge and intermediate legs, if any. Use non-corrosive shims of metal or plastic, set in adhesive or otherwise anchored against dislocation from impact or traffic upon threshold.

3.3 ADJUST AND CLEAN

A. Adjust each operable unit for correct function and smooth, free operation and so doors close tightly.

B. Clean exterior and interior soon after installation of glass, taking care to avoid damage to finishes.

C. Clean glass surfaces as specified elsewhere.

END OF SECTION 08120

SECTION 08211 - WOOD DOORS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes:

1. Wood Doors

B. Related work

1. Standard steel door frames (08111)
2. Door Hardware (08710)
3. Painting (09900)

2.2 QUALITY STANDARDS:

A. Comply with NWWDA I.S.1 and AWI "Architectural Woodwork Quality Standards".

B. Comply with WIC "Manual of Millwork" for requirements in the door grade comparable to AWI grade indicated and exceeding those in other referenced standards.

1.3 SUBMITTALS: In addition to product data, submit the following:

A. Shop Drawings indicating location, size, face material, and finishes of each door required.

B. Samples 1-0" square, of each type of core construction, face material and finish required.

PART 2 - PRODUCTS:

2.1 MANUFACTURERS: Subject to compliance with requirements, provide wood doors by one of the following:

A. Algoma Hardwoods, Inc.
B. Mohawk Plush Doors, Inc.
C. Weyerhauser Company

2.2 GENERAL WOOD DOOR PRODUCT REQUIRMENTS:

A. Provide doors with same exposed surface material on both faces of each door, unless otherwise indicated.

2.3 INTERIOR SOLID CORE DOORS FOR TRANSPARENT FINISH: As follows:

A. Faces: Stain grade Birch
B. See Door Schedule and Plans
C. Construction: Solid Core
D. Hollow metal frames

PART 3 - INSTALLATION

3.1 Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.

3.2 Align and fit door uniform clearances and bevels. Prepare doors for hardware. Seal cut surfaces after fitting and machining.

END OF SECTION 08211

SECTION 08 33 00
Thermiser®
INSULATED ROLLING SERVICE DOOR

PART 1 GENERAL

1.1 SUMMARY

A. **Section Includes:** Electric operated overhead insulated rolling doors

B. **Products also to be supplied:**
1. Control Station
2. Keypad
3. Remotes

1.2 SYSTEM DESCRIPTION

A. **Design Requirements:**
B.
1. **Wind Loading:**
a. Supply doors to withstand up to 150 mph wind load.

2. **Cycle Life:**

a. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door

3. **Seismic Performance:**

a. Provide manufacturer's seismic calculations confirming ASCE7-10

4. **Insulated Door Slat Material Requirements:**

a. Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84
b. Minimum R-value of 8.0 (U-value of 0.125) as calculated using the ASHRAE Handbook of Fundamentals
c. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero

1.3 WARRANTY

A. Standard Warranty: Two years from date of shipment against defects in material and workmanship

B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products

PART 2 PRODUCTS

2.1 MANUFACTURER

A. **Manufacturer:**

1. **Cookson:** 1901 South Litchfield Road, Goodyear, AZ 85338. Phone: (855) 719-4040
3. Equal products by **Overhead Door Corporation**.

2.2 PRODUCT INFORMATION

A. **Model:** ESD20

2.3 MATERIALS

A. **Curtain:**

1. **Fabrication:**

a. **Slat Material:** No. 6F, (Listed Exterior/Interior):

1) **Galvanized Steel/Galvanized Steel (No Paint Finish):** Manufacturer recommended gauge based on performance requirements. Minimum 24/24 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating.

b. **Insulation:** 7/8 inch (22 mm) foamed-in-place, closed cell urethane

c. **Total Slat Thickness:** 15/16 inch (24 mm)

d. **Flame Spread Index** of 0 and a **Smoke Developed Index** of 10 as tested per ASTM E84

e. **R-value:** 8.0

2. **Exterior Slat Finish:**

a. **GalvaNex™ Coating System (Stock Colors):**

1) **GalvaNex™** - ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and white baked-on polyester enamel finish coat

3. **Interior Slat Finish:**

a. **GalvaNex™ Coating System (Stock Colors):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and white baked-on polyester enamel finish coat

B. **Endlocks:** Fabricate interlocking sections with high strength nylon endlocks on alternate slats each secured with two ¼" (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.

1. **Nylon:** Required up to 21'-5" width (DBG - Distance Between Guides)

C. **Bottom Bar**

1. **Configuration:**

a. **Insulated Bottom Bar:** Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4" tall x 1-1/16" thickness.

2. **Finish:**

a. **Exterior/Interior:** Mill Finish

D. **Guides:**

1. **Fabrication:**

a. Minimum 3/16 inch (4.76 mm) structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

Top 16 ½" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.

2. **Finish:**

a. **Powder Coat (Stock Colors):** Zirconium treatment followed by a white baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

D. **Counterbalance Shaft Assembly:**

1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width

2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

F. **Brackets:**
Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

1. **Finish:**

a. **Powder Coat (Stock Colors):** Zirconium treatment followed by a white baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

G. **Hood:**
Minimum [24 gauge galvanized steel] [24 gauge stainless steel] [0.040 inch (1.016 mm) aluminum] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

1. **Finish:**

a. **GalvaNex™ Coating System (Stock Colors):**
1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and white baked-on polyester enamel finish coat

H. **Weatherstripping:**

1. **Bottom Bar:**

a. **Bottom Bar, Motor Operated Doors:** Sensing/weather edge with neoprene astragal extending full width of door bottom bar

2. **Guides:** Replaceable vinyl strip on guides sealing against fascia side of curtain
3. **Lintel Seal:** Nylon brush seal fitted at door header to impede air flow

2.4 OPERATION

A. **Motor – Standard Use – Model MG (Industrial Duty Gear Head) Operator:** The operator must not extend above or below the door coil when mounted front-of-coil. Rated for a maximum of 20 cycles per hour (not to be used for consecutive hours) cULus listed (to comply with UL requirements in The United States and Canada), Totally Enclosed Non Ventilated gear head operator(s) rated (1/3) (1/2) or (3/4) hp as recommended by door manufacture for size and type of door, verify Volts, verify Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist and control station(s). Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with #50 roller chain. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

B. **Control Station:**

1. Surface mounted: “Open/Close/Stop” push buttons: NEMA 1 (2) per door
2. Remote control operator (1) per door.

C. **Control Operation:**

1. Momentary Contact to Close:
Fail Safe, UL325-2010 Compliant Entrapment Protection for Motor Operation.
a. NEMA 1 – Safety photocells

2.5 ACCESSORIES

A. **Locking:**

1. **Motor Lock**

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports
B. Follow manufacturer's installation instructions

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer
B. Remove surplus materials and debris from the site

3.5 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative
B. Instruct Owner's Representative in maintenance procedures

END OF SECTION

SECTION 08520 - ALUMINUM WINDOWS/STOREFRONT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Fixed windows

B. Operational windows as indicated.

C. This Section includes Architectural Grade aluminum windows of the performance class indicated. Window types required include the following:

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide aluminum windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies representing types, grades, classes, and sizes required for Project according to test methods indicated.

B. Test Criteria: Testing shall be performed by a qualified independent testing agency based on the following criteria:

1. Design wind velocity at Project site is 150 mi/h.

2. Heights of window units above grade at window centerline are indicated on or can be determined from the Drawings. Consult with the Architect, if necessary, to confirm required l loading and test pressures.

3. Test Procedures: Test window units according to ASTM E 283 for air infiltration, both ASTM E 331 for water penetration, and ASTM E 330 for uniform load deflection and structural performance.

C. Performance Requirements: Testing shall demonstrate compliance with requirements indicated in AAMA 101 for air infiltration, water penetration, and structural performance for type, grade, and performance class of window units required. Where required design pressure exceeds the minimum for the specified window grade, comply with requirements of AAMA 101, Section 3, "Optional Performance Classes", for higher than minimum performance class.

D. Air-Infiltration Rate: Not more than 0.15 cfm/ft. (1.67 cu. m/h per m) of area for an inward test pressure of 6.24 lbf/sq. ft. (299 Pa).

E. Water Penetration: No water penetration as defined in the test method at an inward test pressure of 20 percent of the design pressure.

F. Uniform Load Deflection: No deflection in excess of 1/175 of any member's span during the imposed load, for a positive (inward) and negative (outward) test pressure of 60 lbf/sq. ft. (2873 Pa).

G. Thermal Movements: Provide window units that allow thermal movement resulting from the following maximum change (range) in ambient temperature when engineering, fabricating, and installing aluminum windows to prevent buckling, opening of joints, and overstressing of

components, connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime sky heat loss.

H. Temperature Change (Range): 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.

I. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum window work required and are to be field verified and coordinated with metal building structure.

1. Aluminum window: Kawneer TriFab 451-T.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of window required, including the following:

1. Construction details and fabrication methods.
2. Profiles and dimensions of individual components.
3. Data on hardware, accessories, and finishes.
4. Recommendations for maintaining and cleaning exterior surfaces.

C. Shop Drawings showing fabrication and installation of each type of window required including information not fully detailed in manufacturer's standard Product Data and the following:

D. Samples for initial color selection on 12-inch (300-mm) long sections of window members. Where finishes involve normal color variations, include Sample sets showing the full range of variations expected.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer has completed installation of aluminum windows similar in material, design, and extent to those required for this Project and with a record of successful in-service performance.

B. Single-Source Responsibility: Obtain aluminum windows from one source and by a single manufacturer.

1.7 PROJECT CONDITION

A. Field Measurements: Check window openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents. For:

1. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.

2. Faulty operation of sash and hardware.

3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

B. Warranty Period for Metal Finishes and Glass: Five (5) years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available manufacturer: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following: (See also window schedule on drawings.)

B. Fixed Windows: Storefront.
1. Kawneer Company, Inc. (TRIFAB 451T)

C. Equal product by USG will be acceptable.

2.2 MATERIALS

A. Aluminum Extrusions: Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength and not less than 0.062 inch (1.6mm) thick at any location for main frame and sash members.

B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.

C. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125 inch (3.2 mm) thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, non-corrosive, pressed-in, splined grommet nuts.

D. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.

E. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, non-magnetic stainless steel, or hot-dip zinc-coated steel or iron complying with requirements of ASTM B 633; provide sufficient strength to withstand design pressure indicated.

1. Provide stripping with integral centerline barrier fin of semi-rigid plastic sheet of polypropylene.

F. Sealant: For sealants required within fabricated window units, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating. Comply with Division 7 Section “Joint Sealants: of these Specifications for selection and installation of sealants.

G. Glass and Glazing Accessories: Use 1” insulated glass as specified in Section 08800 at all locations. (Impact glazing required)

2.3 ACCESSORIES

A. Provide operators and locks.

2.4 FINISHES

A. Comply with NAAMM “Metal Finishes Manual” for recommendations relative to applying and designating finishes.

B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Class I, Color Anodic Finish: AA-M12C22A42/42 (Mechanical Finish: non-specular as fabricated; Chemical Finish: etched, medium matte: Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying AAMA 606.1 or AAMA 608.1.
   1. Color to be Dark Bronze Anodized Aluminum.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect openings before installation. Verify that rough or masonry opening is correct and sill plate is level.

3.2 INSTALLATION

A. Comply with manufacturer’s specifications and recommendations for installing window units, hardware operators, and other components of the Work.

B. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.

   1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified under “Dissimilar Materials” Paragraph in appendix to AAMA 101.

C. Sealants, joint fillers, and gaskets to be installed after installation of window units are specified in another Division 7 Section.

3.3 CLEANING

A. Cleaning aluminum surfaces promptly after installing windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

B. Clean glass of pre-glazed units promptly after installing windows. Comply with requirements of Division 8 Section “Glazing” for cleaning and maintenance.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to aluminum window manufacturer, that ensure window units are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08520

SECTION 08710 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

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

B. Definition
1. "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door hardware. For any door not shown to receive hardware, provide hardware as shown for a similar opening. If there is no similar opening, provide three (3) butt hinges, one (1) mortise lockset, one (1) door closer, one (1) kick plate, and one (1) doorstop per leaf.

C. Submittals: Submit through Contractor required product data, final hardware schedule, separate keying schedule, and samples as specified in this Section, unless otherwise indicated.

D. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.

E. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.

F. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.

G. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

H. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware, which has been tested and listed by UL or FM types and sizes of doors, required and complies with requirements of door and doorframe labels.
1. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors UL or FM labels indicating "fire door to be equipped with fire exit hardware") provide UL or FM label on exit devices indicating "fire exit hardware."
2. Provide hardware as required to meet label requirements whether scheduled or not.

1.2 CONTRACTOR'S RESPONSIBILITIES SHALL BE AS FOLLOWS:

A. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.

B. Construction Schedule: Cooperate with door hardware supplier in establishing schedules dates for submittals and delivery of templates and door hardware.

Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.

C. Coordination: Coordinate door hardware with other Work. Furnish Hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.

D. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.

E. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification section.
1. Product data including manufacturer's technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
3. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
4. Type, style, function, size, and finish of each hardware item.
5. Name and manufacturer of each item.
6. Fastenings and other pertinent information.
7. Location of each hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
8. Explanation of all abbreviations, symbols, and codes contained in schedule.
9. Mounting locations for hardware.
10. Door and frame sizes and materials.
11. Keying information.

B. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.

C. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawing of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

B. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction.
Provide only items of door hardware that are listed and are identical to products

tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

1.5 PRODUCT HANDLING

A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two more identical sets may be packed in same container.

C. Inventory door hardware jointly with representative of hardware supplier and hardware installer until each is satisfied that count is correct.

D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.6 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 The following types of hardware will be used generally, but are not restricted to same: All hardware to be approved by Architect and Owner.

A. Hardware Schedule:
AB ABH
GL Glynn Johnson
HA Hager Hinge
MA Markar
MC McKinney
NA National Guard
RO Rockwood
SA Sargent
YA Yale
SC Schlage

B. All interior doors are to be ADA lever type.

C. All exterior hardware used to be of appropriate material to resist rust.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.

B. "Recommended Locations for Builders Hardware for Standard Steel doors and Frames" by the Door and Hardware Institute.

C. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors".

D. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.

E. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment 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 specified in Division 7 Section "Joint Sealers".

H. Weather-stripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

B. Clean adjacent surfaces soiled by hardware installation.

C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

D. Six-Month Adjustment: Approximately six month after the date of Substantial Completion, the Installer, accompanied by representatives of the manufacturers of latch sets and locksets and of door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:

1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.

2. Consult with and instruct Owners personnel 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.

D. Hardware Schedule:
1. Submit for approval.

3.3 KEYING

A. Provide master keying system. Provide 4 keys to each door and 4 master keys.

3. 4 HARDWARE ALLOWANCE

A. See 01020 Allowances.

END OF SECTION 08710

SECTION 08800 - GLAZING

PART 1 -GENERAL

1.1 SUMMARY:

A. Work included in this section includes:
1. All glass as shown on drawings

B. Work related includes
1. Aluminum doors and frames (Section 08120)
2. Steel door frames (Section 08111)

1.2 STANDARDS:

A. Install glazing with dry glazing system.

B. Glazing Standard: Comply with FGMA "Glazing Manual" and "Sealant Manual".

C. Safety Glazing Standard: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

D. Fire Resistance Rated Wire Glass: Provide UL-labeled and listed products, identical with those tested per ASTM E 163 (UL 9).

E. Insulating Glass Certification Program: Provide insulating glass units complying with requirements indicated which are permanently marked with certification label of the following inspecting and testing agency:
1. Insulating Glass Certification Council.

F. Preconstruction Sealant-Substrate Tests: Submit glass and glazing substrate materials to manufacturer of glazing sealants for testing to determine if primers are required and for sealant compatibility.

1.3 SUBMITTALS: Submit shop drawings on dry glazing systems with physical sample 6" long.

A. Comply with requirements of section 01340

B. See page 3 for 2.1 manufacturers

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. LOF, Libby-Ownes-Ford Co.

B. PPG Industries, Inc.

C. CE, Combustion Engineering, Inc.

D. Guardian Industries

2.2 GLAZING SCHEDULE:

A. Insulated Glass: Low E glass (Impact Glazing Required for All Exterior Windows)
1. 1" insulated glass shall be 2 pieces of clear 1/4" glass separated by air space. 5/8" insulated glass shall be two pieces of clear 3/6" thick glass separated by a desiccant and hermetically sealed with a structural sealant.
2. Insulating glass shall be assembled by the glass manufacturer.

3. Insulated glass shall meet the requirements of Federal Specification DD-G-451D.
4. All exterior glazing to be impact rated.

B. Tempered Glass
1. Provide tempered glass where required by code.

C. Fire Rated Glass
1. Provide fire rated glass in rated walls as shown in plans.

D. Interior Glazing.
1. Clear Glass.

2.3 GLAZING SYSTEM:

A. Windows - glazing system shall be dry glazing as recommended by window manufacturer. Submit shop drawings and sample of proposed system per section 01340.

B. Fixed glass in Hollow Metal Frames and Doors shall be wet glazed with silicone sealant, color to match finish. Submit shop drawings and sample of proposed system per section 01340.

2.4 SETTING BLOCKS:

A. Neoprene or EPDM with a Shore A durometer hardness of 85, 0.1" per sq. ft. of glass supported, or min. of 4" in length. Lead blocks may only be used for single float glass.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Meter frame shall not be in contact with installed glass.

B. Setting blocks: Lites larger than 6 sq. ft., and all glass thicker than 1/8", shall be installed on 2 setting blocks at the bottom quarter points.

C. Edge Blocks: In dry glazing systems, one 3" neoprene edge block shall be installed in each jamb, allowing 1/8" space between edge block and glass edge.

D. Watershed: Glass shall be installed in frames with sealant forming a 1/16" watershed, both sides.

E. Glass shall be installed clean, free of chips, cracks, scratches, blemishes, oil, dirt, stains or visible waves or distortions.

F. All glass shall be cleaned immediately prior to final inspection.

3.2 PERFORMANCE:

A. System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 F degrees without causing detrimental effects to system or components.

B. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with the requirements of the N. C. Building Code, and as measured in accordance with ANSI/ASTM E330.

C. Limit air infiltration through assembly of 0.06 cu. ft./min./sq. ft. of assembly surface area, measured at a reference differential pressure across assembly of 0.3 inches water gage, measured in accordance with ANSI/ASTM E283.

D. System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.

E. Maintain continuous air and vapor barrier throughout assembly primarily in line with inside pane of glass.

F. Maintain: Vapor seal with Interior Atmospheric Pressure of One Inch (25 mm) sp, 72 degrees F (22 degrees C), 40 percent RH: no failure.

END OF SECTION 08800

SECTION 09110 – METAL STUD SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included: Provide metal studs and accessories as indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. In addition to complying the pertinent codes and regulations of governmental agencies having jurisdiction, comply with pertinent recommendations contained in “Specification for Metal Lathing and Furring” published by the Metal Lath/Steel Framing Association.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340

B. Product data: Within 45 calendar days after the Contractor has received the Owner’s Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer’s recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 – PRODUCTS

2.1 METAL STUDS AND ACCESSORIES

A. Meet or exceed minimum requirements of Fed Spec QQ-S-698 and Fed Spec QQ-S-775d, class d, for the item and use intended.

B. Metal studs
1. At interior non-load bearing metal stud partitions, unless otherwise shown on the Drawings, provide standard punched steel studs 22 gauge or as otherwise shown on the Drawings, hot-dip galvanized.

C. Accessories: Provide all accessories including, but not necessarily limited to, tracks, clips, anchors, fastening devices, sound attenuation pencil rods and resilient clips, and other accessories required for a complete and proper installation, and as recommended by the manufacturer of the steel studs used.

2.2 GROUT

A. Provide a good grade of commercial grout for leveling the floor runner member of steel stud partitions as required.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Accurately layout partition and wall lines from the dimensions shown on the Drawings. Contractor to inspect all partitions before drywall is applied.

B. Install metal studs and accessories in strict accordance with the manufacturer's recommendations as approved by the Architect, anchoring all components firmly into position.

C. Align partition and wall assemblies to a tolerance of one in 200 horizontally and one in 500 vertically.

D. Coordination:
1. Space the studs as required for compliance with pertinent regulations, to give proper support for the covering material, and as indicated on the Drawings.
2. Coordinate and provide required backing and other support for items to be mounted on the finished covering.
3. Coordinate requirements for pipes and other items designed to be housed within the partition and wall systems.

3.3 LEVELING

A. By use of the specified grout, or by other means approved by the Architect, provide continuous solid bearing under floor runner members of steel stud partitions and walls.

B. Level in a manner to provide uniform interface with ceilings and other overhead construction.

3.4 SOUND ATTENUATING PARTITIONS

A. At sound attenuating partitions (at patient room walls, toilet walls, Conference 142, Directors Office 149, Chapel 146), set floor runners in two ¼" diameter continuous beads of sealant complying with provisions of Section 07900 of these Specifications.

3.5 U.L.

A. Conform to all required U.L. requirements.

END OF SECTION 09110

SECTION 09260 - GYPSUM WALLBOARD SYSTEMS

PART 1- GENERAL:

1.1 SUMMARY

A. Work included in this section: Provide gypsum drywall and accessories where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work includes
1. Painting (section 09900)
2. Building insulation (section 07200)
3. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

C. Mock-ups
1. At an area on the site where approved by the Architect, provide a mock-up gypsum wallboard panel.
   a. Make the panel approximately 8'-0" x 8' - 0".
   b. Provide one mock-up panel for each gypsum wallboard finish used on the work.
   c. The mock-ups may be used as part of the work, and may be included in the finished work, when so approved by the Architect.
   d. Revise as necessary to secure the Architect's approval.
2. The mock-up panels, when approved by the Architect, will be used as datum points for comparison with the remainder of the work of this Section for the purpose of acceptance or rejection.
3. If the mock-up panels are not permitted to be part of the finished work, completely demolish and remove them from the job site upon completion and acceptance of the work of this Section.
4. The mock panel shall be completely finished including painting.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 -PRODUCTS:

2.1 MANUFACTURERS: Subject to compliance with requirements, provide gypsum board and related products by one of the following, or pre-approved equal:

A. Domtar Gypsum Co.

B. Georgia-Pacific Corp.

C. Gold Bond Building Products Div., National Gypsum Co.

D. United States Gypsum Co.

E. Louisiana-Pacific

2.2 COMPONENTS FOR SUSPENDED CEILING:

A. Concrete Inserts: ASTM E 488
1. Embedded type capable of sustaining a load equal to 3 times that imposed by ceiling construction.

B. Steel Rigid Furring Channels: ASTM C 645
1. Where shown as “Furring” provide manufacturer’s 7/8” furring channels or as otherwise noted.

C. Steel Studs for Furring Channels: ASTM C 645.

2.3 GYPSUM BOARD: Provide gypsum board of types indicated in maximum lengths available to minimize end joints:

A. General
1. Provide mildew resistant/water resistant gypsum wallboard complying with ASTM D3273, in 48” widths and in such lengths as will result in a minimum of joints.
2. Regular wallboard: Provide mildew resistant/water resistant, 5/8” thick except as may be shown otherwise on the drawings.
3. Fire-retardant wallboard: Provide grade XD, 5/8” thick.
4. Ceilings/Interior Soffits: 5/8” mildew / water resistant or as shown on the drawings.
5. Provide backer board at all tile locations.

2.4 TRIM ACCESSORIES: ASTM C 840: Mfr's standard trim accessories, including cornerbead and edge trim of beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed type is indicated.

A. Provide corner bead formed from zinc alloy, Series 800.

B. Provide one-piece control joints with 1/4-inch-wide by 7/16-inch-deep vee-shaped slot, covered with removable tape, of roll- formed zinc or extruded vinyl as recommended by gypsum board Mfr. space not more than 20 feet on centers.

C. Edge beads for use at perimeter of ceilings:
1. Provide angle shapes with wings not less than ¾” wide.
2. Provide concealed wing perforated for nailing, and exposed wing edge folded flat.
3. Exposed wing may be factory finished in white color.

2.5 GYPSUM BOARD JOINT TREATMENT MATERIALS: ASTM C 475 and ASTM C 840, and as allows:

A. Joint Tape: Paper reinforcing tape, unless otherwise indicated.
   1. Use open-weave glass fiber tape where recommended by gypsum board Mfr. with use of setting-type joint compound.
   2. Provide a jointing system, including reinforcing tape and compound, designed as a system to be used together and as recommended for this use by the manufacturer of the gypsum wallboard approved for use on this work.

B. Drying-Type Joint Compounds: Factory-prepackaged vinyl-based products complying with the following requirements:
   1. Ready-Mix Formulation: Factory-premixed.
   2. All-purpose compound formulated for use as both taping and topping compound.
   3. Jointing compound may be used for finishing if so recommended by its manufacturer.

C. Miscellaneous Materials: As follows, recommended by gypsum board Mfr.
   1. Gypsum Board Screws: ASTM C 1002.
   2. Sound Attenuation Blankets: ASTM C 665, Type I, unfaced mineral fiber blanket insulation.

D. Expansion Joints: As recommended by manufacturer, Architect or Owner's representative to approve all recommended locations.

2.6 FASTENING DEVICES

A. For fastening gypsum wallboard in place on metal studs and metal channels, use flat-head screws, shouldered, specially designed for use with power-driven tools, not less than 1" long, with self-tapping threads and self-drilling points.

2.7 ACCESS DOORS

A. In partitions and ceilings installed under this Section, provide doors where required for access to mechanical installations and electrical installations. (Architect or Owner's representative to approve locations prior to installation.)

B. Types
   1. Unless otherwise required, provide 24" x 24" (or as required by code) metal access doors with concealed hinges to metal frame, and with Allen key lock.
   2. For piercing fire-rated surfaces, provide access doors having the same fire rating as the surface being pierced.
   3. For tile surfaces and toilet rooms, provide stainless steel access doors and frames, with satin finish.
   4. For other installations, provide prime-coated steel access doors and frames for finish painting to be performed at the job site under Section 09900 of these Specifications.

2.8 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION:

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General
1. Install the gypsum wallboard to ceilings with the long dimension of the wallboard at right angles to the supporting members.
2. Wallboard may be installed with the long dimensions parallel to supporting members that are spaced 16” on centers when attachment members are provided at end joints.
3. Do not bridge building expansion joints. Leave space of the width indicated between boards, and trim both edges for installation of sealant or gasket.

B. Install and finish gypsum board to a level 5 finish and to comply with ASTM C 840 and as follows:
1. Form "Floating" construction for gypsum boards at internal corners, except where special isolation or edge trim is indicated.
2. Isolate drywall construction from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by Mfr.
3. Install sound attenuation blankets where indicated, without gaps; and support where necessary to prevent movement or dislocation.

C. Ceilings
1. Install the gypsum wallboard to ceilings with the long dimension of the wallboard at right angles to the supporting members. (Suspension System)
2. Wallboard may be installed with the long dimension parallel to supporting members that are spaced 16” on centers when attachment members are provided at end joints.

D. Walls
1. Install the gypsum wallboard to studs at right angles to the furring or framing members.
2. Make end joints, where required, over framing or furring members.

E. Attaching
1. Drive the specified screws with clutch-controlled power screwdrivers, spacing the screws 12” on centers at ceilings and 16” on centers at walls.
2. Where framing members are spaced 24” apart on walls, space screws 12” on centers.
3. Attach double layers in accordance with the pertinent codes and the manufacturer’s recommendations as approved by the Architect.
4. Screw gypsum board to metal supports.

F. Access doors
1. By careful coordination (All locations to be approved by Architect) with trades involved, install the required access doors where required.
2. Submit a location drawing for approval.
3. Anchor firmly into position, and align properly to achieve an installation flush with the finished surface.

3.3 JOINT TREATMENT

A. General
1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.
2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment, and until joint and finishing compounds have dried.

3. Apply the joint treatment and finishing compound by machine or hand tool.
4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

B. Embedding compounds
1. Apply to gypsum wallboard joints and fastener heads a thin uniform layer.
2. Spread the compound not less than 3” wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.
3. After this treatment has dried, apply a second coat of embedding compound to joints and fastener heads, spreading in a thin uniform coat to not less than 6” wide at joints, and feather edged.
4. Sandpaper between coats as required.
5. When thoroughly dry, sandpaper to eliminate ridges and high points.

C. Finishing compounds
1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and fastener beads.
2. Feather the finishing compound to not less than 12” wide.
3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the wallboard.
4. Drywall Finishing: Apply joint tape and joint compound at joints between gypsum boards. Apply compounds indicated below at accessory flanges, penetrations, fastener heads and surface defects. All drywall to be a level 5 finish.

3.4 CORNER TREATMENT

A. Internal corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.
B. External corers
1. Install the specified corner bead, fitting neatly over the corner and securing with the same type fasteners used for installing the wallboard.
2. Space the fasteners approximately 6” on centers, and drive through the wallboard into the framing or furring member.
3. After the corner bead has been secured into position, treat the corner with joint compound and reinforcing tape as specified for joints, feathering the joint compound out from 8” to 10” on each side of the corner.

3.5 OTHER METAL TRIM

A. General
1. The drawings do not purport to show all locations and requirements for metal trim.
2. Carefully study the drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum wallboard approved for use in this work.

3.6 CLEANING UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.
B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

END OF SECTION 09260

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 Summary

A. Work included in this section:

1. Suspended acoustical tile and grid

1.2 Standards

A. Acoustical Ceiling Unit Standard: ASTM E 1264

B. Acoustical Suspension System Standard: ASTM C 635 for materials

C. Surface Burning Characteristics:

1. 25 or less for flame spread, 50 or less for smoke developed, per ASTM E 84.

D. Fire-Resistance-Ratings:

1. As determined per ASTM E 119 and as indicated by reference to design designations in UL "Fire Resistance Directory".

1.3 Submittals:

A. In addition to submission of product data for each type of acoustical ceiling unit and suspension system required, submit the following:

1. 6-inch square samples of each type of acoustical unit required.

2. Set of 12-inch long samples of exposed runners and moldings.

1.4 Extra Material: Provide the Owner with 2 unopened cartons of extra acoustical units of each type.

1.5 Warranty: Acoustical units displaying warping, shrinking, sagging, or discoloration shall be corrected during one-year guarantee period.

PART 2 - PRODUCTS

2.1 A. Accoustical Panel Ceiling (SAT-1)
1. Basis of Design: Armstrong; Ultima 1910.
2. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 2 water felted.
3. Pattern: E (Lightly textured)
4. Color: White
5. Light Reflectance (LR): Not less than 0.88.
6. Ceiling Attenuation Class (CAC): Not less than 35.
7. Noise Reduction Coedffiecent (NRC): Not less than 0.75.
8. Edge/Joint Detail: Square Edge.
9. Thickness: 3/4 inch.
10. Modular Size: 24 by 24 inches.

B. Accoustical Panel Ceiling (SAT-2)
1. Ceramaguard 605: Square Edge
2. Color: White

2.2 Non-Fire-Resistance-Rated Suspension Systems: As recommended by Tile Manufacturer, with hangers, attachment devices, and edge moldings and trim as required. (Color – White)

2.3 MANUFACTURER

A. Subject to compliance with requirements, provide products of one of the following:

1. Armstrong World Industries, Inc.
2. USG
3. Certainteed

PART 3 - EXECUTION

3.1 General

A. Install acoustical ceiling systems to comply with below per manufacturer's instructions and CISCA "Ceiling Systems Handbook".

1. ASTM C 636

3.2 Layout

A. Balance ceiling borders on opposite sides, using more-than-half-width acoustical units.

3.3 Suspension System

A. Secure to building structure, with hangers spaced 4'-0" along supported members.

3.4 Edge Moldings

A. Secure to substrate with screw anchors spaced 16 inches o.c. Miter corner joints.

B. Cope exposed edges of intersecting exposed suspension members to produce flush intersections.

END OF SECTION 09511

SECTION 09660 - VINYL PLANKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Vinyl Planks

1.2 SUBMITTALS

A. Comply with the requirements of section 01340.

B. Product Data: Submit technical data from each manufacturer of resilient products required.

C. Initial Samples: Submit manufacturer's standard color selection samples for resilient products required, including all available colors and patterns.

1.3 PROJECT CONDITIONS

A. Environmental Requirements: At least 48 hours prior to beginning work, move resilient flooring materials to areas of installation and maintain at minimum 70 degrees F until 48 hours after completing installation and at minimum 55 degrees F thereafter.

B. Sequencing: Do not begin installation of resilient flooring products until painting has been completed for each area.

C. Existing Conditions: Do not install resilient flooring on concrete substrates until testing has been conducted to assure that moisture levels are acceptable.

1.4 MAINTENANCE

A. Extra Materials: At time of completing installation, deliver stock of maintenance materials to the owner. Furnish products matching those actually installed, packaged for storage and clearly labeled.

B. Vinyl planks: 10 planks of each variety.

PART 2 - PRODUCTS

2.1 VINYL PLANK

A. Mannington Commercial, Nature’s Path Select Plank

B. Colors to match existing in new addition.

2.2 MISCELLANEOUS ACCESSORIES

A. Resilient Edge Strips: Solid rubber or vinyl edging, in tapered or rounded profile, nominally 1 inch in width and 1/8 inch in thickness.

B. Color: Matching flooring.

C. Adhesive: Type recommended by manufacturer of resilient product for specific substrate conditions.

2.3 COLORS AND PATTERNS

A. Provide colors and patterns of resilient flooring materials as selected by the architect from manufacturer's standard product line.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Comply with manufacturer's published recommendations for installation in each area, extending resilient flooring into spaces which are partially concealed. Cut and fit tightly to fixtures, pipes, and other obstructions, as well as to walls and partitions.

B. Tightly adhere resilient flooring to substrate with no open joints or cracks, and without raised or blistered areas. Spread adhesive evenly, so that final installation will be without telegraphed markings from adhesive or substrate.

C. Verify conditions ready to receive all work of this section. Do not proceed until unsatisfactory conditions are corrected.

3.2 TILE INSTALLATION

A. Layout: Establish center of each space and lay tile from center point, so tiles at each edge will be not less than 1/2 tile and equal in width.

B. Matching: In each space, use tiles from same production run, and lay tiles in same sequence as removed from cartons. Discard broken, chipped, or otherwise damaged tiles.

C. Lay tile square to room axis.

D. Lay tile to achieve monolithic appearance, with pattern in all tiles oriented in same direction.

3.3 INSTALLATION OF MISCELLANEOUS ACCESSORIES

A. Resilient Edge Strips: At locations shown on drawings, or where otherwise required to protect edge of resilient flooring, install resilient edge strips securely with recommended adhesive, to achieve tightly butted joint.

3.4 CLEANING

A. Initial Cleaning: Remove excess and waste materials promptly, and sweep or vacuum clean resilient flooring as soon as installation has been completed in each area. After

adhesive has had adequate time to set, mop each area with damp mop and mild detergent.

B. Final Cleaning: Remove scuff marks, excess adhesive, and other foreign substances, using only cleaning products and techniques recommended by manufacturer of resilient products. The contractor shall provide final waxing and buffing at the completion of the project.

C. Provide Owner with manufacturer's standard cleaning procedures.

END OF SECTION 09660

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Amendments to General Conditions, and Supplementary Conditions and Sections in Division 1 of the Specifications apply to work of this section.

1.2 DESCRIPTION

A. Work included: Paint and finish the exterior and interior exposed surfaces listed on the Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation.

B. Related work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.

C. Work not included:
   1. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.
   2. Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finish materials will not require painting under this Section unless otherwise indicated.
   3. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise indicated.
   4. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
   5. Do not paint concrete which has been sandblasted.

D. Definitions:
   1. "Paint," as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section;
   2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements.

C. Samples:
   1. Colors as selected.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1. Paint shall be tinted by the Paint Company; on-site tinting is not permitted.

B. Paint coordination:
1. Provide finish coats which are compatible with the prime coats actually used.
2. Review other Sections of these specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrate.
3. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
4. Provide barrier coats over non-compatible primers, or remove the primer and re-prime as required.
5. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

C. Provide 8’ x8’ wall and 8’ x 8’ ceiling mock-up panel for approval of finishes.

1.5 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

1.6 JOB CONDITIONS

A. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees F, unless otherwise Permitted by the manufacturers' printed instructions as approved by the Architect.

B. Weather conditions:
1. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces, unless otherwise permitted by the manufacturers' printed instructions as approved by the Architect.
2. Applications may be continued during inclement weather only within the temperature and humidity limits specified by the paint manufacturer as being suitable for use during application and drying periods.

1. 7 EXTRA STOCK

A. Upon completion of the Work of this Section, deliver to the Owner an extra stock equaling one gallon of each color, type, and class of paint used in the Work. Tightly seal each container, and clearly label, stating contents and location(s) where used.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS

A. Acceptable materials:
1. Benjamin Moore. Sherwin Williams, Devoe or approved equal

B. Undercoats and thinners:
   1. Provide undercoat paint produced by the same manufacturer as the finish coat.
   2. Use only the thinners recommended by the paint manufacturer, and use only to the recommended limits.
   3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

2.2 COLOR SCHEDULES

A. As selected

2.3 APPLICATION EQUIPMENT

A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Architect.

B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.4 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. General:
   1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the Architect.
   2. When materials are not in use, store in tightly covered containers.
   3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.
   4. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

B. Stirring:
   1. Stir materials before application, producing a mixture of uniform density.
   2. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain, the material before using.

3.2 SURFACE PREPARATION

A. General:
   1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations as approved by the Architect.
   2. Remove removable items which are in place and are not scheduled to receive paint finish; or provide surface-applied protection prior to surface preparation and painting operations.
   3. Following completion of painting in each space or area, reinstall the removed

items by using workmen who are skilled in the necessary trades.

4. Clean each surface to be painted prior to applying paint of surface treatment.
5. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F. prior to start of mechanical cleaning.
6. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.

B. Preparation of wood surfaces:
   1. Clean wood surfaces until free from dirt, oil, and other foreign substance.
   2. Smooth finish wood surfaces exposed to view, using the proper sandpaper. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface in preparation for the application of stain.
   3. Unless specifically approved by the Architect, no not proceed with painting of wood surfaces until the moisture content of the wood is 12% or less as measured by a moisture meter approved by the Architect.

C. Preparation of metal surfaces:
   1. Thoroughly clean surfaces until free from dirt, oil, and grease.
   2. On galvanized surfaces, use solvent for the initial cleaning, and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely and allow to dry thoroughly before application of paint.
   2. Allow to dry thoroughly before application of paint.

3.3 PAINT APPLICATION

A. General:
   1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
   2. Slightly vary the color of succeeding coats.
      a. Do not apply additional coats until the completed coat has been inspected and approved.
      b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
   3. Sand and dust between coats to remove defects visible to the unaided eye
   4. On removable panels and hinged panels, paint the back sides to match the exposed sides.

B. Drying:
   1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.

C. Brush applications:
   1. Brush out and work the brush coats onto the surface in an even film.
   2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.

D. Spray application:
   1. Except as specifically otherwise approved by the Architect, confine spray application to concrete masonry surfaces, metal framework and similar surfaces where hand brush work would be inferior.
   2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
   3. Do not double back with spray equipment to build up film thickness of two coats

in one pass.

E. For completed work, match the approved Samples as to texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

3.4 PAINTING SCHEDULE

A. Provide the paint finishes as indicated on Finish Schedule 1.

B. Number of coats Required:
1. First coat: Primer.
2. Second and Third coat: Finish Coats

C. Provide Block Filler on all Concrete Masonry Units and minimum 2 Finish Coats.:

END OF SECTION 09900

SECTION 10400 – IDENTIFYING DEVICES (Signage)

PART 1- GENERAL

1.1 DESCRIPTION

A. Work included: Provide identifying devices where shown on the Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:

1. Door Signs

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 - Submittals and Substitutions.

B. Product Data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Details of installation and anchorage sufficient to enable proper interface of the work of this Section with the work of other trades.

4. Manufacturer's recommended installation procedures which, when approved by the Architect will become the basis for accepting or rejecting actual installation procedures used on the work.

5. The Contractor is to submit a sample of <u>each</u> type of sign in the specified color and size and a sample of the Grip-A-Strip Smart Strip showing its attachment to the appropriate sign type.

1.4 GUARANTEE

A. Any signs that do not remain securely bonded to the substrate for a period of 1 year after acceptance of the project shall be removed and properly reinstalled at no additional cost to the owner.

1.5 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 – PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Acceptable Manufactures:
1. Best Sign System
2. Corum Sign
3. ASI Sign System
4. Signature Sign, Inc.
5. 290 Sign System

B. Except as otherwise approved by the Architect, provide all products of this Section from a single manufacturer. (See Summary of Allowances)

C. ADA: All signage on the project that falls under the jurisdiction of the American with Disabilities Act shall be provided as required to comply with all applicable requirements of ADA. It shall be the responsibility of the Contractor and the signage manufacturer to ensure that all signage complies with ADA.

D. Materials: Provide signage manufactured by a photomechanical etching process, leaving the copy and Braille raised. The plaque is then laminated to a 1/8" opaque acrylic base cut to size and finished with a professional coat of acrylic polyurethane enamel in a selected color. Signs are to be unframed with a square corner.

E. Braille and text are to be raised 1/32".

F. Room Numbers are to be 1" high.

G. Text is to be 5/8" high on all signs except Sign Type #5. On Sign Type #5 the text is to be 1" high.

H. Letter Style is to be: Standard Bold Condensed – Upper Case Letters

I. Finished signs are to be ¼" thick.

J. Edge Treatment: Beveled.

K. The signs are to have a square corner with no border.

L. The color of the sign is to be chosen from standard selection.

M. The Grip-A-Strip Smart Strip is to be clear anodized aluminum finish with black plastic end caps.

N. The Contractor is to supply and install all the graphic inserts (pre-cut and printed) for the Type 1 and Type 2 signs. The inserts are to be on paper.

O. Attachment: Vinyl Tape or Silicone.

P. Signs are to be mounted so that they are ADA compliant.

Q. The Grip-A-Strip Smart Sign is to be mounted to the plastic sign and not directly to the wall.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the manufacturer's recommendations as approved by the Architect, using only the approved mounting materials, and locating all components firmly into position, level and plumb.

B. Prior to the installation, the contractor is to supply in duplicated the signage finish schedule and shop drawings showing the colors, words, numbering and other information to be included on the signage as it is to be installed.

C. Installation:

1. The Contractor is to install the signage in accordance with the Drawings, the Specifications, approved Shop Drawings and in accordance with manufacturer's printed instructions.

2. Include all accessories to provide a proper installation.

3. Work shall be level, plumb and in true plane.

4. Work shall be secure and rigid.

5. Installation accessories shall be furnished by the signage manufacturer.

6. Do not use installation materials from any other source.

7. Signs adhered to glass shall have a blank plate attached to the back of the glass so that the tape is not visible.

8. The color of the blank plate shall match the sign color.

9. The size of the blank plate shall match the size of the sign.

END OF SECTION 10400

SECTION 10155 - TOILET COMPARTMENTS - SOLID PHENOLIC-CORE UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes phenolic-core units as follows:

1. Toilet Enclosures: Floor-mounted.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each exposed finish.

PART 2 - PRODUCTS

2.1 PHENOLIC-CORE UNITS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Accurate Partitions Corporation
b. General Partitions Mfg. Corp.
c. Global Steel Products Corp.
d. Metpar Corp.
e. Sanymetal; a Crane Plumbing Company

B. Door, Panel and Pilaster Construction: Solid phenolic-core panel material with melamine facing on both sides fused to substrate during panel manufacture (not separately laminated), and with eased and polished edges. Provide minimum 3/4-inch thick doors and pilasters and minimum 1/2-inch thick panels.

1. Facing Sheet Color: One color in each room as selected by Architect from manufacturer's full range of colors.

2. Core Color: Manufacturer's standard dark color.

C. Pilaster Shoes and Sleeves (Caps): Stainless steel, ASTM A 666, Type 302 or 304.

D. Brackets (Fittings):

1. Stirrup Type: Ear or U-brackets, Stainless Steel.
2. Full-Height (Continuous) Type: Manufacturer's standard design; Stainless Steel.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.

1. Material: Stainless Steel

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with anti-grip profile and in manufacturer's standard finish. Head rail shall be provided to bridge all compartments and brace the end free-standing pilasters to the wall.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized.

2.3 FABRICATION

A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.

B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

C. Doors: Unless otherwise indicated, provide 24-inch wide in-swinging doors for standard toilet compartments and 36-inch wide out-swinging doors with a minimum 32-inch wide clear opening for compartments indicated to be accessible to people with disabilities.

1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees.

2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Accessible stall door hardware shall comply with North Carolina Accessibility Code 11.4.4.

3. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.

4. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging.

5. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with accessibility requirements of authorities having jurisdiction. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written Installation Instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels: 1/2 inch

b. Panels and Walls: 1 inch

2. Brackets: Secure panels to walls and to pilasters with full-length brackets.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 10155

SECTION 10520 – FIRE EXTINGUISHERS AND CABINETS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included: Provide fire extinguishes and cabinets where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Dimensioned drawings as needed to depict the space required for these items, and their interface with the work of other trades.
4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 – PRODUCTS

2.1 CABINETS

A. Where shown on the Drawings (See sheets G-2) or specified elsewhere, provide Larsen's, or equal products of other manufacturers approved in advance by the Architect.
1. Semi-Recessed, FS 2409-R3 complying with ADA requirements.
2. Brushed Chrome Finish.

2.2 FIRE EXTINGUISHERS

A. At each fire extinguisher cabinet, provide one multi-purpose chemical fire extinguisher with UL rating of 2A-10B; C, Larsen model, "MP5", (verify compatibility with cabinet) or equal products by J-L Industries or Potter Roemer.

B. Service, charge, and tag each fire extinguisher not more than five calendar days prior to the Date of Substantial Completion of the work as that date is established by the Architect.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures firmly into position for long life under hard use.

C. Coordinate all locations with local Fire Inspector before blocking out cabinet locations.

3.3 LOCATION:

A. Provide fire extinguishers and cabinets as located on drawings.

B. Provide fire extinguishers and standard mounting bracket located on drawings G-2.

END OF SECTION 10520

SECTION 10800 – TOILET ROOM ACCESSORIES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included: Provide toilet room accessories where indicated on the Drawings, as specified herein, and as needed for a compete and proper installation.

B. Related work
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01620.

PART 2 - PRODUCTS

2.1 TOILET ROOM ACCESSORIES

See Drawings.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install each item in its proper location, firmly anchored into position, level and plumb, and in accordance with the manufacturer’s recommendations.

C. Provide non-combustible blocking in walls for toilet accessories and all handicap grab bars, etc. in all locations as required by code.

END OF SECTION 10800