BUNCOMBE COUNTY SCHOOLS
PREPARING STUDENTS FOR THEIR TOMORROW

Tony Baldwin, Ed. D., Superintendent

175 Bingham Rd., Asheville, NC 28806
P: 828-255-5921 | F: 828-255-5923
buncombeschools.org

PROJECT MANUAL FOR
OAKLEY ELEMENTARY SCHOOL
EXIT RAMP AND AREA OF REFUGE

RFP# 11-20

175 BINGHAM ROAD, ASHEVILLE, NORTH CAROLINA 28806

BID DATE: MONDAY, MAY 11, 2020 at 4:00 pm EST

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STATE OF NORTH CAROLINA/BUNCOMBE COUNTY SCHOOLS
REQUEST FOR PROPOSAL RFP# 11-20

PROJECT: OAKLEY ELEMENTARY SCHOOL EXIT RAMP AND AREA OF REFUGE

PROJECT DESIGNER: Tim Fierle, Project Manager

ISSUING AGENCY: Buncombe County Schools **ISSUE DATE: April 15, 2020**

Sealed proposals subject to the conditions made a part hereof will be received until **4:00 pm EST on Monday, May 11, 2020** for furnishing all labor, materials, equipment, and services incidental and implied, for completion of the project described herein.

PRE-BID MEETING: A Pre-Bid meeting has been scheduled for Friday, May 1, 2020 at 10:30 am at Oakley Elementary School, 753 Fairview Road, Asheville, NC 28803. All visitors will meet/check-in at the front of the building outside. ***DUE TO THE COVID-19 OUTBREAK, AND PER THE GOVERNOR'S EXECUTIVE ORDER, A MINIMUM OF 6 FEET OF SOCIAL DISTANCING WILL BE ENFORCED DURING THE MEETING***

SEND ALL PROPOSALS DIRECTLY TO THE ADDRESS AS SHOWN BELOW:

Buncombe County Schools, Purchasing Division
175 Bingham Road
Asheville, NC 28806
FAX: (828) 251-1730 (fax is not guaranteed, call to confirm 828-255-5890)

Direct inquiries concerning this RFP to:	Tim Fierle, Planning/Facilities Director	Phone: (828) 255-5916
	Carol Fay, Asst. Direct Facilities	Phone: (828) 255-5917
	Tiffany McCants, Purchasing Officer	Phone: (828) 255-5890

THE PROCUREMENT PROCESS

The following is a general description of the process by which a firm will be selected to provide services.

1. Request for Proposals (RFP) is issued to prospective contractors.

2. Proposals in one original will be received from each offeror in a sealed envelope or package. Each original shall be signed and dated by an official authorized to bind the firm. Unsigned proposals will not be considered.

3. All proposals must be received by the issuing agency no later than the date and time specified on the cover sheet of this RFP.

4. At that date and time the proposals from each responding firm will be opened. Interested parties are cautioned that these costs and their components are subject to further evaluation for completeness and correctness and therefore may not be an exact indicator of an offeror's pricing position. Proposals are confidential until such time that award has been made. Thereafter, the Purchasing Department will furnish a bid tab on the district's website.

5. Proposals will be evaluated according to completeness, content, experience with similar projects, ability of the offeror and its staff, and cost. Award of a contract to one offeror does not mean that the other proposals lacked merit, but that, all factors considered, the selected proposal was deemed most advantageous to Buncombe County Board of Education.

6. Offerors are cautioned that this is a request for offers, not a request to contract, and that Buncombe County Board of Education reserves the unqualified right to reject any and all offers when such rejection is deemed to be in its best interest.

(NOTE: THIS PAGE MUST BE FULLY EXECUTED AND RETURNED FOR CONSIDERATION OF PROPOSAL)

PROPOSAL FORM

OAKLEY ELEMENTARY SCHOOL EXIT RAMP AND AREA OF REFUGE
RFP# 11-20
DUE DATE: Monday, May 11, 2020 at 4:00 pm EST

By submitting this proposal, the potential contractor certifies the following:

** This proposal is signed by an authorized representative of the firm.

** It can obtain and submit to the Owner insurance certificates as required within 5 calendar days after notice of award.

** The cost and availability of all equipment, materials, and supplies associated with performing the services described herein have been determined and included in the proposed cost.

** All labor costs, direct and indirect, have been determined and included in the proposed cost.

** All taxes have been determined and included in the proposed cost.

** The offeror has attended the conference *(if applicable*) or conducted a site visit and is aware of prevailing conditions associated with performing these services.

** The potential contractor has read and understands the conditions set forth in this RFP and agrees to them with no exceptions.

Therefore, in compliance with this Request for Proposals, and subject to all conditions herein, the undersigned offers and agrees, if this proposal is accepted within 60 days (normally less) from the date of the opening, to furnish the subject services for a cost not to exceed:

BASE BID: Exterior Concrete Ramp, Handrails and Area of Refuge.

$ _____ dollars and _____/100 ($).

Addenda received: _____ (Yes/No)

OFFEROR: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

TELEPHONE NUMBER: _____ FAX: _____

FED ID No: _____ Type & License #: _____

E-MAIL: _____ MBE Status: _____

Principal Place of Business if different from above (See General Information on Submitting Proposals, Item 18.):

_____

BY: (Signature) _____ TITLE: _____

DATE: _____ (Typed or printed name) _____

End of Proposal Form

GENERAL INFORMATION ON SUBMITTING PROPOSALS

1. **EXCEPTIONS:** All proposals are subject to the terms and conditions outlined herein. All responses shall be controlled by such terms and conditions and the submission of other terms and conditions, price lists, catalogs, and/or other documents as part of an offeror's response will be waived and have no effect either on this Request for Proposals or on any contract that may be awarded resulting from this solicitation. Offeror specifically agrees to the conditions set forth in the above paragraph by signature to the proposal.

78615644. **CERTIFICATION:** By executing the proposal, the signer certifies that this proposal is submitted competitively and without collusion (G.S. 143-54), that none of our officers, directors, or owners of an unincorporated business entity has been convicted of any violations of Chapter 78A of the General Statutes, the Securities Act of 1933, or the Securities Exchange Act of 1934 (G.S. 143-59.2), and that we are not an ineligible vendor as set forth in G.S. 143-59.1. False certification is a Class I felony.

78615645. **ORAL EXPLANATIONS:** The State/Buncombe County Schools shall not be bound by oral explanations or instructions given at any time during the competitive process or after award.

78615646. **REFERENCE TO OTHER DATA:** Only information which is received in response to this RFP will be evaluated; reference to information previously submitted shall not be evaluated.

78615647. **ELABORATE PROPOSALS:** Elaborate proposals in the form of brochures or other presentations beyond that necessary to present a complete and effective proposal are not desired.

In an effort to support the sustainability efforts of the State of North Carolina we solicit your cooperation in this effort.

It is desirable that all responses meet the following requirements:

- All copies are printed **double sided**.
- All submittals and copies are printed on **recycled paper with a minimum post-consumer content of 30%** and indicate this information accordingly on the response.
- Unless absolutely necessary, all proposals and copies should **minimize or eliminate use of non-recyclable or non re-usable materials** such as plastic report covers, plastic dividers, vinyl sleeves, and GBC binding. Three-ringed binders, glued materials, paper clips, and staples are acceptable.
- Materials should be submitted in a format which allows for **easy removal and recycling** of paper materials.

78615648. **COST FOR PROPOSAL PREPARATION:** Any costs incurred by offerors in preparing or submitting offers are the offerors' sole responsibility; the State of North Carolina/Buncombe County Schools will not reimburse any offeror for any costs incurred.

78615649. **TIME FOR ACCEPTANCE:** Each proposal shall state that it is a firm offer which may be accepted within a period of 45 days. Although the contract is expected to be awarded prior to that time, the 45-day period is requested to allow for unforeseen delays.

78615650. **TITLES:** Titles and headings in this RFP and any subsequent contract are for convenience only and shall have no binding force or effect.

78615651. **CONFIDENTIALITY OF PROPOSALS:** In submitting its proposal the offeror agrees not to discuss or otherwise reveal the contents of the proposal to any source outside of the using or issuing agency, government or private, until after the award of the contract. Offerors not in compliance with this provision may be disqualified, at the option of the State/Buncombe County Schools, from contract award. Only discussions authorized by the issuing agency are exempt from this provision.

78615652. **RIGHT TO SUBMITTED MATERIAL:** All responses, inquiries, or correspondence relating to or in reference to the RFP, and all other reports, charts, displays, schedules, exhibits, and other documentation submitted by the offerors shall become the property of the State/Buncombe County Schools when received.

78615653. **OFFEROR'S REPRESENTATIVE:** Each offeror shall submit with its proposal the name, address, and telephone number of the person(s) with authority to bind the firm and answer questions or provide clarification concerning the firm's proposal.

78615654. **SUBCONTRACTING:** Offerors may propose to subcontract portions of the work provided that their proposals clearly indicate what work they plan to subcontract and to whom and that all information required about the prime contractor is also included for each proposed subcontractor.

78615655. **PROPRIETARY INFORMATION:** Trade secrets or similar proprietary data which the offeror does not wish disclosed to other than personnel involved in the evaluation or contract administration will be kept confidential to the extent permitted by NCAC T01:05B.1501 and G.S. 132-1.3 if identified as follows: Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL". Any section of the proposal which is to remain confidential shall also be so marked in boldface on the title page of that section. Cost information may not be deemed confidential. In spite of what is labeled as confidential, the determination as to whether or not it is shall be determined by North Carolina law.

78615656. **HISTORICALLY UNDERUTILIZED BUSINESSES:** Pursuant to General Statute 143-48 and Executive Order #150, Buncombe County Schools invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises and non-profit work centers for the blind and severely disabled.

The Contractor agrees in particular to maintain open hiring and employment practices and to receive applications for employment in compliance with all requirements of applicable federal, state and local laws and regulations issued pursuant thereto relating to nondiscriminatory hiring and employment practices. Each Prime Contractor shall undertake an affirmative action program to ensure that no person shall be excluded from participation in any employment activities because of age, sex, race, religion, color, national origin or handicap.

78615657. **PROTEST PROCEDURES**: If an offeror wants to protest a contract awarded pursuant to this solicitation, they must submit a written request to the Purchasing Officer, Buncombe County Schools, 175 Bingham Road, or PO Box 16771, Asheville, NC 28806. This request must be received by the Purchasing Division within thirty (30) consecutive calendar days from the date of the contract award and must contain specific sound reasons and any supporting documentation for the protest. NOTE: Contract award notices are sent only to those actually awarded contracts, and not to every person or firm responding to this solicitation. Contract status and award notices are available through the purchasing division or the project designer with contact information as shown on the first page of this solicitation. Offerors may call to obtain a verbal status of contract award. All protests will be handled pursuant to the North Carolina Administrative Code, Title 1, Department of Administration, Chapter 5, Purchase and Contract, Section 5B.1519.

16. **TABULATIONS:** Offerors may visit the Buncombe County Schools website for bid tab details at www.buncombeschools.org/purchasing.

17. **VENDOR REGISTRATION AND SOLICITATION NOTIFICATION SYSTEM:** Vendor Link NC allows vendors to electronically register free with the State to receive electronic notification of current procurement opportunities for goods and services available on the Interactive Purchasing System. Online registration and other purchasing information are available on the Internet web site: http://www.state.nc.us/pandc/.

18. **RECIPROCAL PREFERENCE:** G.S. 143-59 establishes a reciprocal preference law to discourage other states from applying in-state preferences against North Carolina's resident offerors. The "Principal Place of Business" is defined as the principal place from which the trade or business of the offeror is directed or managed.

NORTH CAROLINA GENERAL CONTRACT TERMS AND CONDITIONS
(Contractual and Consultant Services)

1. **GOVERNING LAW:** This contract is made under and shall be governed and construed in accordance with the laws of the State of North Carolina.

78615732. **SITUS:** The place of this contract, its situs and forum, shall be North Carolina, where all matters, whether sounding in contract or tort, relating to is validity, construction, interpretation and enforcement shall be determined

78615733. **INDEPENDENT CONTRACTOR:** The Contractor shall be considered to be an independent contractor and as such shall be wholly responsible for the work to be performed and for the supervision of its employees. The Contractor represents that it has, or will secure at its own expense, all personnel required in performing the services under this agreement. Such employees shall not be employees of or have any individual contractual relationship with the Agency.

78615734. **KEY PERSONNEL:** The Contractor shall not substitute key personnel assigned to the performance of this contract without prior written approval by the Agency's Contract Administrator. The individuals designated as key personnel for purposes of this contract are those specified in the Contractor's proposal.

78615735. **SUBCONTRACTING:** Work proposed to be performed under this contract by the Contractor or its employees shall not be subcontracted without prior written approval of the Agency's Contract Administrator/Project Designer. Acceptance of an offeror's proposal shall include any subcontractor(s) specified therein.

78615736. **PERFORMANCE AND DEFAULT:** If, through any cause, the Contractor shall fail to fulfill in timely and proper manner the obligations under this agreement, the Agency shall thereupon have the right to terminate this contract by giving written notice to the Contractor and specifying the effective date thereof. In that event, all finished or unfinished deliverable items under this contract prepared by the Contractor shall, at the option of the Agency, become its property, and the Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such materials. Notwithstanding, the Contractor shall not be relieved of liability to the Agency for damages sustained by the Agency by virtue of any breach of this agreement, and the Agency may withhold any payment due the Contractor for the purpose of setoff until such time as the exact amount of damages due the Agency from such breach can be determined.
In case of default by the Contractor, the State may procure the services from other sources and hold the Contractor responsible for any excess cost occasioned thereby. The State reserves the right to require performance bond or other acceptable alternative guarantees from successful offeror without expense to the State.

Upon the entering of a judgment of bankruptcy of insolvency by or against the Contractor, the Agency may terminate this contract for cause.

Neither party shall be deemed to be in default of its obligations hereunder if and so long as it is prevented from performing such obligations by any act of war, hostile foreign action, nuclear explosion, riot, strikes, civil insurrection, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

78615737. **TERMINATION:** The Agency may terminate this agreement at any time by *15 days*' notice in writing from the Agency to the Contractor. In that event, all finished or unfinished deliverable items prepared by the Contractor under this contract shall, at the option of the Agency, become its property. If the contract is terminated by the Agency as provided herein, the Contractor shall be paid for services satisfactorily completed, less payment or compensation previously made.

78615738. **AVAILABILITY OF FUNDS:** Any and all payments to the Contractor are dependent upon and subject to the availability of funds to the Agency for the purpose set forth in this agreement.

78615739. **CONFIDENTIALITY:** Any information, data, instruments, documents, studies or reports given to or prepared or assembled by the Contractor under this agreement shall be kept as confidential and not divulged or made available to any individual or organization without the prior written approval of the Agency.

78615740. **CARE OF PROPERTY:** The Contractor agrees that it shall be responsible for the proper custody and care of any property furnished it for use in connection with the performance of this contract or purchased by it for this contract and will reimburse the State for loss of damage of such property.

78615741. **COPYRIGHT:** No deliverable items produced in whole or in part under this agreement shall be the subject of an application for copyright by or on behalf of the Contractor.

78615742. **ACCESS TO PERSONS AND RECORDS:** The State Auditor shall have access to persons and records as a result of all contracts or grants entered into by State agencies or political subdivisions in accordance with General Statute 147-64.7.
The Contractor shall retain all records for a period of three years following completion of the contract.

78615743. **ASSIGNMENT:** No assignment of the Contractor's obligations nor the Contractor's right to receive payment hereunder shall be permitted. However, upon written request approved by the issuing purchasing authority, the State may:

a. Forward the contractor's payment check(s) directly to any person or entity designated by the Contractor, or

b. Include any person or entity designated by Contractor as a joint payee on the Contractor's payment check(s).

In no event shall such approval and action obligate the State to anyone other than the Contractor and the Contractor shall remain responsible for fulfillment of all contract obligations.

78615744. **COMPLIANCE WITH LAWS:** The Contractor shall comply with all laws, ordinances, codes, rules, regulations, and licensing requirements (permits) that are applicable to the conduct of its business, including those of federal, state, and local agencies having jurisdiction and/or authority.

78615745. **AFFIRMATIVE ACTION:** The Contractor shall take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of people with disabilities and concerning the treatment of all employees without regard to discrimination by reason of race, color, religion, sex, national origin, or disability.

78615746. **INSURANCE:** During the term of the contract, the contractor at its sole cost and expense shall provide commercial insurance of such type and with such terms and limits as may be reasonably associated with the contract. As a minimum, the contractor shall provide and maintain the following coverage and limits:

a. Workers Compensation - The contractor shall provide and maintain Worker's Compensation Insurance, as required by the laws of North Carolina, as well as employer's liability coverage with minimum limits of $150,000.00, covering all of Contractor's employees who are engaged in any work under the contract. If any work is subcontracted, the contractor shall require the subcontractor to provide the same coverage for any of its employees engaged in any work under the contract.

b. Commercial General Liability - General Liability Coverage on a Comprehensive Broad Form on an occurrence basis in the minimum amount of $2,000,000.00 Combined Single Limit. (Defense cost shall be in excess of the limit of liability.

c. Automobile - Automobile Liability Insurance, to include liability coverage, covering all owned, hired and non-owned vehicles, used in connection with the contract. The minimum combined single limit shall be $500,000.00 bodily injury and property damage; $500,000.00 uninsured/underinsured motorist; and $100,000.00 medical payment.

Providing and maintaining adequate insurance coverage is a material obligation of the contractor and is of the essence of this contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business in North Carolina. The contractor shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or this contract. The limits of coverage under each insurance policy maintained by the contractor shall not be interpreted as limiting the contractor's liability and obligations under the contract.

The Contractor shall furnish a Certificate of Insurance as proof of the above coverages. Certificate will contain provision that the insurance coverages cannot be canceled, reduced in amount or coverage eliminated without 30 days written notice to the Buncombe County Board of Education. Owner's Protective insurance must list the Buncombe County Board of Education as the Certificate Holder and as "additional insured" as it's interest may appear. Owner's approval of Certificate of Insurance does not decrease or relieve the contractor's responsibility for maintaining insurance coverage as required in this Request for Proposal.

78615747. **ADVERTISING:** Contractor agrees not to use the existence of this contract, the name of the agency, or the name of the State of North Carolina as part of any commercial advertising.

78615748. **ENTIRE AGREEMENT:** This contract and any documents incorporated specifically by reference represent the entire agreement between the parties and supersede all prior oral or written statements or agreements. This Request for Proposals, any addenda thereto, and the offeror's proposal are incorporated herein by reference as though set forth verbatim.

All promises, requirements, terms, conditions, provisions, representations, guarantees, and warranties contained herein shall survive the contract expiration or termination date unless specifically provided otherwise herein, or unless superseded by applicable Federal or State statutes of limitation.

78615749. **AMENDMENTS:** This contract may be amended only by written amendments duly executed by the Agency and the Contractor.

78615750. **TAXES:** G.S. 143-59.1 bars the Secretary of Administration from entering into contracts with vendors if the vendor or its affiliates meet one of the conditions of G. S. 105-164.8(b) and refuse to collect use tax on sales of tangible personal property to purchasers in North Carolina. Conditions under G. S. 105-164.8(b) include: (1) Maintenance of a retail establishment or office, (2) Presence of representatives in the State that solicit sales or transact business on behalf of the vendor and (3) Systematic exploitation of the market by media-assisted, media-facilitated, or media-solicited means. By execution of the bid document the vendor certifies that it and all of its affiliates, (if it has affiliates), collect(s) the appropriate taxes.

78615751. **GENERAL INDEMNITY:** The contractor shall hold and save the State/Buncombe County Schools, its officers, agents, and employees, harmless from liability of any kind, including all claims and losses, with the exception of consequential damages, accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the contractor in the performance of this contract and that are attributable to the negligence or intentionally tortious acts of the contractor provided that the contractor is notified in writing within 30 days that the State/Buncombe County Schools has knowledge of such claims. The contractor represents and warrants that it shall make no claim of any kind or nature against the State's agents who are involved in the delivery or processing of contractor goods to the State. The representation and warranty in the preceding sentence shall survive the termination or expiration of this contract.

CONTRACTOR'S SALES TAX REPORT
Buncombe County Schools

NC State and Local Sales Taxes Paid

CONTRACTOR: _____ PO#/RFP# 11-20_____

Address:_____ For Period: _____

Invoice Date	Invoice #	Type of Property	NC Tax 4.75%	County Tax 2.25%	Name of County
		TOTAL	**$**	**$**	

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

Sworn to and subscribed before me,

This the _____ day of _____, 20____

_____
Signed

_____
Notary Public

_____
Print or Type Name of Above & Title

My Commission Expires: _____

Seal

NOTE:
This certified statement may be subject to audit.

The North Carolina General Assembly has amended the Statute to provide refunds of sales and use tax to local school units in accordance with the provisions of G.S. 105-164. 14(c) effective with tax paid on or after July 1, 1998.

These refunds are to include the “sales and use taxes paid by contractors on building materials, supplies, fixtures and equipment that become a part of or annexed to a building or structure that is owned or leased by the governmental entity and is being erected, altered or repaired for use by the governmental entity (G.S. 1O5-164.14).”

Sales and Use Tax Technical Bulletin Section 18-2F specifies: “To substantiate a refund claim for sales or use taxes paid on purchases of building materials, supplies. fixtures and equipment by its contractor, the claimant must secure from such contractor certified statements setting forth all of the following information:

a. the date the property was purchased;
b. the type of property purchased:
c. the project for which the property was used:
d. if the property was purchased in this State, the county in which it was purchased;
e. if the property was not purchased in this State, the county in which the property was used; and
f. the amount of sales and use taxes paid.

In the event the contractor makes several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the State and local sales and use taxes paid thereon. Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of sales and use tax paid thereon by the contractor. Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant. Any local sales or use taxes must be shown separately from the State sales or use taxes. The contractor’s statements must not contain sales or use taxes paid on purchases of tangible personal property purchased by such contractors for use in performing the contract which does not annex to, affix to or in some manner become a part of the building or structure that is owned or leased by a governmental agency and is being erected, altered or repaired for use by a governmental entity as defined by G.S. 105-164.14(c). Examples of property on which sales or use tax has been paid by the contractor and which shall not be included in the contractor's statement are scaffolding, forms for concrete, fuel for the operation of machinery and equipment, tools, repair parts and equipment rentals.

All information requested in these specifications and actual bids shall be entered on enclosed “Request for Proposal" All areas of this document must be completed in full, especially: (1) Name of Company, (2) By (signature), (3) Official Title, and (4) Quotation Date.

OAKLEY ELEMENTARY SCHOOL EXIT RAMP AND AREA OF REFUGE
RFP# 11-20

Project Description: Furnish all labor, materials, equipment and services, incidental and implied, for turnkey improvements as shown in the drawings, consisting of construction of a new exterior masonry and concrete ramp, handrail modifications and communications system for new area of refuge.

Scope: Work shall consist of furnishing all labor, taxes, materials, equipment, services, permits and startup, incidental and implied, to create a new exit ramp and area of refuge at Oakley Elementary School.

Contractor's Responsibility: The Contractor shall be responsible for the construction site during the performance of the work. The Contractor shall be responsible for all damages to persons and property during the performance of work and shall further provide all necessary safety measures and shall fully comply with all federal state and local laws, building rules, and regulations to prevent accidents or injury to persons or property on or about the location of the work site. This is to include OSHA 1910, General Construction, or those regulations mandated by these specifications. Special attention shall be made to proper barricading of the work area.

Safety Regulations: The Contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974 Federal Register) which is hereby incorporated in these specifications.

Codes: All work shall be performed in accordance with the specifications and shall comply with North Carolina Building Code, National Electrical Code Underwriters' Rules and Regulations and Federal, State and Local Regulations covering work of this nature. Whenever specifications are more than such laws, codes and regulations, the specifications shall hold. All equipment shall have U. L. labels attached.

Permits: The Contractor shall hold the appropriate license for work to be performed and shall secure all permits required for the job completion, obtain and deliver to Owner, all certification of inspection issued by the authorities having jurisdiction and roofing material manufacturer. Contractor is responsible for paying all costs associated with Buncombe County building permits. All final certificates must be delivered to owner prior to request for final payment.

School Security and Access: Security, safety and protection of the instructional environment are priority concerns of Buncombe County Schools. The Contractor shall confine activities to the work area and shall not engage or interact with students, teachers or staff that is not designated as contact personnel. The Contractor shall screen all employees on-site; and, at the request of the Owner, provide documentation that employees and subcontractors meet standards. The Owner, school staff and Contractor shall designate contact personnel and provide contact information to assist in the resolution of any logistical or safety issues beforehand, or that may arise during construction.

Scheduling: The Contractor must submit a precise time schedule as to when specific work will occur in specific areas within the building. This will be used to coordinate the work with the occupants of the building. The Maintenance Supervisor, Project manager or Principal may alter the schedule at any time to maintain the work process within the facility. Work must be scheduled during hours that are acceptable to each school and the Buncombe County Board of Education shall not incur any additional cost due to scheduling.

All work must be scheduled to avoid conflict with classroom instruction time and Cafeteria operation times. All permits and inspections will be the responsibility of the contractor, and copies of permits and final inspection will be submitted to Buncombe County Schools prior to final payment.

PROJECT TIMELINE: Project shall be completed **Before July 6, 2020**. *Complete is defined as: Contractor has passed the final inspection and a Certificate of Completion is issued by authorities having jurisdiction.* Liquidated damages in the amount of $250/day will be assessed for late completion.

Workers on Job: All employees of the Contractor shall, while on Buncombe County Board of Education property, act in a professional and courteous manner. All workers shall be expected to wear long pants and shirts while on Board property. Also, all employees of the Contractor must "sign in" in the main office upon entering the facility and must "sign out" upon leaving the property. Any employee of the Contractor may be told to leave the property by either the Principal or the Electrical Supervisor, if they do not follow the above procedure. The employee shall be replaced with another at no additional cost to the Buncombe County Board of Education. Smoking or use of Tobacco products is prohibited on Buncombe County School's property.

In accordance with G.S. 14-208.18, all persons who (1) are required to register under the Sex Offender and Public Protection Program AND (2) have been convicted of certain sexually violent offenses or any offense where the victim was under the age of 16 years at the time of the offense are expressly forbidden to knowingly be present on any property owned or operated by the school system, including school buildings, athletic fields, playgrounds, parking lots, school buses, activity buses or other property of any kind for any reason, including attendance at sporting events or other school related functions, whether before, during or after school hours. It is the responsibility of the Contractor or vendor that their employees and sub-contractors are in accordance with G.S. 14-208.18.

E-Verify: Contractor shall comply with E-Verify, the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law and as in accordance with N.C.G.S. §64-25 et seq. In addition, to the best of Contractor's knowledge, any subcontractor employed by Contractor as a part of this contract shall be in compliance with the requirements of E-Verify and N.C.G.S. §64-25 et seq.

Iran Divestment Act: North Carolina Local Government Units may not enter into contracts with any entity or individual found on the State Treasurer's Iran Final Divestment List N.C.G.S. 143C-6A. By bidding on this project, the bidder certifies it is not listed on the Final Divestment List created by the State Treasurer.

Equipment and Tools: The Contractor shall not use equipment or tools that are owned by the Buncombe County Board of Education. Also, employees of the Buncombe County Board of Education shall not be utilized by the Contractor except for opening locked doors and giving directions.

Materials: All materials stored on site must be stored in a safe and secure manner that does not interfere with the school's daily operation. Buncombe County Board of Education is not responsible for any materials, equipment or tools lost or stolen from the site.

Clean Up: The area of work shall be cleaned daily so that the Buncombe County Board of Education shall not incur any additional costs to make the area suitable for the work process. Also, the Contractor shall utilize no trash receptacles or dumpsters owned by the Buncombe County Board of Education. All trash and removed materials shall be properly disposed of off the property. Onsite dumpsters shall not be used.

Changes during project: Changes during the project shall only be made by written direction signed by the owner. No additional cost to the contract shall be allowed unless accepted in writing by the owner before work has begun.

Price Adjustments:(Term Contracts Only) Any price changes, downwards or upward, which might be permitted during the contract period must be general, either by reason of market change or on the part of the contractor to the other customers.

a. **Notification**: Must be given to Buncombe County Schools, in writing, concerning any proposed price adjustments. Such notification shall be accompanied by copy of manufacturer's official notice or other acceptable evidence that the change is general in nature.

b. **Decreases**: Buncombe County Schools shall receive full proportionate benefit immediately at any time during the contract.

c. **Increases**: **Consumer Price Index (CPI)**: Contract prices for equipment and/or service will remain firm through June 30, 2020. Contractors must request price adjustments, in writing, 30 days prior to the renewal date. If a Contractor fails to request CPI price adjustment 30 days prior to the adjustment date, the adjustment will be effective 30 days after Buncombe County Schools receives their written request. Price adjustments will be made in accordance with the percentage change in the U.S. Department of Labor Consumer Price Index (CPI-U) for all urban consumers, all items, southern region.

The price adjustment rate will be determined by comparing the percentage difference between the CPI in effect for the base yearly average (January through December beginning the year 2020); and each (January through December) thereafter. The percentage difference between those two CPI issues will be the price adjustment rate. No retroactive contract price adjustments will be allowed. All bidders will be capped with a 3% maximum price increase.

d. **Invoices**: It is understood and agreed that orders will be shipped at the established contract prices in effect on dates orders are placed. Invoicing at variance with this provision will subject the contract to cancellation. Applicable North Carolina sales tax shall be invoiced as a separate item.

Payment: Progress payments will be made for this project.

Final documents required:

1. Letter to the project manager from contractor which states all work is completed and payment is desired.
2. Delivery to owner, copies of all permits, certifications of inspection issued by the authorities having jurisdiction

Performance of Work: All work shall be performed at the highest level of quality. The Owner shall be responsible for determining the quality of work and may notify the Contractor of same. ANY WORK COMPLETED THAT IS NOT SUITABLE TO THE OWNER SHALL BE REPEATED BY THE CONTRACTOR AT NO COST TO THE OWNER. Any damage to existing area or utilities will be the responsibility of the Contractor. NO EXCEPTIONS.

Warranty: All labor, material and equipment shall be warranted for one (1) years from issuance of inspection.

Contractor must adhere to the guidelines within these specifications; failure to do so will result in default of payment by the BCBOE and/or cancelation of this contract.

The Buncombe County Board of Education reserves the right to reject any or all bids or any or no reason.

End of RFP# 11-20

SECTION 01 0000
GENERAL REQUIREMENTS

DIVISION 1 – GENERAL REQUIREMENTS

A. PROJECT IDENTIFICATION

1. General: This Project Manual includes specifications for Oakley Elementary - Exit Ramp & Area of Rescue Assistance as shown on the contract documents prepared by Architectural Design Studio, P.A. Drawings and specifications are dated December 2, 2019.
2. The Owner may, at his discretion, award other separate contracts for work on the site while the work being performed under the contracts listed above is in progress. Contractors shall coordinate their work with all other contractors who may be working at the site and shall fully cooperate with them.

B. CONSTRUCTION TIME

1. The Contractor shall commence construction work to be performed under this agreement on a date to be specified in a written order from the Architect. Final completion of all work shall be obtained within fifteen (15) calendar days of substantial completion.
2. Time is of the essence with respect to this contract and a material consideration thereof. For each day in excess of the above number of days, the Contractor shall pay the Owner the amount of **Two Hundred Fifty Dollars ($250)** as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner should the Contractor fail to complete the Work within the time specified.
3. Dates given are to Final completion. Final completion shall be defined as the date of acceptance by the Owner but in no case shall occur prior to completion of all punch list items. See General Conditions and Supplementary Conditions of the Contract, regarding construction schedule, delays, damages due to delays and extensions of time.

C. COMMUNICATIONS

1. General: Construction communications shall be made in writing. As a general rule, all communications shall be made through the architect and the architect will communicate construction directives and information only through the general contractor's designated representative for communications.
2. Email: Email may be utilized for time sensitive communications such as field reports, weather reports, RFI's, shop drawings, discoveries in the field, coordination of meeting schedules, construction conference reminders, changes in scheduled meetings, proposed changes etc.

D. PHASING OF THE WORK

1. General: The contractor shall phase the work to minimize disruption of school activities. The work will disrupt a primary exit for an existing building and must be accomplished when the building is unoccupied.

E. SUBCONTRACTORS AND SUPPLIERS

1. The successful bidders shall, after contract award, submit to the Architect for review the names of all subcontractors and major suppliers he proposes to employ and the branches of work they will perform.

F. CONSTRUCTION CONFERENCES

1. A preconstruction conference will be held immediately upon execution of contracts. The preconstruction conference will be held at a mutually agreeable site for the purpose of verifying general construction procedures, expediting the handling of shop drawings and schedules, and to establish a working understanding between all parties concerned. Present at the conference shall be a responsible representative of the Contractor, the job superintendent, and representatives of the Owner and Architect. The time of the conference shall be agreed upon by all parties.
2. The contractor shall notify the architect in writing 45 days prior to a requested Final Inspection. A Closeout Conference will be scheduled 30 days prior to the anticipated Final Inpection.

G. PROJECT RECORD DOCUMENTS

1. Record Drawings: During the entire construction period, the Contractor shall maintain a clean set of drawings for recording as-built conditions where they differ from the layout details shown on the drawings. Such changes in the work shall be recorded by the Contractor as they occur and shall be kept current and reviewed at each construction conference. Monthly payments to Contractor will be withheld in the absence of up to date record drawings.

H. PROGRESS AND SCHEDULING

1. The Contractor shall carry out the work as expeditiously as possible, planning ahead and scheduling work with subcontractors and material dealers to avoid conflicts and delays. Samples and shop drawings shall be submitted in sufficient time to permit checking, returning for correction if necessary, and resubmitted, and ordering of material.

I. CONSTRUCTION SCHEDULE

1. Bar-Chart Schedule: The Contractor shall prepare a fully developed, horizontal bar chart type Contractor's construction schedule detailing how the work will be accomplished. Submit within 15 days of the date of Notice to Proceed. No payment will be made until an approved schedule has been prepared.
2. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner and other parties required to comply with schedule dates. Post copies in the temporary field office.
   When revisions are made, distribute to the same parties and post in the same location. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
3. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.
4. Approval: Initial construction schedule and schedule updates shall be approved by the Owner.

J. SCHEDULE OF VALUES

1. The Contractor shall coordinate preparation of the Schedule of Values with preparation of the Construction Schedule.
2. Submit the Schedule of Values to the Architect at the earliest feasible date, but in no case later than 14 days before the date scheduled for submittal of initial Application for Payment.
   Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values. Provide a detailed breakdown of the Contract Sum to facilitate continued evaluation of Applications for Payment and progress reports. Break subcontracts and work categories into line items to shop materials, equipment and labor costs. Round amounts off to the nearest whole dollar. The total shall equal the Contract Sum.
3. Allowances: Show separate line items for each Allowance.
4. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Application of Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
5. At the Prime Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
6. Schedule Updating: When Change Orders or Construction Change Directives result in a change to the Contract Sum, add these to the Schedule of Values as a separate line item.
7. Approval: Schedule of Values shall be approved by the Owner.

END OF SECTION

SECTION 01 1000
SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

B. Section 01 1400 - Work Restrictions.

1.02 PROJECT INFORMATION

A. Project Name: This Project Manual includes specifications for Oakley Elementary - Exit Ramp & Area of Refuge.

B. Project Locations: 753 Fairview Road, Swannanoa, NC 28803.

C. Owner: Buncombe County Board of Education

D. Architect: Architectural Design Studio, Mike Cox, FAIA.

E. Project Description:
   1. General: The Project generally consists of generally consists of selective interior renovations to create an area of refuge, and the construction of a new exterior ramp and stair at Oakley Elementary School. Work includes selective demolition, poured in place ramp and steps, welded guardrails and handrails, hollow metal frames, solid core wood doors, glazing, signage, two-way communications system for area of rescue assistance.

1.03 CONTRACT DESCRIPTION

A. Contract Type: Single prime contract(s) based on competitive bid as described in Instructions to Bidders.

1.04 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent existing school buildings during the entire construction period. The Old Grammar Building will be unoccupied while the exit stair and ramp are being renovated.

B. Owner intends to occupy the Project upon Final Completion.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Allow the Owner occupancy and access to the campus by the public throughout the construction period. Repair damage caused by construction operations without additional cost to the Owner. Take all precautions necessary to protect building and site features to remain and their occupants during the construction period.

E. Construction operations and methods shall not adversely affect the Owner's working environment.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Contractor’s use of premises is limited by the Owner’s ongoing use of the school, right to perform work, and right to employ other contractors on portions of the Project. Cooperate with Owner to minimize disruption of owner operations, and to avoid disruption to instruction, safety or security.

B. Limits of Construction: Confine construction operations to areas indicted in the plans and as agreed to in the pre-construction conference.
   1. Parking: The Contractor will be assigned limited parking spaces on the campus.
   2. Ancillary Areas: Locations for a dumpster, materials lay-down storage will be as agreed upon in the pre-construction conference. There will be no construction trailer. Damage to landscaped, grassed or paved areas shall be repaired to the Owner’s satisfaction.

C. Provide access to and from site as required by law and by Owner:

1. Maintain required emergency egress from adjacent occupied spaces throughout construction.
2. Keep existing driveways, walkways and entrances serving the premises clear and available to the Owner, his employees, students, visitors and emergency personnel at all times. Do not use these areas for parking or storage of materials.

1.06 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

A. Unless otherwise noted, all provisions of the sections listed below apply to all subcontracts. Specific items of work listed under individual contract descriptions constitute exceptions.

B. Section 01 0000 - General Requirements

C. Section 01 1000 - Summary of Work

D. Section 01 1400 - Work Restrictions

E. Section 01 5000 - Temporary Facilities and Controls.

F. Section 01 6000 - Product Requirements.

G. Section 01 7000 - Execution and Closeout Requirements.

H. Section 01 7800 - Closeout Submittals.

END OF SECTION

SECTION 01 1400
WORK RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project-specific work restrictions.

1.02 RELATED REQUIREMENTS

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

B. Request for Proposal: Additional restrictions for workers.

C. Section 01 1000 - Summary of Work: Use of premises and occupancy.

1.04 OCCUPANCY REQUIREMENTS

A. Contractor's employees are not allowed to interact with Buncombe County Schools staff or students other than those designated as construction or emergency contacts.

B. Profanity, lewd comments, or suggestive behavior will not be tolerated on the job site.

C. Use of the Owner's toilets by employees of the Contractor and their subcontractors is prohibited.

D. Use of the Owner's telecommunications systems by employees of the Contractor and their subcontractors is prohibited.

E. Prohibitions of firearms on school property are governed by state law. Bearers of concealed carry permits may conceal their weapon in their locked vehicle while on campus.

F. Buncombe County Schools is tobacco free. Smoking and tobacco products are not permitted within the building or on Board of Education property.

G. The use of radios is prohibited.

H. Lock automotive type vehicles such as passenger cars and trucks, and other types of mechanized and motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

END OF SECTION

Construction Term Abbreviations

# or No.	Number or Pound
&	and
@	at
Ø	Diameter
%	Percent
A.B.	Anchor Bolt
A.F.F.	Above Finish Floor
Approx.	Approximate
Bldg	Building
CJ	Control Joint
CL	Centerline
Col.	Column
Conc.	Concrete
Cont	Continuous
Dia.	Diameter
Dwg.	Drawing
EC	Electrical Contractor
EJ	Expansion Joint
Elec.	Electrical
Elev.	Elevation
EQ	Equal Space
Ex. Or Exist.	Existing
F.V.	Field Verify
Ft	Foot or Feet
Ft²	Square Feet
GC	General Contractor
Ga.	Gauge
Galv.	Galvanized
HM	Hollow Metal
Hr	Hour (Fire Rating)
H or Ht.	Height
Max.	Maximum
Mfr.	Manufacturer
Min.	Minimum
N/A	Not Applicable
N.I.C.	Not in Contract
Nom.	Nominal
O.C.	On Center
Req'd	Required
SF	Square Feet
SS	Stainless Steel
Sim	Similar
Spec	Specification
Stl	Steel
Struct.	Structural
TYP	Typical
UON	Unless Otherwise Noted
UNO	Unless Noted Otherwise
Vert.	Vertical
W	Width
W/	With

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities. Including, but not limited to:
   1. Electric power.
   2. Water service.

B. Temporary construction and support facilities. Including, but not limited to:
   1. Sanitary facilities, including drinking water.
   2. Controls: Barriers.
   3. Storage.
   4. Vehicular access and parking.
   5. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

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

B. Section 01 1000 - Summary of Work: Requirements for Owner notification of utility service interruptions.

C. Section 01 1400 - Work Restrictions requirements and restrictions related to use and occupancy of project site.

1.03 TEMPORARY UTILITIES, GENERAL

A. The cost of securing the use of the Owner's utilities or other temporary facilities to point of use shall be borne by the Contractor.

B. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders.

1.04 TEMPORARY ELECTRICITY

A. The Contractor may utilize the owner's electricity so long as its use is not abused.

B. Permanent convenience receptacles may be utilized during construction.

C. Walkways shall be kept clear of cords. Extension cords shall be grounding type and without splices.

1.05 TEMPORARY WATER SERVICE

A. Water Service: The contractor may connect to Owner's existing water source.
   1. The contractor may utilize the owner's water so long as such usage is not abused. Abuse of this privilege will result in the cessation of water use and backcharge to the contractor for water spillage. The contractor under those conditions will be responsible for seeking and providing their own construction water.
      a. Hoses shall be turned off at the end of their use for each activity.

1.06 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide the necessary portable sanitary facilities for use by all persons performing work at the site. Provide at time of project mobilization and locate as directed by the owner.

B. Maintain daily in clean and sanitary condition.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

1.08 MATERIALS STORAGE

A. Confine stockpiling of materials and location of storage to areas approved by the Owner.

1.09 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. A limited number of parking spaces will be designated for the contractor's use.

1.10 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

1.11 CONTRACTOR'S FIELD OFFICE

A. No field office is required.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Submittal procedures.

E. Substitution limitations and procedures.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7000 - Execution and Closeout Requirements.

1.03 SUBMITTALS, GENERAL

A. Check submittals carefully against drawings, specifications, field conditions, and adjacent work, and when satisfied that they are correct, mark them accordingly before submitting them to the Architect. Apply Contractor's stamp, signed or initialed certifying that information is in accordance with the requirements of the Work and Contract Documents.

B. Submittals received by the Architect that do not bear the Contractor's stamp of approval will be immediately returned to the Contractor without review by the Architect. Delay caused by shop drawings being returned because of incomplete or inaccurate information or for lack of Contractor's approval stamp will not be grounds for an extension of time.

C. Acceptance of material on the basis of shop drawings, samples, brochures, and other materials submitted, shall be understood to be conditional on the acceptability of the actual material incorporated into the building. The inclusion into the work of a material which may at a later date be disclosed to be unsuitable for job conditions or not in conformity with samples, brochures, shop drawings, or materials submitted, shall be at the risk of the Contractor.

D. Submittals will be accepted in electronic or hard (paper) format. In general, where hard copies of submittals are provided, two sets of shop drawings and product data shall be submitted in addition to those required by the Contractor for his own use:

E. Project Closeout Submittals: Refer to Section 01 7800.

1.04 PRODUCT DATA

A. Product Data Submittals: Submit manufacturer's standard published data, instructions certifications and test results, as indicated in the individual specification sections. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project and as required to verify compliance with all specified requirements.

1. Collect Product Data into a single submittal for each element of construction or system.

1.05 SHOP DRAWINGS

A. Submit newly prepared information, specific to this Project, drawn to accurate scale.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
   1. Dimensions.
   2. Identification of products and materials included. Where practicable, markings of items shall be so coded that "shop marks" agree with "Architect's Mark".
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurement.

C. Submittal Format:
   1. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 24" x 36".

1.06 SAMPLES

A. Submit fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Include the following:
   1. Product name or name of manufacturer.
   2. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

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

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

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

B. No asbestos-containing material may be used on this project.

2.03 PRODUCT OPTIONS

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

B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Transmit each submittal with a transmittal form identifying the Project, Contractor, product and the associated specification section number. Provide a separate transmittal form for each individual product.

B. For electronic submittals, provide a single file in pdf format for each product, containing the transmittal followed by the relevant submittal data.

C. Deliver submittals to Architect at business address.

D. Schedule submittals to expedite the Project, and coordinate submission of related items. All shop drawing submittals shall be made within 30 days of the Notice to Proceed. Allow 15 days minimum, excluding delivery time to and from the contractor to allow for comparison with of shop drawings with the original contract documents, any change orders which have been issued, or any necessary changes required for proper coordination with other trades.

E. **Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.**

F. When revised for resubmission, identify all changes made since previous submission.

G. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

H. Submittals not requested will not be recognized or processed.

3.02 SUBSTITUTION PROCEDURES

A. Prior to bidding, requests for substitutions may be submitted for consideration up to seven days prior to the scheduled bid opening.

B. After contract award, subcontractors and material suppliers shall submit proposed materials for approval only through the Contractor and shall not come directly to the Architect. All approvals will be handled entirely through the Contractor.

C. Substitutions will be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on the proposer.

E. Substitution Submittal Procedure:
   1. Submit three hard copies or one electronic copy of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Each request must be accompanied by a completed CSI request form.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

D. All materials and equipment delivered to job shall be handled, stored, and maintained in such manner as to thoroughly protect them from damage. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

3.04 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.

B. Provide suitable storage for all materials subject to damage from exposure. All material shall be placed in orderly piles or stacks and shall not be so placed as to damage trees, shrubs, or other plants. Prevent contact with material that may cause corrosion, discoloration, or staining.

C. For exterior storage of fabricated products, place on supports above ground.

D. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Cutting and patching. Cutting includes removal of existing construction or materials associated with the existing building as necessary to permit installation or performance of other work. Patching includes fitting and repair work required to restore surfaces to original conditions after installation of other work.

D. Cleaning and protection, including final cleaning.

E. Starting of systems and equipment.

F. Demonstration and instruction of Owner personnel.

G. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS

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

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

C. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 PROJECT CONDITIONS

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

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

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Acceptance of Substrates: Each Contractor or Subcontractor is responsible for inspecting the work which precedes his work and reporting any deficiencies which will affect his work to the Architect prior to beginning new work. Commencement of new work over preceding work constitutes this Contractor's or Subcontractor's acceptance of preceding work. The cost of removing new work to make remedial repairs to existing conditions will be borne by the contractor. The Contractor shall immediately bring to the attention of the architect any discrepancy between existing conditions as shown on the drawings and conditions found at the site. Corrections of existing conditions are the responsibility of the Owner and may at the discretion of the Architect be made by others. The cost of corrections to existing conditions made by the Contractor without the prior approval of the Architect shall be borne by the Contractor.

C. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

D. Examine and verify specific conditions described in individual specification sections.

3.02 LAYING OUT THE WORK

A. Promptly notify Architect of any discrepancies discovered.

B. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means.

3.03 GENERAL INSTALLATION REQUIREMENTS

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

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

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

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

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

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

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

H. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

3.04 ALTERATIONS

A. Drawings showing existing construction are based on casual field observation and existing record documents only.
   1. Verify that construction arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.

D. Remove existing work as indicated and as required to accomplish new work.

1. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Provide adequate notice to Owner prior to disabling existing services of occupied facilities.

F. Protect existing work to remain.
   1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   2. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

H. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

3.05 OPENINGS AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Cutting and patching shall be done by workers skilled in the trade. All affected areas are to be patched with materials similar to adjacent surfaces, and as required to restore surfaces to their original condition. Provide temporary support of Work to be cut.
   1. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

C. Structural Integrity and Performance: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

3.06 PROGRESS CLEANING

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

B. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

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

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

3.08 SYSTEM STARTUP

A. Verify that each piece of equipment or system has been checked for proper operation.

B. Verify that wiring and support components for equipment are complete and tested.

3.09 DEMONSTRATION AND INSTRUCTION

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

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

C. Perform instruction onsite.

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

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

3.10 FINAL CLEANING

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

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

C. Clean surfaces exposed to view; remove stains and foreign substances

D. Remove all labels that are not permanent.

E. Wipe surfaces of electrical equipment.

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

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

3.11 FINAL INSPECTION PROCEDURES

A. The contractor shall notify the architect in writing prior to an anticipated Preliminary Final Inspection.

B. No less than 48 hours prior to a Preliminary Final Inspection, the contractor shall submit to the architect written certification that Contract Documents have been reviewed, work has been inspected, that work is complete in accordance with Contract Documents and that the project is ready for the Architect's review. The contractor shall include with their certification their punch list of work that does not comply with contract requirements, but is being corrected.

C. The Architect will schedule a Preliminary Final Inspection of the project for the purpose of further developing the list of discrepancies, from the Contractor’s punch list. All punch list items shall be corrected within 30 days from the date of the Preliminary Final Inspection.

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

E. The Architect will verify the completeness of the project and schedule a formal final inspection with the contractor and owner.

F. Upon satisfaction of all requirements and correction of the punch list, the Architect will confirm in writing, the completion of all final punch list items by the Contractor.

3.12 FINAL ACCEPTANCE

A. Written approval from the Owner is required for final acceptance.

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

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

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Warranties.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 Appendix A - List of Warranties.

C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Preliminary Documents - Warranties: Where specific warranty requirements are described in the individual specification sections, submit sample warranties for verification purposes when submitting product data.

B. Documents Due prior to Final Inspection: Applicable items from the following list shall be submitted by the Contractor prior to the scheduling of the Final Inspection with the Owner:
   1. Contractor’s statement of completion with request for designer’s inspection.

C. Final Documents: Applicable items from the following list shall be submitted by the Contractor with claim for final Application for Payment:
   1. Final Application and Certificate for Payment Document (AIA Document G702).
   2. Appendix E - MBE Documentation of Contract Payments.
   3. List of Subcontractors and Suppliers.
   4. Cancellation of Builders Risk Insurance: The contractors shall not cancel their builder's risk insurance until final acceptance of the project. The contractor shall forward cancellation notice to the Designer and the Owner.
   5. All remaining warranty documents.
   6. Final Certificate and Release.
   7. Project record documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. General: During the entire construction period, the General Contractor shall maintain a clean set of drawings for recording as-built conditions where they differ from the layout details shown on the drawings. Monthly payments to Contractors will be withheld in the absence of up to date record drawings.

B. Maintain on site one complete set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

C. Ensure entries are complete and accurate, enabling future reference by Owner.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

F. Record Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

G. Prior to final close-out of the job, submit complete record marked-up prints and specifications to the Architect in good condition.

3.02 WARRANTIES

A. Verify that documents are in proper form, contain full information, and are notarized. Co-execute submittals when required.

B. Verify that warranty periods begin at the date of Final Acceptance of the work, or the date of Beneficial Occupancy, as applicable.

C. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

3.03 CLOSEOUT COPIES

A. At completion of project, transmit all required final closeout documents and warranties to Architect in a single, complete submittal. Partial submittals of final closeout documents will be rejected.

B. Submit 1 hard copy of bound sets and 2 electronic copies of sets of all final closeout documents unless otherwise noted.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.

B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Materials to be destroyed shall be disposed of in strict compliance with applicable local, state and federal law. The General Contractor shall be responsible for all permits, fees, inspections and applications associated with building demolition and the disposal of building materials. Contractors shall comply with governing EPA notification regulations before starting demolition.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required applicable permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   5. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of campus.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants. Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
   7. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

C. Notify NC One Call prior to start of excavation work.

D. Do not begin removal until receipt of notification to proceed from Owner.

E. Protect existing structures and other elements that are not to be removed.
   1. Prevent movement or settlement of adjacent structures.

2. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.02 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Patch as specified for patching new work.
   4. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

E. Protect existing work to remain.
   1. Repair adjacent construction and finishes damaged during removal work.
   2. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

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

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

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

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

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

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

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

1.04 QUALITY ASSURANCE

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

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

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

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

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

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

PART 2 - PRODUCTS

2.01 FORMWORK

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

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

2.02 REINFORCEMENT

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

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

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

2.03 CONCRETE MATERIALS

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

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

C. Lightweight Aggregate: ASTM C 330.

D. Fly Ash: ASTM C618, Class F. Loss on ignition shall be less than 3% and all fly ash shall be a classified process material. Fly ash shall be obtained from one source for the entire project and for all concrete delivered to the project. Complete chemical and physical analysis of the fly ash shall be submitted to the Engineer prior to use, and the reports of chemical and physical tests on all shipments to the supplier shall be maintained by the supplier for the duration of the project. The amount of fly ash in concrete mixes prepared with fly ash shall not be less than fifteen percent (15%) nor more than twenty five percent (25%) by weight of cement.

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

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

G. Water: Potable

2.04 CHEMICAL ADMIXTURES

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

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

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

D. Mid Range Water Reducing Admixture: ASTM C 494/C 494M Type F.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. MasterPolyheed, Master Builders Solutions, Inc.

E. Water Reducing and Accelerating Admixture: ASTM C 494 Type E.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Accelguard 80, Euclid Chemical Co.
      b. Daraset, W.R. Grace & Co.
      c. MasterSet FP 20, Master Builders Solutions, Inc., BASF.

F. Water Reducing and Retarding Admixture: ASTM C 494 Type D:
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Eucon Retarder 75, Euclid Chemical Co.
      b. Daratard-17, W.R. Grace & Co.
      c. MasterSet R, Master Builders Solutions, Inc., BASF.

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

2.05 ACCESSORY MATERIALS

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

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

J. Non-Shrink Cementitious Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Euco N.S.; Euclid Chemical Co.
      b. Crystex; L & M Construction Chemicals, Inc.
      c. MasterFlow 928; Master Builders Solutions, Inc., BASF.

d. Five Star Grout; U.S. Grout Corp.

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

2.06 BONDING AND JOINTING PRODUCTS

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

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

C. Waterstops: Rubber, complying with COE CRD-C 513.
1. Configuration: Provide flat, dumbbell-type or centerbulb-type waterstops at construction joints and other joints as indicated. Size to suit joints.
2. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. The Burke Co.
b. Progress Unlimited.
c. Williams Products, Inc.

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

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

2.07 CURING MATERIALS

A. General: Provide curing agent that will not adversely affect concrete.

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

C. Liquid Membrane-Forming Curing Compound: ASTM C 309, Class A, for exterior use. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 Sq. Ft./gal.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. Pro-Cure, Atlas Construction Supply.

b. Eucocure, Euclid Chemical Co.
c. CS-309, W.R. Meadows, Inc.

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

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

2.08 CONCRETE MIX DESIGN

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

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

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

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

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

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

2.09 ADMIXTURES

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

B. Use accelerating admixture in concrete slabs placed at ambient temperatures under 50º F.

C. Use high-range water-reducing admixture in pumped concrete, architectural concrete, and concrete with water-cement ratios below 0.50.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:
1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure: 6.0 percent (severe exposure) for 3/4-inch maximum aggregate.
2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.10 CONCRETE MIXING

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

PART 3 - EXECUTION

3.01 EXAMINATION

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

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

3.02 PREPARATION

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

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

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, etc. for easy removal.

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

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

F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. 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.

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

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

J. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
   2. Use latex bonding agent only for non-load-bearing applications.

K. In locations where new concrete is doweled to existing work, drill holes in existing concrete; insert steel dowels and pack solid with non-shrink grout.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

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

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

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

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

3.04 INSTALLING EMBEDDED ITEMS

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

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

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

3.05 PREPARING FORM SURFACES

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

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

3.06 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

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

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

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

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

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

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

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

I. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

2. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the

machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.

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

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

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

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

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

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

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

Q. Place floor slabs in pattern indicated.

R. Saw cut joints within 24 hours after placing.

3.07 JOINTS

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

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

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

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

E. Waterstops: Provide waterstops in all construction joints unless otherwise indicated. Install waterstops to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.

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

G. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.
   1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
   2. 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.
   3. If joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
   4. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.08 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

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

3.09 CONCRETE FINISHING

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

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

C. Exposed Form Finish: Typical finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. As-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed. Provide finish as follows:
   1. Smooth Rubbed Finish: Typical finish, unless otherwise noted. Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
   2. Grout-Cleaned Finish: For scheduled concrete surfaces that have received smooth-formed finish treatment.
      a. Combine one part portland cement to one and one-half parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard portland cement and white portland cement in amounts determined by trial patches so that final color of dry grout will match adjacent surfaces.

b. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

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

MONOLITHIC SLAB FINISHES

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

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

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

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

3.10 CURING AND PROTECTION

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

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

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

3.11 REMOVING FORMS

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

3.12 FIELD QUALITY CONTROL

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

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

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

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

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

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

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

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

3.13 DEFECTIVE CONCRETE

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

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

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

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

F. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
   1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
   2. Correct high areas in surfaces by grinding after concrete has cured for 14 days.
   3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.

4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

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

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

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

END OF SECTION

SECTION 05 5213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Welded pipe and tube railings.

1.02 RELATED REQUIREMENTS

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

B. Section 09 9000 - Painting and Coating: Paint finish.

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

B. Shop Drawings: Plans, elevations, sections, and details of railing fabrications and their connections. Indicate profiles, sizes, splices, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Show all dimensions not governed by field conditions. Indicate all required field measurements.

PART 2 PRODUCTS

2.02 RAILINGS - GENERAL REQUIREMENTS

A. General: Factory- or shop-fabricated in design and dimensions indicated on the drawings, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.

B. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E 985 and applicable local code.

C. Configuration, General: See drawings for configurations and heights.
   1. Configure so as to prevent a 4" diameter from passing through any area of the railings from the walking surface to the guard height.
   2. Guard Height: As shown on the drawings, but not less than 42 inches above walking surface.
   3. Handrails: Provide continuous, uninterrupted grasping surface.

D. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
   1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
   2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
   3. Posts: Provide adjustable flanged brackets.

E. Provide fittings as required to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.03 MATERIALS

A. Steel Tube: Grade as indicated below unless otherwise indicated.
   1. Cold-Formed Steel Tube: ASTM A 500, Grade B structural tubing.
   2. Hot-Formed Steel Tube: ASTM A 501, Grade B structural tubing.
   3. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating.

B. Steel Shapes and Bars: ASTM A 36.

C. Steel Pipe: ASTM A 53/A 53M, Grade B unless otherwise indicated, galvanized for exterior locations.

2.04 STEEL PIPE RAILING SYSTEM, WELDED

A. General: Fabricate handrails and railing systems to comply with requirements indicated for design, dimensions, details, finish and member sizes, including wall thickness of hollow members, post spacings and anchorage, but not less than required to support structural loads.

B. General: Design and fabricate handrails and railing systems to comply with requirements indicated for design, dimensions, details, finish and member sizes, including wall thickness of hollow members, post spacings and anchorage, but not less than required to support structural loads.
   1. Rail and Posts Sizes: 1-1/4” inside diameter.

C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

D. Straight Splice Connectors: Steel concealed spigots.

E. Pipe Sleeves: For railing posts set in concrete, provide preset 8 inch long sleeves of steel with inside dimensions not less than 1/2 inch greater than outside dimensions of post, and steel plate forming bottom closure. Sleeves shall be stainless steel for stainless steel railings.

F. Galvanizing: In accordance with requirements of ASTM A 123/A 123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

2.05 ANCHORING CEMENT

A. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating, recommended for exterior use.

B. Products: Subject to compliance with requirements, available products include, but are not limited to:
   1. Bonsal Anchor Cement; W.R. Bonsal Co.
   2. Super Por-Rok; Minwax Construction Products Division.
   3. Thorogrip; Thoro Systems Products.

2.06 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.
   1. Form changes in direction of members by mitering at elbow bends.
   2. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming the pipe surface.
   3. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
3. Obtain fusion without undercut or overlap.
4. Remove welding flux immediately.
5. At tee and cross intersections, cope ends of intersecting members to fit contour of pipe or tube to which end is joined, and weld all around.
6. Comply with NOMMA Voluntary Joint and Finish Standards for Type 2 joints. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.

2.07 FINISHES, GENERAL

A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designing finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and they are assembled or installed to minimize contrast.

2.08 STEEL AND IRON FINISHES

A. Galvanizing: In accordance with requirements of ASTM A 123/A 123M.
1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
1. Interiors (SSPC Zone 1A): SSPC-SP 3 "Power Tool Cleaning."

C. Shop and Touch-Up Primer: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

B. Anchor railings securely to structure.
1. Anchor posts in new concrete with pipe sleeves of sufficient depth to develop required post strength, preset and anchored into concrete. After posts have been inserted into sleeves, solidly fill annular space between post and sleeve with the anchoring cement.
2. Anchor posts in existing concrete in core-drilled holes of sufficient depth to develop required post strength, hole diameter 3/4 inch larger than post diameter. Solidly fill annular space with anchoring cement.

3. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members by welding flanges to post and bolt to metal supporting surfaces.

C. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100 percent contact, or use fittings designed for this purpose. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

D. Expansion Joints: Provide slip joint with internal sleeve at straight runs exceeding 40 feet. Locate joints at a distance of 6 inches from posts. Fasten sleeve securely to one side.

E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

F. Attach handrails to wall with wall brackets and end fittings. Provide bracket with 1-1/2-inch clearance from inside face of handrail to finished wall surface. Locate brackets as shown or, if not shown, at spacing required to support structural loads, but no greater than 6 feet on center.
   1. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
   2. For hollow masonry anchorage, use toggle bolts with square heads.

G. Anchor rail ends into concrete and masonry with round flanges connected to rail ends and anchored into wall construction with postinstalled anchors and bolts.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.05 ADJUSTING AND CLEANING

A. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

1.02 RELATED REQUIREMENTS

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

B. Section 07 9000 - Joint Sealants: Non-fire rated joint sealants.

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

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

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. With minimum 3 years documented experience installing work of this type.
   2. Able to show at least 5 satisfactorily completed projects of comparable size and type.
   3. Licensed by authority having jurisdiction.

1.05 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING SYSTEMS

A. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and T Rating Equal to F Rating and that meets all other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authority having jurisdiction.

C. Install labeling required by code.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces of firestopping materials.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9000
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

C. Hollow gaskets.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 8400 - Firestopping: Firestopping sealants.

D. Section 08 8000 - Glazing: Glazing sealants and accessories.

E. Section 32 1313 - Exterior Concrete Paving: Sealants for exterior concrete.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.04 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after date of Final Acceptance of the work or Beneficial Occupancy.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 SEALANTS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants as selected by the Architect from manufacturer's full range of standard colors for products of type indicated.

C. Fire Rated Sealants: Where sealants are installed in rated assemblies, provide fire rated sealant assemblies of designs listed by UL or tested in accordance with ASTM E814 that provide the required fire ratings.

2.02 SEALANTS FOR EXTERIOR USE

A. Type ES2 - Polyurethane Sealant: ASTM C 920 Type M, Grade NS, Class 50. Uses T, NT, M, A, O. Multiple component, chemical curing, non-sag, non-staining, non bleeding, capable of continuous water immersion.
   1. Color: Match adjacent finished surfaces.
   2. Movement Capability: Plus and minus 25 percent.
   3. Service Temperature Range: -20 to 180 degrees F.
   4. Shore A Hardness Range: 20 to 35.
   5. Applications: Use for:
      a. Exterior and interior joints between concrete or masonry and other materials.
      b. Other exterior joints for which no other sealant is indicated.
   6. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Dynatrol II, Pecora Corporation.
      b. SikaFlex 2C NS, Sika
      c. Dymeric, Tremco.

B. Type ES3 - Self-Leveling Polyurethane Sealant: ASTM C 920, Type S, Grade P, Class 25, Uses T, I, M, A, O. Single component, chemical curing, non staining, non bleeding, capable of continuous water immersion, self-leveling type.
   1. Movement Capability: Plus and minus 25 percent.
   2. Service Temperature Range: -40 to 180 degrees F.
   3. Shore A Hardness Range: 20 to 35.
   4. Applications: Use for:
      a. Exterior joints in horizontal surfaces of concrete.
      b. Exterior joints in horizontal surfaces between concrete and metal.
      c. Exterior joints in horizontal surfaces between concrete and masonry.
   5. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Urexpan NR-201, Pecora Corp.
      b. MasterSeal SL1, Master Builders Solutions, BASF.
      c. Vulkem 45, Tremco.

C. Type ES5 - Silicone Sealant: ASTM C 920 Type S, Grade NS, Class 50, Uses NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, non-bleeding.
   1. Movement Capability: Plus and minus 50 percent.
   2. Service Temperature Range: -60 to 180 degrees F.
   3. Shore A Hardness Range: 15 to 35.
   4. Applications: Use for:
      a. Exposed joints within glazed hollow metal framing systems, interior and exterior.
      b. Exposed joints within aluminum entrance framing systems, interior and exterior.
   5. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. 999-A, Dow Corning
      b. Contractors 1000, GE
      c. 864NST, Pecora Corp.
      d. Spectrem 3, Tremco.

2.03 SEALANTS FOR INTERIOR USE

A. Type IS2 - Acrylic Emulsion Latex Sealant: ASTM C 834, Type OP, Grade NF. Single component, paintable.
   1. Color: Match adjacent finished surfaces.

2. Applications: Use for:
   a. Interior joints between door and window frames and wall surfaces.
   b. Other interior joints for which no other type of sealant is indicated.
3. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
   a. AC-20, Pecora Corp.
   b. Siliconized Acrylic Construction Grade (35 Year) Sealant, Red Devil.
   c. Tremflex 834, Tremco, Inc.

2.05 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Joint Backing in Rated Assemblies: Provide manufacturer’s recommended joint backing as approved for use in the appropriate UL classified assembly.

E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

2.06 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C 1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel frames for wood doors.

B. Thermally insulated steel doors.

C. Steel glazing frames.

1.02 RELATED REQUIREMENTS

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

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

D. Section 09 9000 - Painting and Coating: Field painting.

1.03 SUBMITTALS

substitution procedures.

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

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

C. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

D. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Fire Doors and Frames: Provide door and frame units that have been investigated and/or successfully tested in accordance with the latest revision of ANSI/UL 10B, ANSI/UL 10C or ANSI/NFPA 252, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames: Subject to compliance with requirements, manufacturers include but are not limited to:
   1. Assa Abloy: Ceco, Curries, or Fleming.
   2. Windsor Republic Doors.
   3. Steelcraft.

2.02 MATERIALS

A. Cold Rolled Steel: Commercial quality carbon steel. Comply with ASTM A1008 and ASTM A568.

B. Hot Rolled Steel: Commercial quality carbon steel, pickled and oiled. Comply with ASTM A1011 and ASTM A568.

C. Galvanizing: Hot-dipped zinc coated steel of commercial quality, complying with ASTM A924 and ASTM A653. Coating shall meet or exceed the minimum requirements for A40 coatings.

D. Shop-Applied Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

E. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.03 DOORS AND FRAMES, GENERAL

A. Provide doors and frames in sizes and configurations noted on the drawings.

B. Fire-Rated Doors and Frames: Provide fire-rated units, listed and labeled by UL, in locations indicated. Labels shall comply with NFPA 80. Permanently attach fire rating label to each fire rated unit.
   1. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with NFPA 252 or UL 10C ("positive pressure").
   2. Maximum Air Leakage: 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
   3. Glazing in fire rated door assemblies tested in accordance with NFPA 257 or UL 9.
   4. No visible seals when door is open.

C. Glazed Lights: Sizes and configurations as indicated on drawings.
   1. Glazing Stops: Minimum 20 gage steel or 0.40 inch thick aluminum.
      a. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.
      b. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.

D. Galvanizing: Provide galvanized doors and frames for all exterior doors.

E. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.04 STEEL DOORS

A. General: Comply with ANSI 250.8 and as herein specified. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.
   1. Accessibility: Comply with ANSI/ICC A117.1.
   2. Door Top Closures: Flush with top of faces and edges.
   3. Door Edge Profile: Square or beveled on both edges per manufacturer’s standard.
   4. Door Texture: Smooth faces.
   5. Thickness: 1-3/4 inches.
   6. Core Construction: Manufacturer’s standard honeycomb, polyurethane, polystyrene, steel channel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate.

B. Exterior Doors:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Thermal-Rated (Insulating) Assemblies: At all exterior locations provide doors fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236 or ASTM C 976 on fully operable door assemblies.
      a. U-value of 0.48 maximum, when tested in accordance with ASTM C 1363.

2.05 STEEL FRAMES

A. General: Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 18-gage cold-rolled steel.
   1. Frames for Steel Doors: Comply with frame requirements specified in ANSI 250.8 as follows:
      a. Exterior Doors: Level 3, 16 gage frames.
      b. Interior Doors: Level 2, 16 gauge frames.
   2. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 18 gage frames.
   3. Frames for Fire Rated Doors: Provide same rating as door, labeled.
   4. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

B. Exterior Door Frames: Full profile welded.
   1. Weatherstripping: Separate, see Section 08 7100.

C. Interior Door Frames: Knock-down type, welded and ground smooth. Provide knock-down frames where existing frames in masonry walls are being replaced, and at new openings in existing masonry walls.

D. Mullions for Pairs of Doors: Removable type, where indicated on drawings, of profile similar to jambs.

E. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.

F. Transom Bars: Fixed, of same profile as jamb and head.

G. Door Silencers: Except on weatherstripped frames, drill stops to receive three silencers on strike jambs of single door frames and four silencers on heads of double door frames.

2.06 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.

B. Hardware Preparation: In accordance with BHMA A156.115, “American National Standard for Hardware Preparation in Steel Doors and Steel Frames”, with reinforcement welded in place, in addition to other requirements specified in door grade standard. Comply with ANSI A250.6, “Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames” where applicable.
   1. Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
   2. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.

C. Factory Priming: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces. Apply rust-inhibitive enamel or paint after fabrication, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A250.10, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.07 ACCESSORY MATERIALS

A. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames. Provide minimum three anchors per jamb, suitable for adjoining wall construction.
   1. Base Anchors: Provide frames with base anchors for attachment to floor. For wall conditions that do not allow for use of base anchor, provide additional jamb anchor.

B. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A153, Class C or D as applicable.

C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

D. Glazing: As specified in Section 08 8000, factory installed.

E. Removable Stops: Formed sheet steel or rolled steel bar, shape as indicated on drawings, mitered or butted corners ; prepared for countersink style tamper proof screws.

F. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

G. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install frames plumb, level, rigid and true in accordance with the requirements of the specified door grade standard, ANSI A250.11 “Recommended Erection Instructions for Steel Frames,” and NAAMM HMMA 840 “Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.”

B. Install fire rated units in accordance with NFPA 80.

C. In masonry walls, install frames prior to laying masonry; anchor frames into masonry mortar joints. Grout frames in masonry construction, fill jambs with grout as walls are laid up using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Coordinate installation of hardware.

E. Coordinate installation of glazing.

3.04 CLEARANCES AND TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

C. Tolerances: Comply with SDI-117, “Manufacturing Tolerances for Standard Steel Doors and Frames.”

3.05 ADJUSTING AND CLEANING

A. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 08 1113 - Hollow Metal Doors and Frames.

D. Section 08 7100 - Door Hardware.

E. Section 08 8000 - Glazing.

F. Section 09 9000 - Painting and Coating: Site finishing of doors.

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

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

C. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

D. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
   2. Include certification program label.

E. Specimen warranty.

F. Manufacturer's Installation Instructions: Indicate special installation instructions.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Installed Fire Rated Door and Transom Panel Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Identify each door with individual opening numbers correlating with designation system used on shop drawings, using temporary, removable or concealed markings.

B. Package, deliver and store doors in accordance with specified quality standard.

C. Accept doors on site in manufacturer's packaging. Inspect for damage.

D. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Submit written warranty, executed by the wood doors manufacturer, agreeing to replace interior wood doors that fail in materials or workmanship within the specified warranty period. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.
   1. Warranty Period: Life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors, subject to compliance with requirements, manufacturers include but are not limited to:
   1. Algoma Hardwoods, Inc.
   2. Eggers Industries.
   3. Haley Brothers.
   4. Lambton Doors.
   5. Marshfield Door Systems, Inc.
   6. Mohawk Flush Doors, Inc.

2.02 DOORS AND PANELS

B. Door Style & Configuration: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at all locations.

C. Quality Level for Transparent Finish: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.

D. Performance Level: Extra Heavy Duty per ANSI/WDMA I.S.1A.

E. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
   2. Veneer Grade: AA Grade per ANSI/WDMA I.S.1A.

F. Edge Type, Doors Over 20-Minute Rated: Stainless steel edges and astragals.

G. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with International Building Code ("positive pressure"); UL or WH (ITS) labeled.
   1. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with NFPA 252 or UL 10C ("positive pressure").
   2. Maximum Air Leakage: 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
   3. No visible seals when door is open.

H. Panels: Same construction and finish as door; same performance rating as door.

2.03 DOOR AND PANEL CORES

I. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

A. Wood Veneer Facing for Field Transparent Finish:
   1. Species: Natural birch, veneer grade as specified by quality standard,
   2. Cut: Rotary cut, slip veneer match, balance assembly match.

2.05 ACCESSORIES

E. Glazing: As specified at Section 08 8000.

F. Glazing Stops: Rolled steel channel shape, 18 gauge, factory primed, butted corners. Approved for use in door of fire-rating indicated.

2.06 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

1. Comply with tolerance requirements of AWI for prefitting. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
2. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.

B. Fabricate doors by hot-press method, bonding faces, crossbands and core together in a single operation with Type I glue. Doors manufactured by cold pressing of manufactured or pre-manufactured components will not be accepted.

C. Hardware Blocking:
1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
2. Provide solid blocking for other through-bolted hardware.
3. Premachine astragals and formed steel edges for hardware where required for pairs of fire-rated doors.

D. Factory machine doors for hardware other than surface-mounted hardware. Comply with final hardware schedules, door frame shop drawings, DHI A115 -W series standards, and hardware templates.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
1. Exception: Doors to be field finished.

F. Provide edge clearances in accordance with the quality standard specified.

G. Factory install vision lights at rated doors. Comply with requirements of NFPA 257 and NFPA 80.

2.07 FACTORY PRIMING

A. Section 09 9000 - Painting and Coating: Site finishing of doors.

B. Shop seal faces and edges of doors for transparent finish and other required pretreatments for job site finish.

C. Seal door top edge with color sealer to match door facing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes, swing characteristics and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
1. Install fire-rated doors in accordance with NFPA 80 requirements.
2. Install smoke doors in accordance with NFPA 105 requirements.

B. Field-Fitted Doors: Trimming to fit is acceptable. Align and fit doors in frames with uniform clearances as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Seal cut surfaces after fitting and machining.
1. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
2. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
3. Trim maximum of 3/4 inch off bottom edges.
4. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.
5. Bevel fire-rated doors 1/8" in 2" at lock edge; trim stiles and rails only to extent permitted by labeling agency.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 CLEARANCES AND TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement. Rehang or replace doors that do not operate freely.

B. Adjust closers for full closure.

3.05 PROTECTION

A. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Final Acceptance.

B. Refinish or replace doors damaged during installation or construction.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes items known commercially as finish or door hardware. Hardware includes but is not limited to:
   1. Butts and Hinges.
   2. Cylinder Locks, Locksets and Keys.
   3. Exit Devices.
   4. Closers.
   5. Protection Plates.
   6. Weatherstripping, Thresholds, Seals, Door Gaskets and Sweeps.

B. Hardware for wood and hollow metal doors.

C. Hardware for fire-rated doors.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 9000 - Joint Sealers.

D. Section 08 1113 - Hollow Metal Doors and Frames.

E. Section 08 1416 - Flush Wood Doors.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware.

C. Hardware Supplier shall provide and install temporary hardware for security and convenience of the Owner if shipment of the permanent hardware would cause delays in construction or use of the building by the Owner.

1.04 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

A. Qualification Data: Indicating compliance with Quality Assurance Article.
   1. Installers Qualifications: Submit in writing for approval by the Architect and the Hardware Supplier.

B. Product Data: Manufacturer's catalog literature for each item of hardware, marked to clearly show products to be furnished for this project. Include installation instructions, instructions on maintenance of operating parts and finish, and all information necessary to show compliance with requirements. Every proposed substitution shall be accompanied by product data for the originally specified item.

C. Specimen Warranty.

D. Hardware Schedule: Hardware is critical in the project construction schedule. Submit final schedule at earliest possible date. Detailed listing of each item of hardware to be installed on each door. Organize schedule into hardware sets indicating complete designation of each item for each door or opening. Include the following:
   1. Type, style, function and finish of each item.
   2. Name and manufacturer of each item.
   3. Location of hardware set cross referenced to door numbering scheme as included in the Contract Documents.
   4. Fastenings and mounting locations.
   5. Keying information.
   6. Explanation of all abbreviations, symbols and codes contained in the schedule.

E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

F. Submit manufacturer's parts lists and templates.

G. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Tools: One set of all special wrenches or tools for Owner's continued adjustment, maintenance, and removal and replacement of door hardware. Provide all tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

H. Supplier's Certification: Written certification of proper installation.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of hardware from a single manufacturer.

B. Standards for Fire-Rated Doors: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

D. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware, and with a record of successful in-house performance for supplying door hardware similar in quantity, type and quality to that indicated for this Project.

E. Installer Qualifications: Company with no less than 10 years experience in the installation of hardware of similar types and quantities.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packaging of door hardware is the responsibility of the Hardware Supplier. Sort and repackage in containers marked with the hardware set number.

B. Package hardware items individually; label and identify each package with door opening code to match hardware schedule. Tag each item or package separately with identification corresponding to numbers shown on the drawings and schedules and the final hardware schedule. Include basic installation instructions with each item or package.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer’s standard warranty against defects in materials and workmanship.
   1. Warranty Period, from date of Final Acceptance of the work or Beneficial Occupancy:
      a. Door Closers: Five years.
      b. Exit Devices: Three years.
      c. Locksets: Three years.

PART 2 PRODUCTS

2.01 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Hardware Schedule at the end of this section. The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing hardware to match existing or minimum requirements. Provide either the product designated, or the comparable product of one of the other specified or pre-approved manufacturers that complies with requirements. The burden of proof of equality of proposed substitutions is on the proposer subject to the approval of the Architect concerning deviations or adherence to the design concept.

2.02 DOOR HARDWARE - GENERAL

A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide all items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities, 2009 edition.
   3. Applicable provisions of NFPA 101, Life Safety Code.
   4. Fire-Rated Doors: NFPA 80.
   5. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.

D. Finishes: All door hardware the same finish unless otherwise indicated.
   1. Match items to the manufacturer's standard color and texture finish for the latch and locksets (or push and pull units if no latch or locksets).
   2. For iron and steel base metal required for exterior work and in areas shown as High Humidity, and also when designated with the suffix -RR, provide 0.2 mil thick copper coating on base metal before applying brass, bronze, nickel or chromium plated finishes.
   3. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
   4. Secondary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
      d. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.
   5. Finish Definitions: BHMA A156.18. Designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.
   6. Exceptions:
      a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
      b. Hinges for Fire-Rated Doors: Steel base metal with painted finish.
      c. Door Closer Covers and Arms: Color to be selected by Architect from manufacturer's standard colors.
      d. Aluminum Surface Trim and Gasket Housings: Anodized to match door, not to match other hardware.
      e. Hardware for Aluminum Storefront Doors: Finished to match door, except hand contact surfaces to be satin stainless steel.

E. Fasteners:
   1. Furnish screws for installation with each hardware item. Provide Philips flat-head screws unless otherwise indicated.

2. Provide hardware manufactured to conform to published templates. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.
4. Finish screws exposed under any condition to match hardware finish. If exposed in surfaces of other work, match finish of this other work as closely as possible, including prepared-for-paint surfaces to receive painted finish
5. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Hinges: Provide hinges on every swinging door.
1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
2. Provide ball-bearing hinges at all doors.
3. Provide hinges in the quantities indicated.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Outswinging Exterior Doors with Locks: Non-removable pins.
2. Interior Doors: Non-rising pins. **Provide non-removable pins for all doors for which 7 pin keyways are specified.**
3. Tips: Flat button and matching plug, finished to match leaves.

D. Metals: Provide brass/bronze butts for all USP finish butts.

E. Screws: Provide Philips flat-head screws complying with the following:
1. For metal doors and frames install machine screws into drilled and tapered holes.
2. For wood doors and frames install wood screws.
3. For fire rated wood doors install #12 by 1-1/4 inch threaded to the head steel wood screws or #12 thru bolts.
4. Finish screw heads to match surface of hinge or pivot.

F. Size: 4-1/2 inch by 4-1/2 inch typical unless otherwise noted. Provide 5 inch by 4-1/2 inch hinge for doors over 36 inches in width.

G. Quantity of Hinges Per Door:
1. Doors From 60 inches High up to 90 inches High: Three hinges.

H. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy McKinney.
2. Hager Companies.
3. Stanley Hardware.

2.04 LOCKS AND LATCHES

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
1. Provide flat-lip strikes for locks with three-piece, antifriction latchbolts as recommended by the manufacturer.

B. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
1. Hardware Sets indicate locking functions required for each door.
2. If no hardware set is indicated for a swinging door provide an office lockset.
3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

C. Lock Cylinders: Manufacturer's standard tumbler type, small format, interchangeable core. Provide construction cores. **Rekey all locks at the completion of the project if construction core is omitted.**
   1. Provide cams and/or tailpieces as required for locking devices required.
   2. Metals: Construct lock cylinder parts from brass or bronze, stainless steel or nickel silver.

D. High Security Lock Cylinders: Where indicated in the "Hardware Sets" at the end of this Section, provide high security cylinders with 7-pin, interchangeable core and keyed into the existing factory registered Key System with a restricted keyway.

E. Keying: Except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
   1. Provide visual key control with identifying key symbol stamped on the key and the plug or cylinder face. Inscribe each key with the notation "DO NOT DUPLICATE".
   2. Furnish one extra blank for each lock.
   3. When providing keying information, comply with DHI Handbook "Keying systems and nomenclature".
   4. Key Material: Nickel silver only.
   5. Owner's Key System: **Masterkey keys to Owner's existing factory- keyed system.**

F. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

G. Lock Throw: Provide 5/8 inch minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on fire rated openings.

H. Levers: Lever trim shall be vandal-resistant, providing for free rotation of the lever in the locked position.

I. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. Assa Abloy Corbin Russwin or Yale.
   2. Best Access Systems, division of Stanley Security Solutions.
   3. Schlage.

2.05 EXIT DEVICES

A. All exit devices shall be provided with anti-slip stainless steel roller strikes. Strikes shall have toothed reverse face to positively engage the toothed face of the strike anchor plate.

B. Dogging: Except on fire-rated doors where closers are provided on doors equipped with exit devices, equip units with **cylinder keyed dogging device** to keep latch bolt retracted when engaged.

C. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. Von Duprin.
   2. Assa Abloy Corbin Russwin.
   3. Precision Hardware Inc.

2.06 CLOSERS

A. Closers: Complying with BHMA A156.4.
   1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
   2. Provide parallel arms for all overhead closers, unless specifically otherwise indicated.
   3. Provide a door closer on every exterior door.
   4. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
   5. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
   6. Coordinate selection and installation of closers with door head, frame head, hold opens and weatherstripping to ensure proper installation and operation of all door hardware items.
   7. Provide grey resilient parts for exposed bumpers.

B. Access-Free Manual Closers: Where manual closers for doors are indicated for doors required to be accessible to the physically handicapped, provide adjustable units in conformance with ANSI A117.1 and the Americans With Disabilities Act for door opening force.

C. Unit Size: Except as otherwise specifically indicated, comply with manufacturer's recommendations for size of door control unit depending on door size, exposure to weather and anticipated frequency of use.
   1. Where parallel arms are indicated, provide closer unit one size larger than recommended for use with standard arms.

D. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. Assa Abloy Corbin Russwin.
   2. LCN.
   3. Stanley Hardware.

2.07 STOPS AND HOLDERS

A. Door Silencers: Provide three door silencers for strike jamb of single door frames, and four silencers on heads of double door frames, unless frame is weatherstripped. Basis of design is Rockwood #608 for hollow metal frames and Rockwood #609 for wood frames.

B. Manufacturers - Door Silencers: Subject to compliance with the specifications, available manufacturers include:
   1. Assa Abloy [Rockwood].
   2. Burns Manufacturing Inc.
   3. Ives.

2.08 GASKETING AND THRESHOLDS

A. Provide continuous weatherstripping, threshold and sweep for every exterior door. Provide items to match similar specified opening if weatherstripping, threshold or sweep have been omitted from the schedule for any exterior door.

B. Gaskets: Complying with BHMA A156.22.
   1. On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
   2. On wood doors with fire rating more than 20-minutes, provide frame-applied intumescent gaskets.
   3. On each exterior door, provide door bottom sweep to contact threshold, unless otherwise indicated.
   4. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from sticks maintained by the manufacturer.
   5. Coordinate selection and installation of weatherstripping with strike plates, exit devices, closers and hold-opens to ensure proper installation and operation of all door hardware.

C. Thresholds: Provide thresholds, complying with ICC A117.1-2009, of required size and design shown in the schedule.
   1. Provide units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames.
   2. Shop cut thresholds to fit tight to face of door frame.

D. Fasteners At Exterior Locations and as required elsewhere: Non-corroding.

E. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. National Guard Products, Inc.
   2. Pemko Manufacturing Co.
   3. Reese Enterprises, Inc.

2.09 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates: Provide plates of not more than 1-1/2 inches less than door width on hinge side and not more than 1/2 inch less than door width on pull side, height as indicated.
   1. Kickplate: Provide on push side of every door with closer, except storefront and all-glass doors.
   2. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.

B. Fabricate plates of material indicated.

C. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. Assa Abloy Rockwood.
   2. Burns Manufacturing Inc.
   3. Ives.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Coordinate removal, storage and reinstallation or application of surface protection with painting specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.

C. Use templates provided by hardware item manufacturer.

D. Use only manufacturer’s supplied fasteners for installation of hardware. Lost or damaged fasteners, strikes etc. shall be replaced with original equipment. Maintain possession of all spare fasteners and parts and deliver same to the owner upon completion of the work.

E. Do not install surface mounted items until finishes applied to substrate are complete.

F. Set units level, plumb and true to line and location. Adjust and reinforce substrate as necessary for proper installation and operation.

G. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

H. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant.

I. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.

J. After fitting and hanging doors, remove doors so that top and bottom edges can be painted, and rehang after painting is complete.

K. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted:
   1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
   2. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."
   3. As required by accessibility codes and in conformance with the requirements of the 2010 ADA Standards for Accessible Design.

L. Instruct Owner's designated representatives in the adjustment and maintenance of door hardware and hardware finishes. Deliver to the Owner's designated representatives all installation and adjusting tools, instructions and templates, and a copy of the Final Hardware Schedule.

M. Verify with the Architect the instructions for delivery of permanent keys to the Owner. Manufacturer shall deliver keys and cores directly to the Owner's designated representative and shall provide the Architect with a signed receipt for the keys. Under no circumstances are permanent keys to be delivered to the Contractor. Keys shall be properly indexed and filed in Key Cabinet prior to delivery to the Owner.

N. Hardware Supplier shall provide and install temporary hardware for security and convenience of the Owner if shipment of the permanent hardware would cause delays in construction or use of the building by the Owner.

3.03 FIELD QUALITY CONTROL

A. The Hardware Supplier shall remove the construction cores when advised by the Architect.

B. Upon completion of the work, the Hardware Supplier, in the presence of the Installer, shall examine the hardware installation and note any improper installation or required adjustments. When he is satisfied that all hardware has been properly installed and adjusted, the Supplier shall certify in writing to the Architect that the hardware has been installed in accordance with the intent of the drawings and the manufacturer's recommendations.

3.04 ADJUSTING

A. Adjust hardware for smooth operation. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application.

B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

C. Access-Free Closers: Adjust manual closers for doors required to be accessible to the physically handicapped as required by accessibility codes and in conformance with ANSI A117.1, 2009 edition and the 2010 ADA Standards for Accessible Design for door opening force and delayed action closing.

3.05 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.06 PROTECTION

A. Protect finished Work under provisions of Section 01 7000.

B. Do not permit adjacent work to damage hardware or finish.

3.07 FINAL ADJUSTMENT

A. Eleven-Month Adjustment: Approximately eleven months after the date of Final Acceptance, the Installer, accompanied by a representative of the Supplier, shall return to the Project to perform the following work:

1. Examine and readjust each item of door hardware as necessary to restore full function of doors and hardware.
2. Consult with the Owner's designated representative in recommended additions to the maintenance procedures.
3. Replace hardware items that have deteriorated or failed due to faulty design, materials or installation of hardware units.
4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

PART 4 HARDWARE SETS

4.01 GENERAL

A. General: Provide hardware for each door to comply with the requirements of this specification, including the following schedule of hardware sets, and the hardware set numbers indicated on the Drawings.

B. Hardware Supplier shall check the plans and be responsible for quantities, hands of doors, and other details including adaptability of all items of hardware. Hardware Supplier shall be responsible for coordinating the various hardware items, making sure that types and styles submitted are mechanically compatible.

3.02 SCHEDULE OF HARDWARE SETS

HW-1 Doors 1

2	Continuous Hinges	Stanley 661 HD Geared Hinge	Al
1	Exit Device	Von Duprin 99 x NL07	US26D
1	Exit Device	Von Duprin 99 x DT07	US26D
1	Removable Mullion	Von Duprin KR4954 with stabilizers	313
2	Cylinders	Schlage	US26D
2	Closers	LCN 4111	Al
2	Kick Plates	Rockwood 6"x34" K2060	US32D
2	Wall Stops	Rockwood 403	US26D
1	Saddle Threshold	National Guard 613 (6”x72”)	Al
1 Set	Weatherstripping	National Guard 130	Al
1	Sweep	National Guard C607NDkB	Al

HW-2 Door 2

1-1/2 Pr	Butts	Stanley FBB179	US26D
1	Exit Device	Von Duprin 9975 x NL07	US26D
1	Closer	LCN 4111 Spring-Cush Arm BF-DA	Al
1	Wall Stop	Rockwood 403	US26D
1	Kick Plate	Rockwood 6"x34" K1062	US32D

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass in doors.

B. Glass in hollow metal frames.

C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 08 1113 - Hollow Metal Doors and Frames: Glazed doors and borrowed lites.

D. Section 08 1416 - Flush Wood Doors: Glazed doors.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

1.04 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

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

C. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

D. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

E. Specimen Warranty.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

B. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:
   1. Insulating Glass Certification Council (IGCC).

C. Installer Qualifications: Company specializing in performing the work of this section Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

D. Fire-Resistive Glazing Products for Window Assemblies: Fire protection rated glazing to comply with requirements of NFPA 257 and NFPA 80, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

E. Single-Source Responsibility for Glass: Obtain primary glass of each (ASTM C 1036) type and class indicated from one source for each product.

F. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.07 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.

C. Manufacturer's Warranty on Coated Glass Products: Submit written warranty signed by coated glass manufacturer agreeing to furnish replacements for those coated glass units that deteriorate, f.o.b. point of manufacture, freight allowed Project site, within 10 years after project acceptance. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.

D. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLASS MATERIALS

A. Float Glass: Annealed Type, ASTM C 1036, Type I (transparent flat), Class 1 (clear), Quality Q3 (glazing select). All glazing is to be float glass unless otherwise indicated.
   1. Thicknesses: As indicated, 1/4 inch minimum for interior single glazing. For exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
   2. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. AGC Flat Glass North America, Inc.
      b. Guardian Industries Corp.
      c. Pilkington North America Inc.
      d. Saint-Gobain North America.
      e. Vitro Architectural Glass.

B. Safety Glazing: Uncoated, clear, heat-treated float glass.
   1. Heat-Strengthened and Fully Tempered Types: ASTM C 1048, Condition A (uncoated surface), Type I (transparent glass, flat), Quality q3 (glazing select).
   2. Type: Class 1 (clear) unless otherwise noted.
   3. Type: Class 2 (tinted) where noted.
   4. Impact Resistance: Compliant with CPSC 16-CFR, Part 1201.
      a. Comply with Category I for lights of 9 square feet and less.
      b. Comply with Category II for lights of over 9 square feet.
   5. Impact Resistance, Alternate Compliance: In lieu of 16-CFR, Part 1201 compliance, comply with ANSI Z97.1.
      a. Comply with Category A.

6. Thicknesses: As indicated, 1/4 inch minimum for interior single glazing. For exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
7. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
   b. AGC Flat Glass North America, Inc.
   c. Guardian Industries Corp.
   d. Pilkington North America Inc.
   e. Saint-Gobain North America.
   f. Vitro Architectural Glass.

C. Fire Rated Safety Glazing: Monolithic or glass ceramic, UL- or WH-listed as fire-protection-rated glazing. Surface finish Premium, polished both sides, free of amber tints.
1. Visible Light Transmittance: 85%.
2. Fire Resistance: Comply with NFPA 80 and NFPA 257. Listed and labeled for fire ratings scheduled at opening locations on the drawings.
3. Impact Resistance: Compliant with CPSC 16-CFR, Part 1201.
   a. Comply with Category II with or without the use of a surface applied film.
4. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to the following:
   b. O'Keeffe's Inc. SAFTIFIRST Division.
   c. Nippon Electric Glass Company
   d. SCHOTT North America Inc.
   e. Vetrotech Saint-Gobain North America.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.03 SEALED INSULATING GLASS UNITS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
1. Any of the manufacturers specified for float glass.
2. Cardinal Glass Industries.
3. Viracon, Apogee Enterprises, Inc.

B. General: Provide preassembled permanently sealed insulating glass units complying with ASTM E2190.
1. Edge Spacers: Warm edge spacer, steel with bent and spot welded corners.
2. Edge Seal: Glass to elastomer with supplementary silicone sealant.

C. Low-E Insulating Glass: Low-E vision glazing units.
1. Basis of Design: LoE2, Cardinal Glass Industries.
2. Between-lite space filled with dry hermetic air.
3. Total Visible Light Transmittance: 70 percent.
4. Outdoor Visible Reflectance: 11 percent.
5. Outdoor-Indoor Transmission Class Rating:
6. Thermal Resistance (U-Value): Maximum 0.29 winter and summer, nominal, center of glass.
7. Total Solar Heat Gain Coefficient: Maximum 0.40, nominal, center of glass.
8. Outboard Lite: Safety glazing, 6 mm thick, minimum.
   c. Tint: Clear.
   d. Coating: Low-E type, on #2 surface.
9. Inboard Lite: Safety glazing, 6 mm thick.

a. Tint: Clear.
10. Total Thickness: 1 inch nominal.

2.04 GLAZING COMPOUNDS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
1. Bostik Inc.
2. Momentive Performance Materials, Inc (formerly GE Silicones).
3. Pecora Corporation.
4. BASF Construction Chemicals-Building Systems.

B. General: Provide products of type indicated, complying with the following requirements:
1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact under conditions of installation and service, as demonstrated by testing and field experience.
2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.

C. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements.

D. Glazing Sealant for Fire-Resistant Glazing Products: Identical to product used in test assembly to obtain fire-resistive rating.

E. Butyl Sealant: Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of10 to 20; black color; non-skinning.

F. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C 920, Type M, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of15 to 25;color as selected.

G. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range20 to 35;color as selected.

H. Silicone Sealant: Single component, neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of15 to 25;color as selected.

2.05 GLAZING ACCESSORIES

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

D. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonextruding, non-outgassing, strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

E. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistive rating.

F. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area. Compatible with edge seal of insulating glass units. Notched, to allow water in glazing pocket to drain to weeps.

G. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

H. Glazing Tape: Preformed butyl-based elastomeric compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; nonstaining and nonmigrating in contact with nonporous surfaces, packaged on release paper backing; black color. Comply with AAMA 800.
   1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. Pecora Corporation.
      b. Schnee Morehead.
      c. Tremco Global Sealants.

I. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal. Comply with AAMA 810.1.
   1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. Adhesives Research, Inc.
      b. Capital Tape Co.
      c. Norton Foam.

J. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.
   1. Color: As selected from manufacturer's standards.

K. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

3.03 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:
   1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.

2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.04 FACTORY GLAZING

A. Refer to Section 08 1416 for factory glazing at rated wood doors.

3.05 DRY GLAZING, GASKET METHOD

A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.06 WET/DRY GLAZING, TAPE AND SEALANT

A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each lite is installed.

F. Apply heel bead of elastomeric sealant.

3.07 WET GLAZING (SEALANT AND SEALANT)

A. Install glazing resting on setting blocks and install applied stop

B. Center pane by use of continuous spacer shims between glass lites and glazing stops, kept 1/4 inch below sight line, to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

C. Locate and secure glazing pane using glazers' clips.

D. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

E. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.08 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Remove glazing materials from finish surfaces

C. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

D. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

E. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

F. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Final Acceptance. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 08 1113 - Hollow Metal Doors and Frames: Shop-primed items.

D. Section 08 1416 - Flush Wood Doors: Shop-primed items.

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

B. Product Data: Provide data on all paint materials specified. Identify each material by the manufacturer's catalog number and general classification; cross-reference the specified coating, finish system, and application. Include label analysis and instructions for handling, storage, and application of each material proposed for use.

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

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

E. Certification by manufacturer that products comply with Contract Documents and are compatible with applicable substrates and with each other.

F. Manufacturer's Instructions: Indicate special surface preparation procedures.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Paint and Coatings: Turn over unused paint, in original labeled containers, to Owner.
   2. Label each container with color in addition to the manufacturer's label.

H. Warranty: Submit installer warranty.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years documented experience in applications similar in material and extent.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in manufacturer's original sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Submit written warranty, executed by the installer, against paint system failure resulting from improper installation, including peeling and blistering, within specified warranty period. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.
   1. Warranty Period: 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer, no exceptions.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Provide the manufacturer's best-quality trade sale paint material of the various coating types specified.
   4. Supply each coating material in quantity required to complete entire project's work in a single production run.
   5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint ME-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:
   1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
   2. Gloss: Two coats of alkyd enamel.
      a. AkzoNobel: Devguard 4308 Alkyd Gloss Enamel.
      b. Benjamin Moore: C133 Impervo Alkyd High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial Acrylic.

2.04 PAINT SYSTEMS - INTERIOR

A. Wood, Transparent, Varnish, Stain: Wood finished off-site.
   1. One coat of stain.
      a. AkzoNobel: Woodpride 1700 Oil-Based Wood Finishing Stain.
      b. Benjamin Moore: 234 Benwood Interior Penetrating Stain.
      c. Sherwin Williams: Wood Classics Interior Oil Stain.
   2. One coat sealer.
      a. AkzoNobel: Woodpride 1916 Quick Dry Oil-Based Sanding Sealer.
      b. Benjamin Moore: 413 Benwood Quick Dry Sanding Sealer.
      c. Sherwin Williams: Wood Classics Fast Dry Sanding Sealer.
   3. Satin: Two coats of varnish.
      a. AkzoNobel: Woodpride 1902 Oil-Based Wood Varnish.
      b. Benjamin Moore: C404 Benwood Interior Alkyd Varnish.
      c. Sherwin Williams: Wood Classics Fast Dry Oil Varnish.

B. Ferrous Metals, Primed, Latex, 2 Coat:
   1. Touch-up with latex primer.
   2. Gloss: Two coats of latex enamel.
      a. AkzoNobel: Devflex 4208 Quick-Dry Waterbourne Gloss Enamel.
      b. Benjamin Moore: 309 Impervex Latex High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial 0 VOC Acrylic Gloss.

C. Gypsum Board/Plaster, Latex-Acrylic, 2 Coat: Existing walls.
   1. Touch up with latex primer.

2. Eggshell: Two coats of latex-acrylic enamel.
   a. AkzoNobel: Dulux Lifemaster 9300 Eggshell Interior Latex Enamel.
   b. Benjamin Moore: UltraSpec 500 Interior Latex Eggshell Finish.
   c. Sherwin Williams: B20 ProMar 200 Zero VOC Interior Latex Eg-Shel.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

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

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
   3. Use only thinners approved by the paint manufacturer and only as recommended.

H. Provide barrier coats over incompatible primers or remove and reprime.

I. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

J. Corroded, Painted & Unpainted Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning). Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

L. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

M. Wood Doors to be Field-Finished: Seal wood door cutout, top and bottom edge surfaces with clear sealer immediately upon delivery.

N. Metal Doors to be Painted: Prime metal door top, side and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's instructions, using the preparation, products, sheens, textures, and colors as indicated.
   1. Remove, refinish, or repaint work not complying with requirements.

B. Apply products in accordance with manufacturer's instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
   1. Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.
   2. Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
   3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
   4. Where application method is listed in the MPI Manual for the paint system that application method is required; otherwise any application method recommended by manufacturer for material used and objects to be painted is acceptable.

G. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
   1. Number of coats and film thickness required are the same regardless of application method.
   2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
   3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

H. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
   1. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
   2. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
   3. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.

4. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
5. Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.

I. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

J. Sand wood and metal surfaces lightly between coats to achieve required finish.

K. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

L. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

M. Metal Doors to be Painted: Finish doors on tops, bottoms, and side edges same as exterior faces.

N. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.

3.05 PROTECTION

A. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in MPI Manual.

END OF SECTION

SECTION 32 1313
EXTERIOR CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks.

1.02 RELATED REQUIREMENTS

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

B. Section 03 3000 - Cast-in-Place Concrete.

C. Section 03 3000 - Cast-in-Place Concrete: Cast-in-place ramps, steps.

D. Section 07 9000 - Joint Sealers: Sealant for joints between paving and adjacent materials.

1.03 SUBMITTALS

A. See Section 01 6000 - Product Requirements, for submittal and substitution procedures.

B. Product Data: Provide data on materials, mixes, admixtures and accessories.

C. Job-Mix Designs: Include technical data and tested physical and performance properties for each mix proposed for the Work.

PART 2 PRODUCTS

2.01 FORM MATERIALS

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

B. Form Materials: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible or curved forms for curves of a 100-foot or less radius.

C. Form Ties: Removable end, permanent embedded body type, with sufficient strength and rigidity to support and maintain the form in proper position and alignment without the use of auxiliary spreaders.

D. Form Release Agent: Commercial formulation form-release agent with a maximum of 350 mg/l volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.02 REINFORCEMENT

A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 03 3000.

B. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications. Use supports with sand plates or horizontal runners where base material will not support chair legs.

2.03 CONCRETE MATERIALS

A. Obtain cementitious materials from same source throughout.

B. Concrete Materials: As specified in Section 03 3000.

2.04 ADMIXTURES

A. General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.

B. Concrete Admixtures: As specified in Section 03 3000.

2.05 ACCESSORIES

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

B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
   1. Waterproof paper.
   2. Polyethylene film.
   3. White burlap-polyethylene sheet.

C. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
   1. Curing compound for use with dry shake hardener shall be approved for use by the manufacturer.

D. Joint Sealer: See Section 07 9000 for sealers between exterior concrete paving and adjacent materials.

E. Joint Sealer: One-part, low-modulus, neutral-cure silicone sealant complying with ASTM C 920 for Type S, Use T grade, Class 25.

F. Joint Filler: Preformed, non-extruding bituminous type (ASTM D 1751) or sponge rubber or cork (ASTM D 1752). Thickness 1/2 inch.

2.06 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with NCDOT Specification Section 900.

A. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
   1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs. Do not use Owner's field quality control agency as the independent testing agency.
   2. Use of fly ash is not permitted.

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

C. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

D. Concrete Properties:
   1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4000 psi.
   2. Air Entrainment Admixture: Approximately 6 percent.
   3. Water Cement Ratio: Maximum 45 percent by weight.
   4. Maximum Slump: Minimum of 4 inches, maximum of 6 inches.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

2.07 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C 685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C 94/C 94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads. Proof-roll prepared subbase surface to check for unstable areas and need for additional

compaction. Remove loose material. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

B. Verify gradients and elevations of base are correct.

3.02 PREPARATION

A. Moisten subbase and/or base to minimize absorption of water from fresh concrete.

B. Moisten subgrade to minimize absorption of water from fresh concrete.

C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.03 FORMING

A. Formwork General: Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
   1. Provide Class C tolerances for concrete surfaces.

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

C. Form concrete walks to 4 inch depth, unless otherwise noted.

D. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

E. Check complete formwork for grade and alignment to required tolerances.

F. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

A. Place reinforcement as indicated.

B. Reinforcement for concrete walks shall be 6x6 W2.9xW2.9 unless otherwise noted.

C. Interrupt reinforcement at contraction joints.

3.05 COLD AND HOT WEATHER CONCRETING

A. Follow recommendations of ACI 305R when concreting during hot weather.

B. Follow recommendations of ACI 306R when concreting during cold weather.

C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.06 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for spreading and consolidation.

C. Ensure reinforcement is not disturbed during concrete placement.

D. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened surfaces.

E. 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. If interrupted for more than ½ hour, place a construction joint.

3.07 JOINTS

A. Expansion Joints: Place 3/8 inch wide expansion joints at 24 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
   2. Secure to resist movement by wet concrete.
   3. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

B. Weakened-Plane (Contraction) Joints: Section concrete into areas as shown on drawings. Provide scored joints for a depth equal to at least 1/4 concrete thickness, as follows:
   1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
   2. Provide contraction joints between sidewalks and curbs, and between curbs and pavement.

G. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than ½ hour, except where such placements terminate at expansion joints. Construct joints as shown or if not shown, use standard metal keyway-section forms. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.

H. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing.

3.08 FINISHING

A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

B. After floating, test surface for trueness with the 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

C. Exterior Concrete Paving Float Finish: Begin floating when bleed water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven float, or by hand-floating if area is small or inaccessible to power units. Finish surfaces to true planes within tolerance of 1/4 inch in 10 feet as determined by a 10-foot-long straightedge placed anywhere on the surface in any direction. Cut down high spots and fill low spots.

E. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to ½-inch radius, unless other indicated. Eliminate tool marks on concrete surface.

F. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface. Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Architect. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.

G. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

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

3.09 JOINT SEALING

A. Apply joint sealer at all expansion joint locations in exterior concrete paving.

3.10 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/8 inch in 10 ft.

B. Maximum Variation From True Position: 1/4 inch in 10 feet.

3.11 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests.
   1. Provide free access to concrete operations at project site and cooperate with appointed firm.
   2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

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

B. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
   1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
   2. Perform one slump test for each set of test cylinders taken.

C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.12 PROTECTION

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

B. Repair or replace broken or defective concrete, as directed by Architect.

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

D. Do not permit pedestrian traffic over pavement until 75 percent design strength of concrete has been achieved.

E. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION