PROJECT MANUAL

DON NORTH MUNICIPAL BUILDING
NORTH VESTIBULE ADDITION

1399 East High Street
Bryan, Ohio 43506

July 8, 2020

Kraig A. Beilharz
Registered Architect #9482

BEILHARZ
ARCHITECTS
INCORPORATED

Project B9-4645

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ADVERTISEMENT FOR BIDS

Sealed Bids will be received by the City of Bryan in the Clerk's office, 1399 East High Street, Second Floor, Bryan, Ohio 43506 until **12:00 Noon, Wednesday, July 29, 2020**, when they will be opened and read, for the **Don North Municipal Building North Vestibule Addition**, located at 1399 East High Street, Bryan, Ohio 43506, in accordance with the Drawings and Specifications prepared by Beilharz Architects, Inc.

A pre-bid meeting will be held at the job site in the Council Chambers, Second Floor, at 3:30 p.m., Wednesday, July 15, 2020.

Contract Documents may be reviewed without charge during business hours at the office of the Architect and various plan rooms obtaining documents. Contract Documents may be purchased from Newfax Corporation, 333 W. Woodruff, Toledo, OH 43604, 419-241-5157 or 800-877-5157, www.newfaxcorp.com, at the cost of reproduction and shipping. Addenda will be distributed to registered plan holders only.

All bids must be accompanied by a Bid Guaranty in the form of either a Bid Guaranty and Contract Bond for the full amount of the bid or a certified check, cashier's check, or an irrevocable letter of credit in an amount equal to 10% of the bid, in accordance with the Instructions to Bidders.

Each Contractor will be required to furnish an Affidavit of Contractor or Supplier on Non-Delinquency of Personal Property Tax (O.R.C. 5719.042).

Prevailing Wage Rates, as published by the Ohio Department of Commerce, shall be complied with throughout the entire project in accordance with O.R.C. 4115.03 et. seq.

No bidder may withdraw its bid for a period of 60 days after the opening thereof. The Owner reserves the right to waive irregularities in bids, to reject any or all bids, and to conduct such investigation as necessary to determine the responsibility of any bidder.

Advertising Dates: July 8 and 15, 2020.

INSTRUCTIONS TO BIDDERS

1. EXAMINATION OF CONTRACT DOCUMENTS AND PROJECT SITE:

A. Each Bidder shall visit the site prior to the bid date and shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the site, the character and extent of the existing work within or adjacent to the site, and any other work being performed thereon at the time.

   1. Obtain all relevant information of conditions relating to transportation, handling and storage of materials, availability of electric power, utility company requirements, existing structures and equipment and all other facilities in the area which will impact the performance of work.

B. Each Bidder shall examine all Contract Documents for requirements which may affect the Bidder's Work in any way.

C. Failure of a Bidder to be acquainted with all available information will not be considered as a basis for additional compensation or extension of time, nor relief from responsibility for proper performance of the work.

D. Site visits may be made at the convenience of each Bidder at times when the building is open to the public.

2. PROJECT SCHEDULE:

A. Refer to Section 01 1000 – Summary of Work.

3. BIDDERS' QUESTIONS:

A. Questions and technical communications during bidding should be directed to the Architect by email (kentp@beilharzarchitects.com). Requests for lists of bidders, and other communications of an administrative nature, should be directed to the Architect by email (architects@beilharzarchitects.com).

B. If a Bidder finds any perceived ambiguity, conflict, error, omission or discrepancy on or between any of the Contract Documents, submit a written request for interpretation or clarification to the Architect as directed above. Failure of a Bidder to make such request prior to bidding will result in rejection of claims for additional compensation or extension of time based on insufficiency of the Contract Documents.

C. Questions submitted later than 4 business days prior to the scheduled bid opening may not be answered.

D. Requests for Product Substitutions: Refer to Section 01 6000. Product substitution requests must be made by Prime Bidders only.

E. Information affecting all bidders will be distributed by written Addendum. The receipt of each Addendum shall be acknowledged in the space provided on the Bid Form. A

list of Addenda issued will be posted on the Architect's web site at www.beilharzarchitects.com.

F. Statements made orally by the Architect or Owner, or in any form other than a written Addendum, will not be binding.

G. All Addenda will be issued, except as hereafter provided, and mailed or otherwise furnished to all plan holders of record, at least 72 hours prior to the published time for the opening of bids, excluding Saturdays, Sundays and legal holidays. If any Addendum is issued within such 72 hour period, then the time for opening of bids shall be extended one week with no further advertising of bids required.

H. If a Bidder fails to indicate receipt of all Addenda through the last Addendum issued by the Architect on its Bid Form, the bid of such Bidder will be deemed to be responsive only if:
   1. The bid received clearly indicates that the Bidder received the Addendum, such as where the Addendum added another item to be bid upon and the Bidder submitted a bid on that item; or
   2. The Addendum involves only a matter of form or is one which has either no effect or has merely a trivial or negligible effect on price, quantity, quality, or delivery of the item bid upon.

4. BID FORMS:

A. Submit bids in duplicate on Bid Forms issued with the bidding documents. Fill in all blank spaces, typewritten or in ink. Submit original Bid Forms as follows:
   1. Corporation: State full legal name of corporation and State of Incorporation; apply original signature of authorized officer or officers; type or print name and corporate title beneath each signature.
   2. Partnership: State the full names of all partners; apply original signature of authorized partner or other representative; type or print name and title beneath signature.
   3. Sole Proprietor: Apply original signature of bidder; type or print name and title beneath signature, followed by the words "Sole Proprietor".
   4. When requested by Owner, furnish evidence of agency or authority of any person signing on behalf of another.

B. Submit two originals, or one original and one photocopy, of all attachments to Bid Forms.

C. Submit only the Bid Forms and required attachments. Do not submit Project Manuals or sets of Drawings as part of the bid.

D. The bid will be rejected if it contains an alteration or erasure, unless alteration is made by crossing out without obscuring the original information, and the correct information is printed in ink or typed adjacent thereto and initialed in ink by the person signing the bid.

E. The Bidder shall take the following precautions in preparing the bid:
   1. Sign the Bid Form and ensure that all blank spaces are filled in with requested information and that the Bid Guaranty is included in a sealed opaque envelope addressed as provided herein.
   2. Where the Bid Form provides for quoting either an addition or deduction for an Alternate item, indicate whether the sum named is an addition or deduction.
   3. Where the Bid Form provides for quoting a unit price, the Bidder should quote the unit price.
   4. When applicable, make sure that the Bid Guaranty is properly executed and signed by:
      a. The Bidder.
      b. The Surety or Sureties.
   5. Make sure that the amount of the Bid Guaranty is for a specific sum in an amount equal to the base bid amount plus all add alternates or is left blank.

5. MODIFICATION AND WITHDRAWAL OF BIDS:

A. Modification: A Bidder may modify its bid by written communication to the Owner at any time prior to the scheduled closing time for receipt of bids, provided such written communication is received by the Owner prior to the closing time. The written communication shall not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known until the sealed bid is opened.

B. Withdrawal Prior to Bid Closing: Bids may be withdrawn pursuant to a written request submitted by Bidder or Bidder's agent and received by the Owner prior to the time fixed for closing of bids, without prejudice to the right of the Bidder to file a new bid. Withdrawn bids will be returned unopened. Negligence on the part of the Bidder in preparing a bid confers no right for withdrawal of bid after it has been opened.

C. Withdrawal After Bid Closing: A Bidder may withdraw its bid after the bid closing time when all of the following apply:
   1. The price bid was substantially lower than the other bids.
   2. The reason for the bid being substantially lower was a clerical mistake, rather than a mistake in judgment, and was due to an unintentional and substantial error in arithmetic or an unintentional omission of a substantial quantity of work, labor, or material.
   3. The bid was submitted in good faith.
   4. The Bidder provides written notice to the Owner within two business days after the bid opening for which the right to withdraw is claimed.

D. Bids shall remain valid and no bid may be withdrawn, except as permitted by applicable law, for a period of 60 days after the day set for the opening thereof, unless a longer period is stated on the Bid Form.

6. BID GUARANTY AND CONTRACT BOND:

A. Each bid shall be accompanied by a Bid Guaranty in one of the following forms, in the name of or payable to the order of the Owner. Any bid which is not accompanied by a completed Bid Guaranty in one of these forms will be considered "NO BID" and will be returned to the maker unrecorded.
   1. A completed Bid Guaranty and Contract Bond with a satisfactory Surety Company, on the form included in this Project Manual.
   2. A certified check, cashier's check, or irrevocable letter of credit made payable to the Owner in the amount of 10% of the maximum amount of the bid, including add alternates and excluding deduct alternates.
      a. The successful Bidder who, as a Bid Guaranty, submits a certified check, cashier's check, or irrevocable letter of credit in an amount equal to 10% of the amount of the bid, shall furnish to the Architect a Contract Bond as prescribed in Ohio Revised Code Section 153.57 in an amount equal to 100% of the Contract Sum, on the form included in this Project Manual, within 3 days of being notified of the Owner's intent to award the contract to the successful Bidder.

B. For purposes of these Instructions to Bidders, a satisfactory surety company for the issuance of either a Bid Guaranty and Contract Bond or a Contract Bond is a surety company ("Surety") authorized by the Ohio Department of Insurance to transact business in the State of Ohio. The bond must be issued by a Surety capable of demonstrating a record of competent underwriting, efficient management, adequate reserves, and sound investments. These criteria will be deemed to be met if the Surety currently has an A.M. Best Company Policyholders Rating of "A-" or better and has or exceeds the Best Financial Size Category of Class VI; other sureties may be determined acceptable by the Owner.

C. All bonds shall be signed by an authorized agent of an acceptable Surety and by the Bidder. Affix Corporate Seals to all copies. The name and address of the Surety and the name and address of the Surety's Agent must be typed or printed on each bond.

D. Surety bonds shall be supported by credentials showing the Power of Attorney of the agent including the monetary limit of the power, a certificate showing the legal right of the Surety to do business in the State of Ohio, and a financial statement of the Surety.

E. All bid securities, except those of the two lowest qualified bidders, will be returned to their makers within 10 days after bid opening. All such retained securities will be returned immediately after signing of the Contract by the successful bidder.

7. ATTACHMENTS TO BID FORM:

A. Non-Collusion Affidavit: Each bidder shall submit with the bid a completed Non-Collusion Affidavit.

B. Nondiscrimination Agreement: Each bidder shall submit with the bid a completed Nondiscrimination Agreement.

C. Out-of-State Corporations: Corporations incorporated in jurisdictions other than the state of Ohio shall submit with the bid a Certificate of Good Standing from the Ohio Secretary of State and the name and address of the Ohio Statutory Agent.

D. Hourly Rates and Markups: Each bidder shall submit the following on the form provided in the Project Manual. The Owner reserves the right to reject any bid not including this information. This data will be included by reference in the Owner-Contractor Agreement and shall form the basis for Change Order pricing and evaluation for this project.
   1. Hourly labor rates for each classification of labor performed by the Contractor's own forces.
   2. Hourly usage rates for each classification of construction equipment owned by the Contractor.
   3. Proposed percentage markup on materials, supplies, and equipment rentals. Refer to Section 01 2900 for limitations.
   4. Proposed percentage markup on subcontracts. Refer to Section 01 2900 for limitations.

8. BID OPENING:

A. Bids will be publicly opened and read aloud at the date, time, and place stated in the Advertisement for Bids.

B. Bid results will not be available from the Architect for at least 24 hours after the bid opening, excluding weekends and holidays.

9. BID EVALUATION CRITERIA:

A. The Owner reserves the right to reject all bids or any bid, and to award the Contract to the lowest and best Bidder as determined by the Owner. The Owner also reserves the right to reject any alternate prices for additions to, or deductions from, the Base Bid, or to accept any or all of such alternate prices in any order.

B. The Owner reserves the right to waive, or allow any Bidder a reasonable opportunity to cure, a minor irregularity or technical deficiency in a bid, provided the amount of the bid is not affected and the Bidder does not thereby gain a competitive advantage.

C. Factors which may be considered by the Owner in evaluating bids may include, without limitation:
   1. Whether the bid responds to the Contract Documents in all material respects. Noncompliance with any requirement of the Contract Documents may cause a bid to be rejected.
   2. The experience, financial condition, bonding experience, licenses and certifications of the Bidder.
   3. The conduct and performance of the Bidder on previous contracts, including compliance with applicable laws, rules, and regulations.
   4. The management skills of the Bidder, and the ability of the Bidder to perform the Work in accordance with the Contract Documents.

5. The experience and capabilities of the Bidder's key personnel and subcontractors to be employed on the Project.
6. The equipment and facilities of the Bidder.
7. Additional factors as the Owner may determine to be appropriate.

D. The Owner may obtain from the lowest Bidder, and such other Bidders determined to be appropriate, any information determined to be relevant to the consideration of the above factors. The Owner may also obtain such information from, and verify such information with, third parties as may be considered relevant. By submitting a bid, each Bidder authorizes the Owner to obtain relevant third party information including, but not limited to, references and credit reports.

E. Each Bidder's information will be considered separately and not comparatively. If the lowest Bidder is determined not to be responsible, the bid will be rejected and the Bidder will be notified of such action. Each next lowest Bidder will then be considered in sequence until the Contract is awarded or all bids are rejected.

F. By submitting its bid, the Bidder agrees that the Owner's determination of responsiveness and responsibility shall be final and conclusive, and that if the Bidder, or any person at the Bidder's urging, directly or indirectly challenges such determination in any legal proceeding and such challenge is not successful, the Bidder will reimburse the Owner for all legal fees and expenses incurred by the Owner that are related to such challenge, including the cost of collection.

G. The Owner further reserves the right to disqualify bids, before or after opening, upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder.

H. The Bidder acknowledges that although there is an estimate for the cost of the Project, the market conditions may and frequently do result in the estimate being different from the sum of the bids received, either higher or lower. The Bidder understands that the Owner has included alternates, which may include deduct alternates as well as add alternates, to give it the flexibility in building the Project with the funds that are available. The Bidder further understands and acknowledges that use of add and deduct alternates is a long held customary practice in the construction industry in the State of Ohio. The Bidder also acknowledges that the Owner will not make a decision about what alternates on which to base the award of contracts until the bids are received, and the Owner can compare its available funds with the base bids and the cost or savings from selecting different alternates. The Bidder understands that the award to the lowest responsible and responsive Bidder will be based on the lowest base bid plus selected alternates, and may result in an award to a Bidder other than the Bidder that submitted the lowest base bid. Refer to Section 01 2300 for further provisions related to Alternates.

10. REGULATORY REQUIREMENTS:

A. Sales and Use Taxes: Refer to Section 01 4000.

B. Statement of Personal Property Tax Status: After award of contract, and as a condition of entering into the contract, the successful bidder shall submit an Affidavit of Personal Property Taxes disclosing the amount, if any, of delinquent personal property taxes on the general tax list of personal property of any county in which the Owner has territory.

C. Prevailing Wage Rates: The prevailing wage rates of public improvements are required inasmuch as public money is used for this project. Prevailing rates of wages are a part of the Supplementary Conditions and have been incorporated in this Specification.

11. EXECUTION OF CONTRACT:

A. Notice of Intent to Award Contract. The successful Bidder will be notified of the award of the contract and provided with three copies of the Agreement between Owner and Contractor ("Agreement") in the form described in the Project Manual.

B. The successful Bidder shall sign and return the original forms to the Owner, or as otherwise directed, for execution by the Owner. The contract will be submitted to the Owner at its next regularly scheduled Board meeting for approval by the Owner. The successful Bidder will be provided with a fully executed copy of the Agreement for its records.

C. If the successful Bidder does not return the executed contracts to the Owner within 5 business days of its receipt of the contracts from the Owner, the Owner reserves the right to reject the bid and award the contract to the next low responsible Bidder.

12. EQUAL EMPLOYMENT OPPORTUNITY/NONDISCRIMINATION:

A. Minority, female, and disadvantaged businesses will be afforded full opportunity to submit bids, and Bidders will not be discriminated against on the grounds of race, color, religion, sex, age, handicap, ancestry, or national origin in the consideration of an award. The successful Bidder(s) shall include a provision in any subcontract entered into for the Project that requires that each of its Subcontractors not discriminate against any employee or applicant for employment on the basis of race, religion, color, sex, age, handicap, ancestry, or national origin in any actions that it takes. Such actions include, without limitation, employment, upgrading, demotion, transfer recruitment or recruiting advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeships.

END OF DOCUMENT

BID FORM

(Submit two copies of Bid Form and all attachments)

BIDDER: _____

PROJECT:
Don North Municipal Building
North Vestibule Addition
1399 East High Street
Bryan OH 43506

BIDS DUE AT:
City of Bryan Clerk's Office
1399 East High Street, Second Floor
Bryan OH 43506

BIDS DUE BY: Wednesday, July 29, 2020, 12:00 Noon EDT

Having read the bid documents and specifications and examined the drawings prepared by the Architect, Beilharz Architects, Inc., Defiance, Ohio, for the item of work described above, and having inspected the site and the conditions affecting and governing the construction of the said project, and acknowledging that the bid documents, specifications and drawings are adequate for the performance of the Work, the undersigned hereby proposes to furnish all materials and perform all labor, as described in the specifications and shown on the drawings, for the following sum. Bid shall be good for 60 days.

BASE BID:

Complete Work for the Stipulated Sum of ..... $_____

ALTERNATE 1:

Decorative Railing System ..... ADD $_____

Addenda received and included in this Bid: No. _____, _____, _____, _____, _____.

Attachments to Bid Form (submit 2 copies):

- ☐ Bid Guaranty and Contract Bond (or certified check)
- ☐ Non-Collusion Affidavit
- ☐ Nondiscrimination Agreement
- ☐ Out-of-State Corporation Information (if applicable)
- ☐ Hourly Rates and Markups

SIGNED:

_____ (Signature)	_____ (Name of Company or Corporation)
_____ (Printed Name)	_____ (Business Address)
_____ (Title)	_____ (Date of Signature) _____ (Phone)

BID GUARANTY AND CONTRACT BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned,

_____
(Name and Address of Contractor)

as Principal and _____
(Name of Surety)

as Surety, are hereby held and firmly bound unto the City of Bryan, Ohio, hereinafter called the Obligee, in the penal sum of the dollar amount of the bid submitted by the Principal to the Obligee on _____
(Date)

to undertake the project known as: _____

_____ .

The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of

_____ Dollars ($_____).

(If the above line is left blank, the penal sum will be the full amount of the Principal's bid, including add alternates. Alternatively, if completed, the amount stated must not be less than the full amount of the bid, including add alternates, in dollars and cents. A percentage is not acceptable.)

For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal has submitted a bid on the above referred project:

NOW, THEREFORE, if the Obligee accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications and bills of material; and in the event the Principal pays to the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal will pay the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmissions, of printing new contract documents, required advertising and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be void, otherwise to remain in full force and effect. If the Obligee accepts the bid of the Principal and the Principal within ten days after the awarding of the contract, enters into a proper contract in accordance with the bid, plans, details, specifications and bills of material, which said contract is made a part of this bond the same as though set forth herein; and

IF THE SAID Principal shall well and faithfully perform each and every condition of such contract; and indemnify the Obligee against all damage suffered by failure to perform such contract according to the provisions thereof and in accordance with the plans, details, specifications and bills of material therefor; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of said contract or in or to the plans and specifications therefor shall in any ways affect the obligations of said Surety on this bond, and it does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED AND SEALED this _____ day of _____ , _____ .

PRINCIPAL:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

SURETY:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Agency Name)

_____
(Street Address)

_____
(City, State, ZIP)

_____
(Telephone Number)

_____
(Fax Number)

_____
(Email)

HOURLY RATES AND MARKUPS

(Attach additional sheets if needed)

BIDDER: _____

LABOR RATES:

Classification	Hourly Rate

EQUIPMENT RATES:

Classification	Hourly Rate

MARKUPS:
(including overhead and profit; refer to Section 01 2900 for limitations)

	Add Change Orders	Deduct Change Orders
Materials and Supplies:	%	%
Equipment Rental:	%	%
Subcontracts:	%	%

NON-COLLUSION AFFIDAVIT

STATE OF OHIO

TO: City of Bryan
Bryan, Ohio 43506

The undersigned, being first duly sworn, having bid on a contract by you for

_____
(Name of Project)

hereby states that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, or connived or agreed with any bidder or anyone else to put in a sham bid, or that any one shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with any one to fix the bid price of said bidder or of any other bidder, or to fix any overhead, profit, or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or any one interested in the proposed contract; that all statement contained in such bid are true; and, further, that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any other individual except to such persons as have a partnership or other financial interest with said bidder in his general business.

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

Sworn to before me and subscribed in my presence this _____ day of

_____, 20 ____.

_____
(Notary Public)

My commission expires:

_____

NONDISCRIMINATION AGREEMENT

O.R.C. 153.59

STATE OF OHIO

TO: City of Bryan
Bryan, Ohio 43506

The undersigned, being first duly sworn, having authority to agree on behalf of the above named contractor, and having bid on a contract by you for

_____
(Name of Project)

do hereby understand and agree:

A) That, in compliance with the provision of Chapter 153.59, Ohio Revised Code, the hiring of employees for the performance of work under this Contract or any subcontract shall not discriminate by reason of race, creed, sex, handicap, color, or age against any person qualified to perform the work herein concerned.

B) That no contractor, subcontractor, or any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex, handicap, color, or age.

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

Sworn to before me and subscribed in my presence this _____ day of _____, 20 ____.

_____
(Notary Public)

My commission expires:

_____

CONTRACT BOND
(O.R.C. § 153.57)

INSTRUCTIONS: The Contract Bond form is to be used ONLY by a bidder that is determined to be the lowest responsible bidder and that submits a form of bid guaranty other than the combined Bid Guaranty and Contract Bond with its bid. If a bidder submits a combined Bid Guaranty and Contract Bond, then the bid guaranty becomes the contract bond when the contract is awarded.

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned, _____

_____
(Name and Address of Contractor)

as Principal and _____
(Name of Surety)

as Surety, are hereby held and firmly bound unto the City of Bryan, Ohio, as Obligee, in the penal sum of _____

_____ Dollars ($_____),
for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal did on the _____ day of _____, 20___, enter into a contract with the City of Bryan, Ohio, for the construction of _____,
(Project)
which said contract is made a part of this bond the same as though set forth herein;

Now, if the said Contractor shall well and faithfully do and perform the things agreed by the Contractor to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of said contract or in or to the plans and specifications therefor shall in any wise affect the obligations of said Surety on its bond, and does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED AND SEALED this _____ day of _____ , _____ .

PRINCIPAL:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

SURETY:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Agency Name)

_____
(Street Address)

_____
(City, State, ZIP)

_____
(Telephone Number)

_____
(Fax Number)

_____
(Email)

AFFIDAVIT OF CONTRACTOR OR SUPPLIER ON NON-DELINQUENCY OF PERSONAL PROPERTY TAX

O.R.C. 5719.042

STATE OF OHIO

TO: City of Bryan
Bryan, Ohio 43506

The undersigned, being first duly sworn, having bid on a contract by you for

_____
(Name of Project)

hereby states that we are not charged at the time the bid was submitted with any delinquent personal property taxes on the general tax list of personal property of any county in which you as a taxing district have territory and that we were not charged with delinquent personal property taxes on any such tax list.

In consideration of the award of the above contract, the above statement is incorporated in said contract as a covenant of the undersigned.

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

Sworn to before me and subscribed in my presence this _____ day of _____, 20 ____.

_____
(Notary Public)

My commission expires:

_____

APPLICATION AND CERTIFICATE FOR PAYMENT

TO OWNER:	**City of Bryan** **1399 E. High St.** **Bryan OH 43506**	PROJECT: **Don North Building, North Vestibule Addition** **1399 E. High St.** **Bryan OH 43506**	APPLICATION NO: PERIOD TO: ARCHITECT'S PROJECT NO: **B9-4645**
FROM CONTRACTOR:		VIA ARCHITECT: **Beilharz Architects, Inc.** **701½ West First Street** **Defiance, OH 43512**	CONTRACT FOR: CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Schedule of Values, Document G703, is attached.

1. **ORIGINAL CONTRACT SUM** $ _____
2. **CHANGE ORDERS**
   a. Changes Approved in Previous Months $ _____
      C.O. # _____
   b. Changes Approved This Month $ _____
      C.O. # _____
   c. **Net change by Change Orders** $ _____
3. **CONTRACT SUM TO DATE** (Line 1 + Line 2c) $ _____
4. **WORK COMPLETED TO DATE**
   a. Labor Completed to Date $ _____
   b. Material Completed to Date $ _____
   c. Stored Material $ _____
   d. **Total Completed and Stored to Date** $ _____
   e. Percent Complete (Line 4d/Line 3) _____ %
5. **RETAINAGE**
   a. Completed Labor (8% of Line 4a) $ _____
      (same as previous application if Line 4e on previous application is >50%)
   b. Stored Material (8% of Line 4c) $ _____
   c. **Total Retainage** $ _____
6. **TOTAL EARNED LESS RETAINAGE** $ _____
   (Line 4d less Line 5c)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT**
   (Line 6 from prior Certificate) $ _____
8. **CURRENT PAYMENT DUE**
   (Line 6 less Line 7) $ _____
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 less Line 6) $ _____

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of Ohio

County of: _____

Subscribed and sworn to before me

this _____ day of _____, 20_____

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $ _____

(Attach explanation if amount certified differs from amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified.)

Beilharz Architects, Inc.

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

SCHEDULE OF VALUES

CONTRACTOR:
CONTRACT FOR:

APPLICATION NO:
APPLICATION DATE:

PROJECT: **Don North Bldg., N. Vestibule Addn.**
ARCHITECT'S PROJECT NO: **B9-4645**

SECTION NO.	DESCRIPTION OF WORK	LABOR					MATERIALS						TOTAL COMPLETED AND STORED TO DATE	%
		SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	MATERIALS PRESENTLY STORED		
			PREVIOUS APPLICATION	THIS PERIOD				PREVIOUS APPLICATION	THIS PERIOD					
00 6113	**Bonds**													
00 7200	**Insurance**													
01 1000	**General Requirements**													
01 3300	**Submittals**													
01 7000	**Progress Cleaning**													
01 7700	**Final Cleaning**													
01 7700	**Punch List Work**													
01 7700	**Project Record Submittals**													
	SHEET TOTALS													
	PROJECT TOTALS													

SCHEDULE OF VALUES

CONTRACTOR:
CONTRACT FOR:

APPLICATION NO:
APPLICATION DATE:

PROJECT: **Don North Bldg., N. Vestibule Addn.**
ARCHITECT'S PROJECT NO: **B9-4645**

SECTION NO.	DESCRIPTION OF WORK	LABOR					MATERIALS						TOTAL COMPLETED AND STORED TO DATE	%
		SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	MATERIALS PRESENTLY STORED		
			PREVIOUS APPLICATION	THIS PERIOD				PREVIOUS APPLICATION	THIS PERIOD					
	SHEET TOTALS													
	PROJECT TOTALS													

STATE OF OHIO
DEPARTMENT OF TAXATION
CONSTRUCTION CONTRACT EXEMPTION CERTIFICATE

Identification of Contract:

Contractee's (Owner's) name: City of Bryan

Exact location of job/project: 1399 East High Street, Bryan, OH 43506

Name of job/project as it appears on contract documentation: Don North Municipal Building, North Vestibule Addition

The undersigned hereby certifies that the tangible personal property purchased under this exemption certificate was purchased for incorporation into:

- ☒ real property under a construction contract with the United States government, its agencies, the State of Ohio, or an Ohio political subdivision.
- ☐ real property which is owned, or will be accepted for ownership at the time of completion, by the United States government, its agencies, the State of Ohio, or an Ohio political subdivision.
- ☐ a house of public worship or religious education.
- ☐ a building used exclusively for charitable purposes by a nonprofit organization operated exclusively for charitable purposes as defined in section 5739.02(B)(12) of the Revised Code.
- ☐ the original construction of a sports facility under section 307.696 of the Revised Code.
- ☐ a hospital facility entitled to exemption under section 140.08 of the Revised Code.

The original of this certificate must be signed by the owner/contractee and/or government official and must be retained by the prime contractor. Copies must be maintained by the owner/contractee and all subcontractors. When copies are issued to suppliers when purchasing materials, each copy must be signed by the contractor or subcontractor making the purchase.

Prime Contractor		**Owner/Contractee**	
Name		Name	City of Bryan
Signed by		Signed by	
Title		Title	
Address		Address	1399 East High Street
City, State, Zip		City, State, Zip	Bryan OH 43506
Date		Date	
Subcontractor		**Political Subdivision**	
Name		Name	same as Owner
Signed by		Signed by	
Title		Title	
Address		Address	
City, State, Zip		City, State, Zip	
Date		Date	

CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF LIENS

OWNER:	**City of Bryan** **1399 E. High St.** **Bryan OH 43506**	PROJECT:	**Don North Municipal Building** **North Vestibule Addition**
		ARCHITECT'S PROJECT NO:	**B9-4645**
		CONTRACT FOR:	
ATTN:		CONTRACT DATE:	

STATE OF: _____

COUNTY OF: _____

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

The undersigned hereby futher certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

- ❑ Consent of Surety to Final Payment (required whenever Surety is involved) on AIA Document G707, Consent of Surety, or equivalent.
- ❑ Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
- ❑ Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required in accordance with Section 01 2900.

CONTRACTOR:
(name and address)

By: _____
(signature of authorized representative)

_____
(printed name and title)

Subscribed and sworn to before me on: _____
(date)

Notary Public: _____

My Commission Expires: _____

GENERAL CONDITIONS

A. AIA Document A201-2017, General Conditions of the Contract for Construction, hereinafter referred to as "General Conditions," is hereby made part of the Contract Documents, as if attached hereto or repeated herein. Bidders and Contractors shall consult this document and become thoroughly familiar with its contents before submitting bids or proposals. Copies are available for purchase from the American Institute of Architects, www.aiacontracts.org, phone 800-942-7732.

B. AIA General Conditions are hereinafter supplemented and amended by Supplementary Conditions. All supplementary provisions shall be considered as added thereto. Where any article is amended, deleted or superseded hereby, unaltered provisions of such article shall remain in effect.

C. In case of conflict, Supplementary Conditions shall take precedence.

END OF DOCUMENT

SUPPLEMENTARY CONDITIONS

1. MODIFICATIONS TO GENERAL CONDITIONS

A. These Supplementary Conditions supplement, modify, change, delete from, or add to the General Conditions. Where a portion of the General Conditions is modified or deleted by Supplementary Conditions, the unaltered portions of the General Conditions remain in effect.

2. ARTICLE 1 – GENERAL PROVISIONS

A. 1.1 Basic Definitions

1. Revise the last sentence of 1.1.1 to read as follows: Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, sample forms, or other information furnished by the Owner in anticipation of receiving bids or proposals.

2. Add the following at the end of 1.1.2: The Contractor acknowledges and agrees that the Contract Documents are sufficient to provide for the completion of the Work and include all Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in accordance with all applicable laws, codes, and professional standards.

3. Modify 1.1.5 – The Drawings: Add the following:
   a. Refer to the List of Drawings for a listing of Drawings issued.
   b. The word "Plans" shall be construed to include all Drawings, except in the context of a horizontal section view of the Project or a specific portion thereof.

4. Modify 1.1.6 – The Specifications: Add the following:
   a. The requirements of each Section of Division 01 apply to all Specification Sections.

5. Add the following definitions:
   a. 1.1.9 – Project Manual: The Project Manual is the written document assembled for the Work which may include Procurement and Contracting Requirements, Conditions of the Contract, and Specifications. Refer to the Project Manual Contents for a complete listing.
   b. 1.1.10 – The Architect: The Architect is Beilharz Architects, Inc., 701½ West First Street, Defiance, Ohio 43512, phone 419-782-6211.
   c. 1.1.11 – The Owner: The Owner is the City of Bryan, 1399 East High Street, Bryan, Ohio 43506.
   d. 1.1.12 – Contractor: Inasmuch as this Project is bid on a single prime contract basis, the terms "General Contractor," "Plumbing Contractor," "HVAC Contractor," "Electrical Contractor," etc. shall mean "the Contractor." Responsibility for completion of all portions of the Project, except where

specifically noted otherwise, shall be borne by the Contractor. The Contractor may use the reference to separate contracts, and to Plumbing, Electrical and other contractors, as an aid in establishing major subcontract responsibilities, but by so doing shall in no way relieve himself of the final responsibility for proper completion of the Work.

B. 1.2 Correlation and Intent of the Contract Documents

1. Modify 1.2.2 by replacing the period at the end of the paragraph with a comma and adding the following: "nor shall the Architect by reason thereof become an arbiter to establish subcontract limits between Subcontractors of any Prime Contractor. Where responsibility for particular work is assigned to a particular trade or contract, that trade or contract shall not be released from that responsibility by reason of the location of the assigning of responsibility. The Contractor shall be responsible for all work assigned to him, even though that responsibility may be shown only in that portion of the Contract Documents typically pertaining to another contract or trade."
2. Add the following after 1.2.3:
   a. 1.2.3.1 – Furnish, Install, Provide: Wherever the words "furnish," "install," "provide," or equivalent words are used, without further limitation, they shall be construed to mean the responsibility to supply and place in position for use the devices, equipment or material named, together with all associated devices, equipment, materials, wiring, piping, and related components as may be required for a complete and operating installation.
   b. 1.2.3.2 – Warranty and Guarantee: The words "warranty" and "guarantee" shall have the same meaning and shall be defined as "legally enforceable assurance of the duration of satisfactory performance or quality of a product or work."
3. Add 1.2.4 – Complete sets of Contract Documents are intended, and the Contract will include all documents referenced in the List of Drawings and Project Manual Contents. It is the Contractor's responsibility to request missing documents from the Architect in writing before submitting a bid.
4. Add 1.2.5 – Reference to standards, codes, or specifications, or to manufacturer's specifications, instructions, recommendations, requirements or directions, require that the Contractor become fully and adequately informed of the contents of such documents, and shall properly apply the information therein so that the best possible intended use of the item, material or technique is achieved.

C. 1.7 Digital Data Use and Transmission

1. Modify 1.7 by inserting "or equivalent" after the title of the AIA Document.

D. 1.8 Building Information Models Use and Reliance

1. Modify 1.8 by inserting "or equivalent" after the title of each AIA Document.

3. ARTICLE 2 – OWNER

A. 2.1 General

1. Revise 2.1.2 to read as follows: The Owner will prepare a Notice of Commencement for the Project in accordance with the Ohio Revised Code and furnish a copy to the Contractor or a subcontractor or supplier within a reasonable time upon receipt of a written request. The Contractor shall furnish a copy of the Notice of Commencement to a Subcontractor or supplier within fifteen days after receipt of a written request.

B. 2.2 Evidence of the Owner's Financial Arrangements

1. Replace 2.2.1 through 2.2.4 with the following: The Owner shall attach to the Agreement with the Contractor, the certificate of available resources required by Ohio Revised Code Section 5705.41, as evidence of available funds to fulfill the Owner's obligations under the Contract.

C. 2.3 Information and Services Required of the Owner

1. Add the following at the end of 2.3.6: The Contractor may purchase additional copies of the Contract Documents at the cost of reproduction and delivery.

D. 2.5 Owner's Right to Carry Out the Work

1. Add 2.5.1 – Notwithstanding anything to the contrary in the Contract and without limiting Owner's rights and remedies, it is agreed and understood by the Contractor that if there is a work stoppage or delay of Contractor's work, directly or indirectly, involving Contractor's employees, and if any such work stoppage or delay is not resolved to the satisfaction of the Owner within seven calendar days from the commencement of said work stoppage or delay, the Owner may terminate the Contract for cause as provided in Section 14.2.

4. ARTICLE 3 – CONTRACTOR

A. 3.2 Review of Contract Documents and Field Conditions by Contractor

1. Modify 3.2.2, 3.2.3, and 3.2.4; change "request for information" to "request for interpretation."
2. Add 3.2.5 – If, in the Contractor's opinion, any portion of the Work is indicated or specified in a manner that makes it impossible to produce work of the required quality, the Contractor shall report this to the Architect as a request for interpretation in such form as the Architect may require, before proceeding with that portion of the Work. If Contractor fails to make such request, no excuse will be entertained for failure to carry out that portion of the Work in a satisfactory manner.
3. Add 3.2.6 – If the Contract Documents disagree as to the quality or quantity of Work required, the better quality or greater quantity shall be provided, but not before referring the points in question to the Architect for approval.

B. 3.3 Supervision and Construction Procedures

1. Add 3.3.4 – Contractor shall not erect vertically and independently to a height greater than one scaffold from the foundation, masonry walls, structural steel, or any other building feature dependent on connection with other portions of the structure for support or anchorage without sufficient bracing, tying, or other approved method. The Contractor shall be responsible for the design and erection of all bracing, shoring, and sheathing as required for safety and the proper execution of the work, and shall remove such components when the work is completed.

C. 3.10 Contractor's Construction and Submittal Schedules

1. Modify 3.10.3; change "submitted to" to "approved by."

D. 3.11 Documents and Samples at the Site

1. Modify 3.11; delete the word "field" from the phrase "indicate field changes."

E. 3.12 Shop Drawings, Product Data and Samples

1. Add the following at the end of 3.12.7: Work commenced by Contractor prior to final approval of the Shop Drawings or other submittals is at the risk that no payment will be approved or made by the Owner for such Work.
2. Add the following at the end of 3.12.10: The Contractor shall defend, indemnify and hold harmless the Owner, Architect, and Architect's consultants from and against all claims, losses, liabilities and damages arising out of or resulting from any professional services rendered by or on behalf of the Contractor, or failure to render such services. The Contractor shall require that any design professionals retained to provide such services provide similar indemnities in favor of the Owner, Architect, and Architect's consultants.

F. 3.13 Use of Site

1. Add 3.13.1 – Before commencing work, Contractor shall verify with Owner and receive Owner's permission to use areas in the immediate vicinity of construction for storage of materials and for activities related to construction. Contractor shall confine construction activities to these agreed areas.

G. Add 3.19 Workmanship

1. Add 3.19.1 – Work shall be of the specified quality and conform to normal industry standards. Work of substandard quality (as determined by the Architect or inspecting authorities) shall be removed and replaced to conform to the quality standards of the trades concerned, or otherwise corrected to the satisfaction of the complainant, at Contractor's expense.

5. ARTICLE 4 – ARCHITECT

A. 4.2 Administration of the Contract

1. Add 4.2.2.1 – The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.
2. Modify 4.2.14; change "request for information" to "request for interpretation" at both locations.

6. ARTICLE 5 – SUBCONTRACTORS

A. 5.3 Subcontractual Relations

1. Add 5.3.1 – Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner. The Divisions and Sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or to limit the work performed by any trade. The Contractor shall be as fully responsible to the Owner for the acts and omissions of Subcontractors and of persons employed by them, as for the acts and omissions of persons directly employed by the Contractor. The Contractor shall be responsible for the coordination of the trades, Subcontractors and Suppliers, and persons engaged upon the Contractor's work. The Contractor shall, without additional expense to the Owner, utilize the services of specialty Subcontractors on those parts of the work which are required by the Contract Documents to be performed by specialty Subcontractors. The Owner or Architect shall not undertake to settle any differences between the Contractor and Subcontractors, or between Subcontractors. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to give the Contractor the same power as regarding termination of any subcontract that the Owner may exercise over the Contractor under any provisions of the Contract Documents.
2. Add 5.3.2 – If any Contractor, Subcontractor, or Sub-subcontractor desires to obtain the services of any other Contractor, Subcontractor or Sub-subcontractor, the party hired to do the work shall become a Subcontractor or Sub-subcontractor under the party hiring them, and shall be subject to all provisions of the Contract Documents which pertain to Subcontractors and Sub-subcontractors, as applicable.

7. ARTICLE 7 – CHANGES IN THE WORK

A. 7.2 Change Orders

1. Add 7.2.2 – Agreement on any Change Order shall constitute a final settlement of all matters related to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs and cumulative

impact associated with such change, and all adjustments to the Contract Sum and the Contract Time.

8. ARTICLE 8 – TIME

A. 8.2 Progress and Completion

1. Add 8.2.4 – The Contractor shall obtain insurance and permits, file documents and notices as required and necessary, and perform other duties required under the Contract Documents, in a timely manner so as not to impede progress of the Work.

B. 8.3 Delays and Extensions of Time

1. Modify 8.3.3 by replacing the period at the end of the paragraph with a comma and adding the following: "except that extensions of time arising from adjustments to the Construction Schedule affecting multiple Contractors, and not made primarily for the convenience of the Owner, shall not be grounds for claims for Consequential Damages as defined in Section 15.1.7."

9. ARTICLE 9 – PAYMENTS AND COMPLETION

A. 9.9 Partial Occupancy or Use

1. Add 9.9.4 – If it becomes necessary at any time during construction to move materials which are to enter into the construction, or equipment which has been temporarily placed, the Contractor furnishing said materials or equipment shall, when directed by the Owner, move them or cause them to be moved without charge to Owner. Once such materials and equipment are stored at the site they may not be removed from the site without the Owner's permission.

10. ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

A. 10.2 Safety of Persons and Property

1. Revise 10.2.1 by renumbering .3 to .4 and adding a new .3: materials, equipment, and completed Work of Separate Contractors; and

B. 10.3 Hazardous Materials and Substances

1. Add the following at the end of 10.3.1: Hazardous substance shall mean any substance that is toxic, ignitable, reactive, or corrosive and that is regulated by any local, state, or federal government agency or entity; any and all material or substance that is defined as "hazardous waste", "extremely hazardous waste", or a "hazardous substance" under any local, state, or federal law or regulation; and all petroleum products.
2. Add the following at the end of 10.3.5 – Contractor shall not cause or permit any hazardous substance, including those necessary for execution of the Work, to be used, stored, generated, or disposed of on or in the site without first obtaining

Owner's written consent. Regardless of whether Contractor has obtained Owner's written consent, if any contamination of any kind whatsoever occurs during Contractor's use of the site, or if Contractor violates any local, state, or federal law or regulation relating to hazardous substances or environmental contamination, Contractor shall indemnify and hold harmless the Owner from any and all claims, damages, fines, judgments, penalties, costs, liabilities, or losses, including without limitation, any and all sums paid for settlement of claims, attorney's fees, consultant fees, and expert fees arising during or after the Contract period.

3. Add 10.3.7 – Contractor shall have no liability for environmental damages resulting from hazardous materials not addressed in the Contract Documents which were present at the site prior to the date of commencement of the Work.

4. Add 10.3.8 – Upon request of the Owner, the Contractor and each direct Subcontractor to the Contractor shall certify that all materials are free of asbestos fibers and other hazardous carcinogenic ingredients.

C. 10.4 Emergencies

1. Revise 10.4 to read as follows: In case of an emergency which threatens loss or injury of property and/or safety of life, the Contractor shall act, in the absence of previous instructions from the Owner or the Architect, as the situation may warrant, and shall notify the Architect immediately thereafter of the nature of the emergency and the action taken. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 7 and Article 15.

D. Add 10.5 Contractor Responsibilities

1. Add 10.5.1 – The Contractor shall be the custodian of the building and premises and shall (1) provide protection as required against rain, wind, and storms to maintain work free from damage by same; (2) provide temporary closures to protect against intrusion of building once enclosure is attained; and (3) furnish and maintain temporary stairs, ladders, ramps, and similar access facilities, as required for safe and proper execution of the work of all trades.

2. Add 10.5.2 – The Contractor shall be fully responsible for initiating and maintaining all procedures necessary to prevent damage to physical property or personnel. Contractor shall be especially careful to maintain optimum fire safety programs at all times, including control of rubbish, fire watches, fire-fighting equipment, maintenance of exit ways and alarm systems, and all other techniques necessary.

3. Add 10.5.3 – The Contractor shall comply with all applicable provisions of the Occupational Safety and Health Act, and shall be responsible for fines and costs incurred as a result of violations or alleged violations.

4. Add 10.5.4 – The Contractor shall provide and maintain protection of approved type for all floors, passageways, and other surfaces subject to damage, involved in the execution of the work.
5. Add 10.5.5 – The Contractor shall provide and maintain suitable temporary walks, passageways, barricades, fences, railings, and similar facilities, and all necessary lights, signs, and warnings, as required by law and necessary for the protection of the public and others having access to the site.
6. Add 10.5.6 – The Contractor shall make good any such loss or damage without expense to Owner.
7. Add 10.5.7 – The Contractor shall make good any loss or damage due to water leakage caused by the Contractor's and Subcontractors' work without expense to the Owner.
8. Add 10.5.8 – Methods of protection shall be subject to the approval of the Architect and protection shall be maintained until the completion of the Work or until removal is directed by the Architect.
9. Add 10.5.9 – The Contractor shall post warning signs at each entrance to the construction site prohibiting anyone from entering upon the premises with firearms or concealed firearms, and shall enforce this prohibition with respect to its employees, Subcontractors, Suppliers, and other parties under its control.

11. ARTICLE 13 – MISCELLANEOUS PROVISIONS

A. 13.4 Tests and Inspections

1. Add 13.4.7 – When any work is being performed away from the site, the Contractor shall notify the Architect, within a reasonable time in advance, of the location where such work is being done, and when it will be ready for inspection, so that the Architect may inspect the same from time to time prior to delivery, at Owner's request.
2. Add 13.4.8 – The Contractor shall not be relieved of responsibility for proper completion of the Work in accordance with the Contract Documents due to the Architect's observation of faulty Work or Work not in accordance with the Contract Documents.

12. ARTICLE 15 – CLAIMS AND DISPUTES

A. 15.2 Initial Decision

1. Replace 15.2.6 with the following: When a written decision of the Initial Decision Maker states that the decision is final but subject to mediation or binding dispute resolution, failure to demand mediation or to file binding dispute resolution proceedings within 30 days after the date on which the party making the demand receives the written decision shall result in the decision becoming final and binding upon the Owner and the Contractor, unless in conflict with

applicable law. If the Initial Decision Maker renders a decision after mediation or binding dispute resolution has been initiated, such decision may be entered as evidence, but shall not supersede the proceedings, unless the decision is acceptable to all parties concerned.

END OF DOCUMENT

WAGE RATE REQUIREMENTS

1. GENERAL REQUIREMENTS:

A. This document supplements the General Conditions and Supplementary Conditions and is a part of the Contract Documents.

B. Mechanics and laborers employed on this Project shall be paid a prevailing rate of wage as required by Chapter 4115 of the Ohio Revised Code.

C. The Prevailing Wage Coordinator is Melanie Kaiser, City of Bryan Engineering Department, 1399 East High Street, Second Floor, P.O. Box 190, Bryan, Ohio 43506, phone 419-633-6011, email mkaiser@cityofbryan.com.

2. PREVAILING WAGE RATES:

A. A schedule of the most current prevailing wage rates and related forms may be accessed at the web site of the Ohio Department of Commerce, Division of Industrial Compliance, Bureau of Wage and Hour Administration: http://www.com.ohio.gov/dico. Click on Sections, Wage & Hour, and View Wage Rates.

B. If you are unable to obtain a copy of the prevailing wage rates and forms at the web address above, you may obtain a copy from the Prevailing Wage Coordinator.

C. It is the Contractor's responsibility to request additional Prevailing Wage Rates, where necessary, from the Prevailing Wage Coordinator prior to submitting a bid, and to comply with the applicable Prevailing Wage Rates for all Work Classifications.

3. REPORTING REQUIREMENTS:

A. Prepare Certified Payroll Reports using the form and Instructions accompanying the wage rates. Fill in all information on the report form.
   1. Work Classification: List the classification from the Prevailing Wage Determination Schedule which most closely resembles the work performed. Do not use classifications not listed in the Determination Schedule.
   2. For each classification listed on the report, attach a copy of the classification with the pay schedule highlighted.
   3. For each employee listed on the report, attach a copy of the Prevailing Wage Notification to Employee form, completed in its entirety. This form is required to be submitted once for each employee on the project, unless the employee's classification changes.

B. Submit Certified Payroll Reports to the Prevailing Wage Coordinator biweekly, except that reports may be submitted monthly if the time period between the Notice to Proceed and the scheduled date of Substantial Completion is more than three months.
   1. The first report is due two weeks after construction begins.

C. At completion of Project, submit Affidavit of Compliance to the Architect along with the Application for Final Payment in accordance with Section 01 2900.

END OF DOCUMENT

SECTION 01 1000 – SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Contract description.
   2. Project estimate.
   3. Contract time schedule.
   4. Liquidated damages.
   5. Work by Owner.
   6. Work restrictions.
   7. Use of site.

1.02 CONTRACT DESCRIPTION:

A. Award of Contracts: Contracts will be written with a single Prime Contractor.

B. Form of Contract: Document A101-2017, Standard Form of Agreement Between Owner and Contractor.

   1. Insurance: Insurance requirements will be included in the Agreement using AIA Document A101-2017 Exhibit A.
      a. Commercial General Liability and all other liability coverage shall have policy limits of not less than $1,000,000 per each occurrence, accident, employee, or claim, $1,000,000 in the aggregate, and $1,000,000 aggregate for products-completed operations hazard.
         (1) The Commercial General Liability insurance shall include coverage for property damage resulting from defective work of Contractor and Subcontractors.
      b. The Contractor shall purchase and maintain insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

1.03 PROJECT ESTIMATE:

A. In accordance with Section 153.12, ORC, the estimate of construction cost for this project, for the prime contracts described above, is $166,750.

1.04 CONTRACT TIME SCHEDULE:

A. Schedule of Completion Dates:

   1. Award of Contract: Owner intends to award contracts within 30 days after receipt of bids. Contract awards made later than 60 days after receipt of bids are subject to consent of the Contractor.

2. Notice to Proceed: Upon award of contract.
3. Substantial Completion: October 30, 2020.
4. Final Completion: 7 days after Substantial Completion.

B. Description of Completion Dates:

1. Award of Contract: The date that Contractor is notified of Owner's intent to enter into contract. At this time, the Contractor shall begin generating all required submittals and ordering long lead-time materials.
2. Notice to Proceed: The date that Contractor is allowed to commence work in the subject area. Notification shall be made by separate communication from the above Schedule.
3. Substantial Completion: The date by which the subject area is sufficiently completed to be fully occupied by the Owner. The Architect will perform a walk-through review of the work and compile an itemized punch list of non-conforming or unsatisfactory work.
   a. The Contractor shall obtain the Certificate of Occupancy from local governing authorities by this date.
4. Final Completion: The date by which all punch list items and any other required work in subject area is 100% complete. Contractor's superintendent for the subject area may not leave until this date.
   a. For a work item to be considered complete, all contract closeout submittals must be received by the Architect. If necessary, and only if actual work has been completed on items, seven additional calendar days will be allowed for contract closeout submittals.
   b. In the event the date of Substantial Completion is modified by Change Order, the date of Final Completion shall be correspondingly modified by the same number of days unless specifically provided otherwise.

1.05 LIQUIDATED DAMAGES:

A. In the event the Contractor has failed to achieve Substantial Completion by the specified date, the Owner shall be entitled to retain or recover from the Contractor as liquidated damages, and not as a penalty, the amount scheduled below for each day until Substantial Completion has been achieved or until the specified date for Final Completion, whichever occurs first.
   1. Subject Area: 0.067% of the Contract Sum per calendar day (annual rate of 24%); minimum $25 per calendar day.

B. In the event Substantial Completion has not been achieved by the date specified for Final Completion, liquidated damages for Substantial Completion as specified above shall accrue for the period between the specified dates for Substantial Completion and Final Completion. Beginning with the specified date for Final Completion, the Owner shall be entitled to retain or recover from the Contractor as liquidated

damages, and not as a penalty, the amount scheduled below for each day until Final Completion has been achieved.

1. Subject Area: 0.115% of the Contract Sum per calendar day (annual rate of 42%); minimum $50 per calendar day.

C. In the event Substantial Completion has been achieved by the specified date, but Final Completion has not been achieved by the specified date, the Owner shall be entitled to retain or recover from the Contractor as liquidated damages, and not as a penalty, the amount scheduled below for each day until Final Completion has been achieved.

1. Subject Area: 0.115% of the Contract Sum per calendar day (annual rate of 42%); minimum $50 per calendar day.

D. Completion Date Conflicts:

1. Bids shall be based solely on the Contract Time Schedule indicated. Do not include any anticipated liquidated damages costs in the Base Bid price.
2. If, in any bidder's opinion, the Contract Time Schedule dates do not seem obtainable, such bidder may submit a proposal for revised completion dates, along with any cost adjustments necessary, on a separate sheet attached to the Bid Form.

PART 2 PRODUCTS

2.01 WORK BY OWNER:

A. The following work will be performed by others under separate contract and shall not be included under this contract.

1. Testing and inspecting services identified in Section 01 4520.

PART 3 EXECUTION

3.01 WORK RESTRICTIONS:

A. The Owner will occupy the premises during the entire period of construction for the conduct of normal operations.

B. Schedule, coordinate and perform all Work to minimize disruption to Owner's activities.

1. Allow for Owner occupancy and use by the public.
2. Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site and to avoid peak traffic hours.
3. Maintain means of egress from existing building exits at all times designated for public occupancy.
4. Shutdowns of existing systems shall be limited to minimum time required and scheduled with other involved parties. Provide minimum two days written notice of shutdown to Architect and Owner. Shutdowns shall not interfere with

scheduled activities. For shutdowns performed outside normal working hours, include overtime and premium labor costs.

3.02 USE OF SITE:

A. The Contractor shall prepare a proposed Project Use Site Plan, also referred to as a Site Logistics Plan, for approval by Architect and Owner.

B. Confine operations at the site to areas within the boundaries indicated and approved on the Project Use Site Plan, and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.

C. The Project Use Site Plan shall include access to proposed buildings for construction purposes, storage of materials and products, employee parking, temporary facilities including offices, storage, and workshop sheds or portable trailers, and unloading space.

D. Where a temporary fence is to be provided, show any additional area needed in the Contractor's use of the site beyond that which may be indicated on the Drawings. Where additional fencing is required, such fencing shall be included at no additional cost to the Owner.

E. The Owner will designate which portions of existing parking lots and other site areas can be used for construction activities. Damage to existing parking lots, unpaved areas, or other existing site features shall be repaired at the expense of the Contractor responsible for damage.

END OF SECTION

SECTION 01 2300 – ALTERNATES

PART 1 GENERAL

1.01 ALTERNATES:

A. Each Bidder shall include the cost of all Alternates listed on the Bid Form. A Bidder's failure to include on its Bid Form the cost of an Alternate selected by the Owner and applicable to the Bidder's work may render the bid non-responsive and be grounds for rejection of the bid. Otherwise, the failure to include the cost of an alternate will not be deemed material.
   1. An Alternate which results in no net change to the Base Bid should be noted as "N/C".
   2. An Alternate which does not apply to the scope of work of a bidder should be noted as "N/A".

B. At the time of awarding the contract, the Owner will select or reject Alternates as it determines is in its best interest. Owner reserves the right to select, in any order, any or all Alternates, or to reject all Alternates. Accepted Alternates will be identified in Owner-Contractor Agreement.

C. The Bidder agrees to hold the prices stated for Alternates on the Bid Form for a period of 90 days after the bid opening. Following that 90-day period, during the progress of the Work, the Owner reserves the right to reinstate any Alternate not initially included in the Contract at the price bid by the Contractor provided that such action is taken in sufficient time so as not to delay the progress of the Work or cause the Contractor additional expense.

D. Coordinate related work and modify or adjust surrounding work as required to ensure that work affected by each accepted Alternate is complete and fully integrated into the project.

E. Include as part of each Alternate all miscellaneous devices, accessories, appurtenances, and similar items incidental to or required for a complete installation, whether or not mentioned as part of the Alternate.

1.02 SCHEDULE OF ALTERNATES:

A. Alternate 1: Decorative Railing System
   1. Base Bid Item: Omit decorative railing system.
   2. Alternate Item: Include decorative railing system; refer to Section 06 6000 and Drawings A-2 and A-3.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2900 – PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Contract modification procedures.
   2. Schedule of values.
   3. Notices of commencement and furnishing.
   4. Application for payment.

B. Related Sections:
   1. Section 01 2300 – Alternates.
   2. Section 01 7700 – Closeout Requirements.

1.02 CONTRACT MODIFICATION PROCEDURES:

A. The Owner shall have the right at any time, with reasonable notice to Contractor and resulting adjustment to Contract Sum or Contract Time, if any, to require alterations, additions to or deductions from the Work described in the Contract Documents.

B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing an Order for Minor Changes.

C. Architect may issue a Request for Proposal which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications. Contractor shall promptly prepare and submit a detailed itemized proposal for revising the Contract Sum or Contract Time, or both, to incorporate the proposed change. Do not proceed with the proposed changes until a Construction Change Directive or Change Order is issued.

D. Architect may issue a Construction Change Directive approved by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum or Contract Time. Promptly execute the change.
   1. Maintain detailed records of work performed. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

E. Contractor may propose changes by submitting a request for change to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation, and a statement describing the effect on Work by separate or other Contractors. Document any requested substitutions in accordance

with Section 01 6000. Architect and Owner reserve the right to accept or reject such proposed changes, or to request modifications thereto.

F. Accompany all proposals, whether Contractor initiated or in response to a Request for Proposal or Construction Change Directive, with a detailed itemized breakdown including the following:
   1. Materials: Indicate quantities and unit costs.
   2. Labor: Indicate man hours of labor and hourly rates for each classification of labor involved.
   3. Direct Costs: Fuel, supplies, scaffolding, construction equipment, insurance, taxes and related items.
   4. Overhead and Profit: In no case will a rate greater than 10 percent of the sum of the above items be approved for an amount to include overhead, profit, insurance, and bonds.
      a. For deduct change orders, the rate shall be a minimum of 5 percent of the sum of the above items, but need not exceed the rate charged for add change orders.

G. Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.03 SCHEDULE OF VALUES:

A. Submit Schedule of Values within 15 days after Notice to Proceed. Revise and resubmit as required by Architect prior to initial Application for Payment.

B. Submit on forms provided with this Project Manual. Electronic copies of the form are available from the Architect on request. Utilize the Table of Contents of this Project Manual. Identify each line item with the number and title of the specification Section.

C. Include separate line items for each of the following: General Requirements, bonds, insurance, submittals, progress cleaning, final cleaning, punch list work, and project record submittals.

D. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including construction progress schedules, schedule of submittals, and lists of subcontractors, products, principal suppliers and fabricators.

E. Obtain itemized quotations from Subcontractors and suppliers performing work under multiple Sections. “Package bids” will not release Contractor from the responsibility of furnishing values for each Section of the Work.

F. Revise schedule with each Application for Payment to list approved Change Orders.

G. Architect reserves the right to use the Schedule of Values for guidance in evaluating Change Order proposals and claims submitted by the Contractor.

1.04 NOTICES OF COMMENCEMENT AND FURNISHING:

A. Owner will prepare a Notice of Commencement (NOC) in accordance with the Ohio Mechanics' Lien Law (Section 1311 O.R.C.) and deliver a copy to the Contractor.

B. Contractor shall post the NOC at the job site adjacent to the building permit, plan approval certificate, or zoning permit, and shall distribute copies upon request to Subcontractors and suppliers.

C. If the Contractor has not received an NOC within 10 days after construction begins, the Contractor shall deliver to the Owner a written request for a Notice of Commencement.

D. Prior to submitting each Application for Payment, deliver to the Owner a written request for a list of all parties who have requested NOCs from the Owner or delivered Notices of Furnishing to the Owner.

1.05 APPLICATION FOR PAYMENT:

A. Submit three copies of each Application for Payment to the Architect on the forms provided with this Project Manual. No other Application for Payment document will be processed. Electronic copies of the form are available from the Architect on request.

B. Submit sequentially numbered typewritten applications. Notarize each copy, keeping embossed seals away from areas intended for Architect's signature and notations.

C. Content and Format: Rounding to whole dollar amounts is preferred.
   1. Value of labor, materials, and equipment incorporated in the Work or delivered and stored at the site. Utilize Schedule of Values for listing items of Work.
   2. Deduction of retainage.
   3. Deduction of all previously approved payments.
   4. New amount applied for.

D. Contractor shall pay for transportation, services, materials, tools, expendables, and Subcontractor work. Each payment shall be in an amount equal to the percentage of completion allowed to the Contractor for each item or category, less the percentage retained from payments to the Contractor. Contractor shall make payments to Subcontractors.

E. Change Orders for additional work may be included in progress payments after approval by all parties.

F. Payment Period: Progress payments will be made at monthly intervals, from the date of the Notice to Proceed to the date specified for Substantial Completion. Each monthly payment shall be in an amount determined in accordance with Paragraph 9.3 of the General Conditions and the Supplementary Conditions.
   1. After the payment of the last scheduled progress payment, no further progress payments will be made until the Certificate of Substantial Completion has been issued. In the event that changes in the work result in an extension of time, the

number of scheduled progress payments may be changed in accordance with the extension of time granted by Change Order.

2. After Substantial Completion, no further payment will be made until the final Application for Payment is approved.

G. Retainage: In making progress payments, 8 percent of the total labor performed to date, and 8 percent of stored materials, will be retained.
   1. After the work is 50 percent complete, as evidenced by approved Applications for Payment of at least 50 percent of the Contract Sum, no additional labor retainage shall be made, and all funds retained in accordance with this Section pursuant to Sections 153.12 and 153.14 of the Ohio Revised Code shall be deposited in the escrow account designated in Section 153.63 of the Revised Code.
   2. At Substantial Completion, provided there exists no other reason to withhold retainage, the retained percentages held in connection with the partial payments shall be released from escrow and paid to the Contractor, withholding only that amount necessary to assure completion.
   3. Within 30 days of Final Completion, funds in escrow account not heretofore paid, with accumulated interest, shall be paid to the Contractor in accordance with Section 153.63 (A) (2) of the Ohio Revised Code.

H. Initial Application for Payment: Submittals that must precede or coincide with submittal of the first Application for Payment include the following:
   1. Certificates of insurance.
   2. Construction schedule in accordance with Section 01 3200.
   3. Submittal Schedule, List of Subcontractors, and List of Products in accordance with Section 01 3300.

I. Submit the following additional forms in duplicate with each Application for Payment. Applications will not be processed without receipt of the proper forms.
   1. Updated construction progress schedule in accordance with Section 01 3200.
   2. Waivers of Lien on a form acceptable to Owner, for the Prime Contractor and each of the following:
      a. All parties who have filed Notices of Furnishing with the Contractor or Owner.
      b. All parties who have requested Notices of Commencement from the Contractor or Owner.
      c. All Subcontractors performing work or suppliers providing material during the period covered by the application.

J. Submit the following additional forms in duplicate with final Application for Payment. Applications will not be processed without receipt of the proper forms.
   1. Waivers of Lien on a form acceptable to Owner, for the Prime Contractor and each of the following:
      a. All parties who have filed Notices of Furnishing with the Contractor or Owner.

b. All parties who have requested Notices of Commencement from the Contractor or Owner.
c. All Subcontractors performing work or suppliers providing material during the 21 days preceding the date of the application.

2. Closeout submittals in accordance with Section 01 7700.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Project coordination.
   2. Requests for interpretation.
   3. Facility services coordination.
   4. Project meetings.
   5. Alteration project procedures.

1.02 PROJECT COORDINATION:

A. The Contractor shall assign one person who will be on site full-time and who will have authority to speak and act on behalf of the Contractor. This person shall supervise and direct the work using their best skill and attention, and shall coordinate all trades and Subcontractors and provide adequate labor, equipment and materials as needed.
   1. Communications to the Contractor's superintendent shall be as binding as if given directly to the Contractor.
   2. Upon Notice to Proceed, Contractor shall notify the Owner of the proposed superintendent, and if requested by the Owner shall also submit a summary of qualifications and experience, including references.
   3. Contractor shall not change their superintendent without prior written notice to the Owner, including justification for the change and identification and qualifications of the proposed replacement.
   4. Owner reserves the right to reject proposed superintendents within 30 days, in which case Contractor shall provide an acceptable replacement without adjustment of Contract Sum or Contract Time.

B. Maintain a constant check on the progress of the Project; coordinate and sequence work with that of others to facilitate progress of the Project; provide reasonable advance notification to all parties concerned of any special provisions regarding the placing, setting, or preparation of work that will affect the work of others; afford others every reasonable opportunity for installation and execution of their work and storage of their materials.

C. Alterations to work already placed and necessitated by failure to properly coordinate work shall be accomplished at the expense of the negligent party.

D. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

E. Before installing any work, and before purchasing any equipment, carefully check Contract Documents for conflicts or lack of coordination between or among required Work, Contract Documents, and job conditions; immediately report same to Architect in writing.
   1. In the event of failure to bring such lack of coordination between or among Contract Documents, work of other trades, and job conditions to Architect's attention in writing before work is performed or before equipment is purchased, resulting conflicts shall be corrected as directed by the Architect, without adjustment of Contract Sum or Contract Time.

F. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.

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

1.03 REQUESTS FOR INTERPRETATION (RFI):

A. In the event the Contractor determines that some portion of the Contract Documents requires clarification or interpretation, submit a Request for Interpretation in writing on forms approved by the Architect.

B. Each RFI shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed, the date by which a response is requested, and shall include his interpretation or understanding of the contract requirements along with reasons why such an understanding was reached.

C. RFIs shall be submitted by the Prime Contractor only and shall not be used for routine project communication, to transmit submittals, to request substitutions, or for other correspondence. Documents which are not RFIs will be returned for resubmittal on the proper form.

D. Minor detail items related to shop drawing submittals shall be highlighted on the shop drawings and do not require an RFI.

E. Submit each RFI in sufficient time to avoid delaying the project, allowing minimum one week for Architect's response. If the Architect determines that a longer time is necessary to provide an adequate response, the Architect will advise of the anticipated response time within one week of receipt of the RFI. Adjustment of Contract Time will not be granted due to the Architect's response time.

F. Responses to RFIs shall be considered interpretations and clarifications of the contract requirements and do not change the Contract Documents. If the Contractor believes that a response constitutes a change to the Contract Documents, Contractor shall promptly give written notice.

G. In the event of an excessive number of RFIs where the requested information is available from the Contract Documents, field observations, or prior Project

correspondence or documentation, the Owner shall be entitled to deduct from the Contract Sum all reasonable costs charged by the Architect to the Owner for additional services required for the processing of such RFIs.

1.04 FACILITY SERVICES COORDINATION:

A. Contract Documents: Facility Services work (Fire Suppression, HVAC, Electrical, and Electronic Safety and Security) may be shown throughout the Drawings. Information required for proper coordination of the work may be contained in specifications of other trades. Become thoroughly familiar with all documents referenced in the Project Manual Contents and List of Drawings and coordinate the Work with all provisions thereof.

B. System Layout: Facility Services drawings are diagrammatic and are intended to show the approximate locations of components. Field verify dimensions shown on the Drawings. Do not scale drawings to obtain exact dimensions.

1. Coordinate space requirements and installation of work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
2. The exact location of items not located by dimensions on the Drawings shall be determined in the field with consideration given to appearance, clearances, and potential conflicts, and is subject to approval by the Architect.
3. Before beginning installation, verify required clearances for the erection of finish beams, columns, pilasters, walls, casework, and other structural or architectural members as shown on the Drawings. If any work is installed and it later develops that the architectural design cannot be followed, make such changes as the Architect may direct to facilitate completion of the architectural work in accordance with the Contract Documents.
4. Report actual and potential interferences and conflicts among Facility Services work and the work of other trades to the Architect as soon as they are discovered. The Architect's decision shall be final in regard to the rearrangement of conflicting work, regardless of which was first installed.
5. Field verify exact locations of apparatus, fixtures, and equipment supplied by the Owner and others, and install the work accordingly. If the installer fails to ascertain such locations before proceeding with the work, the work shall be changed at the installer's expense when so ordered.
6. Throughout the course of the work, up to the time of roughing-in and installation, minor changes and adjustments to the installation may be requested by the Architect. Make such adjustments without modification to the Contract Sum or Contract Time, where such adjustments are necessary to facilitate proper installation and operation within the intent of the Contract Documents. This does not include work already completed.

7. Position fixtures, equipment, devices, switches, outlets, and related components, to avoid interferences with and to assure proper coordination with work of other trades, partitions, wall, floor and ceiling patterns, and architectural features. Coordinate recessed devices and fixtures with wall, floor and ceiling patterns.
8. Equipment and piping shall not be installed or run above electrical switchgear or panelboards, nor in or above the access space in the immediate vicinity of the electrical switchgear or panelboards, in accordance with the applicable electrical code. Failure to notify the Architect of conflict and to provide adequate coordination will result in costs incurred at the expense of the negligent party.
9. Maintain service access clearances to equipment as indicated on submittals. Verify that filter replacement, scheduled maintenance, and repair parts replacement can be performed without obstruction by other systems or components.
10. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Utility Coordination: Contact each utility company providing service to the project and determine or verify their requirements.
   1. Make all arrangements with each utility company and pay all service charges associated with temporary or new services or modifications to existing services.
   2. Utility tie-ins shall be arranged with local utility company and other involved parties for minimum interruption of service.

D. Equipment Requirements: Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
   1. The current to building for light and power will be 60 cycle, A.C. Verify voltage, amperage, and phase requirements for the work with the service available at the building.
   2. Prior to ordering electrically operated items, verify requirements so that they will operate on the voltage, amperage, and phase provided for them.
   3. Any item delivered to the job which will not operate on the current provided will be rejected or the Contractor will stand the expense of changing the wiring or piping to accommodate the equipment.
   4. Verify equipment can be installed and removed through permanent building openings. Where necessary, provide modular components which can be disassembled and reassembled. Bring exceptions to the attention of the Architect and provide lintels, knockout panels, and other construction as directed to facilitate installation and future removal of equipment.

E. Structural Supports: Except as otherwise noted, furnish the main supporting structure and provide floor, wall, and roof openings, as shown on the structural Drawings.
   1. Coordinate requirements for floor, wall, and roof openings, including openings not shown on the Drawings, before the structure is erected. Perform cutting and patching, where required, in accordance with Section 01 7000.
   2. Where equipment is supported by the building structure, the structural Drawings indicate supports and other design considerations which are based on the use of the scheduled equipment. Where products of another listed manufacturer are supplied, or where substitutions are approved, coordinate dimensions, clearances, structural supports, and other conditions as required for proper installation.
   3. Provide supplemental framing, rods, supports, and hangers required to install or mount equipment indicated, and as necessary to provide a complete working system. Do not support equipment, piping, conduit, or any other components from roof deck, or from open web framing members at any locations other than panel points.
   4. Provide cross bracing for suspended equipment to prevent swaying.

F. Access Panels: Where valves, traps, water hammer arresters, dampers, or other specialties are concealed in construction or behind a wall or ceiling surface, furnish and install an access panel of adequate size to permit adjustment or service of concealed device.
   1. Access panels shall be of a design suitable for installation in the material forming the finished surface in which each is mounted. Where doors are installed in fire-rated construction, they shall have the appropriate required rating.
   2. Each access panel in masonry or gypsum board surfaces shall have a flush metal frame and flush hinged steel door with flush screwdriver-operated latch.
   3. Coordinate access panel locations with the work of other trades. Wherever practicable, group components requiring access to be accessible from a single panel and eliminate as many access panels as possible.
   4. Where acoustical ceiling systems with removable panels are used, access doors need not be supplied. Indicate the presence and type of concealed components with a color coded sticker on the ceiling grid.

G. Identification and Labeling: Where room numbers are used for identification of Facility Services components, utilize the Owner's final room names and numbers, which may vary from room names and numbers on the Drawings. Coordinate with interior signage and other permanent room identification.

1.05 PROJECT MEETINGS:

A. Preconstruction Meeting: Architect will schedule a meeting after Notice of Award.
   1. Attendance Required: Owner, Architect, and Contractor.
   2. Agenda:
      a. Execution of Owner-Contractor Agreement.
      b. Submission of executed bonds and insurance certificates.

c. Distribution of Contract Documents.
d. Submission of list of Subcontractors, list of Products, schedule of values, and project schedule.
e. Designation of personnel representing the parties in Contract, and the Architect.
f. Procedures and processing of field decisions, submittals, substitutions, applications for payment, change procedures, and contract closeout procedures.
g. Use of premises by Owner and Contractor.
h. Construction facilities, controls, and temporary utilities provided by Owner.
i. Security and housekeeping procedures.
j. Procedures for maintaining record documents.
k. Scheduling.

3. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

B. Progress Meetings: Schedule and administer meetings throughout progress of the Work at maximum monthly intervals, scheduled to coordinate with preparation of payment requests. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Notify parties, including Architect, at least four days in advance.

1. Attendance Required: Representatives of Contractor, major Subcontractors and suppliers, as appropriate to agenda topics for each meeting.

2. Agenda:
a. Review minutes of previous meetings.
b. Review of Work progress.
c. Field observations, problems, and decisions.
d. Identification of problems which impede planned progress.
e. Review of submittals schedule and status of submittals.
f. Review of off-site fabrication and delivery schedules.
g. Maintenance of progress schedule.
h. Corrective measures to regain projected schedules.
i. Planned progress during succeeding work period.
j. Coordination of projected progress.
k. Maintenance of quality and work standards.
l. Effect of proposed changes on progress schedule and coordination.
m. Other business relating to Work.

3. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

C. Preinstallation Meetings: When required in individual specification sections, convene a preinstallation meeting prior to commencing work of the section.

1. Require attendance of parties directly affecting, or affected by, work of the specific section.

2. Notify Architect four days in advance of meeting date.

3. Prepare agenda and preside at meeting:
   a. Review conditions of installation, preparation and installation procedures.
   b. Review coordination with related work.

4. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

1.06 ALTERATION PROJECT PROCEDURES:

A. Existing Conditions: Existing equipment, sewers, piping, ducts, conduit, and other existing items in place shown or noted on the Drawings, may be relied upon only for general layout. Field verify all measurements, grades, relative elevations and locations, and obtain additional information as necessary to assure the proper fit and coordination of new work with existing.

B. Where there are alterations or additions to an existing structure, remove, reroute, or replace existing facilities and services as may be necessary to permit installation of new work or alterations to old work.
   1. Where building systems or utility services must be disrupted to permit connections and modifications, notify Architect in advance and coordinate scheduling with Owner to cause the least possible inconvenience and shortest delay.
   2. Where existing equipment, piping, or miscellaneous related items are permanently abandoned, each component exposed to view or accessible in concealed locations shall be removed completely. Concealed inaccessible piping and conduit shall be plugged or capped at a point well behind the proposed new finished closures or surfaces.

C. Existing Hazardous Materials: If the existence of asbestos or other hazardous material in the structure or building is observed during the course of construction or work, promptly notify the Owner. The Owner will consult with their consultant regarding removal or encapsulation of the asbestos material. Do not perform any work which may affect the hazardous material prior to receipt of special instructions from the Owner.

D. Materials: As specified in Product sections; match existing Products and work for patching and extending work.

E. Employ skilled and experienced installer to perform cutting and patching in accordance with Section 01 7000.

F. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

G. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.

H. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with a neat transition to adjacent finishes.

I. Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

J. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Architect for review.

K. Where a change of plane of ¼ inch or more occurs, submit recommendation for providing a smooth transition to Architect for review.

L. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

M. Finish surfaces as specified in individual Product sections.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Construction progress documentation.

1.02 CONSTRUCTION PROGRESS DOCUMENTATION:

A. Submit initial construction schedule in triplicate within 15 days after date of Notice of Award.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit a horizontal bar chart with separate line for each section of Work, identifying first work day of each week. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, critical path, float dates, and duration.

E. Indicate estimated percentage of completion for each item of Work at each submission.

F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

G. Schedule shall begin with Notice to Proceed and conclude with the date of final completion of the project. Float or slack time within the construction schedule is not for the exclusive use or benefit of either the Owner or Contractor but is a jointly owned, expiring project resource available to both parties as needed to meet contract milestones and the contract completion date.

H. No time extensions will be granted nor delay damages paid until a delay occurs that impacts the project's critical path, consumes all available float or contingency time, and extends the work beyond the contract completion date.
   1. Delays arising from multiple causes which may have concurrent or interrelated effects on the progress of the Work shall be combined into a single unit for the purposes of determining the appropriate time extension, if any.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3300 – SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. General requirements for submittals.
   2. List of subcontractors and products.
   3. Shop drawings, product data and samples.
   4. Manufacturer's installation instructions and certificates.

B. Related Sections:
   1. Section 01 6000 – Product Requirements: Submittals for substitutions.
   2. Section 01 7700 – Closeout Requirements: Contract warranties, operation and maintenance data, and closeout submittals.

1.02 GENERAL REQUIREMENTS FOR SUBMITTALS:

A. Electronic Submittals: Submittals (except samples, color selectors, and submittals requiring certification by a registered professional) shall be submitted in electronic format.

   1. Only PDF files will be accepted, unless otherwise approved in advance.

   2. For submittals to be distributed to governing authorities, electronic submittals shall be used for review by Architect and Architect's consultants. If requested, provide the number of paper submittals required for use by authorities having jurisdiction.

   3. Submittals shall be accompanied by a statement from the submitter indicating approval.

   4. Submittals will be returned in electronic format. Architect's notations may be included in the submittal file or in a separate document, and shall be distributed with all copies of the reviewed submittals.

B. Paper Submittals:

   1. Transmit each submittal with Transmittal Letter, AIA Form G810 or equivalent. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

   2. Apply Contractor's stamp, signed or initialed, indicating approval.

   3. Submit three copies, unless individual specification sections require a greater number of copies. One copy will be returned to the Contractor. Additional copies will not be processed or returned.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, date, and specification section number, as appropriate.

D. Use standard letter, tabloid, and architectural page sizes only. Provide space on first page for Architect, and professional subconsultant review stamps, minimum 1½ x 3 inch each space.

E. Where items are identified in the Contract Documents by number, letter or similar mark, include the same identification on submittals. Arrange items within the submittal in the same sequence as the identification in the Contract Documents, unless another sequence is approved in advance by the Architect.

F. By approving and submitting submittals, the Contractor represents that he has reviewed and verified field dimensions, quantities, adjacent construction Work, field construction criteria, materials, catalog numbers, specified design requirements and performance requirements, and similar data, and coordinated information in accordance with the requirements of the Work and Contract Documents.

G. Submittals stamped "For Approval Only" or "Not For Construction" will not be accepted.

H. Where individual specification sections require submittals to be prepared under the supervision of a Professional Engineer or other registered professional, apply the registered professional's seal and signature to such submittals.

I. All responsibility for the submittal shall be that of the submitter. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any submittal.

J. Identify deviations from Contract Documents, and Product or system limitations which may be detrimental to successful performance of the completed Work.

K. Correct returned submittals marked "Revise and Resubmit" or "Not Approved"; identify all changes made since previous submission. Review of revised submittals will be limited to previously noted items, unless other changes are specifically called out. Direct specific attention in writing on resubmittals to revisions other than the corrections requested on previous submissions.

L. Distribute copies of reviewed submittals as appropriate, including distribution to separate Contractors whose work connects to or interfaces with the submittal item. Instruct parties to promptly report any inability to comply with provisions.

M. Submittals not requested will not be acknowledged or processed.

N. Submittals for Review: Architect's review of submittals is limited to conformance with the design concept and to compliance with requirements of the Contract Documents.

   1. Architect's review of submittals is a gratuitous assistance, and the Architect's action does not relieve the submitter of responsibility for deviations from the

requirements of the Contract Documents unless the Architect has been informed in writing of the deviation at the time of submission and has given written approval to the specific deviation, nor shall the Architect's action relieve the submitter from responsibility for errors or omissions in the submittals. Such errors, omissions, or deviations shall be made good by the submitter, irrespective of the receipt, checking, review, or approval of submittals by the Architect, and even though the Work is performed in accordance with approved submittals.

2. Contractor retains all responsibility for quantities, field dimensions, fabrication, installation, construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination with Work by others. The content of the submittal and wording of the Contractor's review stamp shall not serve to limit responsibility for the above items.

3. For submittals requiring approval by governing authorities, Architect's approval of the submittal is contingent upon and subject to approval by authorities having jurisdiction.

4. Architect's notations and remarks added to submittals are to ensure compliance with Contract Documents and do not constitute, imply or require a contract modification.

5. The Architect's review of an individual item does not indicate review of an assembly in which the item is included.

O. Submittals for Information: The following categories of submittals, and additional submittals identified in individual specification sections, will not be approved by the Architect or returned to the Contractor, but will be retained for record purposes. When requested by Contractor, Architect will acknowledge receipt. Submittals may be rejected for not complying with requirements.

1. Manufacturer certificates, material certificates, material safety data sheets, and material test reports.

2. Manufacturer's guide specifications.

3. Installer certificates, welding certificates, and installer qualification data.

4. Work plans, waste management plans, storm water pollution prevention plans, and similar representations of construction means, methods, sequences, and procedures.

5. Insurance certificates and bonds.

6. Test reports.

7. Environmental product declarations.

8. Engineering calculations.

9. Installation instructions and maintenance recommendations.

10. Manufacturer's field reports.

11. Construction photographs.

1.03 SUBMITTAL SCHEDULE:

A. Prepare a complete schedule of submittals within 10 days of Notice to Proceed.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Construction Schedule.

2. Organize the schedule by Project Manual Contents. Provide the following information for each specification Section:
   a. Scheduled date for the first submittal.
   b. Name of Subcontractor.
   c. For each submittal for review, including revised submittals, allow 15 working days excluding delivery time.

3. Allow time for review by Architect and Architect's consultants, including delivery time. Allow time for one resubmittal after the initial submittal without delaying the Construction Schedule.

4. Review of submittals and resubmittals will be prioritized by date indicated on the Submittal Schedule.

5. Alterations or additional work required because of Contractor's failure to make timely submittals shall be corrected without additions to the Contract Sum.

B. Prioritize the submittal of critical schedule items, long lead items, items requiring coordination between trades, and submittals that may affect final plan approval.

1.04 LIST OF SUBCONTRACTORS:

A. Within 15 days after date of Notice to Proceed, submit list of Subcontractors proposed for use, with postal addresses, email addresses, and telephone numbers. Indicate all sections of Work to be performed by each Subcontractor.

B. Sections of Work for which a Subcontractor is not listed will be construed to be done by the Prime Contractor.

C. Notify the Architect in writing in advance of any proposed changes to the list of Subcontractors.

1.05 LIST OF PRODUCTS:

A. Within 15 days after date of Notice to Proceed, submit list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

B. For Products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

C. Notify the Architect in writing in advance of any proposed changes to the list of Products.

1.06 SHOP DRAWINGS:

A. Prepare neat, legible, accurate drawings at scales adequate to fully illustrate all pertinent data. Where applicable, include plan, elevation, and section views complete with dimensions, notes, and other data sufficient to demonstrate compliance with requirements of Contract Documents and to show relationships and connections to adjacent materials and related work by others.

B. Electronic Base Drawings: Contractors may obtain drawings from the Architect in Autocad format for use in preparing shop drawings. Drawings will remain the property of the Architect, and will be subject to a License Agreement which must be completed prior to distribution of the Drawings.
   1. Drawings prepared by Architect's consultants may or may not be available. Contact each consultant for availability and pricing.
   2. The Architect makes no representation regarding the accuracy or completeness of electronic drawings. Addenda, Change Orders, and other revisions may or may not be included. Electronic drawings are not contract documents, and in case of discrepancy or conflict, the contract documents shall govern.
   3. Use of electronic drawings does not relieve the user of duty to check, confirm, and coordinate all dimensions and details, field verify dimensions and conditions, and coordinate the work with that of others.

C. Submit for review. After review, produce copies and distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Structural Calculations: State specific loads on which calculations are based. References to code requirements without listing specific loads are not sufficient.

F. Wiring Diagrams: When specified in individual specification sections, submit detailed point-to-point wiring diagrams indicating each component, locations and quantities, and interconnecting wiring between components. Manufacturer's generic system layouts are not normally sufficient without modification to indicate specific Project requirements.

1.07 PRODUCT DATA:

A. Identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

B. Submit for review. After review, distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

C. Indicate electrical characteristics, including voltage, amperage, and phase.

D. Indicate special utility characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.08 SAMPLES:

A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work so that adjacent or coordinating materials may be reviewed together.

B. Submit samples of the precise article proposed to be furnished.

C. Submit samples whenever a choice of color or pattern is available in a specified material or Product. Include the full range of manufacturer's standard colors, textures, and patterns for selection.

D. Include identification on each sample, with full Project information.

E. Submit the number of samples specified in individual specification sections, or two samples where not otherwise specified; one of which may be retained by Architect.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

1.09 MANUFACTURER'S INSTALLATION INSTRUCTIONS:

A. Maintain on site one printed or electronic copy of manufacturer's instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

B. When specified in individual specification sections, or upon request, submit instructions to Architect for information.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 MANUFACTURER CERTIFICATES:

A. When specified in individual specification sections, or upon request, submit certification by manufacturer to Architect.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4000 – QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Regulatory requirements.
   2. References.
   3. Quality assurance and control.

B. Related Sections:
   1. Section 01 3300 – Submittal Procedures: Submittals of manufacturer's instructions and certificates.
   2. Section 01 6000 – Product Requirements: Requirements for material and product quality.

1.02 REGULATORY REQUIREMENTS:

A. General Requirements:
   1. Perform Work in conformance with the codes and standards listed in this Section, and with the requirements of federal, state and local authorities having jurisdiction.
   2. Become familiar with all regulatory requirements which may affect the Work.
   3. Standards which apply to specific portions of the Work are listed in individual specification sections.
   4. Comply with regulatory requirements in effect on the date for receiving bids, or on date of Contract Documents if there were no bids, except where a specific date is established.
   5. In the event of conflict between regulatory requirements and the Contract Documents, comply with regulatory requirements, but not before referring the points in question to the Architect for approval.

B. Codes and Regulations:
   1. Building Code: Ohio Building Code.
   2. Handicapped Accessibility Code: ICC A117.1.
   3. Mechanical Code: Ohio Mechanical Code.
   4. Electrical Code: National Electrical Code, NFPA 70.
   5. All work involving refrigerants, including servicing of and modifications to existing systems, shall comply with the Clean Air Act and current Amendments, and applicable EPA regulations.

C. Standards: Ensure products and installation are in conformance with applicable recommendations and requirements of the following:

1. Factory Mutual Engineering.
2. Owner's insurance underwriter.
3. Americans with Disabilities Act (ADA) Standards for Accessible Design.
4. National Electrical Manufacturers Association (NEMA).
5. National Fire Protection Association (NFPA).
6. Occupational Safety and Health Administration (OSHA).
7. Underwriters Laboratories (UL).
8. Local utility companies.
9. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

D. Taxes:

1. Bidders and Contractors shall be responsible for informing themselves of tax laws, requirements, regulations, and interpretations as they apply to this project.
2. The Owner is a political subdivision of the State of Ohio. Building materials purchased for incorporation into the improvements will be exempt from the state sales and use taxes, if the Contractor provides a properly completed and executed sales tax exemption certificate to the vendors or Suppliers at the time of the acquisition of the materials. The Owner will execute properly completed certificates on request.
   a. Contractor shall not charge Owner, and Owner shall not be liable for payment of, taxes from which Owner is exempt by law.
   b. Purchases of expendable items such as form lumber, tools, oils, fuel, or equipment rentals are subject to the application of the Ohio Sales or Use Tax.
3. Contractor shall pay all income taxes and payroll taxes required by local jurisdictions, including City of Bryan.

E. Permits and Fees:

1. The Architect will apply for Building Plan Approval from the Ohio Department of Commerce, including General, Mechanical, Electrical, and Sprinkler work. Contractor will not be responsible for initial filing fees.
   a. All communications related to plan approval, including shop drawing submittals, are required to be made through the Architect.
   b. Coordinate shop drawing submittals and correction letter responses with the project schedule, planned not to exceed the allowable number of resubmittals.

Fees for additional resubmittals resulting from delinquent, incomplete, or incorrect information will be the responsibility of the Contractor.

2. Prior to beginning work, Contractor shall conduct a meeting with the building inspector, fire chief, and Owner to develop an approved egress plan for existing building exits affected by new construction. Include costs for temporary construction necessary to implement the plan.

3. Except as noted above, each Contractor shall procure from the proper authorities and pay all fees for permits, taps, licenses, inspections, and other charges applicable to their Work, as required by state laws, city and county ordinances, and regulations pertaining to the work.
   a. All costs shall be borne by the Contractor responsible for the work.
   b. Arrange for inspections to be performed, giving notice to inspecting authorities in ample time so that work can be inspected and approved as it progresses.
   c. Do not cover or conceal work requiring inspection until inspection has been performed.
   d. At the conclusion of the installation, secure a certificate of final inspection and approval by enforcement authorities.

1.03 REFERENCES:

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except where more rigid requirements are indicated in the Contract Documents or are required by applicable codes.

B. Conform to edition of reference standard current on date of Contract Documents, except where a specific edition is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Submit one copy of any referenced standard when requested by Architect.

E. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 QUALITY ASSURANCE AND CONTROL:

A. General Requirements:

1. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

2. Comply with manufacturer's instructions, including each step in sequence.

3. Should manufacturer's instructions conflict with Contract Documents, request clarification from Architect before proceeding.

4. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
5. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
6. Coordinate with Owner for procedures to mitigate risk of infectious diseases according to current regulatory requirements, and recommendations of the Centers for Disease Control and Prevention.

B. Personnel:

1. Perform work by persons qualified to produce workmanship of specified quality.
2. The Owner may direct the removal and replacement of personnel for the following:
   a. Consistently poor workmanship or production of low quality work.
   b. Failure to actively cooperate with the Owner, Architect, or other Contractors in the construction effort.
   c. Theft, vandalism or fraudulent acts.
   d. Dangerous or unsafe practices.
   e. Use of alcohol or drugs; possession or sale of illegal substance of any kind.
   f. Any activity in, on, or about the premises, or in connection with the work, that violates any ordinance, statute, or other regulation of any governmental body having jurisdiction over the premises.
3. Upon receipt of a written directive from the Owner requiring removal of an employee for one of the above causes, immediately remove the employee from the Project. The removal or replacement of an employee for the above causes shall not be cause for additional compensation. Any such dismissed worker shall not be reemployed in any other capacity for work on the Project.

C. Tolerances:

1. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
2. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
3. Adjust Products to appropriate dimensions; position before securing Products in place.

D. Manufacturers' Field Services and Reports:

1. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, adjustment and balancing of equipment, as applicable, and to initiate instructions when necessary.

2. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
3. Submit report in duplicate within 30 days of observation to Architect for information.

E. Mockups:

1. When specified in individual specification sections, construct full-size representations of construction, materials, and finishes to demonstrate aesthetic effects, quality of workmanship, and coordination of elements.
2. Build mockups in locations and size indicated, or if not indicated, as directed by Architect.
3. Notify Architect minimum 7 days in advance of scheduled date for construction of mockup.
4. Construct mockup using workers to be employed for the construction illustrated by the mockup, and under the direction of the supervisory personnel who will direct the work.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting fabrication or construction of the work, allowing minimum 7 days for initial review and each subsequent review of each mockup.
7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4210 – ABBREVIATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Definition of abbreviations used in the Contract Documents.

1.02 ABBREVIATIONS – TERMS:

A. Listed below are terms and abbreviations which may be found in the Contract Documents. Common English language terms have not been included. Refer also to Drawings and individual specification Sections for terms and abbreviations specific to those documents. Acronyms used to refer to associations and organizations are listed separately below. Where multiple definitions are listed for an abbreviation, refer to the context for the intended meaning. For abbreviations not listed, and where the intended meaning is not obvious, request interpretation from the Architect.

AC	air conditioning; alternating current
A.B.	anchor bolt
ACC.	accessible
ACOUST.	Acoustical
ADA	Americans with Disabilities Act, Standards for Accessible Design
ADJ.	adjacent; adjustable
A.F.F.	above finished floor
A.F.G.	above finished grade
AFUE	annual fuel utilization efficiency
AHU	air handling unit
ALT.	alternate
ALUM.	aluminum
AMP	ampere
ANOD.	anodized
APPROX.	approximate
ARCH.	Architect
ASSY.	assembly
ATTN.	attention
AUTO.	automatic
AUX.	auxiliary
AWG	American wire gauge
B&B	balled and burlapped
BD.	board
B.F.F.	below finished floor
BHP	brake horsepower
BLDG.	building
BLKG.	blocking
BLKHD.	bulkhead
BM	beam; benchmark
BN	bullnose
BOT.	bottom
BRG.	bearing
BSMT.	basement
BTU	British thermal unit
BTUH	British thermal unit per hour
C	Celsius; channel
CAB.	cabinet
CAP.	capacity
CAT.	catalog
CATV	community antenna (cable) television
CAV.	cavity
CB	catch basin; cementitious (backer) board
CCF	hundred cubic feet
CFM	cubic feet per minute
CHW	chilled water; circulating hot water
CI	cast iron; curb inlet
CJ	construction joint; control joint
CKT.	circuit
CL	center line; class
CLG.	ceiling; cooling
CLOS.	closet; closure
CMU	concrete masonry unit
CO	cased opening; cleanout; company
COEFF.	coefficient
COL.	column
CONC.	concrete; concentric
COND.	condenser; condensate
CONF.	conference
CONN.	connection
CONT.	continue; continuous
CONTR.	contract; contractor
CONV.	convert; conventional
COORD.	coordinate
CORR.	corridor; correct

CPT	carpet
CPVC	chlorinated polyvinyl chloride
CT	ceramic tile; countertop; current transformer
CTR.	center
CU	cubic; copper; coefficient of utilization
CUH	cabinet unit heater
CW	cold water
CYL.	cylinder
D	deep; depth; penny (nail)
DAT.	datum
DB	decibel; dry bulb
DBL.	double
DC	direct current
DDC	direct digital control
DEG.	degree
DEL.	delete; deliver
DEPT.	department
DET.	detail
DF	drinking fountain
DI	ductile iron
DIA.	diameter
DIAG.	diagonal; diagram
DIFF.	difference; diffuser
DIM.	dimension
DISC.	disconnect
DISP.	dispenser; disposal
DIST.	distance; district; distribution
DL	dead load
DOC.	document
D.P.	down pipe
DR.	door
DW	dishwasher
DWG.	drawing
DWV	drain, waste and vent
EA.	each
E.C.	Electrical Contractor
EIFS	exterior insulation and finish system
EJ	expansion joint
EL.	elevation
ELEC.	electric
ELEV.	elevator
EP	edge of paving; electrical panel
EPDM	ethylene propylene diene monomer
EPS	expanded polystyrene
EQUIP.	equipment
EQUIV.	equivalent
ESMT.	easement
ESP	external static pressure
EST.	estimate
EW	each way
EWC	electric water cooler
EXH.	exhaust; exhibit
EXIST.	existing
EXP.	expansion; exposed
EXT.	exterior; extinguisher
F	Fahrenheit; female
FACP	fire alarm control panel
FC	footcandle
FCO	floor cleanout
FD	floor drain
FDN.	foundation
FE	fire extinguisher
FFE	finish floor elevation
FH	fire hydrant
FHMS	flat head metal screw
FIG.	figure
FIN.	finish
FIXT.	fixture
FL	flow line
FLA	full load amps
FLG.	flange; flashing
FLR.	floor
FLUOR.	fluorescent
FOUND.	foundation
FP	fire protection
FR	fire rating
FRP	fiber reinforced polyester
FRTW	fire retardant treated wood
FS	Federal Specification
FT	feet; foot
FTG.	footing
FURN.	furnace; furnish; furniture
FXT.	fixture
GA	gage
GAL.	gallons
GALV.	Galvanized
GBF	granular backfill
G.C.	General Contractor
GCO	grade cleanout
GF	gas furnace
GFCI	ground fault circuit interrupter
GL	glass
GLULAM	glued laminated wood
GPM	gallons per minute
GYP.	gypsum
H	height
HB	hose bibb
HC	HVAC Contractor; hollow core
HDO	high density overlay
HDW.	hardware
HID	high intensity discharge
HM	hollow metal
HORIZ.	horizontal
HP	high pressure; horsepower

HPS	high pressure sodium
HT.	height
HVAC	heating, ventilating and air conditioning
HW	hot water
ID	inside diameter; identification
IN.	inches
INCAND.	incandescent
INCL.	included
INSUL.	insulation
INT.	interior
INV.	invert
IPS	international pipe standard; iron pipe size
IR	infrared
JAN.	janitor
JST.	joist
JT	joint
KD	kiln dried; knocked down
KIT.	kitchen
KO	knockout
KSF	thousand square feet
KVA	kilovolt amperes
KW	kilowatt
L	angle; liter
LAM.	laminate
LAV	lavatory
LB	pound; load bearing
LDG.	landing; loading
LED	light emitting diode
LF	linear feet (foot)
LH	left hand
LL	live load; lead lined
LLH	long leg horizontal
LLV	long leg vertical
LONG.	longitudinal
LPG	liquid petroleum gas
LRA	locked rotor amps
LTWT	lightweight
LTG.	lighting
MAINT.	maintenance
MAN.	manual
MATL.	material
MAX.	maximum
MBH	thousand BTU per hour
M.C.	HVAC Contractor; moisture content
MCA	minimum circuit amps
MDO	medium density overlay
MECH.	mechanical
MED.	medium; medical
MFR.	manufacturer
MH	manhole
MIN.	minimum; minute
MISC.	miscellaneous
MLDG.	molding
M.O.	masonry opening; motor operated
MOD	motor operated damper
MON.	monument
MSB	mop service basin
MT.	mount
MTD.	mounted
MTG.	mounting
MTL.	metal
NC	noise criteria; normally closed
NEC	National Electrical Code (NFPA 70)
NIC	not in contract; noise isolation class
NO	number; normally open
NOC	notice of commencement
NRC	noise reduction coefficient
N.T.S.	not to scale
OA	outside air; overall
OAI	outside air intake
OC	on center
OCC.	occupant
OD	outside diameter
OH	overhead
OPG.	opening
OPP.	opposite
OPT.	optional; optimum
OZ.	ounce
P	pole
PART.	partial
PC	Plumbing Contractor; point of curve
PEND.	pendant
PERF.	perforated
PERIM.	perimeter
PERM.	permanent
PERP.	perpendicular
PH	phase
PI	point of intersection
PIV	post indicator valve
PKG	package; parking
PL	plate; property line
P. LAM.	plastic laminate
PLBG.	plumbing
PLYWD.	plywood
PNL.	panel
PORC.	porcelain
PORT.	portable
POS	positive; position
PREF.	preference
PREFAB.	prefabricated
PREFIN.	prefinished
PRELIM.	preliminary
PREV.	previous
PROJ.	project

PSF	pounds per square foot
PT	preservative treated
PVC	polyvinyl chloride
QT	quarry tile
QTY.	quantity
R	radius; thermal resistance
RA	return air
RCB	rubber cove base
RD	roof drain
REBAR	reinforcing steel bars
RECIRC.	recirculation
RECEPT.	reception; receptacle
RECT.	rectangular
REF.	reference; refrigerator
REFL.	reflected
REINF.	reinforcing; reinforced
REQD.	required
RESIL.	resilient
REV.	revision
RH	right hand; relative humidity
RM.	room
R.O.	rough opening
RPM	revolutions per minute
RS	rough sawn; rapid start
RSB	rubber straight base
RTU	rooftop unit
R/W	right of way
S4S	surfaced four sides
SA	supply air
SAN.	sanitary
SAT	suspended acoustical tile
SC	Site Contractor; solid core; shading coefficient
SCHED.	schedule
SCWD	solid core wood
SENS	sensible
SF	square feet (foot)
SGFT	structural glazed facing tile
SHT.	sheet
SIM.	similar
SM.	small
SP	static pressure
SPKR.	speaker
SQ.	square
SS	service sink; stainless steel
ST	storm
STC	sound transmission class
STD.	standard
STL.	steel
STOR.	storage
STRUCT.	structural
SURF.	surface
SUSP.	suspended
SV	sheet vinyl
SW	switch
SWR.	sewer
SYM.	symbol; symmetrical
SYS.	system
T&G	tongue and groove
TAN.	tangent
TB	through bolt; test boring
TC	top of curb
TEL.	telephone
TEMP.	temporary; temperature; tempered
TERM.	terminal
THK.	thickness
TOIL.	toilet
TP	top of pavement; telephone pole; toilet paper
TRANS.	transparent; transverse; transom
TS	tube steel
TYP.	typical
U	heat transfer coefficient
UC	under cabinet
UG	underground
UH	unit heater
UNO	unless noted otherwise
UR.	urinal
UTIL.	utility
UV	unit ventilator; ultraviolet
V	volt
V.B.	vapor barrier
VCT	vinyl composition tile
VERT.	vertical
VFY.	verify
VNR	veneer
VOC	volatile organic compound
VOL.	volume
VTR	vent through roof
VWC	vinyl wall covering
W	watt; width; west; wall
W/	with
W/O	without
WC	water closet; water column
WCO	wall cleanout
WD	wood
WDW.	window
WH	wall hydrant; water heater
WOLM.	preservative treated
WT	weight
WWF	welded wire fabric
XFMR	transformer
XFR	transfer
XPS	extruded polystyrene
YD	yard

1.03 ABBREVIATIONS – ASSOCIATIONS AND ORGANIZATIONS:

AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABAA	Air Barrier Association of America
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFPA	American Forest and Paper Association
AGA	American Gas Association
AHA	American Hardboard Association
AHRI	Air Conditioning, Heating, and Refrigeration Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALA	American Laminators Association
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute
APA	The Engineered Wood Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builder's Hardware Manufacturer's Association
BIA	Brick Institute of America
BICSI	Building Industry Consulting Service International
CDHS	California Department of Health Services
CISCA	Ceilings and Interior Systems Contractors Association
CISPI	Cast Iron Soil Pipe Institute
CPSC	Consumer Products Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DHI	Door Hardware Institute
DIN	Deutsches Institut für Normung
DOC	Department of Commerce
ECIA	Electronic Components Industry Association
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FM	Factory Mutual Engineering Corporation
FSC	Forest Stewardship Council
GA	Gypsum Association
HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	International Code Council Evaluation Service
ICEA	Insulated Cable Engineers Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IETF	Internet Engineering Task Force

ISO	International Organization for Standardization
MBMA	Metal Building Manufacturers Association
MIC	Masonry Industry Council
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NCPWB	National Certified Pipe Welding Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NFSHSA	National Federation of State High School Associations
NHLA	National Hardwood Lumber Association
NJATC	National Joint Apprenticeship and Training Committee for the Electrical Industry
NLGA	National Lumber Grades Authority
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NSI	Natural Stone Institute
NTMA	National Terrazzo & Mosaic Association
NWWDA	National Wood Window and Door Association
OBC	Ohio Building Code
ODOT	Ohio Department of Transportation
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
PS	Product Standards
RFCI	Resilient Floor Covering Institute
SDI	Steel Deck Institute
SDI	Steel Door Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Industry
SSPC	Society for Protective Coatings
TCNA	Tile Council of North America
TIA	Telecommunications Industry Association
TPS	Technical Preservation Services, National Park Service
UBC	Uniform Building Code
UL	Underwriters Laboratories
USC	University of Southern California
USGBC	U. S. Green Building Council
WDMA	Window and Door Manufacturers Association

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4520 – TESTING AND INSPECTING SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Testing and inspecting services.

1.02 TESTING AND INSPECTING SERVICES:

A. Coordinate inspection and testing work with independent testing firm employed by Owner. The testing firm will perform inspections, tests, and other services scheduled in this Section and as required by the Architect.
   1. At Owner's option, more than one firm may be employed.
   2. Testing required by individual specification Sections and not scheduled below, shall be performed at the Contractor's expense by a qualified independent testing firm acceptable to Architect and Owner.

B. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Architect.

C. The testing firm shall promptly submit reports indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
   1. Non-compliance of any portion of Work with Contract Document requirements shall be cause for rejection of that portion of Work.
   2. Retesting required because of non-conformance to specified requirements shall be performed by the same testing firm at Contractor's expense on instructions from the Architect.
   3. The testing firm is not authorized to revoke, alter, relax, enlarge, or release any requirement of the Contract Documents.

D. Cooperate with testing firm; furnish samples of materials, design mix, manufacturer or supplier certifications, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Architect and testing firm 48 hours prior to expected time for operations requiring services.
   2. Make arrangements with testing firm and pay for additional samples and tests required for Contractor's use.

E. Testing or inspecting does not relieve Contractor from performing work in full compliance with Contract Documents.

1.03 SUBMITTALS:

A. The testing firm shall distribute copies of each test report to the Architect and Contractor.

B. The first copy of each type of report, and all test reports indicating non-compliance with specified requirements, shall be submitted promptly, but not more than 72 hours after test results are available.

C. Remaining test reports shall be submitted at maximum monthly intervals.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SCHEDULE OF TESTING AND INSPECTING SERVICES:

A. Except for code required special inspections, scope of testing work is subject to modification at the discretion of the Owner. Provide periodic special inspections except where continuous special inspection is specifically indicated or required by code.

B. Earthwork Testing: Site and Building Excavating and Backfilling.

1. Testing firm shall employ a full-time Soils Engineer and Soils Laboratory qualified in soils testing and evaluation to observe site grading, and excavation and backfill, and perform the activities scheduled below.

2. Analyze native and imported fill and backfill material and top soil proposed for use to determine suitability for use and compliance with Contract Documents.
   a. Test fill and backfill material to determine soil classification, plasticity index, optimum moisture content, and dry density.

3. Field test natural grades to be retained, areas of cut, and areas of controlled fill and backfill to determine moisture content, percent of compaction and compliance with specified values.
   a. Number of Tests: Minimum number as scheduled below, and additional tests at the discretion of the Soils Engineer.
      (1) Building Area: One test for every 500 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every 10,000 square feet, located to give equal coverage to all portions of the building subgrade.
      (2) General Site Areas: One test for every 2000 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every acre, located to give equal coverage to all earthwork areas.
      (3) Exterior Slabs and Walks: One test for each air slab location, and one test for every 50 lineal feet of walk.

4. Observe building foundation excavation and subgrade preparation; confirm size, depth, and suitability of the excavated areas; test soil bearing capacity to verify compliance with specified values; test porous fill to determine soil classification, depth, and percent of compaction.
   a. Test soil bearing capacity of one column footing per 5000 square feet of building area, and every 100 lineal feet of wall foundation. Test results must indicate in-place soil bearing capacity.

C. Concrete Testing:

1. Testing firm shall test all building concrete and Portland Cement concrete pavement. The firm's personnel shall obtain samples and adequately protect all samples during storage and transporting.
   a. Check batching and mixing operation periodically for compliance with the Contract Documents.
   b. Review the manufacturer's mill test certificate for each shipment of cement and reinforcing steel, or conduct laboratory tests or spot checks of these materials as received.
   c. Mold and test concrete field cylinders as scheduled.

2. Observe placement of reinforcing bars and mesh; verify size, spacing, lap dimensions, chairs and supports, concrete cover and surface condition of reinforcing is as specified; verify adequacy of formwork and ties to prevent movement during concrete placement.

3. Test concrete materials as follows:
   a. Aggregate: ASTM C33.
   b. Cement: ASTM C150; accompany all cement used on the job with a testing agency certificate indicating compliance of cement with all tests.

4. Test concrete for slump and strength as follows:
   a. Secure composite samples in accordance with ASTM C172 from each mix design placed in any one day, or from each 100 cubic yards of concrete placed in continuous pours, whichever is less.
   b. Cast cylinder specimens from each sample; cure cylinders in accordance with ASTM C39. Test cylinders for 7-day and 28-day strength. Test reports shall include temperature of air and concrete at site, mix proportions and all data necessary to determine compliance with Contract Documents.
   c. Determine slump of the concrete for each sample and whenever consistency of concrete appears to vary; test in accordance with ASTM C143.
   d. Test a portion of the air-entrained concrete samples to determine the amount of entrained air, in accordance with either ASTM C231 or ASTM C173.
      (1) If these tests indicate at any time that air content is not within specified limits, the Contractor at his expense shall modify the materials as necessary to achieve compliance.

5. If the average strength of test cylinders for any portion of the structure constitutes a failure as defined in ACI 318, or if slump is beyond tolerances, the Architect may require changes in the concrete mix proportions at the Contractor's expense, may require additional testing in accordance with ASTM C42, or may declare all concrete work, of which the non-complying cylinders are representative samples, in violation of the Contract Documents.
6. If the work is in violation of the Contract Documents, or if there is a likelihood of the concrete having been frozen, the Contractor shall make loading tests at his expense, if so directed by the Architect. If the unit area or member under consideration fails to pass the loading test or shows evident signs of failure, the Contractor shall remove and rebuild the defective construction at his expense, or shall provide at his expense such additional construction as the Architect considers necessary to make the structure sound.
   a. Conduct loading tests in the presence of representatives of the Owner and Architect in accordance with Chapter 20 of ACI 318.

D. Masonry Testing: ACI 530.

1. Test compressive strength of mortar in accordance with ASTM C109 and ASTM C780. Cast one set of 3 specimens for each 5000 square feet of masonry wall construction for each type of mortar.
   a. Mortar: 2 inch cubes.
2. A qualified inspector shall observe masonry construction and grouting, and submit reports using NCMA TEK 18-3 Level B as a guideline.
3. Provide full-time on-site observation of flashing and weep installation. Provide photograph or video record of flashing installation at each typical condition, and at each lap, interruption, or penetration of flashing. Submit one copy to Architect, with locations identified on plan or elevation drawing.

END OF SECTION

SECTION 01 5000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Temporary Utilities: Electricity; lighting; heat and ventilation; telephone service; water.
   2. Construction Facilities: Temporary buildings; sanitary facilities.
   3. Access facilities.
   4. Work in occupied facilities.
   5. Temporary barriers, enclosures, fencing, and security.
   6. Temporary Controls: Fire protection; snow removal; water control.

B. Related Sections:
   1. Section 01 7000 – Execution Requirements: Progress cleaning, waste management and disposal; protecting installed construction.
   2. Section 01 7700 – Closeout Requirements: Final cleaning.

1.02 REGULATORY REQUIREMENTS:

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, fire department, and rescue squad rules.
   5. Environmental protection regulations.

B. Engage the appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
   1. Arrange with company and existing users for a time when service can be interrupted.
   2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked in services.

C. Provide plan approvals and permits for temporary buildings, where required by authorities having jurisdiction.

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.03 PROJECT CONDITIONS:

A. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on site.

B. Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

1.04 TEMPORARY ELECTRICITY:

A. Connect to Owner's existing power service. Do not disrupt Owner's need for continuous service. Exercise measures to conserve energy.

B. Provide grounding and ground fault circuit protection as required.

C. Provide adequate distribution equipment, wiring, and outlets to provide circuits for power and lighting.
   1. Provide 20 ampere duplex outlets on single phase branch circuits for power tools and fractional horsepower motors for every 2500 sq ft of active work area, located so that extension cords need not exceed 100 feet. Install outlets in outlet boxes with cover plates.
   2. Provide 20 ampere single phase branch circuits for lighting.
   3. Provide temporary service to field offices.

D. Use of temporary electrical power system for welding operations is prohibited.

E. Electrical Power Cords: Grounded extension cords; hard service type where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length voltage ratio.

F. Upon changeover to permanent electrical service, remove portions of the temporary electrical service no longer needed, including power and lighting distribution and utilization equipment and wiring.

1.05 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES:

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 5 footcandles. Provide additional lighting for performance of tasks.
   1. Provide lighting at each fire extinguisher location and building entrance.

B. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes to achieve a minimum lighting level of 1 footcandle.

C. Provide and maintain lighting to interior work areas after dark for security purposes to achieve a minimum lighting level of 0.25 footcandles.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

E. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide wet location rated fixtures where exposed to moisture.

F. Maintain lighting and provide routine repairs. Relocate temporary lighting as required during progress of the work.

G. Permanent lighting may be utilized during construction. Relamp as necessary so that all lighting is operable at Substantial Completion.

1.06 TEMPORARY HEAT AND VENTILATION:

A. Utilize Owner's existing HVAC equipment, extend and supplement with temporary heating and ventilation equipment as needed to maintain specified conditions for construction operations. Owner will pay cost of energy used. Exercise measures to conserve energy.

B. Maintain temperature and humidity as required by specific construction activities, as specified in individual specification sections.

C. Provide temporary heat where needed for performance of the work, for curing or drying of recently installed work, and for protection of work in place from adverse effects of low temperatures or high humidity.

1. After building enclosure, maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress and 60 degrees F in areas where finished work has been installed.

D. Ventilate enclosed areas to assist curing of materials, to dissipate humidity, to attain and maintain specified moisture levels, to prevent accumulation of dust, fumes, vapors, or gases, and to prevent temperatures of enclosed areas from exceeding ambient outdoor temperatures by more than 10 degrees F when ambient outdoor temperatures are above 70 degrees F.

1. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

E. Temporary Heat Prior to Building Enclosure:

1. The facility is not considered enclosed until the permanent building shell is essentially completed with exterior openings, windows, and doors closed by permanent or temporary closures.

2. Until the facility is enclosed, provide heating for materials to prevent damage from frost or freezing and to permit construction to continue and progress uninterrupted.

3. Provide, maintain, and supervise the operation of UL approved portable direct fired heaters, fired with LP gas, kerosene, #1, or #2 fuel oil. Salamanders and electric heaters will not be permitted. Observe necessary safety precautions; do not use LP

gas fired heaters in low places of construction, such as pits, tunnels, etc., which can collect heavier than air gas or fumes.

4. Do not use equipment producing carbon monoxide where fumes can contact freshly placed concrete or mortar.

F. Temporary Heat and Ventilation After Building Enclosure: Provide equipment with capacity to maintain minimum 50 degrees F space temperature, and to maintain minimum 60 degrees F space temperature once the space temperature has been raised above 60 degrees F.

1. Existing System: Extend and supplement existing HVAC equipment with portable units. Utilize and maintain existing controls, venting, power and fuel connections, and necessary ductwork and piping for safe and proper operation.
   a. Provide and pay for maintenance, lubrication, regular replacement of filters, and replacement of worn or consumed parts as necessary.
   b. Prior to Substantial Completion, install new filters; clean and restore equipment to previously existing condition except for ordinary wear.

2. Portable Units: Provide, maintain, and supervise the operation of approved temporary portable units, such as oil or gas fired unit heaters, furnaces, direct fired make-up air units, or similar equipment. Salamanders and electric heaters will not be permitted. Utilize natural gas fired units when natural gas is available. Units shall be properly vented, piped, and wired. Provide thermostat for temperature control and all required safety controls.

G. Temporary Dehumidification: Provide temporary dehumidification equipment where equipment used for temporary heat and ventilation is not adequate to maintain specified humidity, and where necessary to achieve specified moisture emissions rates in flooring substrates prior to finish flooring application. Provide, maintain, and supervise the operation of portable dessicant dehumidifiers, mechanical dehumidifiers, or similar equipment; equip with high volume blowers and inflatable plastic ducts. Adjust equipment and duct locations daily to assure even dehumidification.

1.07 TEMPORARY TELEPHONE AND INTERNET SERVICE:

A. Provide, maintain, and pay for telephone service where required in connection with the work. Use of Owner's existing telephone service is not permitted. Use of cellular mobile phone system is acceptable, if adequate reception can be maintained.

B. Provide, maintain, and pay for internet service where required in connection with the work. Use of Owner's internet service is not permitted. Use of cellular data system is acceptable, if adequate reception can be maintained.

C. Post a list of emergency telephone numbers at a clearly marked location accessible to all construction personnel, including but not limited to fire, police, ambulance, poison control, and each utility company providing service to the site.

D. Contractor and each subcontractor shall provide cell phone service with minimum one phone for the on-site superintendent.

1.08 TEMPORARY WATER SERVICE:

A. Provide and maintain suitable quality water service for construction operations, temporary toilets, wash facilities, and drinking water. Connect to Owner's existing water system. Owner will pay cost of water used. Exercise measures to conserve water.

B. Provide temporary piping system of sufficient capacity to meet needs of construction operations, with minimum 1 inch piping and vacuum breakers. Comply with local utility regulations. Sterilize temporary water piping prior to use.

C. Extend branch piping with outlets located so water is available in areas where construction is in progress, using maximum 100 ft hoses with threaded connections.

D. Water Hoses: Minimum ¾ inch, heavy duty, abrasion resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

E. Provide temporary pipe insulation to prevent freezing. Replace piping and hoses damaged by freezing or other causes.

1.09 TEMPORARY BUILDINGS:

A. Temporary buildings, where provided, shall meet the following requirements.

B. Offices: Prefabricated mobile units; weather tight, with lighting, electrical outlets, heating and cooling equipment, equipped with sturdy furniture, drawing rack, shelving, bulletin board, and drawing display table with minimum 36 x 48 inch top. Provide space for project meetings with table and chairs to accommodate minimum one representative of the Architect, Owner, Contractor, and each major Subcontractor. Provide first aid kit and portable fire extinguisher.

C. Sheds: Weather tight, substantial, of sufficient size to hold on-site materials which are subject to weather damage. Raise floors minimum 6 inches above ground on heavy joists or sleepers.

D. Locate temporary buildings in approved locations, a minimum distance of 30 ft from existing and new structures.

E. Provide walks for access to office from parking areas and from building.

1.10 TEMPORARY SANITARY FACILITIES:

A. Provide and maintain temporary toilets in quantity and location required by applicable codes and regulations.

B. Existing facility use is not permitted.

C. Maintain facilities daily in clean and sanitary condition. Provide toiletry supplies.

1.11 ACCESS FACILITIES:

A. Construct and maintain culverts, ramps, steps, platforms, scaffolds, and other means of access so that no portion of the Work is delayed or handicapped due to a lack of such facilities.

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

C. Vehicular Access and Parking: Limit parking for private vehicles of Contractor and Subcontractor personnel to designated areas. When site space is not adequate, provide additional off-site parking.

D. Construct and maintain temporary gravel areas to accommodate staging and outdoor storage of construction materials.

E. At lawn areas, remove gravel from site after parking or material storage is no longer required; finish grade and seed areas in accordance with Sections 31 2000 and 32 9200.

1.12 ISOLATION OF WORK AREAS IN OCCUPIED FACILITIES:

A. Provide temporary partitions and ceilings as indicated and as necessary to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
   1. Construction: Framing and plywood or gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces. Paint surfaces exposed to view from Owner occupied areas.

B. Prevent dust, fumes, and odors from entering occupied areas.
   1. Disconnect supply and return ductwork in work area from HVAC system serving occupied areas.
   2. Maintain negative air pressure within work area using HEPA-equipped air filtration units.
   3. Use vacuum collection attachments on dust producing equipment.
   4. Where limited work is required within occupied areas, use portable dust containment devices.
   5. Perform progress cleaning and final cleaning using vacuum equipment equipped with HEPA filters.

1.13 TEMPORARY BARRIERS:

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and public walkways required by governing authorities for public rights-of-way and for public access to existing buildings.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. Provide and maintain barrels with reflective tape and battery operated flashers to direct vehicular traffic away from construction areas.

F. Provide barriers as required by applicable regulations at edges of openings and other hazards, painted with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against.

1.14 EXTERIOR ENCLOSURES:

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Close openings of 25 square feet or less with plywood or similar materials. Close larger openings with plywood or fire retardant reinforced polyethylene securely attached to fire retardant treated wood framing.

C. Close openings through floors, roofs, and horizontal surfaces with load bearing, wood framed construction.

D. Maintain required exits for protection of life and property.

1.15 TEMPORARY FENCING:

A. Construction: Commercial grade chain link fence.

B. Provide 6 ft high fence around construction area and material storage areas; equip with vehicular and pedestrian gates with locks.

C. Where required due to construction operations and sequence, relocate or remove and reinstall temporary fencing. Repair damaged fencing.

D. Where construction sequence requires multiple relocations of temporary fencing, relocatable sections of fencing in maximum 12 foot lengths may be used, subject to approval.

1.16 SECURITY:

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Limit entry into construction areas to the following:
   1. Contractor, including employees and Subcontractors.
   2. Architect, Owner, and persons authorized by them.
   3. Regulatory agency personnel legally entitled to inspect the project.

C. Limit construction personnel to designated construction areas and access routes.
   1. Limit construction activities to Owner's property, street and highway rights-of-way, and permanent easements.

2. Do not enter on or occupy with workers, tools, equipment, or material any ground outside the designated construction areas without written consent of the Owner of such property.
3. Provide approved temporary signage as required to provide directional information to construction personnel and visitors.

1.17 TEMPORARY FIRE PROTECTION:

A. Provide and maintain portable fire extinguishers, readily accessible throughout areas where work is in progress, in accordance with applicable fire code and local fire department regulations. At minimum, provide one 20 lb. ABC extinguisher for each 3000 square feet of floor area.

B. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher. Provide additional extinguishers at locations where hazardous work is in progress, including but not limited to painting, welding, or using torches or open flames for heating or cutting.

C. Store combustible materials in containers in fire safe locations.

D. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and access routes for fighting fires.

E. Prohibit smoking in hazardous fire exposure areas.

F. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

G. At the earliest feasible date in each area of the project, complete installation of permanent fire protection facilities, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

1.18 SNOW REMOVAL:

A. Owner will provide snow removal from Owner occupied roads, parking areas and building entrances.

B. Remove snow from construction roads and parking areas, work areas, material storage areas and field offices as required.

C. Do not allow the accumulation or drifting of snow on roof areas in excess of design loads.

1.19 WATER CONTROL:

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. Architect reserves the right to require additional pumping equipment without adjustment of Contract Sum.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion. Provide temporary soil erosion and sediment control in accordance with ODOT SS 832.

C. Control surface drainage at all areas to limit runoff onto adjacent properties to existing locations and quantities.

1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS:

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

B. Relocate temporary utilities, equipment, and facilities as necessary to correct interference with permanent construction or to facilitate operations of other trades.

C. Remove temporary utilities, equipment, facilities, and materials as rapidly as progress of the Work allows. Perform final removal prior to Final Application for Payment.

D. Remove underground installations to a minimum depth of 3 ft. Grade site as indicated.

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

F. Restore existing facilities to original condition. Restore permanent facilities used during construction to specified condition. Repair damage to existing pavement and roads caused by construction operations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 6000 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Basic product requirements.
   2. Product options.
   3. Substitution procedures.
   4. Product delivery requirements.
   5. Product storage and handling requirements.

1.02 BASIC PRODUCT REQUIREMENTS:

A. Provide new equipment and materials meeting quality standards of the manufacturer. Defective, damaged, reconditioned, or substandard equipment and materials are not acceptable. Remove unacceptable materials incorporated in the Work, replace with sound materials meeting specified criteria, and perform related corrective work to meet approval of Architect.

B. Provide all equipment and materials required for complete assemblies and systems. Omissions of specific reference to incidental parts or accessories required does not constitute a release from furnishing such items.

C. Products of the same type shall be provided by the same manufacturer unless specifically approved by the Architect.

D. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

E. Do not use materials containing asbestos.

F. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

G. Provide interchangeable components of the same manufacture, for components being replaced.

H. Finishes:
   1. Where multiple colors, patterns, or finishes are available, selection will be made from manufacturer's standard range unless specifically indicated otherwise. Submit samples for selection under the provisions of Section 01 3300.
   2. If not otherwise specified, provide equipment with manufacturer's standard baked enamel finish or equal. Do not field paint equipment unless specifically noted in the Contract Documents.

1.03 PRODUCT OPTIONS:

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers, Fabricators, or Installers: Products of manufacturers, fabricators, or installers named and meeting specified criteria, standards and description. Submit a request for substitution in accordance with the following article for any manufacturer, fabricator, or installer not named.
   1. Where a manufacturer is listed by name only without model numbers or specific product reference, a request for substitution is not required. Where products of another manufacturer are listed by model number, provide the closest equivalent product meeting the specified requirements.
   2. All Products must meet specified criteria, standards and descriptions. For manufacturers listed by name only without model numbers or specific product reference, standard products may require modifications and accessories, which shall be included.
   3. Drawings and details incorporate design parameters specific to the products of manufacturers listed by model number in the specifications and schedules. Where equivalent products of other listed manufacturers are provided, coordinate related work and the work of other trades with the requirements of the products provided. Items requiring coordination include, but are not limited to, unit dimensions and clearances, roof openings and curbs, unit weight and structural supports, housekeeping pad dimensions, piping, venting, electrical requirements, controls, panelboard and light fixture dimensions and clearances, motor controls and connections, and equipment connections.
   4. Where a product listed by model number or specific product reference has been superseded or replaced by a different Product from the same manufacturer, provide the replacement Product, but not before submitting product data in accordance with Section 01 3300 for approval, specifically indicating all differences between the specified Product and the replacement Product.

C. The phrase "or equal" or similar language does not exempt substitutions from compliance with the following Substitution Procedures. No substitutions are permitted unless specifically approved in writing for this Work by the Architect.

1.04 SUBSTITUTION PROCEDURES:

A. Architect will consider requests for Substitutions only prior to receipt of bids or within 15 days after date of Notice to Proceed. Due to time constraints, requests made later than 5 business days prior to the scheduled bid opening may not be reviewed. Submit request for Substitution to the Architect.

B. Requests for Substitutions may be made by Prime Bidders/Contractors only. Requests made by others will not be considered unless made jointly with a Prime Bidder/Contractor.

C. Bids shall include specified Products only, unless Substitution is approved by Addendum issued prior to receipt of bids.

D. Substitutions requested more than 15 days after date of Notice to Proceed may be considered or rejected without consideration, at the discretion of the Architect, and are limited to the following circumstances:

   1. Specified Products become unavailable through no fault of the Contractor. Such Substitutions shall not result in additions to the Contract Sum or Contract Time.

   2. The Substitution offers the Owner a substantial advantage in initial cost, life cycle cost, time, energy conservation, sustainable design, or other considerations, after deducting costs for redesign and coordination. Requests for such Substitutions shall include detailed information on the changes to the Contract Sum and Contract Time, including that of separate Contractors.

   3. None of the specified Products can meet the requirements of the Contract Documents, or receive necessary approval by a governing authority, and the Contractor certifies that the Substitution will meet the requirements. Such Substitutions shall not result in additions to the Contract Sum or Contract Time, except to the extent caused by regulatory requirements enacted or modified after the bid date.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitutions will be reviewed for general conformance with the intent of the Contract Documents but not for detailed compliance with all specified requirements. Approval of substitutions does not relieve the Contractor of the responsibility to comply with the Contract Documents, unless the variation is specifically identified in the substitution request.

G. Substitutions incorporated in the Work without Architect's approval shall be removed and replaced with specified Products without additions to the Contract Sum or Contract Time.

H. Substitution Submittal Procedure: Submit Substitution Request Form attached, or provide a cover letter with equivalent information. Limit each request to one proposed Substitution.

   1. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents. Documentation shall specifically note variations from specified Products in function, dimensions, weight, appearance, quality, code compliance, durability, availability of service and parts, and interfaces with related construction.

   2. Submit product data, certified test results, and other supporting data sufficient to demonstrate the proposed Product equivalence. Burden of proof is on proposer.

At Architect's option, installation references and samples of actual products may be required.

3. For products specified to receive warranty coverage, Substitution request shall include a preliminary copy of the specific warranty.
4. Submittal of a Substitution request, or incorporation in the Work of an approved Substitution, constitutes a representation that the submitter:
   a. Has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
   b. Will provide the same warranty for the Substitution as for the specified Product.
   c. Will coordinate installation and make changes to other Work, including the Work of separate Contractors, which may be required for the Work to be complete without additions to the total Contract Sum or Contract Time.
   d. Waives claims for additional costs or time extension which may subsequently become apparent.
   e. Will reimburse Owner and Architect for review or redesign services if re-approval by authorities is required.
5. Architect will notify submitter of decision to accept or reject request. Architect's decision is final.
6. Architect reserves the right to reject requests not containing sufficient information to enable Architect to completely evaluate the request without delay in the scheduled bid opening.

1.05 PRODUCT DELIVERY REQUIREMENTS:

A. Schedule deliveries to coordinate with installation schedule, to minimize long term storage at site and to minimize possibility of damage, deterioration, theft and other losses.

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

C. Accept Products at site, including unloading and uncrating. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

1.06 PRODUCT STORAGE AND HANDLING REQUIREMENTS:

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

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

D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store and handle Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to prevent overcrowding and to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

I. Do not exceed manufacturer's shelf life limitations. Discard and replace Products not installed prior to stated expiration date.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 ATTACHMENTS:

A. Substitution Request Form.

END OF SECTION

SUBSTITUTION REQUEST FORM

Specified Product:

_____	_____	_____
Section	Paragraph	Description

Proposed Substitution: _____

Attachments: _____

The undersigned requests consideration of this Substitution and certifies that the attached product data and other supporting information indicates all variations from the specified Product, in accordance with the requirements and representations of Section 01 6000, and that the following statements are correct unless modified by attachments:

1. The Prime Bidder/Contractor has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
2. The same warranty will be provided for the Substitution as for the specified Product.
3. Installation will be coordinated with other Work, including the Work of separate Contractors, without additions to the total Contract Sum or Contract Time.
4. The Prime Bidder/Contractor will pay for changes to the building design if additional design or detailing is required to properly integrate the Substitution into the Work, and for additional services required to obtain the approval of governing authorities.

SUBMITTER:
(if other than Prime Bidder/Contractor)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

PRIME BIDDER/CONTRACTOR:
(must be completed)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

ARCHITECT'S RESPONSE:

___ Addendum or contract modification to be issued
___ Additional information needed
___ Not approved
___ Received too late

By: _____ Date: _____

Notes: _____

SECTION 01 7000 – EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Examination.
   2. Preparation.
   3. Field engineering.
   4. Execution.
   5. Progress cleaning.
   6. Construction waste management and disposal.
   7. Protecting installed construction.

B. Related Sections:
   1. Section 01 7700 – Closeout Requirements: Final cleaning.
   2. Section 02 4119 – Selective Demolition.

1.02 SUBMITTALS FOR INFORMATION: In accordance with Section 01 3300.

A. Construction Waste Management Plan: Identify material types and estimated quantities for recycling, reuse, or sorting. Describe separation requirements, on-site storage requirements, destinations and transportation methods for each type of material. For waste that cannot be recycled, identify disposal locations and methods.
   1. Provide copy of construction waste management plan to each worker, subcontractor, and supplier when they first begin work on site. Provide periodic training and enforcement as necessary.

1.03 EXAMINATION:

A. Verify that existing site conditions, field measurements, and substrate surfaces are acceptable for subsequent Work. Beginning new Work indicates acceptance of existing conditions.

B. Verify that existing substrate is capable of structural attachment of new Work being applied or attached.

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

D. Verify that utility services are available, of the correct characteristics, and in the correct location.

1.04 PREPARATION:

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

1.05 FIELD ENGINEERING:

A. Locate and preserve survey control and reference points, and establish elevations, lines and levels, under the supervision of experienced engineering and surveying personnel utilizing recognized engineering survey practices.

B. Arrange for replacement of dislocated or destroyed survey control points, or relocation required by changes in grade or other reasons, based on original survey control. Permanent points removed or destroyed during progress of the Work shall be reinstalled at the expense of the party responsible for their removal.

C. Verify setbacks and easements; confirm Drawing dimensions and elevations.

1.06 EXECUTION:

A. Install, erect, and apply Products in accordance with manufacturer's instructions and recommendations. In the event of conflict with requirements of the Contract Documents, request resolution in accordance with Section 01 3100.

B. Cutting and Patching:

1. New Construction: Provide chases, openings, and recesses in new construction, where required by the work of each trade; provide and set in place all boxes, sleeves, inserts, and similar components.

2. Existing Walls, Floors and Ceilings: Work shall be done by persons skilled and experienced in the applicable trade. Finish work shall match material and quality of adjacent construction to the approval of the Architect.

3. Existing Roofs: Where cutting and patching is required in existing roofing, such work shall be done by the Roofing Installer as part of his work, and shall be included in his bid. Curbs, sleeves, and related items shall be furnished by the Contractor requiring same.
   a. For work affecting existing roofing covered by a manufacturer's warranty, the manufacturer shall approve the Roofing Installer. Maintain existing warranty coverage.

4. Slabs, Walks, and Pavements: Saw cut existing materials to provide a neat joint at removal limits, except where removal terminates at an existing joint. Pin new concrete to existing with #5 bars, minimum 24 inches long, spaced at 18 inches o.c. and embedded minimum 12 inches into existing concrete.

5. Submit written request in advance of cutting or altering elements which may affect:
   a. Structural integrity of element.
   b. Integrity of weather-exposed or moisture-resistant elements.
   c. Efficiency, performance, maintenance, useful life, or safety of element.
   d. Visual qualities of elements exposed to view.

e. Work of Owner or separate Contractor.

6. Execute cutting, fitting, and patching, including excavation and fill, to complete Work, and to:
   a. Fit the several parts together, to integrate with other Work.
   b. Uncover work to install or correct ill-timed Work.
   c. Remove and replace defective and non-conforming Work.
   d. Remove samples of installed Work for testing.
   e. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

7. Execute work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

8. Minimize cutting and patching in construction with fire or smoke separation requirements, where shown on the Drawings. Execute work by methods which will not reduce fire ratings or permit passage of smoke.

9. Cut masonry and concrete materials using masonry saw or core drill.

10. Do not cut, notch, or bore holes in metal framing members without approval; utilize factory punch-outs or holes where present. Do not cut or notch flanges.

11. Restore Work with new Products in accordance with requirements of Contract Documents.

12. Refinish surfaces to match adjacent finishes in all respects, including color, size and texture. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

13. Identify hazardous substances and conditions exposed during the Work to the Architect for decision or remedy.

C. Above-Ceiling Work: Where work is required above existing suspended ceilings scheduled to remain, or where new suspended ceilings are installed before overhead work is complete, remove and protect ceiling panels as required for access to work areas. Use caution to avoid damage to ceiling grid. Reinstall ceiling panels when work is complete and tested. Coordinate and pay for repair or replacement of grid, panels, and related components damaged during performance of the work.

D. Items Removed for Reinstallation:

1. Items removed which are to be relocated, reused, or reinstalled in existing locations, shall be stored on site in approved locations until progress of the work permits reinstallation.

2. Contractor removing the items shall be responsible for their storage and protection.

1.07 PROGRESS CLEANING:

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

B. Clean dirt, debris, and mud from on-site locations as directed. Clean and wash down construction vehicles prior to leaving the site as required to minimize tracking of dirt, debris, and mud onto public roads. Clean dirt, debris, and mud from public roads as directed.

C. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, shafts, trenches, equipment vaults, manholes, and other limited access or remote spaces, prior to enclosing the space.

D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust. Clean surfaces of installed products in accordance with manufacturer's instructions.

E. Collect non-hazardous waste materials, debris, packaging materials, and rubbish on a daily basis and place in dumpsters or approved locations for recycling or salvage.

F. Clean and organize work areas daily. Maintain cleanliness in all work areas to assist other Contractors, suppliers, and the Owner in the timely installation of equipment and implementation and completion of concurrent responsibilities.

1.08 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL:

A. Provide and maintain containers of adequate size to receive scrap construction materials, packaging and debris generated by performance of the work.
   1. Do not dispose of construction waste materials in trash receptacles or recycling containers designated for Owner's use.
   2. Do not allow waste materials to accumulate on site. Change out loaded containers for empty containers as demand requires.
   3. Remove and promptly dispose of contaminated or vermin infested materials.
   4. Post approved temporary signage at waste collection areas to assist workers in achieving waste management goals.

B. Recyclable and Recoverable Material: Materials may be separated, stored, protected, and handled at the project site, or transported off-site for separation. Arrange for regular collection, transport, and delivery to respective approved recycling centers to keep site clear and prevent contamination of materials.

C. Salvaged Materials: Temporarily store on site in approved locations, neatly stacked and arranged; remove from the Owner's property promptly. Salvaged material shall not be sold on site.

D. Hazardous Substances: Collect and remove from site daily, and dispose of off-site in a legal location and manner, all hazardous substances in aerosol cans, tubes, pails, buckets, barrels, canisters or other factory packaged containers. Do not dispose of

hazardous substances on-site or in containers for materials to be recycled, salvaged, or disposed of in landfills.

1.09 PROTECTING INSTALLED CONSTRUCTION:

A. Protect equipment and materials from damage during installation. Replace or repair equipment, material or facilities damaged by the Contractor during, or due to, or in the performance of the Work, as directed by the Architect.

B. Protect installed Work; provide special protection where specified in individual specification sections.
   1. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
   2. At the end of each work day, protect all work likely to be damaged from weather, rain, wind, storms, frost, heat, and other causes of injury or damage.
   3. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
   4. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
   5. Upon installation of finish materials and construction exposed to view, and where existing work and finish materials are not indicated to be removed or modified by the work of this project, protect such construction against damage or injury, using materials that may be easily removed without leaving residue or permanent stains.
   6. During construction, cap, plug, or cover open ends of ducts, piping, and conduit, and equipment openings, to prevent entry of foreign material.

C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, follow recommendations for protection from waterproofing or roofing material manufacturer.

D. Prohibit traffic from landscaped areas.

E. Properly and carefully repair materials and finishes which are cut, damaged, disturbed or interfered with to match adjacent and surrounding surfaces, to the approval of the Architect. If repairs cannot be made satisfactorily, replace or refinish with new materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 7700 – CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Final cleaning.
   2. Closeout procedures.
   3. Project record documents.
   4. Operation and maintenance data.
   5. Warranties.
   6. Spare parts and maintenance materials.

B. Related Sections:
   1. Section 01 2900 – Payment Procedures.
   2. Section 01 3100 – Project Management and Coordination.
   3. Section 01 7000 – Execution Requirements: Progress cleaning.

1.02 FINAL CLEANING:

A. Execute final cleaning prior to final project assessment. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to the condition expected from a commercial cleaning and maintenance program. Comply with manufacturer's instructions.

B. Upon completion of the work, remove debris, tools, machines, construction equipment, and other items pertaining to the work.

C. The following are examples, but not by way of limitation, of cleaning levels required.
   1. Remove labels not required as permanent labels.
   2. Clean transparent and reflective materials, including glass (both sides), to a polished condition; remove vision-obscuring materials and substances. Replace broken glass and damaged materials. Restore reflective surfaces to original reflective condition.
   3. Clean exposed hard-surfaced materials to a dirt-free condition, free of dust, stains, films, and noticeable distracting substances.
   4. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces.
   5. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substances.
   6. Remove spatters or other deposits of paint, mortar, concrete, adhesives, roofing, dirt, soil, oil, or any other material foreign to the surface involved.
   7. Vacuum clean carpeted and soft surfaces.
   8. Clean light fixtures to function with full efficiency.

9. Wet mop hard surface floors. Clean concrete floors in unfinished spaces broom clean.
10. Clean debris from roofs, gutters, down pipes, and drainage systems.
11. Clean site, including landscaped and developed areas, free from litter and foreign substances; sweep paved areas broom clean, remove stains, petrochemical spills, and other foreign deposits; rake clean ground surfaces not landscaped or paved, to a smooth, even textured surface.
12. Remove waste and surplus materials, rubbish, and construction facilities from the site; dispose of lawfully.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Comply with governing regulations and safety standards for cleaning operations.

F. Additional cleaning required after final cleaning due to punch list work and warranty repairs shall be performed by the Contractor responsible for the additional work.

1.03 CLOSEOUT PROCEDURES:

A. At Substantial Completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents (except for punch list items attached to certification) and ready for Architect's review.

B. Submit the following to Architect. Final Application for Payment will not be processed until all submittals are received.
   1. Closeout Submittals in accordance with this Section, including project record documents, operation and maintenance data, and warranties.
   2. Receipt signed by Owner, acknowledging delivery of spare parts and maintenance materials. List specific items and quantities.
   3. Copy of Certificate of Plan Approval, Certificate of Occupancy, and other required regulatory approvals, with signatures of all inspectors. Originals shall remain on site; obtain receipt from Owner.
   4. Affidavit of Payment of Debts and Claims (00 6520).
   5. Consent of Surety to Final Payment (AIA Document G707).
   6. Final Waiver of Lien from each subcontractor.
   7. Certificates of Insurance for Prime Contractor and each subcontractor.
   8. Prevailing Wage Affidavit of Compliance.

C. Submit final Application for Payment in accordance with Section 01 2900.

1.04 PROJECT RECORD DOCUMENTS:

A. Maintain one set of the following record documents on site; record actual revisions to the Work:
   1. Drawings.

2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed submittals including shop drawings and product data.
6. Manufacturer's instructions for assembly, installation, and adjusting.

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

C. Store record documents separate from documents used for construction. Label each document "Project Record Documents" in stamped or printed letters, on front cover or other conspicuous place.

D. Record information concurrent with construction progress, before internal or hidden construction is concealed.

E. Make documents available to Architect at all times.

F. Record Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
1. Manufacturer's name, product model and number, and supplier.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish floor datum.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Changes made by Addenda and modifications.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

H. Record Submittals: Approved product data and manufacturer's installation instructions, marked to record field changes.

I. Remove Architect title block and seal from all documents.

J. Submit to Architect prior to or together with final Application for Payment.

1.05 OPERATION AND MAINTENANCE DATA:

A. General Requirements:

1. Submit to Architect for review; allow sufficient time for review and revision prior to final Application for Payment. Upon approval, submit final copies to Owner and Architect.

2. Submittals to Architect and Owner shall be in electronic format. At Owner's option, also submit up to two hard copy sets.

3. Electronic Submittals: Data submitted in electronic format shall be limited to PDF files on DVD or USB drive, unless otherwise approved in advance by Architect.

4. Hard Copy Submittals:
   a. Submit data bound in 8½ x 11 inch format, organized in three-ring binders with durable rigid covers. Provide multiple volumes where appropriate; organized and labeled in a coordinated set with matching appearance.
   b. Prepare binder cover with printed title of manual and title of project. Identify subject matter of binder on cover and spine.
   c. Include a Table of Contents for each volume.
   d. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titles clearly printed under reinforced plastic tabs.

B. Operation and Maintenance Manuals:

1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, suppliers, and maintenance providers.

2. Operation and Maintenance Instructions: Arrange by system and subdivide by specification section. For each category, identify the following as applicable to the Product or system:
   a. Significant design criteria.
   b. List of products, clearly identifying specific product or part installed, with options and accessory items indicated.
   c. Schematic drawings and wiring diagrams for each system, with parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   f. Maintenance instructions for equipment and systems, including recommended service intervals and troubleshooting procedures.
   g. Information required for reordering specially manufactured products.

3. Project Documents and Certificates: Include the following:
   a. Test reports for each item with specified field or laboratory testing.
   b. Warranty documents in accordance with this Section. Indicate names, addresses, telephone numbers, and procedures for filing a claim and obtaining warranty services.
   c. Sprinkler installer's material and test certificate.
   d. HVAC testing and balancing reports in accordance with Section 23 0593.

1.06 WARRANTIES:

A. General Requirements:

1. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers. Manufacturer's disclaimers and limitations on

product warranties do not relieve Contractor of warranty on Work that incorporates products.
2. Include in Operation and Maintenance Manuals.
3. For items of Work delayed beyond date of Substantial Completion, provide updated submittal prior to or together with final Application for Payment, listing date of actual completion as start of warranty period.
4. Written warranties made to Owner are in addition to contractual, implied, and expressed warranties, and shall not limit duties, obligations, rights and remedies otherwise required by Contract Documents and available under law.
5. Warranty claims shall be resolved in the same venue and using the same dispute resolution method as provided for the Prime Contract.

B. Contractor's Warranty: Contractor shall provide warranties, and shall correct nonconforming Work, in accordance with the General Conditions.

C. Specific Warranties: Provide written documentation for each warranty specified in individual specification sections.
1. At the time of shop drawing and product data submittal, submit a preliminary copy of each specific warranty for review in accordance with Section 01 3300.
2. Provide full warranty for parts and labor, without dollar amount limitation or proration based on period of use, unless specifically indicated in individual specification sections.
3. Warranty periods begin on the Date of Substantial Completion, unless specifically indicated in individual specification sections. Where manufacturer warranties begin at an earlier date, such as the date of shipment or installation, coordinate procurement and scheduling so that specified warranty periods are not compromised. Provide extended warranty coverage where necessary.
   a. In the event that items of Work covered by a warranty have punch list work remaining on the Date of Substantial Completion, the warranty period shall not begin until all such work is complete.
4. Where Warranties from Subcontractors, suppliers or manufacturers are limited to material only, Contractor shall include warranty coverage for labor, shipping, equipment, and other costs required to remove defective Work and install replacement materials.
5. Warranty provisions requiring Owner to provide notice to manufacturer shall allow a minimum time period of 30 days for such notice.
6. If the terms of a warranty require Owner signature, registration, or other action prior to commencement of warranty coverage, Contractor shall take all necessary steps to ensure validity of the warranty, and shall indemnify Owner for loss of warranty coverage caused by failure to do so.

D. Manufacturer Warranties: Where a manufacturer provides a standard product warranty that exceeds the duration of the Contractor's warranty or a Specific Warranty, Contractor shall take all necessary actions to ensure that the manufacturer warranty remains in effect beyond the expiration of the shorter warranty periods.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS:

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Extra materials shall be from the same lot as installed materials.

C. Provide protective covering for storage; identify with appropriate labels.

D. Deliver to project site and place in location as directed.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02 4119 – SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Minor demolition and removal for remodeling.

B. Related Sections:
   1. Section 01 3100 – Project Management and Coordination: Alteration project procedures.
   2. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures.
   3. Section 01 7000 – Execution Requirements: Cutting and patching; items removed for reinstallation; progress cleaning; construction waste management and disposal.

1.02 REGULATORY REQUIREMENTS:

A. Comply with all applicable codes and regulations in addition to being responsible for the prevention of any damage to the adjoining materials and site.

B. Permits: Secure and pay for all necessary permits required for this portion of the work.

C. Do not close or obstruct egress width to any building or site exit unless approved in writing.

D. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

E. Comply with requirements of Ohio Environmental Protection Agency and U.S. EPA.
   1. If notification of demolition or renovation is required, provide all required documentation to the appropriate agency.
   2. If testing, inspection, or analysis of potential asbestos-containing material is required, employ a certified Asbestos Hazard Evaluation Specialist to perform such work.
      a. This Contractor's bid shall be submitted on the basis that the amount of regulated asbestos-containing material (RACM) to be removed or disturbed, if any, will be less than the quantity regulated by the National Emission Standards for asbestos.
      b. If testing, inspection, or analysis reveals quantities of RACM sufficient to subject the project to the requirements of the National Emission Standards for asbestos, promptly notify the Architect and the Owner, and do not disturb any materials identified as RACM. The Owner will issue special instructions relating to the disposition of such material. The Owner reserves the right to contract independently for the removal of any or all hazardous materials.

3. If required to do so, employ an individual trained in the provisions of the National Emission Standards for asbestos. This individual shall be on site at all times during the removal of RACM.

1.03 PROJECT CONDITIONS:

A. Provide labor, materials, equipment, insurance and services necessary for the proper and entire completion of the demolition work required for the project.

B. Visit the site prior to bidding and ascertain pertinent local conditions such as location, accessibility and general character of the site, the character and extent of the existing work within or adjacent to the site, and any other work being performed thereon at the time.

C. Include the removal and disposition (or the incorporation in the new work, as the case may be) of all existing portions of the work which are indicated as being removed, or when it becomes necessary to remove such in order to properly complete the new work as shown.

D. Maintain adequate safety measures at all times to protect the existing building, adjacent buildings, their occupants, employees, pedestrians and anyone who may have occasion to frequent the premises in the course of maintaining normal operations. There shall be complete cooperation among Architect, Owner and Contractors to see that all safety requirements are carried out.

E. Where adjoining construction or site improvements are in a condition that might be misconstrued as damage caused by demolition operations, prepare photographs or video of sufficient detail to document existing conditions; deliver to Architect prior to beginning demolition.

F. Furnish all necessary shoring, signs, barricades, dust curtains, etc., to ensure the safety of persons in adjacent areas and other workers in same area.

G. During working hours the Contractor shall be on the job personally or shall be represented by a competent superintendent. The Contractor shall coordinate all trades and subcontractors and provide adequate labor, equipment and materials as needed.

H. Conduct demolition to minimize interference with occupied building areas.

I. Cease operations immediately if structure appears to be in danger; notify Architect. Do not resume operations until directed.

J. Ownership of Removed Materials:
   1. Salvageable and reusable equipment and materials removed are the property of Owner, and shall be delivered to the locations directed by Owner.
   2. Removed materials that are obviously not reusable shall be removed from the site and disposed of.
   3. Items in question shall be brought to the attention of the Owner's representative, who shall determine whether they are to be salvaged or removed from the site and disposed of.

1.04 SEQUENCING AND SCHEDULING:

A. Perform and complete demolition work in a timely manner so as not to disrupt adjacent activities any longer than necessary.

B. Coordinate scheduling of noisy, odor-producing and dusty work with Owner to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Provide labor, materials, tools, and equipment as necessary to complete demolition work.

PART 3 EXECUTION

3.01 PREPARATION:

A. Provide, erect and maintain temporary barriers and partitions where indicated and where required to prevent spread of dust, odors and noise to occupied areas, in accordance with Section 01 5000.

B. Erect and maintain weatherproof closures for exterior openings in roofs, windows, and walls in accordance with Section 01 5000.

C. Protect existing materials and surfaces which are not to be demolished.

D. Prevent movement of structure; provide bracing and shoring.

E. Notify affected utility companies and utilities protection services at least two full working days before starting work; comply with their requirements. Mark site to indicate proposed excavation area.

F. Mark location and termination of utilities.

G. Provide appropriate temporary signage including signage for exit or building egress.

3.02 DEMOLITION:

A. Disconnect, remove, cap and identify designated utilities within demolition areas.

B. Demolish in an orderly and careful manner. Protect existing supporting structural members.

C. Removal of Site Construction: ODOT 202.

D. Removal of Slabs, Walks, and Pavements: Saw cut existing materials to provide a neat joint at removal limits, except where removal terminates at an existing joint.

E. Removal of Concrete and Masonry Walls: Saw cut existing materials to provide a neat joint at removal limits.
   1. Where wall to be removed is in plane with wall to remain, saw cut and remove material to nearest vertical masonry joint (minimum 8 inches) outside indicated limits of removal.
   2. Where new opening is to be provided at existing wall, saw cut vertical edge of new opening and remove material to nearest vertical masonry joint (minimum 8 inches) outside indicated limits of removal. Saw cut head and sill of new opening and remove material to first horizontal masonry course outside the indicated limits of removal.
   3. Where wall to be removed is perpendicular to wall to remain, saw cut block and remove material flush with surface to remain.
   4. Where concrete block is removed from existing floor slab to remain, fully remove bed joint material and leave concrete floor surface suitable for the installation of new floor material.

F. Removal of Ceiling Systems: Where suspended ceilings are indicated to be removed, removal shall include light fixtures, grilles and diffusers, suspension system, hanger wire, clips, anchors, hangers, and blocking.

G. Removal of Resilient Flooring: Where resilient tile or sheet flooring is indicated to be removed, removal shall include removal of mastics and adhesives in accordance with RFCI Recommended Work Practices.

H. Removal of Casework: Where casework is indicated to be removed, removal shall include countertops, plumbing fixtures, anchors, hangers, blocking, and backsplashes or sealant on adjacent surfaces.

I. Removal of Plumbing and HVAC Work:
   1. Verify that abandoned piping and ductwork serve only abandoned facilities.
   2. Disconnect piping and duct systems in walls, floors and ceilings scheduled for removal. Cap existing components to remain at point of disconnection.
   3. Reroute, extend, and reconnect existing systems to maintain integrity of branch or loop serving components not removed.
   4. In building areas to remain, remove abandoned systems to source of supply.
   5. Disconnect and remove abandoned equipment and components, including devices, fasteners, and support framing.
   6. Maintain access to existing equipment and components which remain active. Modify installation or provide access panel as appropriate.

J. Disposal: Remove demolished materials from site except items to be retained by Owner or reinstalled in the work, or as specifically noted otherwise. Do not burn or bury materials on site. Pay fees for transportation and disposal of removed materials.
   1. Dispose of materials removed from the site in a legal location and manner.
   2. Remove and dispose of mercury-containing switches and thermostats in accordance with EPA regulations. Transport in accordance with ODOT regulations.

3. Do not dispose of demolished materials, excavated materials, trees, brush, or other debris in wetlands, flood plains, stream corridors, environmentally sensitive areas, surface waters or storm sewers, even with the permission of the property owner.
4. Do not engage in open burning of debris removed from the project, except in compliance with the regulations of all authorities having jurisdiction, and with all required permits.

K. Remove materials as work progresses. Upon completion of work, leave areas in clean condition.

L. Remove temporary work.

3.03 MINOR ELECTRICAL DEMOLITION FOR REMODELING:

A. Examination:
1. Verify field measurements and circuiting arrangements are as shown on Drawings.
2. Verify that abandoned wiring and equipment serve only abandoned facilities.
3. Demolition drawings are based on superficial field observation and existing record documents, where available. Report discrepancies to Architect before disturbing existing installation.
4. Beginning of demolition means installer accepts existing conditions.

B. Preparation:
1. Disconnect electrical systems in walls, floors and ceilings scheduled for removal.
2. If electrical panels attached to surfaces to be demolished contain circuits serving equipment or devices to remain, relocate panel to approved location in area not affected by demolition; rewire circuits to new panel location.
3. Coordinate utility service outages with Utility Company and Owner.
4. Provide temporary wiring and connections to maintain existing systems in service during construction.
5. Where new systems are installed in place of existing systems, maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

C. Demolition:
1. Remove, reroute, or replace existing facilities and services as required to permit installation of new work or alterations to old work.
2. Remove abandoned wiring to source of supply.
3. Remove exposed abandoned conduit, including abandoned conduit above accessible ceilings. Plug or cap conduit at a point well behind the proposed new finished closures or surfaces.
4. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned or removed. Provide blank cover for abandoned boxes which are not removed.

5. Where devices, luminaires, or equipment are removed, reconnect existing loads not removed, if any, to existing circuit; verify circuit integrity and operation.
6. Disconnect and remove abandoned panelboards and distribution equipment, including fasteners and support framing.
7. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
8. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers and other accessories.
   a. Remove and dispose of lamps and ballasts in accordance with EPA regulations. Transport in accordance with ODOT regulations. Ballasts labeled "Contains No PCBs" may be containerized and recycled.
9. Repair adjacent construction and finishes damaged during demolition work.
10. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

D. Clean and repair existing materials and equipment which remain or are to be reused.
   1. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
   2. Luminaires: Clean existing luminaires in place. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace non-working lamps and ballasts, and broken electrical parts.

3.04 PROTECTION:

A. Exercise caution to avoid damage to existing surrounding materials and structures which are to remain.

B. Protect path of travel from demolition areas to waste collection areas to prevent damage to floor and wall finishes and other existing construction to remain.

C. Prevent damage to adjoining properties, existing buildings, pavement, sidewalks, landscaping, and similar features. Make all necessary repairs where required and do all patching to meet existing conditions.

END OF SECTION

SECTION 03 1000 – CONCRETE FORMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete forming and accessories.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.

1.02 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301. Maintain one copy on site.

B. Perform formwork in accordance with ACI 347.

PART 2 PRODUCTS

2.01 FORMING MATERIALS:

A. Wood Form Materials:
   1. Plywood for Surfaces Exposed to View: APA High Density Overlay Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   2. Plywood for Surfaces Not Exposed to View: APA B-B Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   3. Lumber: Kiln dried softwood; grade as required for loading conditions.

B. Prefabricated Forms: Preformed steel or glass fiber reinforced plastic; matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Permanent Forms: Metal deck, minimum 26 gauge; preservative treated plywood, minimum ½ inch; or other materials of equivalent durability and loadbearing capacity.

2.02 FORMING ACCESSORIES:

A. Form Ties: Metal snap-off type, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Euclid Chemical Company; Eucoslip VOX.
      b. Laticrete International; Debond Form Coating.

c. Sonneborn Building Products; Cast-Off WB.

2. VOC Content: Maximum 340 gm/liter.

C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

D. Waterstops: Polyvinyl chloride (PVC), minimum 1750 psi tensile strength, minimum 50 degrees F to 175 degrees F working temperature range, 6 inch wide, 3/8 inch web thickness, maximum possible lengths, split type with ribbed profile and center bulb, preformed corner sections, heat welded jointing.

1. Manufacturers: In accordance with Section 01 6000.
   a. Sika Corporation; Greenstreak No. 724.
   b. Paul Murphy Plastics Company; SR-6380.
   c. Vinylex Corporation; RSB6-38.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 PREPARATION:

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.03 FORMING:

A. Formwork Erection: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
   1. Earth forms are permitted only at footings and grade beams excavated from undisturbed soil, where soil conditions are sufficiently stable to eliminate the possibility of slide-in. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.
   2. Construct formwork so that concrete members are of the correct size, shape, alignment, elevation, and position.
   3. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
   4. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
   5. Align joints and make watertight. Keep form joints to a minimum.
   6. Obtain approval before framing openings in structural members which are not indicated on Drawings.

7. Install permanent forms for air slabs as shown on Drawings to provide minimum 3 inch void space between form and subgrade. Protect forms from crushing or collapse.
8. Coordinate formwork erection with work of other sections requiring attachment of components to formwork.
9. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

B. Application of Form Release Agent:
1. Apply form release agent on formwork in accordance with manufacturer's recommendations.
2. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
3. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

C. Inserts, Embedded Parts, and Openings:
1. Provide formed openings where required for items to be embedded in or passing through concrete work.
2. Locate and set in place items which will be cast directly into concrete.
3. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, raceways, conduits, ducts, other inserts, and components of other Work.
4. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
5. Install waterstops in accordance with manufacturer's instructions continuous without displacing reinforcement. Seal joints watertight.
6. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow drainage.
7. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted to joints which will not be apparent in exposed concrete surfaces.

D. Form Cleaning:
1. Clean forms as erection proceeds, to remove foreign matter within forms.
2. Clean formed cavities of debris prior to placing concrete.
3. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
4. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

E. Formwork Tolerances: ACI 301.

F. Form Removal:
   1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
   2. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
   3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.04 FIELD QUALITY CONTROL:

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

END OF SECTION

SECTION 03 3000 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Cast-in-place concrete construction:
      a. Footings and foundation walls.
      b. Grade beams.
      c. Floors and slabs on grade.
      d. Sidewalks and ramps.
      e. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.
   2. Concrete reinforcing.
   3. Concrete curing.

B. Products Installed But Not Furnished Under This Section:
   1. Section 05 5000 – Metal Fabrications: Fabricated metal items for casting into concrete.
   2. Section 05 5200 – Metal Railings: Metal anchors.

C. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 03 1000 – Concrete Forming.
   3. Section 03 3500 – Concrete Finishing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings:
   1. Reinforcing: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.
   2. Joint Layout: Indicate layouts and joint locations for slabs and sidewalks. Indicate locations of construction joints.

B. Product Data: Provide data on concrete mix designs, joint devices, attachment accessories, vapor retarders, and admixtures.

1.03 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301.

B. Perform steel reinforcement in accordance with ACI SP-66 and CRSI 63, 65, and Manual of Practice.

C. Acquire cement and aggregate from same source for all work.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Conform to ACI 305R when concreting during hot weather. Provide precautions against plastic shrinkage where indicated by air temperature, relative humidity, concrete temperature, and wind velocity.

B. Conform to ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 REINFORCING:

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, unfinished.

B. Welded Steel Wire Fabric: ASTM A1064, Plain Type; in flat sheets; unfinished.

2.02 REINFORCING ACCESSORIES:

A. Tie Wire: Minimum 16 gauge annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions, including load bearing pad on bottom to prevent vapor retarder puncture. Metal accessories shall be galvanized.

C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

2.03 REINFORCING FABRICATION:

A. Fabricate concrete reinforcing in accordance with ASTM A184, CRSI Manual of Practice, and ACI SP-66.

B. Locate reinforcing splices not indicated on drawings, at point of minimum stress.

C. Remove rust scale and coatings which may reduce bond from reinforcing prior to fabrication.

D. Cold bend reinforcing bars to minimum bend diameters in accordance with ACI 301.

E. Extend horizontal bars in walls and footings minimum 30 bar diameters or 18 inches around corners.

2.04 CONCRETE MATERIALS:

A. Cementitious Materials:

1. Portland Cement: ASTM C150, Type I – Normal.

2. Fly Ash: ASTM C618; Type C or Type F.
   a. Interior Concrete Slabs: Fly ash may be substituted for up to 15 percent of the cement content for each concrete mix.
   b. Other Locations: Fly ash may be substituted for up to 25 percent of the cement content for each concrete mix.
3. Ground Granulated Blast Furnace Slag (GGBFS): ASTM C989, Grade 100 minimum. GGBFS may be substituted for up to 35 percent of the cement content for each concrete mix.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: ASTM C1602; clean, potable and not detrimental to concrete.

2.05 ADMIXTURES:

A. Manufacturers: In accordance with Section 01 6000. Admixtures shall be the products of a single manufacturer.
   1. GCP Applied Technologies.
   2. Master Builders Solutions.
   3. Premiere Concrete Admixtures.
   4. Sika Corporation.

B. Air Entrainment: ASTM C260, neutralized vinsol resin.

C. Chemical: ASTM C494.
   1. Type A – Water Reducing.
   2. Type B – Retarding.
   3. Type C – Accelerating.
   4. Type D – Water Reducing and Retarding.
   5. Type E – Water Reducing and Accelerating.

D. Plasticizing: ASTM C1017.

E. Admixtures containing more than 0.1 percent chloride ions are not approved.

2.06 ACCESSORIES:

A. Vapor Retarder: ASTM E1745, Class B; minimum 10 mil thickness.
   1. Water Vapor Permeance: ASTM E154; maximum 0.025 perms.

B. Non-Shrink Grout for Dowels to Existing Concrete: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Master Builders; Set Grout.
      b. Sonneborn Building Products; Sonogrout.
      c. Sika Corporation; Sika Grout 212.

C. Bonding Agent: Polymer resin emulsion.

1. Manufacturers: In accordance with Section 01 6000.
   a. GCP Applied Technologies; Daraweld-C.
   b. Master Builders Solutions; MasterEmaco A660.
   c. Sika Corporation; Sika Bond.

2.07 JOINT DEVICES AND FILLER MATERIALS:

A. Joint Filler: One of the following at Contractor's option; ½ inch thick.

1. ASTM D994 or ASTM D1751; asphalt impregnated fiberboard or felt.

2. ASTM D4819; closed cell polyethylene.

3. ASTM D8139; closed cell polypropylene.

B. Bond Breaker: No. 15 asphalt saturated felt.

C. Construction Joint Devices: Galvanized steel with mill finish, minimum 20 gauge; 8 inch thick, formed to tongue and groove profile, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

1. Manufacturers: In accordance with Section 01 6000.
   a. Heckmann Building Products, No. 95.

D. Joint Sealant: ASTM C920 Type M, Grade P, Class 25, Use T; cold applied two part polyurethane, self leveling; with corresponding primer.

1. Manufacturers: In accordance with Section 01 6000.
   a. Master Builders Solutions; MasterSeal SL 2.
   b. Quaker Sealants & Coatings Company; QSC-231.
   c. Sika Corporation; Sikaflex-2c SL.
   d. Tremco, Inc.; THC 901.

2.08 CONCRETE MIXES:

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94. Do not mix concrete more than 90 minutes.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 1.

C. Provide concrete to the following criteria:

1. Exterior Concrete, and Concrete Exposed to Weather:
   a. Compressive Strength (28 day): Minimum 4500 psi.
   b. Air Entrained: In accordance with ACI 301.
   c. Slump (plus or minus 1 inch): 3 inches.

2. Foundation Walls and Grade Beams:
   a. Compressive Strength (28 day): Minimum 4000 psi.
   b. Air Entrained: In accordance with ACI 301.
   c. Slump (plus or minus 1 inch): 3 inches.

3. Concrete Fill for Overexcavated Areas and Utility Trench Backfilling:
   a. Compressive Strength (28 day): Minimum 1500 psi.
   b. Aggregate Size (maximum): ½ inch.
   c. Slump (maximum): 6 inches.
4. Interior Concrete Slabs, and Concrete Work Not Otherwise Scheduled:
   a. Compressive Strength (28 day): 3500 psi.
   b. Aggregate Size (maximum): 1 inch.
   c. Slump (plus or minus 1 inch): 3 inches.

D. Maximum Size of Coarse Aggregate: In accordance with ACI 301 unless noted otherwise.

E. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.

F. The use of calcium chloride is not permitted.

G. Use set retarding admixtures during hot weather only when approved by Architect.

H. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

2.09 CURING MATERIALS:

A. Liquid Membrane Curing Compound: ASTM C309, Type I, Class B; dissipating type. Clean thoroughly with power scrubber and industrial strength detergents prior to installing floor coverings.

1. Manufacturers: In accordance with Section 01 6000.
   a. Euclid Chemical Co.; Kurez DR VOX.
   b. Laticrete International.
   c. Tamms Industries.
   d. W. R. Meadows, Inc.

B. Absorptive Mats: ASTM C171, burlap-polyethylene, minimum 8 oz/sq yd, or reinforced water-resistant laminated paper, bonded to prevent separation during handling and placing.

C. Water: Potable, not detrimental to concrete.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

B. Verify that underslab construction, including mechanical and electrical work, is installed complete, backfilled, inspected, and approved.

3.02 PREPARATION:

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. 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.

C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

D. Coordinate floor slab elevations and hold downs with finish flooring materials scheduled.

3.03 PLACING REINFORCING:

A. Verify that reinforcing is free of dirt and form release agents.

B. Place, support, and secure reinforcement against displacement. Do not deviate from required position.

C. Splice reinforcing bars minimum 12 inches and 36 bar diameters.

D. Place welded wire fabric in maximum lengths. Lap adjacent sheets minimum 6 inches; secure lapped edges together at maximum 48 inches o.c. Hold fabric back minimum 2 inches from construction joints and expansion joints.

E. Do not displace or damage vapor retarder.

F. Accommodate placement of formed openings.

G. Maintain concrete cover around reinforcing in accordance with ACI 318.

H. Maintain clear distance between reinforcing bars, minimum 1 inch and 1-1/3 times the maximum coarse aggregate size.

I. Tolerances: In accordance with ACI 301.

3.04 PLACING CONCRETE:

A. Place concrete in accordance with ACI 301.

B. Notify Architect minimum 48 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, and joint devices are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade, in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.

   1. Seal overlapping joints, perimeter joints, openings and penetrations with continuous strip of vapor retarder tape. Seal perimeter to adjoining construction. Seal joints airtight at penetrations.

E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Place slabs on grade and sidewalks in pattern indicated and as approved by Architect.

1. Separate slabs from vertical surfaces with ½ inch thick joint filler.
   a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
   b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

2. Provide expansion joints with ½ inch thick joint filler at maximum 20 ft o.c. both ways in exterior sidewalks. Align joints with joints in adjacent curbs.
   a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
   b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

3. Provide control joints in slabs at maximum 20 ft o.c. unless noted otherwise, in curbs at maximum 10 ft o.c., and in exterior sidewalks to subdivide concrete into areas of minimum 16 sq ft and maximum 36 sq ft, or as detailed.
   a. Control joints may be tooled or saw cut at Contractor's option.

4. Install construction joint devices in coordination with slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete. Thicken slab to full depth of construction joint device.

G. Place concrete continuously between predetermined expansion and construction joints.

1. Install waterstops in construction joints located in foundation walls and footings.

2. Do not locate joints in grade beams or footings.

H. Do not interrupt successive placement. Do not permit cold joints to occur. Do not permit horizontal joints in walls or piers.

I. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into ¼ depth of slab thickness.

J. Apply sealant to exposed exterior and interior joints in accordance with manufacturer's instructions.

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

L. Provide mechanical equipment for conveying concrete to assure a continuous flow of concrete at the delivery end. Provide runways for wheeled concrete conveying equipment from the concrete delivery point to the locations of final deposit. Keep interior surfaces of conveying equipment, including chutes, free of hardened concrete, debris, water, snow, ice, and other deleterious materials.

M. Cold Weather Placing: Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials. Ascer-

tain that forms, reinforcing steel, and adjacent concrete surfaces are entirely free of frost, snow, and ice before placing concrete.

N. Remove excess and unsuitable concrete from project site and dispose of in an acceptable location.

3.05 CURING AND PROTECTION:

A. Cure concrete surfaces in accordance with ACI 308.

B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, excessive temperature changes, and mechanical injury.

C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

D. Schedule of Curing Methods:
   1. Cure horizontal surfaces by ponding, spraying, absorptive mat, or membrane curing compound.
   2. Cure vertical surfaces by spraying or membrane curing compound.

E. Concrete Curing:
   1. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days.
   2. Spraying: Spray water over surfaces and maintain wet for 7 days.
   3. Absorptive Mat: Saturate material and place over floor slab areas, lapping ends and sides; maintain in place for 7 days.
   4. Membrane Curing Compound: Apply curing compound in accordance with manufacturer's instructions in two coats with second coat applied at right angles to first.

F. Protect finished concrete surfaces from damage by subsequent construction operations.

G. Do not permit traffic over unprotected surfaces.

3.06 FIELD QUALITY CONTROL:

A. Testing firm will perform concrete testing in accordance with Section 01 4520.
   1. Provide free access to Work and cooperate with testing firm.
   2. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.
   3. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements. Repair or replacement of defective concrete will be determined by the Architect.

3.07 PATCHING:

A. Allow Architect to inspect concrete surfaces upon removal of forms.

B. Excessive honeycomb, voids over ½ inch diameter, or embedded debris in concrete is not acceptable. Notify Architect upon discovery.

C. Patch imperfections and tie holes in concealed surfaces in accordance with ACI 301.

D. Patch, fill, touch-up, and repair surface defects as directed by Architect for each individual area.
   1. Repair exposed concrete surfaces containing defects which adversely affect the appearance of the finish. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, holes left by tie rods and bolts, fins and other projections on the surface, stains, and other discolorations that cannot be removed by cleaning.
   2. Repair concrete surfaces containing defects which may adversely affect the durability of the concrete. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include cracks in excess of 0.01 inch wide, cracks of any width and other surface deficiencies which penetrate to the reinforcement or completely through non-reinforced sections, crazing, honeycomb, rock pockets, and spalls, except minor breakage at corners.

END OF SECTION

SECTION 03 3500 – CONCRETE FINISHING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete finishing and surface treatment.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.

1.02 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

1.03 ENVIRONMENTAL REQUIREMENTS:

A. During concrete floor finishing, provide temporary heat to maintain ambient temperature of minimum 50 degrees F; provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

PART 2 PRODUCTS

2.01 FINISHING MATERIALS:

A. Sealer:
   1. Manufacturers: In accordance with Section 01 6000.
      a. Sika Corporation; Sikafloor 90.
      b. Sealed Air Corporation; JonCrete High Gloss Sealer.
      c. W. R. Meadows; Tiah.

B. Abrasive Aggregate: 95 percent minimum fused homogeneous aluminum oxide.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Master Builders Solutions, MasterTop 120SR.
      b. Laticrete International, Inc.; Grip It AO.

PART 3 EXECUTION

3.01 CONCRETE FINISHING AND SURFACE TREATMENT:

A. Provide concrete surfaces with finishes in accordance with the definitions in ACI 301. Finish concrete flatwork surfaces in accordance with ACI 301 and ACI 302.
   1. Concealed Formed Concrete: Rough form finish.
   2. Interior Slabs: Troweled finish. Apply sealer where exposed.
   3. Exterior Slabs and Sidewalks: Broom finish.
   4. Exterior Ramps and Landings: Nonslip finish with dry shake application of abrasive aggregate.

B. Tool exposed slab edges, expansion joints, and tooled control joints with ¼ inch radius edging tool.

3.02 FLOOR FINISHING TOLERANCES:

A. Maximum Variation of Surface Flatness: ¼ inch in 10 ft, ACI 301 Class B.

B. Correct defects by grinding or removal and replacement of the defective work. Re-measure corrected areas by the same process.

END OF SECTION

SECTION 04 0500 – COMMON WORK RESULTS FOR MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Mortar for masonry.
   2. Anchorage, flashings and accessories for masonry.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary heat.
   2. Section 03 3000 – Cast-in-Place Concrete.
   3. Section 04 2000 – Unit Masonry.
   4. Section 04 4300 – Stone Masonry.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit for each type of anchorage, flashing, and accessory product.

B. Samples: Submit two samples of mortar, illustrating mortar color and color range.

1.03 REGULATORY REQUIREMENTS:

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store bulk materials and aggregates to prevent deterioration or intrusion of foreign material. Remove unsuitable materials from the job site.
   1. When air temperature is below 40 degrees F, cover with plastic or canvas to prevent wetting and freezing.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.05 FIELD CONDITIONS:

A. Cold Weather Construction (below 40 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Below 40 Degrees F: Heat mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Cover construction with plastic or canvas for 24 hours after laying masonry units; prevent wetting and freezing.
   2. Below 32 Degrees F: Heat sand and mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Thaw frozen materials prior to use. Provide enclosures and temporary heat, or insulated blankets, to maintain masonry above 32 degrees F for 24 hours after laying masonry units.

3. Below 20 Degrees F: In addition to above, heat masonry units to 20 degrees F before placing. Provide enclosures and temporary heat to maintain masonry and air temperature within enclosure above 32 degrees F for 24 hours after laying masonry units.

B. Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Store materials in cool or shaded areas. Limit open mortar beds to maximum 4 foot length; set units within one minute of spreading mortar. Protect wall from rapid evaporation by covering, fogging, damp curing or other approved means.

PART 2 PRODUCTS

2.01 MORTAR MATERIALS:

A. Portland Cement: ASTM C150, Type I, gray color.
   1. When air temperature is below 40 degrees F, use ASTM C150, Type III.

B. Masonry Cement: ASTM C91 or ASTM C1329; Type as required for mortar mix scheduled, gray color.

C. Mortar Aggregate: ASTM C144, standard masonry type.

D. Hydrated Lime: ASTM C207, Type S.

E. Quicklime: ASTM C5, non-hydraulic type.

F. Water: Clean and potable.

G. Bonding Agent: Internally plasticized, high polymer resin.
   1. Manufacturers: In accordance with Section 01 6000.
      a. GCP Applied Technologies; Daraweld-C.
      b. Dayton Superior Corp.
      c. W. R. Bonsal Co.

H. Admixtures: Calcium chloride and other admixtures shall not be used.

2.02 MORTAR COLOR:

A. Manufacturers: In accordance with Section 01 6000.
   1. Cemex; Richcolor.
   2. Euclid Chemical Co.; Concentrated Mortar Colors.
   3. Fairborn Cement Co.; Miamicolor.
   4. Lehigh Cement Company.
   5. Solomon Colors, Inc.
   6. UPCO Company; Hydroment.
   7. York Building Products; Workrite.

B. Pigment: Mineral oxide, not exceeding 10 percent of portland cement by weight.

C. Color: Match existing.

D. Schedule: Use colored mortar at all exposed exterior masonry.

2.03 MORTAR MIXES:

A. Mortar for Foundation Walls and Masonry in Contact with Earth: ASTM C270, Type M using the Property specification.

B. Mortar for Masonry Veneer: ASTM C270, Type S using the Property specification.

2.04 MORTAR MIXING:

A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. Do not use anti-freeze compounds to lower the freezing point of mortar.

E. If water is lost by evaporation, re-temper only within two hours of mixing.

F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.05 REINFORCING MATERIALS:

A. Steel Wire: ASTM A82, cold drawn.
   1. Finish: ASTM A153 Class B2, hot dip galvanized after fabrication to 1.50 oz/sq ft.

B. Steel Sheet: ASTM A653; G60 galvanized coating.

C. Steel Bars, Plates and Shapes: ASTM A36.

D. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, uncoated finish.

2.06 ANCHORAGE DEVICES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Heckmann Building Products.
   2. Hohmann & Barnard.
   3. Masonry Reinforcing Corporation of America; Wire-Bond.
   4. Williams Products, Inc.

B. Veneer Anchors for Stud Walls: Self-drilling barrel screw for self-sealing attachment to backup construction; length as required; with adjustable 3/16 inch steel wire triangle ties. (Heckmann Pos-I-Tie; H&B 2-Seal Tie with 2-Seal Byna-Lok Wire Tie; Wire-Bond Sure-Tie)

C. Wire Ties: Z-shape, ¼ inch steel wire; 8 inch long with 2 inch bends each end. (Heckmann 250; Wire-Bond 1600)

D. Stone Anchors: Steel wire, minimum ¼ inch diameter, with bent ends to engage slot in masonry unit. (Heckmann 162 and 163; H&B 401R and 402R)
   1. Fasteners: Stainless steel screws; self-drilling and self-tapping; minimum size No. 12 diameter.

E. Compressible Joint Filler: ASTM D1056, closed cell neoprene material, oversized 50 percent to joint width; self-expanding; 3 inch width by maximum lengths. (H&B NS Series; Wire-Bond 3300)

2.07 FLASHINGS:

A. Membrane Flashing: Rubberized membrane bonded to cross-laminated polyethylene film; 0.040 inch total thickness; flexible, self-sealing, self-healing, fully adhering.
   1. Manufacturers: In accordance with Section 01 6000.
      a. GCP Applied Technologies; Perm-A-Barrier Wall Flashing.
      b. Hohmann & Barnard; Textroflash.

B. Accessories: Provide surface conditioner, primer, termination bars, and sealant approved by flashing manufacturer.

2.08 ACCESSORIES:

A. Building Paper: ASTM D226, Type I; No. 15 asphalt saturated felt.

B. Bond Break Wrap: Asphalt impregnated cellular paper, ¼ inch minimum thickness.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Williams Products, Inc.; Column Boxboard.

C. Weeps and Cavity Protection: High density nonwoven polyethylene mesh.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Archovations, Inc.; CavClear.
      b. Hohmann & Barnard; Mortar Trap.
      c. Keene Building Products; Driwall.
      d. Mortar Net USA, Ltd.
   2. Weeps: 3/8 inch wide, full height of head joint, 1/8 inch less than thickness of outer wythe; color as selected.
   3. Cavity Protection Material: Shaped to maintain drainage at weep holes without clogging by mortar droppings; minimum 10 inch height, or full height of cavity at Contractor's option; thickness to match cavity air space.

D. Cleaning Solution: As recommended for application by masonry unit and mortar manufacturers, not harmful to masonry work or adjacent materials; not containing hydrochloric acid or salts that form hydrochloric acid in solution.

1. Manufacturers: In accordance with Section 01 6000.
   a. ProSoCo, Inc.
   b. Diedrich Technologies, Inc.
   c. EaCo Chem.

PART 3 EXECUTION

3.01 PREPARATION:

A. Apply bonding agent to existing concrete and masonry surfaces.

3.02 INSTALLATION:

A. Install mortar, reinforcement and anchorage, flashings and accessories in accordance with the requirements of the unit masonry Sections.

END OF SECTION

SECTION 04 2000 – UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Brick veneer.

B. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 04 0500 – Common Work Results for Masonry.
   3. Section 04 4300 – Stone Masonry.
   4. Section 05 4000 – Cold Formed Metal Framing: Structural wall backing.
   5. Section 07 2100 – Thermal Insulation: Insulation for cavity spaces.
   6. Section 07 9200 – Joint Sealants: Backer rod and sealant at control joints.
   7. Section 09 2900 – Gypsum Board: Gypsum sheathing.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Masonry Installer, Contractor, Owner, Architect, and Testing Agency.

B. Review methods and procedures related to masonry construction, including approved submittals and manufacturer's written instructions.

C. Review mockup requirements, location, and scheduling.

D. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Certify that masonry units meet or exceed specified standards.

B. Samples: Submit four units of each type to illustrate color, texture, and extremes of color range.

C. Test Reports: In accordance with Section 01 4520.

1.04 REGULATORY REQUIREMENTS:

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.05 QUALIFICATIONS:

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

1.06 MOCKUP:

A. Construct a mockup panel sized 4 ft long by 4 ft high, which includes each type of exterior unit masonry, mortar, and accessories.

B. Locate where directed.

C. Do not place order for unit masonry materials until mockup is approved.

1.07 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Accept units on site. Inspect for damage.

B. Protect masonry units from breakage and from damage to surfaces which will be exposed.

C. Store masonry units on platforms or pallets above grade, protected from soil contact and from water, snow, and ice.

1.08 ENVIRONMENTAL REQUIREMENTS:

A. Cold Weather Construction (below 40 degrees F) and Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction and Section 04 0500.

1.09 COORDINATION: In accordance with Section 01 3100.

A. Coordinate masonry veneer work with structural wall backing and sheathing, and other work.

PART 2 PRODUCTS

2.01 BRICK UNITS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Belden Brick Co.
   2. Bowerston Shale Co.
   3. Glen-Gery Corp.
   4. Redland Brick, Inc.

B. Face Brick: ASTM C216, Type FBS, Grade SW.

C. Performance Requirements:
   1. Compressive Strength: Minimum 3000 psi.
   2. Initial Rate of Absorption: ASTM C67; maximum 30 g per minute.
   3. Efflorescence: ASTM C67; not effloresced.

D. Size and Shape: Match existing.

E. Color and Texture: Match existing.

2.02 ACCESSORIES:

A. Mortar: As specified in Section 04 0500.

B. Anchorage, Flashings, and Accessories: As specified in Section 04 0500.

PART 3 EXECUTION

3.01 EXAMINATION:

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

B. Verify that items provided by other sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION:

A. Direct and coordinate placement of metal anchors supplied under other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING:

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Bond Pattern: Running bond.

D. Mortar Joints: Concave.

E. Typical Coursing: Three units and three mortar joints to equal 8 inches.

3.04 PLACING AND BONDING:

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints. Lay hollow masonry units in full bed of mortar at starting course above footings and foundation walls.

C. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

D. Remove excess mortar as work progresses.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Avoid the use of less than half size units at corners, intersections, jambs, and wherever possible at other locations.

3.05 WEEPS:

A. Install weeps in place of mortar in head joints on all exterior walls at minimum 16 inches o.c. and maximum 24 inches o.c. horizontally above wall flashings, at bottom of walls, and at lintels.

B. Recess weep material approximately 1/8 inch from face of masonry.

C. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.

D. Install cavity protection material above weeps to prevent accumulation of mortar and to maintain drainage.

3.06 REINFORCEMENT AND ANCHORAGE:

A. Opening Reinforcement: Install wire ties at 8 inches o.c. horizontally at masonry opening sills and lintels.

B. Secure anchors to stud framed back-up and embed into masonry veneer at each wall stud, at maximum 16 inches o.c. vertically. Place at maximum 8 inches each way around perimeter of openings, within 12 inches of openings.

3.07 FLASHINGS:

A. Extend flashings horizontally on all exterior walls at first course above finish grade, at top of wall, above counterflashings, and above lintels.

B. Apply surface conditioner and primer to substrate, and apply termination mastic at top edges, seams, and penetrations, in accordance with flashing manufacturer's recommendations.

C. Turn flashing up minimum 8 inches, and minimum 6 inches above top of cavity protection material; seal to sheathing over stud framed back-up with termination bar and sealant.

D. Lap end joints minimum 6 inches and seal watertight.

E. Turn flashing, fold to form end dam, and seal watertight at corners, bends, penetrations, terminations, and interruptions.

F. Remove and discard release paper from self-adhesive flashings. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere flashing to substrate to prevent water from migrating under flashing.

3.08 LINTELS:

A. Install loose steel lintels over openings where scheduled. Maintain minimum 8 inch bearing on each side of opening.

3.09 JOINTS:

A. Install compressible joint filler in continuous lengths. Seal joints in accordance with manufacturer's instructions.

B. Locate joints as shown on the Drawings, at maximum 25 ft intervals not to exceed 1½ times the wall height, at each corner within a distance of half the wall height, and at changes in wall height, changes in wall thickness, and construction joints in adjacent work.

C. Locate joints at one side of wall openings, and at both sides of wall openings over 76 inches wide. Offset joints above openings to align with the end of lintels above opening; provide horizontal slip plane.

3.10 TOLERANCES:

A. Maximum Variation from Unit to Adjacent Unit: 1/32 inch.

B. Maximum Variation from Plane of Wall: ¼ inch in 10 ft and ½ inch in 20 ft or more.

C. Maximum Variation from Plumb: ¼ inch.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and ¼ inch in 10 ft; ½ inch in 30 ft or more.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

3.11 FIELD QUALITY CONTROL:

A. Testing firm will perform masonry testing and on-site observation in accordance with Section 01 4520.

3.12 CLEANING:

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces and all exterior masonry with cleaning solution. Rinse thoroughly with water. Do not allow cleaning solution to dry on masonry.

D. Use non-metallic tools in cleaning operations.

3.13 PROTECTION:

A. At the end of each work day, cover top of exposed walls with plastic or canvas secured in place to prevent the entrance of water.

B. Protect finished work from damage by all trades.

C. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

D. Protect glazing assemblies and other non-masonry work during masonry cleaning.

END OF SECTION

SECTION 04 4300 – STONE MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Cut limestone bands and trim.

B. Related Sections:
   1. Section 04 0500 – Common Work Results for Masonry.
   2. Section 04 2000 – Unit Masonry.
   3. Section 07 9200 – Joint Sealants.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate layout, dimensions, anchorages, reinforcement; head, jamb, and sill opening details; and control joint methods.
   1. Submit fabricator's installation instructions and field erection or setting drawings. Indicate panel identifying marks and locations.

B. Samples: Submit two samples illustrating minimum and maximum stone size, color range and texture, markings, and surface finish.

1.03 QUALITY ASSURANCE:

A. Stone Supplier Qualifications: Company specializing in quarrying cut stone with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in performing the Work of this section with minimum three years documented experience.

C. Perform limestone work in accordance with Indiana Limestone Institute (ILI).

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store stone vertically on edge, resting weight on edge.

B. Protect stone from discoloration.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Cold Weather Construction (below 40 degrees F) and Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction and Section 04 0500.

1.06 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the work with installation of adjacent construction.

PART 2 PRODUCTS

2.01 LIMESTONE:

A. Suppliers: In accordance with Section 01 6000.
   1. Evans Limestone Co.
   2. Bybee Stone Co., Inc.
   3. Indiana Limestone Co., Inc.
   4. Victor Oolitic Stone Co.

B. Limestone: Cut Indiana Oolitic Limestone; ASTM C568 Classification II – Medium Density.

C. Grade: Select.

D. Color: Match existing.

E. Sizes and Shapes: As detailed; 48 inch typical maximum dimension except where larger units are indicated.

F. Surface Texture: Smooth.

2.02 ACCESSORIES:

A. Mortar: As specified in Section 04 0500.

B. Anchors, Dowels, Ties, Attachments, Supports, Fasteners, and Lifting Devices:
   1. Components Not In Direct Contact With Stone: Steel, hot dip galvanized after fabrication to ASTM A123, 1.25 oz/sq ft, of sizes and configurations required for support of stone and applicable superimposed loads.
   2. Embedded Devices: Stainless steel; ASTM A167, Type 304 or 316.

C. Setting Buttons: Plastic type.

D. Spacers: Inorganic.

E. Wall Flashing, Joint Filler, Weeps and Cleaning Solution: As specified in Section 04 0500.

2.03 FABRICATION:

A. Cut stone accurately to required shape and dimensions, with provisions for joints and bonding. Fabricate holes and slots for anchors, cramps, dowels, and lugs as required.

B. Sizes and Shapes: As detailed.

C. Fabrication Tolerances:
   1. Maximum Variation from Thickness: 1/16 inch.
   2. Maximum Variation from Face Size: 1/16 inch.
   3. Maximum Variation from Flat: 1/16 inch.
   4. Maximum Deviation from Square: 1/16 inch/sq ft.

D. Fabricate units for uniform coloration with adjacent units and over the full area of the installation.

E. Form external corners to quirk mitered joint profile.

F. Slope exposed top surfaces of stone for shedding water.

G. Cut drip slot in stone projecting more than ½ inch. Size slot not less than 3/8 inch wide and ¼ inch deep. Terminate slots 1 inch back from exposed ends.

PART 3 EXECUTION

3.01 EXAMINATION:

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

B. Verify that items provided by other Sections of work are properly sized and located.

C. Field verify required dimensions prior to fabrication.

3.02 PREPARATION:

A. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

B. Establish lines, levels, and coursing indicated. Protect from displacement.

C. Clean stone prior to erection. Do not use wire brushes or implements which can mark or damage exposed surfaces.

3.03 LIMESTONE INSTALLATION:

A. Erect stone in accordance with stone supplier's instructions and erection drawings.

B. Install mortar in accordance with Section 04 0500.

C. Place setting buttons and set stone in full mortar setting bed to fully support stone over bearing surface and to establish joint dimensions.

D. Shore up units until setting bed will maintain panel in position without movement.

E. Rake out mortar joints 5/8 to 3/4 inch and brush joints clean to accommodate pointing mortar.

F. Fill joints with pointing mortar. Pack and work into voids. Neatly tool surface to concave joint.

G. Locate control joints as shown on the Drawings, at maximum 20 ft intervals, and at changes in wall height or wall thickness.

3.04 CUTTING AND FITTING:

A. Obtain approval prior to cutting or fitting any item not so indicated on the Drawings.

B. Do not impair appearance or strength of stone work by cutting.

3.05 CLEANING:

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces and all exterior masonry with cleaning solution. Rinse thoroughly with water.

D. Use non-metallic tools in cleaning operations.

3.06 PROTECTION:

A. At the end of each work day, cover top of exposed walls with plastic or canvas secured in place to prevent the entrance of water.

B. Protect finished work from damage by all trades.

C. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

END OF SECTION

SECTION 05 3123 – STEEL ROOF DECKING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel roof deck and accessories.

B. Related Sections:
   1. Section 05 4000 – Cold Formed Metal Framing.
   2. Section 07 5000 – Membrane Roofing.

1.02 PERFORMANCE REQUIREMENTS:

A. Design metal deck in accordance with SDI Design Manual.

B. Calculate to structural working stress design and maximum vertical deck deflection of 1/240.

C. Lateral deflection of diaphragm shall not exceed 1/500 of the story height.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate manufacturer, deck plan, lap dimensions and connections, support locations, projections, openings and reinforcement, pertinent details, and accessories. Where mechanical fasteners are proposed, include manufacturer's test data and design charts with proposed fastener spacing.

B. Product Data: Provide deck profile characteristics and dimensions, structural properties, and finishes.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Cut plastic wrap to encourage ventilation and avoid condensation.

B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. New Millennium Building Systems, LLC.

B. United Steel Deck, Inc.

C. Vulcraft Division, Nucor Corp.

D. Wheeling Corrugating Co.

2.02 MATERIALS:

A. Galvanized Sheet Steel: ASTM A653, Structural Quality, minimum 33 ksi yield strength; with G60 galvanized coating.

B. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

C. Shop and Touch-Up Primer: SSPC 20.

2.03 ACCESSORIES:

A. Screws: Stainless steel, self tapping.

B. Mechanical Fasteners: Powder-actuated or pneumatically-driven.

2.04 FABRICATION:

A. Metal Deck: Galvanized sheet steel, configured as follows:
   1. Span Design: Multiple; minimum three spans per sheet.
   2. Minimum Metal Thickness Excluding Finish: 26 gauge.
   3. Nominal Height: 9/16 inch, fluted profile.
   4. Formed Sheet Width: 30 inch or 36 inch.
   5. Side Joints: Lapped.
   6. Flute Sides: Plain vertical face.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of this work.

3.02 ERECTION:

A. Erect metal deck in accordance with SDI 30 and manufacturer's instructions.

B. Deliver deck to roof in quantities required for immediate installation. Do not store deck on roof. Do not use deck units as a working platform or storage area until units are permanently attached in position.

C. Bear deck on steel supports with 1½ inch minimum bearing. Align and level. Position end laps over supports; lap sheets 2 inches minimum.

D. Attach deck to steel support members at ends and intermediate supports with welds, screws or mechanical fasteners, spaced in accordance with SDI Diaphragm Design Manual.
   1. Welds: Minimum ½ inch diameter puddle welds at maximum 12 inches o.c. parallel with the deck flute, and at each transverse flute. Weld in accordance with AWS D1.1 and D1.3.
   2. Screws: Minimum No. 12 size at maximum 12 inches o.c. parallel with the deck flute, and at each transverse flute.
   3. Mechanical Fasteners: Minimum 5/16 inch diameter head size, spacing in accordance with manufacturer's recommendations.
   4. At roof corners, space attachments at 6 inches oc maximum. The corner area is defined as the square roof section with sides equal to 40 percent of the building height or 10 percent of the lesser building plan dimension, whichever is less. The minimum length of the side is 10 feet.

E. Fasten side laps at 24 inches oc maximum, using welds, screws, or mechanically crimped connections.

F. Install sheet steel closures and angle flashings to close openings between deck and walls or openings.

G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, on both top and underside of deck. Touch up galvanized surfaces in accordance with ASTM A780.

H. Do not permit the hanging or supporting of any items from the deck, including suspended ceilings, unless specifically approved by the Architect.

I. Provide notice to roofing installer at least 48 hours prior to completion of roof deck installation.

END OF SECTION

SECTION 05 4000 – COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Load bearing formed steel framing.
   2. Formed steel joist framing and bridging.

B. Related Sections:
   1. Section 04 2000 – Unit Masonry: Veneer masonry supported by wall stud metal framing.
   2. Section 05 3123 – Steel Roof Decking.
   3. Section 06 1050 – Miscellaneous Rough Carpentry: Rough wood blocking.
   4. Section 07 2100 – Thermal Insulation.
   5. Section 09 2900 – Gypsum Board.

1.02 SYSTEM DESCRIPTION:

A. Size components to withstand design loads shown on the Drawings and in accordance with applicable building codes.

B. Maximum Allowable Deflection:
   1. Wall Stud Backup for Masonry Veneer: 1/720 of span, based on stud properties only without considering sheathing.
   2. Joists: 1/360 of span.

C. Design systems to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclical day/night temperature ranges.

D. Design systems to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings:
   1. Indicate component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, and accessories or items required of related work.
   2. Indicate stud and joist layout.
   3. Describe method for securing studs to tracks and for bolted and welded framing connections.
   4. Submit the number of sets required for plan approval, with original design professional signature and embossed seal.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, and limitations.

1.04 QUALITY ASSURANCE:

A. Calculate structural properties of framing members in accordance with AISI, Association of Wall and Ceiling Industries (AWCI), Metal Framing Manufacturers Association (MFMA), and AWS requirements.

B. Qualifications:
   1. Manufacturer: Company specializing in performing the work of this section with minimum three years documented experience.
   2. Installer: Company specializing in performing the work of this section with minimum three years documented experience.

C. Design conditions not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. ClarkDietrich Building Systems**.**

B. J. N. Linrose Manufacturing.

C. MRI Steel Framing, LLC.

D. State Building Products.

E. Steel Structural Products LLC.

F. Ware Industries, Inc.; Marino Ware.

2.02 MATERIALS:

A. Sheet Steel: ASTM A1003, Structural Grade as required for project conditions, Type H; galvanized to G90 coating class.

2.03 COMPONENTS:

A. Studs and Joists: ASTM C955; formed steel, minimum 18 gauge, 0.043 inch minimum base metal thickness, unless otherwise indicated or required by loading conditions and deflection criteria; channel shape, punched web; sizes as shown on the Drawings.

B. Track: ASTM C955; formed steel, C-shape; same material, width, and thickness as primary members; solid web.

C. Headers and Jambs: Factory fabricated from unpunched components, with stiffened flanges.

2.04 ACCESSORIES:

A. Bracing: Formed sheet steel, thickness determined for conditions encountered.

B. Stud Bridging: Formed sheet steel, V-bar shape, minimum 18 gauge, 0.043 inch minimum base metal thickness.

C. Joist Bridging:
   1. Solid Bridging: Same material and shape as joists, minimum 16 gauge, 0.054 inch minimum base metal thickness; nominal joist depth less not more than 2 inches.
   2. Strap Bridging: Sheet steel.

D. Plates, Gussets, Clips: Sheet steel, thickness determined for conditions encountered.

E. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

2.05 FASTENERS:

A. Self-drilling, Self-tapping Screws, Bolts, Nuts, and Washers: ASTM A123, hot dip galvanized to 1.25 oz/sq ft; drill points hardened with lower hardness for load-bearing section.

B. Anchorage Devices: Drilled expansion bolts, Tapcon type.

C. Welding: In conformance with AWS D1.1 and AWS D1.3. Limit field welding to locations that cannot be adequately secured with other fastening methods.

2.06 FABRICATION:

A. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify site conditions prior to beginning fabrication or erection.

B. Verify that building framing components are ready to receive work.

3.02 ERECTION:

A. Install components in accordance with ASTM C1007 and manufacturer's instructions.

B. Make provision for erection stresses. Provide temporary alignment and bracing.

C. Stud Framing:
   1. Place lower track on uniform, level bearing surface. Align lower and upper tracks; locate to wall layout. Secure in place at maximum 24 inches oc. Splice lengths of track; secure adjacent ends to common structural element.
   2. Place studs at spacings indicated on the Drawings; not more than 2 inches from abutting walls and at each side of openings. Plumb and align studs; connect studs to tracks.
   3. Construct corners using minimum three studs. Frame wall openings with headers and supporting studs; provide double studs at opening jambs. Frame each side of wall expansion joints with a separate stud.
   4. Erect load bearing studs one piece full length. Do not permit splicing of studs.
   5. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.
   6. Install bridging at maximum 48 inches oc vertically; weld bridging to both stud flanges.
   7. Install intermediate studs above and below openings to align with wall stud spacing.
   8. Where non-load bearing framing extends to underside of structure above, accommodate structural deflection by one of the following methods as approved by framing manufacturer:
      a. Double deep leg head runner with studs secured to lower runner only.
      b. Single deep leg head runner with studs secured to horizontal bridging within 12 inches of track.
      c. Head runner with pre-attached UL classified galvanized steel clips and slotted holes for stud attachment with mechanical fasteners.
   9. Install blocking between studs for attachment of fixtures and mechanical and electrical items anchored to walls.

D. Joist Framing:
   1. Place framing components at spacings indicated on the Drawings; not more than 2 inches from abutting walls. Connect members to supports.
   2. Set members parallel and level, with lateral bracing and bridging.
   3. Install solid joist bridging in first two and last two joist spaces, followed by strap bridging for maximum 10 ft runs. Install solid bridging in one joist space between runs of strap bridging.
   4. Where members bear on wall stud framing, locate bearing points directly over studs or provide load distributing member to top of stud track.
   5. Provide additional joists around openings which interrupt joists.
   6. Provide web stiffeners at reaction points and at points of concentrated loading, where required by loading conditions.
   7. Provide end blocking where joists ends are not otherwise restrained from rotation.

E. Coordinate placement of insulation in spaces made inaccessible after erection.

F. Touch up field welds and damaged galvanized surfaces with primer in accordance with ASTM A780.

3.03 ERECTION TOLERANCES:

A. Vertical Alignment of Studs: 1/960 of span.

B. Horizontal Alignment of Walls: 1/960 of span.

C. Stud Spacing: Within 1/8 inch of designated spacing; cumulative error not exceeding requirements of finishing materials.

D. Prefabricated Panels: Maximum 1/8 inch out of square.

E. Exterior Edge of Stud: 1/8 inch from true position.

F. Differential Movement Capacity Between Top Track and Studs: ½ inch.

END OF SECTION

SECTION 05 5000 – METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Shop fabricated steel items.

B. Related Sections:
   1. Section 03 3000 – Cast-In-Place Concrete: Placement of metal fabrications in concrete.
   2. Section 05 5200 – Metal Railings.
   3. Section 08 7113 – Automatic Door Operators.
   4. Section 09 9000 – Painting and Coating.

1.02 PERFORMANCE REQUIREMENTS:

A. Conform to applicable building code for applicable loads.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate materials, finishes, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections and Plates: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Steel Sheet: ASTM A653, galvanized to G90 designation.

D. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153 for galvanized components.

E. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

F. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

G. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

H. All materials shall be new and free from rust.

2.02 FABRICATION:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Miter members at changes of direction, except where specifically noted otherwise.

C. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler.

D. 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. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Drill or punch all holes required for the attachment of work of other trades.

2.03 FABRICATION TOLERANCES:

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.04 FINISHES:

A. Surfaces to be Primed: Prepare in accordance with SSPC procedures.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.
   2. Prime paint items with one coat.

B. Surfaces to be Galvanized: Apply galvanized coating after fabrication to ASTM A123, minimum 1.25 oz/sq ft.

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. Coordinate work with installer.

3.03 INSTALLATION:

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 SCHEDULE:

A. The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Loose Lintels: Steel sections as indicated.

1. Exterior Walls: Galvanized finish.

2. Interior Walls: Prime paint finish.

C. Supplemental Support Framing: Light gauge galvanized steel channel framing systems.

1. Manufacturers: In accordance with Section 01 6000.
   a. Tyco Electrical & Metal Products; Unistrut.
   b. Cooper B-Line, Inc.; 4Dimension.
   c. Thomas & Betts; Superstrut.

D. Steel Bollard Posts: As detailed; steel tubing, with fabricated openings for conduit and door operator pushbutton; flush watertight top cap; prime paint finish.

END OF SECTION

SECTION 05 5200 – METAL RAILINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel railings.

B. Related Sections:
   1. Section 03 3000 – Cast-In-Place Concrete: Placement of metal anchors in concrete.

1.02 DESIGN REQUIREMENTS:

A. Fabricate railing assembly and attachments to resist a concentrated load of 200 lbs applied in any direction at any point, and a uniform load of 50 lb/ft applied in any direction, without damage or permanent set.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Pipe: ASTM A53, Grade B, Schedule 40.

B. Steel Tubing: ASTM A513; minimum 1/8 inch wall thickness, or as required for application.

C. Welding Materials: AWS D1.1; type required for materials being welded.

D. Welding Electrodes: E70XX.

E. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

F. All materials shall be new and free from rust.

2.02 STEEL RAILING SYSTEMS:

A. Rails and Posts: 1¼ inch nominal diameter steel pipe or 1½ inch outside diameter steel tubing; welded joints.

B. Fittings: Elbows, T-shapes, end caps, escutcheons; cast steel.

C. Mounting: Adjustable brackets and flanges, with inserts for casting in concrete.

D. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing; ASTM B633, Class Fe/Zn 25 zinc plated.

E. Splice Connectors: Steel welding collars.

F. Finish: Galvanized to ASTM A123, minimum 2.0 oz/sq ft galvanized coating; shop prefinished with powder coating to color as selected.

2.03 FABRICATION:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Provide hardware and reinforcement to accommodate site assembly and installation.

C. Provide anchors and other components required for connecting railings to structure.

D. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

F. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

H. Accurately form components to suit ramps and landings.

I. Accommodate expansion and contraction of members without damage to connections or members.

PART 3 EXECUTION

3.01 EXAMINATION:

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

B. Verify field dimensions prior to fabrication.

3.02 PREPARATION:

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

B. Supply setting templates for items required to be cast into concrete. Coordinate work with installer.

3.03 INSTALLATION:

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

B. Anchor railings to achieve required structural capacity.

C. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

D. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

F. After erection, prime welds, abrasions, and surfaces not shop primed, galvanized, or prefinished, except surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch per story, non-cumulative.

B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION

SECTION 06 0573 – WOOD TREATMENT

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Preservative treatment of wood.

B. Related Sections:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.

PART 2 PRODUCTS

2.01 PRESERVATIVE TREATMENT:

A. Wood Preservative (Pressure Treatment): AWPA P5 and AWPA T1; water borne preservative with 0.25 percent retainage. Kiln dry after treatment to specified moisture content, maximum 19 percent.

B. Wood Preservative (Surface Application for Site Treatment and Touch-up): Clear type, compatible with pressure treatment preservative.

PART 3 EXECUTION

3.01 SITE APPLIED WOOD TREATMENT:

A. Apply preservative treatment in accordance with manufacturer's instructions and AWPA M4.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing, and metal flashings.

C. Treat site-sawn cuts in factory treated wood.

D. Allow preservative to dry prior to erecting members.

3.02 SCHEDULES:

A. Preservative Treated Wood Locations: Framing and blocking above grade in contact with cementitious materials, roofing, and metal flashings.
   1. Exterior, Roof, and Parapet Locations: AWPA Use Category UC3B.
   2. Applications Not Otherwise Scheduled: AWPA U1 Table 3-1.

END OF SECTION

SECTION 06 1050 – MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Miscellaneous framing and sheathing.
   2. Roof curbs and perimeter nailers.
   3. Blocking in wall and roof openings.
   4. Concealed wood blocking for support of mechanical and electrical items, and other accessories.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures and barriers.
   2. Section 06 0573 – Wood Treatment.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by ALSC.
   2. Plywood Grading Agency: Certified by APA.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Lumber Grading Rules: AFPA, SPIB, and NLGA.

B. Miscellaneous Framing and Blocking: Southern Pine or Spruce-Pine-Fir, Utility or better grade, 2 to 4 inches thick, 19 percent maximum moisture content.
   1. At Contractor's option, a flexible wood backing plate system fabricated from ¾ inch fire-retardant treated plywood may be used for blocking.

C. Wood Panel Materials: DOC PS 1 or DOC PS 2.
   1. Miscellaneous Sheathing (Exterior): APA Rated Sheathing, preservative treated, Span Rating 48/24, Exposure Durability 1; sanded faces; thickness as indicated, 48 x 96 inch sized sheets, square edges.
   2. Miscellaneous Sheathing (Interior): APA Rated Sheathing, Span Rating 48/24, Exposure Durability 1; sanded faces; thickness as indicated, 48 x 96 inch sized sheets, square edges.

2.02 ACCESSORIES:

A. Fasteners and Anchors:

1. Fasteners: Hot dipped galvanized steel for treated wood locations, and all exterior locations; unfinished steel elsewhere.

2. Anchors:
   a. Toggle bolt type for anchorage to hollow masonry.
   b. Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
   c. Bolt or ballistic fastener for anchorage to steel.

PART 3 EXECUTION

3.01 FRAMING:

A. Set structural members level and plumb, in correct position. Accurately saw-cut members to seat square on bearings. Fit closely into proper location.

B. Frame, anchor, tie and brace members to develop strength and rigidity required for intended purposes. Do not stress members in excess of design strength. Secure members permanently in position with proper fastenings to render parts rigid.

C. Place horizontal members with crown side up.

D. Construct load bearing members full length without splices.

E. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

F. Coordinate curb installation with installation of roof deck and support of roof openings, roofing installation, and related construction.

G. Coordinate installation of blocking with requirements of items to be anchored thereto or supported thereby.

H. Secure sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing.

3.02 TOLERANCES:

A. Framing Members: ¼ inch from true position, maximum.

END OF SECTION

SECTION 06 2000 – FINISH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Standing and running trim.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating: Site finishing of finish carpentry.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with AWI Premium quality.

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

C. In lieu of grade stamping exposed to view materials, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

1.03 ENVIRONMENTAL REQUIREMENTS: In accordance with Section 01 6000.

A. Protect materials from moisture damage.

B. During and after delivery of materials and installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

PART 2 PRODUCTS

2.01 WOOD MATERIALS:

A. Interior Hardwood Lumber Scheduled to Receive Opaque (Painted) Finish: NHLA; graded in accordance with AWI; maximum moisture content of 10 percent; plain sliced Poplar, S4S, Select Grade.

2.02 STANDING AND RUNNING TRIM:

A. Materials: Hardwood lumber of species and grade specified for finish scheduled; all surfaces sanded.
   1. Profiles: Match existing; with kerfed or hollow backs.

B. Lengths:
   1. Standing Trim: Full length without splices.
   2. Running Trim: Commercial long lengths; splices permitted where framing and blocking facilitates solid fastening. Do not splice lengths shorter than 3 feet.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions and dimensions before starting work.

B. Verify adequacy of backing and support framing.

3.02 INSTALLATION:

A. Secure components using appropriate anchorages.

B. Miter external corners of running trim; butt and cope internal corners.

C. Sand work smooth and set exposed fasteners.

D. Apply wood filler in exposed nail and screw indentations.

E. Finish exposed to view, internal, and semi-concealed surfaces.

3.03 CLEANING:

A. Perform final cleaning in accordance with Section 01 7700.

3.04 PROTECTION:

A. Protect exposed finished work of other Sections from damage during installation of the work of this section.

END OF SECTION

SECTION 06 6000 – PLASTIC FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Decorative plastic fabrications.

B. Related Sections:
   1. Section 01 2300 – Alternates.
   2. Section 06 1050 – Miscellaneous Rough Carpentry: Wood blocking and supports.
   3. Section 07 9200 – Joint Sealants: Perimeter sealant to adjacent construction.
   4. Section 09 9000 – Painting and Coating.

1.02 DESIGN REQUIREMENTS:

A. Design items with sufficient strength for handling stresses.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, adjacent construction, materials, thicknesses, fabrication details, required clearances, field jointing, tolerances, colors, finishes, methods of support, integration of related components, and anchorages.

B. Product Data: Provide data on specified component products.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Data: Include instructions for repair, stain removal, and surface and gloss restoration.

1.05 QUALITY ASSURANCE:

A. Fabricator: Company specializing in architectural components with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Protect components from damage by retaining shipping protection in place until installation.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not install components when site conditions may be detrimental to successful installation.

B. Maintain temperature and humidity conditions favorable to proper curing of resin during and after installation.

PART 2 PRODUCTS

2.01 FABRICATORS: In accordance with Section 01 6000.

A. Fypon LLC.

2.02 MATERIALS:

A. Material: Molded polyurethane; smooth surface; moisture resistant.

B. Accessories:
   1. Adhesive: Type recommended by fabricator.
   2. Fasteners: Stainless steel or hot-dipped galvanized screws and nails.

2.03 COMPONENTS:

A. Decorative Railing System (Alternate):
   1. Straight Panel Newel Posts: 48 inch height; 8 inch square; with pipe insert and peaked top. (Fypon NPSP8X48 with NPK600 installation kit)
   2. Railings: Pipe insert; lengths as required to minimize waste.
      a. Top Railing: Fypon BTR5X series with BRK5 installation kit.
      b. Bottom Railing: Fypon BBR5X series with BRK5 installation kit.
   3. Balusters: 20 inch height; 2½ inch square. (Fypon BAL3X20CC)

B. Boards: Dimensions as indicated; surfaced 4 sides. (Fypon FLT series)

C. Crown Molding: 8-1/8 inch overall height; 4-1/8 inch projection. (Fypon MLD1001 series)

D. Moldings and Trim: As detailed.

2.04 SHOP FABRICATION:

A. Finish surfaces not in contact with the mold to match the molded surfaces in appearance.

B. Finish trim corners and edges.

C. Cure components prior to shipment and remove material which may be incompatible with adjacent building materials.

D. Fabrication Tolerances:
   1. Variation in component size: +1/8 inch.
   2. Location of openings: 1/8 inch from indicated location.

2.05 FINISH:

A. Shop Primer: Exterior grade acrylic emulsion paint.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that substrate is ready to receive work and dimensions are as indicated on shop drawings.

3.02 INSTALLATION:

A. Install fabrications in accordance with shop drawings and fabricator's instructions.

B. Install components plumb and level, scribed to adjacent finishes.

C. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.

D. Provide blocking as required for complete installation and proper anchorage of components.

E. Field paint components in accordance with Section 09 9000.

F. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Replace stained components.

G. Completely caulk joints between components and dissimilar materials with sealant recommended by manufacturer.

3.03 TOLERANCES:

A. Maximum Variation from True Position: 1/4 inch.

B. Maximum Offset from True Alignment: 1/8 inch.

3.04 CLEANING: In accordance with Section 01 7700.

A. Clean components of foreign material without damaging finished surface.

B. Clean fabrications in accordance with fabricator's instructions.

3.05 PROTECTION OF FINISHED WORK:

A. Place protective covering over installed units. Maintain in place until substantial completion.

END OF SECTION

SECTION 07 2100 – THERMAL INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Board insulation.
   2. Batt insulation.
   3. Insulating foam sealants and sealing tapes.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 04 2000 – Unit Masonry.
   3. Section 05 4000 – Cold Formed Metal Framing.
   4. Section 07 2216 – Roof Insulation.
   5. Section 08 4113 – Aluminum Entrances and Storefronts.
   6. Section 08 5200 – Wood Windows.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Installer, General Contractor, Owner, and Architect.

B. Review methods and procedures related to installation, including approved submittals and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit product data for each type of product, indicating compliance with specified performance characteristics and physical properties.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Regulatory Requirements:
   1. Fire Performance Characteristics: Provide insulation materials whose fire performance characteristics have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
      a. Surface Burning Characteristics: ASTM E84.
         (1) Flame Spread Index: Maximum 75.
         (2) Smoke Developed Index: Maximum 450.
      b. Fire Resistance Ratings: ASTM E119.

c. Combustion Characteristics: ASTM E136.

2. CFC Compliance: Provide insulation materials which are not produced with, and do not contain, CFC compounds regulated by the U.S. Environmental Protection Agency.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Deliver materials in manufacturer's original, unopened, undamaged packaging with identification labels intact. Store materials protected from exposure to harmful conditions.

B. Handle boards carefully so corners are not broken off or boards otherwise damaged.

C. Shield boards from exposure to direct sunlight with opaque light-colored tarp.

PART 2 PRODUCTS

2.01 BOARD INSULATION:

A. Cavity Wall Insulation: ASTM C578, Type IV, rigid extruded polystyrene board.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Styrofoam Cavitymate Plus.
   b. Kingspan Insulation LLC; GreenGuard Scoreboard.
   c. Owens-Corning Fiberglas Corporation; Foamular 250.

2. Board Size: 3 inches thick; square edges; 16 x 96 inch sheets, or 48 x 96 inch sheets scored at 16 and 24 inches o.c.

3. R Value: ASTM C518, minimum 5.0 per inch at 75 degree F mean temperature.

4. Joint Tape: Provided by or approved by insulation board manufacturer.

2.02 BATT INSULATION:

A. Fiberglass Batt Insulation: ASTM C665, Type I; unfaced.

1. Manufacturers: In accordance with Section 01 6000.
   a. CertainTeed Corporation; Building Insulation.
   b. Johns Manville Building Insulation; Formaldehyde-Free Building Insulation.
   c. Knauf Insulation GmbH.
   d. Owens-Corning Fiberglas Corporation; EcoTouch Pink.

2. Size: Width as required by framing member spacing; manufacturer's standard lengths.

3. Thickness and R Value: As indicated on the Drawings.
   a. 3½ inch thickness: R-15.

2.03 INSULATING FOAM SEALANTS AND SEALING TAPES:

A. Insulating Foam Sealants: ASTM C1029, Type II; ASTM C1620; AAMA 812; single component, minimal expanding, low pressure build, semi-rigid closed cell polyurethane foam.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Great Stuff Pro.
   b. Hilti Corp.; CF-812.
   c. Tremco, Inc.; TremGlaze LEF.
2. Density: ASTM D1622; minimum 1.5 pcf.

B. Sealing Tapes: AAMA 711; flexible, self-sealing, self-healing, fully adhering membrane flashing with butyl or rubberized asphalt adhesive; minimum 0.025 inch thick; minimum 4 inch width or as required for application.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Weathermate.
   b. GCP Applied Technologies; Perm-A-Barrier.
   c. Henry Co.; Blueskin SA.
   d. Protecto Wrap Co.; BT25XL.
   e. W. R. Meadows, Inc.; Air-Shield.
2. Water Vapor Permeance: ASTM E96; maximum 0.02 perm.
3. Accessories: Provide surface conditioner and primer approved by manufacturer.

2.04 ACCESSORIES:

A. Adhesive: Type recommended by insulation manufacturer.

B. Mechanical Fasteners: Type recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

B. Verify substrate and adjacent materials are flat and free of irregularities and foreign materials that may impede adhesive bond, and within manufacturer's recommended temperature range.

3.02 INSTALLATION:

A. General:
   1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions.
   2. Install building insulation to comply with thermal and acoustical requirements.

3. Fit insulation to areas and conditions required, to form a complete thermal barrier around indicated areas without voids.
4. Coordinate insulation installation over or within three inches of lighting fixtures, fans, or other heat-generating electrical devices with manufacturer's recommendations and regulations of authorities having jurisdiction.

B. Cavity Wall Rigid Insulation: Apply insulation boards horizontally.
1. Masonry Substrate: Apply vertical strips of adhesive spaced approximately 12 inches o.c. on inside of insulation board.
2. Framed Substrate: Secure to framing members with fasteners; do not exceed manufacturer's recommended maximum spacing for application.
3. Tape joints and seams with manufacturer's recommended joint tape.

C. Batt Insulation: Friction fit batts between framing members, installed neatly around and behind electrical boxes, vent piping, duct work, and other obstructions. Butt insulation tight, covering the entire area without voids.
1. Pack loose insulation in narrow spaces where fasteners cannot be installed, to ensure complete insulation coverage.

D. Insulating Foam Sealants: Apply in accordance with manufacturer's recommendations to voids between door and window frames and adjacent construction, perimeter of roof penetrations (except flues), and similar cavities in thermal assemblies.
1. Clean surfaces prior to application; remove oil and chemical substances that may prevent adhesion.
2. Protect adjacent surfaces subject to damage from overspray or accidental contact.
3. After initial curing, trim and remove excess material. Apply joint sealant or other protective material promptly to limit ultraviolet exposure.
4. After final curing, operate window or door to confirm proper operation. Correct binding and distortion caused by overfilling or expansion.

E. Sealing Tapes: Apply in accordance with manufacturer's recommendations and ASTM E2112 to perimeter of door and window frames; seal to adjacent construction. Extend onto face of wall minimum 3 inches or as required by manufacturer's recommendations.
1. Test surface for adhesion; apply surface conditioner and primer where necessary.
2. Remove and discard release paper from self-adhesive tape. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere tape to substrate to prevent water from migrating under tape.

3.03 PROTECTION:

A. Protect installed products from harmful weather exposure and physical abuse, where possible by non-delayed installation of concealing work or, where that is not possible,

by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 07 2216 – ROOF INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Roof insulation.
   2. Vapor retarders for roof assemblies.

B. Related Sections:
   1. Section 05 3123 – Steel Roof Decking.
   2. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   3. Section 07 5000 – Membrane Roofing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate tapered insulation layout plan.

B. Product Data: Submit for each type of product, indicating conformance with specified performance characteristics and physical properties.

1.03 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system components during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Coordinate with Section 07 5000 to ensure that insulation is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Manufacturer of membrane roofing in accordance with Section 07 5000.

B. Atlas Energy Products; ACFoam-III.

C. Firestone Building Products Co.; Resista.

D. Hunter Panels; H-Shield CG.

E. Johns Manville Roofing Systems; ENRGY 3 CGF.

2.02 ROOF INSULATION BOARD:

A. General Requirements: Selected from listed manufacturers and products, and meeting all of the following criteria:
   1. Approved by roof system manufacturer for the specified warranty coverage.
   2. UL and FM approved in combination with membrane material.
   3. Approved by applicable building code agency.
   4. Insulation board not listed as approved for use in Class A roofing assemblies without use of separate thermal barrier, shall be installed over substrate board in accordance with Section 07 2600.
   5. All roof insulation shall be of the same type and manufacturer.

B. Polyisocyanurate Insulation: ASTM C1289, Type II; rigid board, both faces surfaced with inorganic polymer coated glass fiber mat facer; produced with non-HCFC blowing agent.
   1. Board Configuration: 48 x 96 inches or 24 x 96 inches; square edges. For adhesive application, maximum board dimension shall be 48 inches.
   2. Board Thickness: Minimum 4.2 inches total thickness, or as required to meet specified LTTR value.
      a. LTTR Value: ASTM C1289, 15 year time weighted average; minimum 5.6 per inch; minimum 24.0 total.
   3. Density: ASTM D1622, nominal 2.0 lb/cu ft.
   4. Compressive Strength: ASTM D1621, minimum 20 psi.
   5. Tapered Insulation: Custom fabricated to slope indicated on Drawings. Apply in multiple layers when recommended by manufacturer.
      a. Minimum Thickness: ¾ inch at lowest point. Maintain specified minimum R and LTTR values.

2.03 VAPOR RETARDERS:

A. Reinforced Vapor Retarder for Roof Assemblies: Non-woven nylon, fiberglass, or polyester scrim laminated between two layers of polyethylene, polyester, or polypropylene; minimum 6 mil nominal thickness; fire rated type where required by roof assembly classification; largest practical widths to minimize seams. Materials shall be approved by the roofing manufacturer.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Reef Industries, Inc.; Griffolyn Type 65.
      b. Lamtec Corp.; WMP-VR-R Plus.
      c. Raven Industries, Inc.; Dura-Skrim.
      d. Manufacturer of roofing system.
   2. Water Vapor Permeance: ASTM E96; maximum 0.05 perm.
   3. Accessories: Factory fabricated pipe boots.

B. Vapor Retarder Tape: Pressure sensitive self-adhesive type for sealing joints and penetrations; approved by vapor retarder manufacturer.

2.04 ACCESSORIES:

A. Insulation Fasteners: Hot dipped galvanized steel; appropriate for purpose intended; approved by Factory Mutual and system manufacturer in combination with roof deck and insulation type; with smooth edge plates or anchor bars designed to prevent fastener backout.
   1. Length: As required for thickness of material, including substrate board where used, and ¾ inch deck penetration.

B. Insulation Adhesive: Two component low-rise adhesive for spray application, as approved by roofing manufacturer and insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify surfaces are dry and free of snow and ice.

B. Verify deck is supported and secure, clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

3.02 PREPARATION:

A. Clean substrate of dust, debris, and other foreign substances.

3.03 INSTALLATION:

A. Loose lay vapor retarder in a single layer over entire roof area extending to roof edges and perimeter walls and parapets. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Firmly attach vapor retarder to substrates with adhesives as recommended by vapor retarder manufacturer. Locate joints over solid substrates.
   1. Provide minimum 2 inch side laps and 6 inch end laps. Seal overlapping joints, perimeter joints, openings and fastener penetrations with continuous strip of vapor retarder tape to form a continuous vapor retarder assembly. Seal joints airtight at penetrations.
   2. Repair tears and punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder tape or another layer of vapor retarder.
   3. Install boots at pipe penetrations; seal in accordance with manufacturer's instructions.

B. Place insulation in accordance with insulation manufacturer's instructions and roofing manufacturer's recommendations.

C. Place insulation board in minimum two layers with joints offset minimum 12 inches from joints of adjacent layers. Mechanically fasten or adhere each layer to substrate at

Contractor's option in accordance with insulation manufacturer's instructions and roof system warranty requirements.

1. Mechanical Application: Fastener density in accordance with Factory Mutual requirements; increase fastener density at corners and perimeters.
2. Adhered Application: For each layer, spray uniform coat of adhesive to substrate at manufacturer's recommended rate. Set insulation board into adhesive using uniform pressure.

D. Tapered Insulation: Place to the required slope pattern in accordance with shop drawing layout and manufacturer's instructions.
   1. Where multiple layers are required, place layers with joints offset minimum 12 inches from joints of adjacent layers.

E. Place boards perpendicular to deck flutes with edges over flute surface for bearing support.

F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof. Do not allow gaps between adjacent boards, or between boards and adjacent components.

G. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the day.

H. Inspect completed insulation work for damage, including moisture, cupping, warping, and physical harm. Replace damaged materials.

END OF SECTION

SECTION 07 5000 – MEMBRANE ROOFING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fully adhered single ply roof system.

B. Related Sections:
   1. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   2. Section 07 2100 – Thermal Insulation.
   3. Section 07 2216 – Roof Insulation.
   4. Section 07 7100 – Roof Specialties.

1.02 DESIGN REQUIREMENTS:

A. Conform to applicable building code for roof assembly fire hazard requirements.

B. ASTM E108/UL 790: Class A Fire Hazard Classification.

C. FM 4470: Roof Assembly Classification, of Class 1 construction, wind uplift requirement of 1-60, in accordance with FM Construction Bulletin 1-28.

D. Ground Roughness Factor: B.

1.03 PERFORMANCE REQUIREMENTS:

A. System Integrity: Roof assembly, including flashings and accessories, shall not permit the passage of liquid water, and shall withstand wind loads, thermally induced movement, and exposure to weather and ultraviolet radiation without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate layout of membrane sheets, location and type of field splices; termination, penetration and attachment details showing specific wall and deck construction, entire roof assembly and additional blocking as required; conditions of interface with other materials.
   1. Standard catalog cuts, if used, shall be supplemented by additional detail drawings approved by membrane manufacturer as necessary to show project specific conditions. Submit proof of manufacturer approval to Architect.
   2. Field changes to approved shop drawings will not be considered unless accompanied by written approval from membrane manufacturer.
   3. Submit results of fastener pullout tests. Indicate test locations on shop drawings.

B. Product Data:
   1. Provide characteristics on membrane materials, flashing materials, and accessories.
   2. Indicate installation requirements for membrane, including procedures and materials for flashing, splicing and bonding.
   3. The membrane manufacturer shall provide the Installer and Architect with a comprehensive listing of chemicals, solutions, oils, compounds, or materials which may be injurious to the sheet membrane, including those materials normally found to exist in the roof environment or likely to occur on this roof.

C. Installer Certificates: Submit evidence of approval, authorization, or license from membrane manufacturer to install specified system, including documentation of specified training. Provide list of completed projects with project names and addresses, and architect and owner contact information.

D. Manufacturer's Approval: Submit membrane manufacturer's approval of all components of the roof assembly, including insulation and roof edge securement; project review and acceptance for warranty, including approval of installer.

E. Warranty Form: At time of shop drawing submittal, submit preliminary copy of manufacturer's warranty.

F. Manufacturer's Field Reports: Submit under provisions of Section 01 4000. Indicate procedures followed, ambient temperatures, humidity, wind velocity during applications, and items requiring corrective action.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Provide proper attachment of roofing to accessory or related work in contact with, or which becomes an integral part of the roofing or flashing system, including when such accessory or related work is provided under other Sections.

C. Membrane Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience; approved by membrane manufacturer.

   1. Provide adequate number of qualified roofers who are experienced and thoroughly trained in the techniques required to properly install the specified roofing system and related work.

   2. Installer's Project Superintendent shall have experience installing the specified roofing system with minimum 5 years experience on projects of similar size and scope, shall be familiar with the requirements of this project, and shall provide on-site supervision at all times when roofing system work is in progress. Training shall include completion of membrane manufacturer's in-house training course and on-site training.

E. Preinstallation Meeting: In accordance with Section 01 3100.

1. Schedule after approval of submittals and prior to completion of roof deck installation.

2. Attendance: Installer; Owner; Architect; Owner's insurer, if applicable; membrane manufacturer's representative; installers of roof deck, vapor retarder, insulation, roof specialties, and other work interfacing with or affecting roofing.

3. Agenda:
   a. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   b. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   c. Review loading limitations of deck during and after roofing.
   d. Review flashings, special roofing details, roofing drainage, roof penetrations, and condition of other construction that will affect roofing.
   e. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
   f. Review temporary protection requirements for roofing system during and after installation.
   g. Review roof observation and repair procedures after roofing installation.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store materials, except membrane, between 60 degrees F and 80 degrees F. If exposed to lower temperature, restore to minimum 60 degrees F before using.

B. Store materials, except membrane, in dry area and protect from water and direct sunlight.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.08 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the work of this section with that of other sections to assure the timely integration of the work into the building construction.

B. Coordinate the work with installation of associated metal flashings as the work of this section proceeds.

C. Observe masonry construction and installation of flashings at interface with roofing systems.

D. Schedule the work to prevent using newly constructed roofing for storage, walking surface, or material or equipment movement.

1.09 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a two year period after Date of Substantial Completion for damage resulting from failure to prevent penetration of water.

B. Provide 15 year manufacturer "total system" warranty without dollar amount limitation for roofing assembly including insulation, flashing, roof edge securement, and accessories, covering leaks, failures, and wind damage.

1. Coordinate with Sections 07 2216 and 07 7100, and related sections, to ensure that insulation, roof edge securement, and accessories are included in warranty.

C. Warranty Coverage Requirements:

1. Wind Speed Coverage: 55 mph, measured at 10 meters above ground. Reference to "gale force winds" or similar language without a specific wind speed and elevation will not be accepted.

2. Warranty claims may be excluded only for the following:
   a. Abuse or misuse of roof system by the Owner.
   b. Acts of God and other "natural disasters" except wind as limited above.
   c. Fire (after occupancy).

3. Warranty coverage shall commence on date of inspection and approval by manufacturer's representative. After inspection and approval, warranty exclusions for improper design and installation will not be accepted.

4. Warranty provisions requiring Owner to provide notice of leaks to manufacturer shall allow a minimum time period of 30 days for such notice.

5. For warranty repair work, provide full labor and materials required to restore roof system to weathertight condition without cost to the Owner.

D. Obligations of the Surety under the Contract Bond do not extend beyond the two year correction period.

PART 2 PRODUCTS

2.01 MEMBRANE MANUFACTURERS: In accordance with Section 01 6000.

A. Carlisle Syntec Incorporated; Sure-Flex Adhered Roofing System.

B. Duro-Last Roofing, Inc.

C. Johns Manville Roofing Systems; Fully Adhered PVC Single Ply Roofing System.

D. Seaman Corporation; FiberTite.

E. Sika Sarnafil, Inc.; Sarnafil Adhered Roof System.

F. Versico Incorporated; VersiFlex Adhered Roofing System.

2.02 MEMBRANE MATERIALS:

A. General Requirements:

1. Provide fire retardant membrane where required to meet specified fire hazard classification in combination with the membrane type, insulation type, roof slope, and related project conditions.

2. Provide membrane in largest sheet lengths possible as determined by job conditions.

3. Membrane materials shall conform to the minimum physical properties published in the roofing system manufacturer's product literature where they exceed the Performance Requirements of this Section.

B. Thermoplastic Membrane: Polyester reinforced; white color.

1. Provide one of the following types at Contractor's option:
   a. PVC (Polyvinyl Chloride) Membrane: ASTM D4434; minimum 0.060 inch nominal thickness.
   b. KEE (Ketone Ethylene Ester) Membrane: ASTM D6754; polyester reinforced membrane; minimum 0.045 inch actual thickness.

2. Factory Welded Seams: Minimum sheet width 60 inches.

3. Field Welded Seams: Minimum sheet width 75 inches. Use half width sheet size at roof perimeter.

4. Performance Requirements:
   a. Breaking Strength: ASTM D751; minimum 200 lbf.
   b. Tearing Strength: ASTM D751; minimum 45 lbf.
   c. PVC Membrane:
      (1) Thickness Over Reinforcing Scrim: ASTM D4434; minimum 0.0160 inch, top and bottom.
      (2) Water Absorption: ASTM D471; maximum 3.0 percent.
      (3) Linear Dimensional Change: ASTM D1204; maximum 0.5 percent.
      (4) Low Temperature Brittleness: ASTM D2136 or D2137; pass at –40 degrees F.
      (5) Puncture Resistance: ASTM D5602; minimum 33 lbf.
      (6) Elongation at Break: ASTM D751; minimum 15 percent.
   d. KEE Membrane:
      (1) Thickness Over Reinforcing Scrim: ASTM D6754; minimum 0.0145 inch, top and bottom.
      (2) Water Absorption: ASTM D471; maximum 3.7 percent.
      (3) Linear Dimensional Change: ASTM D1204; maximum 0.63 percent.
      (4) Low Temperature Brittleness: ASTM D2136 or D2137; pass at –30 degrees F.

(5) Puncture Resistance: ASTM D5602; minimum 95 lbf.
(6) Elongation at Break: ASTM D751; minimum 18 percent.

C. Seaming Materials: As recommended by membrane manufacturer.

D. Flexible Flashings: Same material as membrane; minimum 0.060 inch thick.

E. Stack Boots: Flexible boot and collar with clamps for pipe stacks through membrane.

2.03 ACCESSORIES:

A. Provide bonding adhesive, splicing cement, cleaner, primer, lap sealant, water cut-off mastic, prefabricated pipe seals, overnight seal, pourable sealer, anchor bars and other related items as recommended and furnished by the membrane manufacturer for conditions of construction and as required for warranty and performance requirements.
   1. Fully Adhered Systems: Adhesive may be factory applied or field applied.

B. Temporary Protection: Polyethylene sheet, fiber reinforced plastic sheet, or other materials with equivalent weather resistance; provide weights to retain sheeting in position.

C. Provide additional accessories, such as preservative treated wood blocking, where required by manufacturer's standards, even when not otherwise indicated or specified.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that surfaces and site conditions are ready to receive work and that no conditions exist which may adversely affect installation, permanence, or quality of work.

B. Verify that blocking, curbs, and nailers are installed at required locations and securely anchored.

C. Verify substrate is clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

D. Verify surfaces are dry and free of snow and ice.

E. Perform fastener pullout tests to determine required fastener spacings.

F. Verify roof openings, curbs, pipes, sleeves, and vents through roof are solidly set, and required accessories are in place.

G. Apply insulating foam sealant to perimeter voids at roof penetrations in accordance with Section 07 2100 to maintain continuity of thermal barrier.

H. Verify that no substances listed in the contamination profile exist on the roofing area which cannot be positively isolated from the membrane.

I. Verify that manufacturer's approval of all roof components has been obtained prior to beginning work.

3.02 PREPARATION:

A. Do not place materials on the roof in a manner which would cause induced loads to exceed the roof deck design load at any point.

B. Clean substrate of dust, debris, and other foreign substances. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof drain plugs when no roof work is taking place or when rain is forecast.

3.03 MEMBRANE APPLICATION:

A. Install membrane in accordance with manufacturer's recommended procedures, specifications, approved shop drawings, and observing manufacturer's cautions and as required to meet or exceed specified wind rating.

B. Isolate all materials and substances which may have a detrimental effect on the membrane.

C. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

D. Shingle joints on sloped substrate in direction of drainage.

E. Accurately align sheets and maintain uniform side and end laps of dimensions required by manufacturer, minimum 3 inches. Stagger end laps. Seal permanently waterproof using methods approved by manufacturer. Manually verify entire length of each seam for voids and deficiencies; correct as recommended by manufacturer.
   1. Heat Welding: Use approved automatic heat welding equipment. In areas inaccessible to machine, use hand held heat gun and teflon roller.

F. Securely fasten membrane at terminations and perimeter. Provide base flashing at perimeters and edges of membrane abutting parapets, walls, curbs, or other construction. Provide prefabricated pipe seals for pipe and conduit penetrations, properly cemented to membrane and sealed to pipe or conduit with stainless steel clamp and top bead of sealant.
   1. At parapets adjacent to roof, extend base flashing or membrane up parapet, over top of wall, and terminate approximately 2 inches down the opposite side.
   2. Counter flash drip edge flashing with membrane lap flashing.

G. Install accessories and related items in accordance with manufacturer's instructions.

H. Seal flashings and flanges of items penetrating membrane.

3.04 DAILY SEAL:

A. Temporarily seal any loose edge of membrane with overnight seal. Ensure that water does not flow beneath any completed sections of the membrane system.
   1. Mix the two components thoroughly according to the instructions on the label.

2. Apply the overnight seal in accordance with manufacturer's recommendations. If necessary, use a trowel to spread material to achieve complete seal. When applying to existing built-up roof surfaces, adjust application rate to allow for surface penetration.
3. After embedding membrane in overnight seal, CHECK FOR CONTINUOUS CONTACT. Weight the edge, providing continuous pressure over the length of the cutoff, with 2½ inch rubber tubing filled with dry sand.
4. When work is resumed, pull sheet free before continuing installation.

3.05 FIELD QUALITY CONTROL:

A. Inspection: Manufacturer's representative shall inspect installation minimum 3 times during progress of the work or biweekly, whichever is more frequent, and certify compliance with manufacturer's installation requirements.

B. Correct identified defects or irregularities.

3.06 PROTECTION: In accordance with Section 01 7000.

A. Perform progress cleaning daily. Do not burn debris on the site. Dispose of all rubbish and scrap materials off-site in a legal manner.

B. Protect landscaping, lawn areas, walks and drives, and building surfaces.

C. Provide barricades, covered walkways and traffic direction as required to prevent personal injury.

D. Where traffic must continue over finished roof membrane, protect surfaces.

E. Coordinate and pay for repairs to existing components and the work of other sections damaged by performance of the work.

F. Correct deficiencies and perform repairs as necessary to restore roofing system to a condition free of damage and deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 07 7100 – ROOF SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Gutters and down pipes.
   2. Sheet metal flashings.

B. Related Sections:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.
   2. Section 07 5000 – Membrane Roofing.
   3. Section 07 9200 – Joint Sealants.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Roof edge securement, except gutters, for low slope membrane roofs shall be designed in accordance with SPRI ES-1, for wind speeds determined by the applicable building code.

1.04 DELIVERY, STORAGE, AND PROTECTION: In accordance with Section 01 6000.

A. Do not store materials with strippable film in areas exposed to direct sunlight.

B. Prevent contact with substances which may discolor prefinished surfaces.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Provide minimum 10 year manufacturer warranty for prefinished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading.

B. Coordinate with Section 07 5000 to ensure that roof edge securement is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Galvanized Sheet Steel: ASTM A755, galvanized to G90 coating class.

B. Aluminum: ASTM B209.

2.02 COMPONENTS:

A. Gutters and Down Pipes: Formed aluminum, 0.040 inch thick, or galvanized sheet steel, 24 gauge; minimum 10 ft lengths except at one end of run.

1. Gutters: Shaped as indicated.
2. Down Pipes: Smooth, non-corrugated profile.
3. Gutter Outlets: 1/8 inch less than inside dimension of down pipe; minimum 4 inch length.
4. Brackets and Spacers: Minimum 3/16 x 1 inch.
5. Accessories: Prefabricated soldered and mitered corners; end closures; hangers; wire basket strainers.
6. Finish: 70 percent PVDF fluoropolymer; color as selected.

B. Drip Edge Flashings, Through-Wall Flashing and Reglet: Formed aluminum, 0.050 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.

1. Counterflashing and Hook Strips: Formed aluminum, 0.024 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.
2. Accessories: Secure counterflashing with wedges and fill reglet with sealant in accordance with Section 07 9200.
3. Finish: 70 percent PVDF fluoropolymer; color as selected.

C. Fascia Covers: AAMA 1402; prefinished smooth aluminum sheet, 0.063 inch thick; vertical face size as indicated.

1. Finish: 70 percent PVDF fluoropolymer; color as selected.

2.03 ACCESSORIES:

A. Fasteners: Concealed; hot dipped galvanized steel or stainless steel; size and type as required to penetrate substrate material minimum 1¼ inch; maximum 24 inch o.c. spacing.

1. Nails: Roofing nails with annular threads and minimum 3/16 inch diameter heads.
2. Bolts: Round head, ¼ inch minimum diameter.
3. Rivets: 1/8 inch minimum diameter; compatible with materials being fastened.

B. Sealant: As specified in Section 07 9200.

C. Solder: 50% block tin and 50% lead.

D. Flux: Muratic acid, diluted with equal parts of water.

E. Splash Blocks: Precast concrete.

2.04 FABRICATION:

A. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Hem exposed edges minimum ½ inch.

C. Make all flat and lap seams in direction of flow.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION:

A. Install components in accordance with manufacturer's instructions.

B. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

C. Install components to provide for expansion and contraction of components and adjacent materials. Provide oversized or slotted holes with gasketed fasteners where necessary to accommodate thermal movement.

D. Coordinate installation of components with installation of roof membrane and base flashings.

E. Install gutters level and properly supported, located to collect rainwater and melting snow and ice runoff; lap joints in direction of flow, riveted and sealed watertight.

F. Install down pipes with mounting brackets spaced within 2 ft of each end, and at maximum 6 ft o.c. Provide splash blocks for each down pipe outlet not connected to storm piping.

G. Coordinate installation of sealants and coatings with work of this section to ensure water tightness.

H. Touch up minor scratches and abrasions in finish work. Replace damaged components.

END OF SECTION

SECTION 07 8400 – FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Firestop systems for penetrations through fire resistance rated assemblies.

B. Related Sections:
   1. Division 21 – Fire Suppression.
   2. Division 23 – Heating, Ventilating, and Air Conditioning.
   3. Division 26 – Electrical.
   4. Division 28 – Electronic Safety and Security.

1.02 PERFORMANCE REQUIREMENTS:

A. Provide systems in accordance with UL Fire Resistance Directory that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire resistance rating of assembly penetrated.

B. F-Rated Systems: ASTM E814 or UL 1479; F-rating equal to or exceeding fire resistance rating of construction penetrated.

C. T-Rated Systems: ASTM E814 or UL 1479; provide for systems protecting penetrating items exposed to potential contact with adjacent materials in occupiable floor areas as follows:
   1. Penetrations located outside wall cavities.
   2. Penetrations located outside fire resistive shaft enclosures.
   3. Penetrations located in construction containing fire protection rated openings.
   4. Penetrating items larger than 4 inch diameter nominal pipe size or 16 square inch overall cross-sectional area.

D. For systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
   1. Piping Penetrations for Wet-Pipe Sprinkler Systems: Moisture resistant.
   2. Penetrations Involving Insulated Piping: Provide systems not requiring removal of insulation.
   3. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide systems capable of supporting floor loads involved either by installing floor plates or by other means.

E. For systems exposed to view, provide products with flame spread ratings of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E84.

F. Compatibility: Provide systems compatible with each other, with substrates forming openings, and with penetrating items, under conditions of service and application.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Submit 3 copies in addition to the number required by Section 01 3300, or as required for distribution to governing authorities.

B. Shop Drawings: Where project conditions require modification of qualified testing agency's illustration to suit a particular condition, submit illustration, with modifications marked, approved by manufacturer's fire protection engineer.

C. Product Data: Documentation, including certified test reports and illustrations from qualified testing agency acceptable to authorities having jurisdiction, applicable to each system configuration for construction and penetrating items.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Trained and approved by manufacturer; specializing in installation of work similar to that required for this project.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Do not install systems when ambient or substrate temperatures are outside limits recommended by manufacturer, or when substrates are wet.

B. Ventilate systems per manufacturer's instructions, by natural or mechanical means as required.

1.07 COORDINATION:

A. Coordinate construction of openings and penetrating items to ensure that systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core drilled holes, or cut openings to accommodate systems.

C. Do not cover up system installations that will become concealed by subsequent construction until required inspections have been performed.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Intumescent Sealants: Single component latex formulations that after cure do not re-emulsify during exposure to moisture.

1. Manufacturers: In accordance with Section 01 6000.
   a. Johns Manville Fire Protection Systems; Firetemp CI Caulk and Firetemp SI Spray.
   b. Hilti Construction Chemicals, Inc.
   c. Nelson Firestop Products.
   d. Pecora Corporation.
   e. Specified Technologies, Inc.
   f. 3M Fire Protection Products.

B. Packing Material: Mineral wool insulation, minimum 4 pcf density.

1. Manufacturers: In accordance with Section 01 6000.
   a. Hilti Construction Chemicals, Inc.
   b. Owens-Corning Fiberglas Corporation; Paroc Safing Insulation.
   c. Rock Wool Manufacturing Co.; Delta Safing Board.
   d. Thermafiber, Inc.; Thermafiber Safing Insulation.

2.02 ACCESSORIES:

A. Provide accessories as required to install materials and to comply with performance requirements. Use only components approved by manufacturer and qualified testing agency.

B. Permanent Forming, Damming and Backing Materials:
   1. Sealants used in combination with other materials to prevent leakage of fill materials in liquid state.
   2. Fire rated form board.
   3. Fillers for sealants.

C. Other Accessories: Temporary forming materials, substrate primers, retaining angles, support plates, collars and steel sleeves.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

3.02 PREPARATION:

A. Surface Cleaning: Clean out openings immediately before installation.
   1. Remove from surfaces of opening substrates, and from penetrating items, foreign materials that could interfere with adhesion.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with system materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by manufacturer, using recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking: Use masking tape to prevent system materials from contacting adjoining surfaces that will remain exposed and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to removed smears from firestop system materials. Remove tape as soon as possible without disturbing seal of system to substrates.

3.03 INSTALLATION:

A. Install systems in accordance with performance requirements and manufacturer's instructions.

B. Install systems to comply with listed fire rated assemblies in accordance with ASTM and UL requirements.

C. Install forming, damming and backing materials and other accessories of types required to support fill materials during application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

D. Install fill materials for firestop systems by proven techniques to produce the following results:
   1. Fill voids and cavities as required to achieve fire ratings indicated.
   2. Apply materials to contact and adhere to substrates formed by openings and penetrating items.
   3. Finish fill materials that will remain exposed, to produce smooth, uniform surfaces flush with adjoining finishes.

3.04 IDENTIFICATION:

A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive vinyl labels. Attach labels permanently to both sides of penetrated construction where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
   1. Preprinted Copy: "Warning – Through-Penetration Firestop System – Do Not Disturb. Notify Building Management if Damaged.
   2. Contractor's name, address and phone number.
   3. Testing agency's system designation.
   4. Manufacturer's name.
   5. Installer's name and date of installation.

3.05 CLEANING AND PROTECTION:

A. Clean excess fill materials adjacent to openings as work progresses using methods and cleaning materials approved by manufacturer and that do not damage materials in which openings occur.

B. Protect installed products from damage during construction operations until final completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated materials and install new materials to produce systems complying with specified requirements.

3.06 SCHEDULES:

A. For each location where a fire rated assembly is penetrated, provide a UL listed through-penetration firestop system as scheduled below or as appropriate for project conditions, complying with specified requirements and suitable for penetration conditions indicated.

B. Metallic Pipe, Conduit or Tubing:
   1. Masonry Walls (Single Penetration): UL C-AJ-1226, C-AJ-1259, C-AJ-1281, or C-AJ-5091.
   2. Masonry Walls (Multiple Penetrations): UL C-AJ-1284.
   3. Stud Walls (Single Penetration): UL W-L-1149, W-L-1344, or W-L-5029.
   4. Stud Walls (Multiple Penetration): UL W-L-1249.

C. Nonmetallic Pipe, Conduit or Tubing:
   1. Masonry Walls: UL C-AJ-2223.
   2. Stud Walls: UL W-L-2078 or W-L-2169.

D. Insulated Pipes: Refer to Section 23 0700 for insulation requirements.
   1. Masonry Walls: UL C-AJ-5123.
   2. Stud Walls: UL W-L-5088.

E. HVAC Ducts:
   1. Masonry Walls (Round Ducts): C-AJ-7040.
   2. Masonry Walls (Rectangular Ducts): UL C-AJ-7041.

3. Stud Walls (Round Ducts): UL W-L-7031.
4. Stud Walls (Rectangular Ducts): UL W-L-7030.

F. Electrical Cables Not in Conduit:
1. Masonry Walls: UL C-AJ-3140.
2. Stud Walls: UL W-L-3121 or W-L-3210.

G. Wall Head Joints: UL 2079.
1. Metal Stud Wall Head at Metal Roof Deck: UL HW-D-0047.

H. Openings Without Penetrating Items:
1. Without Support Plates: UL C-AJ-0062.
2. With Support Plates: UL C-AJ-0063.

END OF SECTION

SECTION 07 9200 – JOINT SEALANTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sealing of interior and exterior joints.
   2. Sealing of glazing joints.

B. Related Sections:
   1. Caulking and sealant work performed under other Sections shall be performed in accordance with the provisions of this Section.
   2. Section 03 3000 – Cast-in-Place Concrete: Joint fillers and sealants for floors, sidewalks and pavements.
   3. Section 07 2100 – Thermal Insulation: Insulating foam sealants.
   4. Section 08 8000 – Glazing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide manufacturer's standard details and installation instructions; identify substrates requiring primers, type of primer recommended by manufacturer, and surface preparation required.

B. Samples: Submit full range of colors for selection.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Firm regularly engaged in installation of sealers of the type specified for not less than 5 years; all work performed by workers thoroughly skilled and specially trained in the techniques required.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials between 40 and 90 degrees F, and under conditions and for a period of time not longer than that recommended by manufacturer.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Install sealants when air and substrate temperatures are over 40 degrees F and rising, but less than 100 degrees F, unless specific installation instructions are obtained from manufacturer.

1.06 WARRANTY: In accordance with Section 01 7700.

A. Exterior Joints: Correct defective Work within a 5 year period after Date of Substantial Completion for damage resulting from adhesive or cohesive failure, and failure to prevent infiltration of water or air through the sealed joint.
   1. Obligations of the Surety under the Contract Bond do not extend beyond the initial two years of the correction period.

PART 2 PRODUCTS

2.01 JOINT SEALERS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Tremco, Inc.
   2. Dow Chemical Co.
   3. Master Builders Solutions.
   4. Momentive Performance Materials, Inc.
   5. Pecora Corporation.
   6. Schnee-Morehead, Inc.
   7. Sherwin-Williams Co.
   8. Sika Corporation.

B. Polyurethane Sealants: ASTM C920.
   1. One-Part Modified Polyurethane: Type S, Grade NS, Class 35, Use NT, M, A, and O; paintable. (Tremco Dymonic FC; MasterSeal NP1)
   2. Multi-Component Polyurethane: Type M, Grade NS, Class 50, Use T, I, M, A, and O. (Tremco Dymeric 240FC; Sikaflex 2c NS)

C. Silicone Sealants: ASTM C920.
   1. General Type: Type S, Grade NS, Class 25, Use NT, M, G, and A. (Dowsil 795)
   2. Exterior Type: Type S, Grade NS, Class 100/50, Use NT, M, G, A, and O. (Tremco Spectrem 1; Dowsil 790)
   3. Glazing Type: Type S, Grade NS, Class 25, Use NT, G, A, and O. (Tremco Proglaze; Tremco Tremsil 600; Dowsil 790)

D. Acrylic Latex Caulk: ASTM C834; paintable. (Tremco Tremflex 834; Sherwin-Williams Magnum XL; Pecora AC-20)

E. Butyl Caulk: ASTM C1311; non-skinning isobutylene-isoprene copolymer. (SikaLastomer 511; Tremco Butyl Sealant)
   1. Tape Mastic: AAMA 800; isobutylene-isoprene copolymer tape. (SikaLastomer 65; Schnee-Morehead SM5227)

F. Colors:
   1. Vertical Joints in Masonry: Match masonry unit color, or slightly darker.
   2. Horizontal Joints in Masonry: Match mortar color.
   3. Joints Around Windows, Doors and Other Openings: Match color of frame material.

4. Other Locations: As selected from manufacturer's standard colors.

2.02 ACCESSORIES:

A. Primers: As recommended by sealant and glazing system manufacturers. Provide primers where indicated, where recommended by manufacturer, and also where preconstruction tests indicate the need for primers to obtain optimum adhesion.

B. Backer Rod: ASTM C1330; round, flexible, closed cell polyethylene, or as recommended by sealant manufacturer; chemically inert, solvent resistant.
   1. Size: Diameter 15% greater than joint width, continuous lengths.

C. Glazing Tape: As specified in Section 08 8000.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Do not begin installation until substrates are clean, dry, and free of loose aggregate, laitance, paint, corrosion, oil, grease, tar, asphalt, mastic compounds, wax, waterproofing agents, release agents, and other deleterious substances.

3.02 PREPARATION:

A. Preconstruction Field Adhesion Testing: ASTM C1193.
   1. Conduct field tests for adhesion of joint sealants to actual substrates using proposed joint preparation methods, for each type of sealant and substrate, prior to general installation.
   2. Use manufacturer's standard field adhesion test methods and joint preparation methods to verify proper priming and preparation techniques required to obtain optimum adhesion of sealants to substrate.
   3. Repeat testing until satisfactory adhesion is achieved. Evaluate and report results.
   4. Approved results shall become the standard of acceptability for the project.

B. Remove foreign substances from substrate. Clean substrate in accordance with manufacturer's instructions and the following general methods:
   1. Porous Surfaces:
      a. Remove laitance by acid washing, grinding or mechanical abrading.
      b. Remove form oils by sandblasting.
      c. Vacuum or blow out joints with oil-free compressed air to remove loose particles.

2. Non-Porous Surfaces:
   a. Remove protective coatings using solvent recommended by sealant manufacturer.
   b. If surface has been treated or coated with a special coating, contact sealant manufacturer for recommendations.

C. Mask adjacent finished surfaces and adjacent porous surfaces that would be damaged by primer, sealant, or cleaning agents.

D. Prime surfaces to receive sealant in accordance with manufacturer's instructions, and allow to dry before installing sealant. Do not apply primer to surfaces outside of joint. Prime surfaces prior to installing backer rod or bond-breaker tape.

E. Install joint backing. Do not puncture, twist, compress less than 25 percent or more than 50 percent, or stretch backer during installation.

   1. Install joint backing to control joint depth as indicated and to prevent 3-sided bond.

   2. Install to control depth at midpoint of sealant as follows, unless otherwise indicated. Do not exceed sealant manufacturer's recommended maximum width.
      a. Joint Width ¼ to ½ Inch: Depth equal to width.
      b. Joint Width Greater Than ½ Inch: ½ inch depth.

3.03 APPLICATION:

A. Install sealants in accordance with manufacturer's instructions and ASTM C1193.

B. Gun Grade Sealants: Extrude sealant to completely fill joint using proper gun and nozzle. Tool to compress sealant against sides of joint and eliminate air bubbles. Leave a neat, slightly recessed concave surface, unless otherwise indicated.

C. Self Leveling Sealants: Pour sealant to fill joint, slightly recessed below adjacent surfaces.

D. Curing:
   1. Cure sealants in compliance with manufacturer's instructions to obtain high early bond strength, internal cohesive strength, and surface durability.
   2. Where joints are scheduled to be painted, allow sealant to cure before painting over joint.
   3. Advise the General Contractor of procedures required for curing and protection during the construction period, to prevent deterioration or damage (other than normal wear and weathering) at Substantial Completion.

3.04 CLEANING:

A. Clean primer and sealant from adjacent surfaces. Wipe fresh sealant immediately from adjacent surfaces. Do not use cleaning agents which may damage finishes.

B. Remove masking tape from completed joints.

3.05 SCHEDULE:

A. General Purpose Interior and Exterior Applications: Multi-component polyurethane.
   1. Joints and recesses between adjacent construction and frames, sills, and subsills of windows, doors, storefront, and similar items.
   2. Around both exterior and interior surfaces of penetrations in exterior walls.
   3. Under door thresholds, and at bottom of door frames.
   4. Wherever necessary to prevent infiltration of water or air into or through exterior building enclosure.

B. Expansion and Control Joints: Silicone sealant, exterior type.
   1. Joints in stone.
   2. Expansion and control joints in brick.

C. Gypsum Sheathing at Masonry Veneer: Silicone sealant, general type.
   1. Panel joints, fasteners, perimeter, and penetrations.

D. Concealed Exterior Locations: Butyl caulk and tape mastic.
   1. Metal to metal joints within sheet metal flashing assemblies.

E. Other Exterior Applications: One-part modified polyurethane.
   1. Between adjacent construction and flashings.
   2. Metal flashing inserted into reglet.
   3. Top edge of surface mounted counterflashing.
   4. Joints between new and existing exterior construction.

F. Other Interior Applications: Acrylic latex caulk.
   1. Small voids between walls or partitions and adjacent door frames.
   2. Interior locations not otherwise indicated or specified, where small voids exist between materials specified to be painted.
   3. Other exposed and concealed locations within partitions to seal against passage of air.

G. Glazing:
   1. Sealer: Silicone sealant, glazing type.
   2. Tape: Glazing tape.
   3. Applications: As scheduled in Section 08 8000.

END OF SECTION

SECTION 08 1100 – METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel doors and frames.

B. Related Sections:
   1. Section 07 9200 – Joint Sealants.
   2. Section 08 7100 – Door Hardware.
   3. Section 08 8000 – Glazing.
   4. Section 09 9000 – Painting and Coating: Field painting of doors and frames.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, closure method, anchor types and spacings, finishes, and cut-outs for hardware and glazing.

1.03 QUALITY ASSURANCE:

A. Conform to requirements of ANSI A250.8 and ADA.

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

1.04 REGULATORY REQUIREMENTS:

A. Fire Rated Door and Frame Construction: Conform to UL 10C and applicable building code.

B. Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000 and HMMA 840.

B. Accept Products on site in manufacturer's packaging. Inspect for damage.

C. Break seal on site to permit ventilation.

D. Provide ¼ inch spaces between stored materials to promote air circulation.

1.06 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Coordinate frame installation with size, location, and installation of service utilities.

B. Coordinate the work with door opening construction and hardware installation.

C. Sequence installation to ensure wiring connections for electric hardware components are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Ceco Door Products.

B. Curries Company.

C. Core Industries, Inc.; Pioneer Industries Division.

D. Mesker Door, Inc.

E. MPI Group, LLC.

F. Republic Doors and Frames.

G. Steelcraft Manufacturing Company.

2.02 FRAMES:

A. Interior Frames: 16 gauge thick cold rolled steel.

2.03 DOORS:

A. Interior Doors: ANSI A250.8, Level 2 Heavy Duty, Model 2 Seamless; ANSI A250.4, physical performance level B; 18 gauge cold rolled sheet steel.

B. End Closure: Continuous channel, flush.
   1. Hinge Edge: Minimum 11 gauge.
   2. Lock Edge, Top, and Bottom: Minimum 14 gauge.

C. Core: Manufacturer's standard for fire rating scheduled.

2.04 ACCESSORIES:

A. Glass: In accordance with Section 08 8000.

B. Anchorages: Galvanized steel, minimum 18 gauge.

C. Anchorages at In-Place Masonry: Galvanized steel machine screws and shield.

D. Fasteners: Concealed type where possible. Where exposed screws and bolts are required, provide only countersunk, flat Phillips head fasteners.

E. Primer: Rust inhibitive, suitable to receive finish coatings specified.

F. Silencers: Resilient rubber or vinyl, fitted into drilled hole.

2.05 FABRICATION:

A. Fabricate frames as welded unit, mitered and ground smooth.

B. Fabricate doors and frames for hardware installation in accordance with approved hardware shop drawings and ANSI A115. Provide hardware reinforcement plates welded in place. Provide mortar guard boxes and dust covers.

C. Prepare frames for silencers. Provide three silencers for single doors on strike side.

D. Fabricate frames located in masonry walls with head member size to suit coursing.

E. Permanently affix fire rating identification label of approved testing agency to each fire rated assembly.

2.06 FINISH:

A. Cold Rolled Steel Sheet: ASTM A1008, matte finish exposed, oiled.

B. Primer: Clean by degreasing process; phosphatize; apply one coat primer, baked on, capable of passing a 70 hour salt spray test in accordance with ASTM B117. Prime all surfaces, including under and inside removable stops.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify exposed steel lintels are painted prior to frame installation.

3.02 INSTALLATION:

A. Install doors and frames in accordance with ANSI A250.8, HMMA 840, and DHI.

B. Coordinate with wall construction for anchor placement. Install frames in masonry walls with 6 anchors. Install frames in stud walls with 8 anchors.

C. Brace frames placed prior to constructing walls; maintain plumb and planar. Remove braces after anchorages are permanently installed.

D. Prior to installation, paint bottom edge of doors scheduled to be field painted.

E. Coordinate installation of glass and glazing.

F. Coordinate installation of door hardware.

G. Touch-up abrasions with primer. Touch-up minor rust areas; sand smooth; apply primer.

3.03 ERECTION TOLERANCES:

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

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust doors for smooth and balanced door movement.

END OF SECTION

SECTION 08 4113 – ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Aluminum doors and frames.

B. Related Sections:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 07 9200 – Joint Sealants.
   3. Section 08 7100 – Door Hardware.
   4. Section 08 7113 – Automatic Door Operators.
   5. Section 08 8000 – Glazing.

1.02 DESIGN REQUIREMENTS:

A. Aluminum entrance and storefront system includes tubular aluminum sections with supplementary internal support framing, shop fabricated, factory finished, withrelated flashings, accessories, anchorage and attachment devices.

B. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, calculated in accordance with applicable building code.

C. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

D. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

E. Thermal Movement: Provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F without causing detrimental effect to system components, sealants, and anchorage.

F. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.03 PERFORMANCE REQUIREMENTS:

A. Air Infiltration: ASTM E283; maximum 0.06 cfm/ft, at 6.24 psf static air pressure differential.

B. Water Leakage: ASTM E331; none, at 8.0 psf static air pressure differential.

C. Deflection: In accordance with AAMA TIR-A11.

D. Thermal Transmittance: AAMA 1503; maximum U-value 0.66 Btu/sq. ft. with specified glazing.

E. Condensation Resistance: AAMA 1503; minimum CRF 45.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, framed opening requirements and tolerances, project-specific interface details with adjacent construction including flashing materials, anchorage, insulation, and expansion and contraction joint locations and details.

B. Product Data: Provide component dimensions, installation instructions, description of components within assembly, anchorage and fasteners, door hardware, internal drainage details, and accessories.

C. Design Data: Provide framing member structural and physical characteristics, calculations, and dimensional limitations.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with AAMA MCWM-1 and AAMA SFM-1.

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

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Handle Products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Capitol Aluminum and Glass Corp.

B. Efco Corporation.

C. Kawneer Company, Inc.

D. Tubelite, Inc.

E. Oldcastle BuildingEnvelope.

2.02 MATERIALS:

A. Extruded Aluminum: ASTM B221, alloy G.S. 10A-T5.

B. Sheet Aluminum: ASTM B209.

C. Fasteners: Aluminum or stainless steel.

2.03 COMPONENTS:

A. Exterior Thermal Break Framing Members: 2 x 4½ inch nominal dimension; thermally broken with interior tubular section insulated from exterior; center plane glazing; flush glazing stops; drainage holes; internal weep drainage system. (Kawneer Trifab VG 451T; Capitol 245T; Oldcastle 3000 Thermal; Tubelite T14000)

B. Wide Stile Doors: 1¾ inches thick; 4½ to 5 inch wide top rail and vertical stiles, 10 inch bottom rail, 0.125 inch nominal extrusion thickness; beveled glazing stops.

C. Framing Accessories: Fillers, glazing adapters; to coordinate with framing members; as indicated.

D. Flashings: 0.050 inch thick aluminum, finish to match mullion sections where exposed.

2.04 GLASS, GLAZING, AND SEALANT MATERIALS:

A. Glass and Glazing Materials: 1 inch thick Low E insulating glass units as specified in Section 08 8000.

B. Sealant and Backing Materials: As specified in Section 07 9200.

2.05 DOOR HARDWARE:

A. Manufacturers: As listed in Section 08 7100.

B. General Requirements: Entrance system manufacturer's standard type to suit application; factory installed where applicable. Refer to Section 08 7100 for additional hardware.

C. Provide the following hardware:
   1. Weatherstripping: Thermoplastic elastomer with semi-rigid polymeric backing.
   2. Astragal at Meeting Stiles: Adjustable type with stainless steel backing, with weatherstripping.
   3. Hinges: Continuous geared hinge, surface applied to door and frame.
   4. Threshold: Extruded aluminum, one piece per opening, ribbed surface; mill finish.
   5. Sill Sweep Strip: Resilient EPDM blade gasket in aluminum extrusion, applied to interior exposed surface of bottom rail with concealed fasteners.
   6. Closer With Stop: Surface mounted, parallel arm; with back-check. (LCN P4041-3077CNS)

2.06 FABRICATION:

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Secure door corners with mechanical clips, sigma deep penetration welds and sigma fillet welds.

D. Prepare components to receive anchor devices. Fabricate anchors.

E. Arrange fasteners and attachments to conceal from view.

F. Reinforce interior horizontal head rails scheduled to receive drapery or blind hardware and attachments.

G. Prepare components with internal reinforcement for door hardware.

H. Reinforce framing members for imposed loads and to receive threaded fasteners.

I. Provide for isolation of incompatible metals to prevent galvanic deterioration.

2.07 FINISH:

A. Exposed Aluminum Surfaces: AAMA 2605; 70 percent PVDF fluoropolymer; 1.2 mil thickness, with clear topcoat; color as scheduled. (Valspar Fluropon)

B. Hardware: Refer to Section 08 7100.

C. Apply one coat of bituminous paint to concealed surfaces in contact with cementitious or dissimilar materials.

D. Extent of Finish:
   1. Apply factory coating to all surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify that wall openings and adjoining materials are ready to receive work of this Section.

D. Verify exposed steel lintels are painted prior to framing installation.

3.02 INSTALLATION:

A. Install wall system in accordance with manufacturer's instructions and AAMA MCWM-1.

B. Install assembly plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Apply insulating foam sealant to perimeter voids in accordance with Section 07 2100 to maintain continuity of thermal barrier.

G. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

H. Install flashings where scheduled. Turn up ends and edges; seal to adjacent work to form water tight dam.

I. Set thresholds and sill members in bed of mastic and secure.

J. Install hardware using templates provided.

K. Install perimeter sealant; type, backing materials, and installation criteria in accordance with Section 07 9200.

L. Install glass in accordance with Section 08 8000.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: 0.06 inch every 3 ft non-cumulative or 1/16 inch per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust operating hardware for smooth operation.

3.05 CLEANING: In accordance with Section 01 7700.

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect finished Work from damage.

END OF SECTION

SECTION 08 5200 – WOOD WINDOWS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Factory fabricated clad wood windows with operating sash; factory glazed.
   2. Operating hardware and insect screens.
   3. Perimeter sealant.

B. Related Sections:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 07 9200 – Joint Sealants: Perimeter sealant and back-up materials.
   3. Section 08 8000 – Glazing.
   4. Section 09 9000 – Painting and Coating: Site finishing wood surfaces.

1.02 SYSTEM DESCRIPTION:

A. Performance Requirements: AAMA 101, Class H-LC30 minimum.
   1. Air Infiltration: ASTM E283; maximum 0.11 cfm/sq ft, at 1.57 psf reference differential pressure across assembly.
   2. Water Penetration: ASTM E331; none, at 7.5 psf test pressure difference.
   3. Deflection: Limit member deflection to flexure limit of glass with full recovery of glazing materials. Limit mullion deflection to 1/175 of span.
   4. Thermal Transmittance: Rated, certified and labeled in accordance with NFRC 100; maximum assembly U value 0.26.
   5. Solar Heat Gain Coefficient (SHGC): NFRC 200; maximum 0.29.

B. System Assembly: Design and size components to withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall, as calculated in accordance with applicable building code. Accommodate movement between window and perimeter framing and deflection of lintel without damage to components or deterioration of seals.

C. Air and Vapor Seal: Maintain continuous air and vapor barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

D. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.

B. Product Data: Provide component dimensions, anchorage and fasteners, glass, and internal drainage details.

1.04 DELIVERY, STORAGE AND PROTECTION: In accordance with Section 01 6000.

A. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

B. Deliver materials to job site in sealed, unopened cartons. Protect uncartoned units from damage prior to installation.

C. Store off ground, under cover, protected from weather and construction activities.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a five year period after Date of Substantial Completion.

B. Provide five year manufacturer warranty for insulated glass units from seal failure, inter-pane dusting or misting, and replacement of same.

C. Warranty:
   1. Include coverage for degradation of color finish.
   2. Include coverage for delamination or separation of finish cladding from window member.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Pella Corp.; Lifestyle series.

B. Andersen Windows.

C. Jeld-Wen, Inc.

D. Marvin Windows & Doors.

E. Weather Shield.

2.02 MATERIALS:

A. Wood: Clear softwood species in accordance with WDMA IS-2, water repellent preservative treated to WDMA IS-4 of type suitable for opaque interior finish.

B. Exterior Surface Cladding: Factory fit to profile of wood members and exterior exposed surfaces; manufacturer's standard of the types listed below:
   1. Formed aluminum, factory finished.
   2. Extruded PVC: ASTM D1784, Class 14344-C; ASTM D4216; low sheen surface.

C. Fasteners: Stainless steel or galvanized steel.

D. Glass and Glazing Materials: Insulating low E glass units with inert gas filling.

E. Sealant and Backing Materials: As specified in Section 07 9200.

2.03 COMPONENTS:

A. Frames: Wood with exterior cladding, with rigid vinyl glazing bead.

B. Simulated Muntin Panels: Permanently installed exterior type; pattern to match existing.

C. Sills: Wood with exterior cladding, sloped for positive drainage; one piece full width of opening.

D. Weather Stripping:
   1. Horizontal: Gasket type vinyl covered foam.
   2. Vertical: Polypropylene channels in contact with ribs in jamb liners.

E. Fasteners: Stainless steel or galvanized steel.

2.04 HARDWARE:

A. Sash Lock: Lever handle with cam lock, recessed in lower sash.

B. Sash Lift: Recessed polystyrene.

C. Balances: Spring power with grooved take-up drum and nylon cord.

2.05 ACCESSORIES:

A. Stools: Match existing.

B. Insect Screens: Fiberglass mesh; aluminum frame with attachment hardware, sized to coordinate with operable sash.

2.06 FABRICATION:

A. Fabricate framing and sash members with doweled joints. Glue joints to hairline fit, weather tight.

B. Finger joints are permitted only in units intended for opaque interior finish, if wood matches in color and grain texture.

C. Provide weather stop flange for perimeter of unit.

D. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet allowing installation and dynamic movement of perimeter seal.

E. Arrange fasteners to be concealed from view.

F. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.

G. Assemble insect screen frame; miter and reinforce frame corners. Fit mesh taut into frame and secure. Fit frame with spring loaded steel pin retainers.

H. Factory weatherstrip operable units.

I. Factory glaze window units.

2.07 FINISHES:

A. Exterior Surface Cladding: White.

B. Interior Surfaces: Opaque factory finish, color as selected.

C. Simulated Muntin Panels: Color to match exterior cladding.

D. Screen Frames: White.

E. Operators and Exposed Hardware: White.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

C. Verify wall opening is square, sill plate is level, and dimensions are correct.

D. Verify exposed steel lintels are painted prior to window installation.

3.02 PREPARATION:

A. Install sealing tape to face of wall insulation in accordance with Section 07 2100; align top with sill opening and extend past each side of the rough opening minimum 8 inches.

3.03 INSTALLATION:

A. Install windows in accordance with manufacturer's instructions.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install components, hardware, and accessories in accordance with manufacturer's instructions.

E. Provide thermal isolation at penetration of building insulation.

F. Apply insulating foam sealant to perimeter voids in accordance with Section 07 2100 to maintain continuity of thermal barrier.

G. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

H. Apply sealing tape vertically to each jamb in accordance with Section 07 2100 to seal window frame to wall insulation. Apply sealing tape to window head; lap over vertical tape.

I. Install perimeter sealant and backing materials in accordance with Section 07 9200.

3.04 ERECTION TOLERANCES:

A. Maximum Variation From Level or Plumb: 1/16 inch every 3 ft non-cumulative or 1/8 inch per 10 ft, whichever is less.

3.05 ADJUSTING:

A. Adjust hardware for smooth operation and secure weathertight closure.

3.06 CLEANING: In accordance with Section 01 7700.

A. Remove protective material from factory finished surfaces.

B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.

C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08 7100 – DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Hardware for hollow metal and aluminum doors.
   2. Keying.
   3. Low voltage control wiring.

B. Related Sections:
   1. Section 08 1100 – Metal Doors and Frames.
   2. Section 08 4113 – Aluminum Entrances and Storefronts.
   3. Section 08 7113 – Automatic Door Operators.
   4. Division 26 – Electrical: Power supply to electric hardware devices; installation of low voltage wiring.
   5. Section 28 1000 – Access Control and Intrusion Detection.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate locations and mounting dimensions of each type of hardware, schedules, and catalog cuts.
   1. Wiring Diagrams: Provide for each opening containing electrically operated hardware. Indicate electrical characteristics and connection requirements; wire and conduit type, size, and location; point-to-point wiring requirements; power supplies and accessories. Identify interfaces to the work of other trades, and requirements affecting their work.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Fire Door Assembly Inspection Reports: In accordance with NFPA 80.

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

C. Maintenance Products: Provide special wrenches and tools applicable to each different or special hardware component. Provide maintenance tools and accessories supplied by hardware component manufacturer.

D. Keys: Deliver to Owner by security shipment direct from hardware supplier. Tag master keys with project name and geographical location. Tag change keys with door number and location in building. Include schematic drawing of keying and explanation of lock operating features, including method of rendering construction master keys inoperative.

1.04 QUALITY ASSURANCE:

A. Perform Work in accordance with applicable requirements of ADA, AWI, BHMA, DHI, NFPA, and UL.

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

C. Hardware Supplier Qualifications: Company specializing in supplying commercial and institutional door hardware with minimum three years documented experience; approved by manufacturers.

D. Hardware Supplier Personnel: Employ a Door + Hardware Consultant (DHC) and Access Control System Consultant (ACSC) or personnel with similar qualifications to assist in the work of this section.

1.05 REGULATORY REQUIREMENTS:

A. Hardware for Fire Rated Openings: Conform to NFPA 80, UL 10B and applicable building code. Provide closers, exit devices and all other hardware required for fire rating classification indicated, whether or not specifically scheduled.

1.06 DELIVERY, STORAGE AND PROTECTION: In accordance with Section 01 6000.

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.07 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Furnish hardware of proper design and function for the door and frame conditions, dimensions, profile, swing, and performance requirements indicated.

B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

C. Sequence installation of surface applied hardware items with painting and finishing of the substrates involved.

D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

E. Coordinate Owner's keying requirements during the course of the Work.

PART 2 PRODUCTS

2.01 SUPPLIERS: In accordance with Section 01 6000.

A. Central Indiana Hardware Co., Inc.

B. General Building Products, Inc.

C. Moss Building Products.

D. Stafford Building Products, Inc.

2.02 COMPONENTS:

A. Butt Hinges: ANSI A156.1; 5 knuckle full mortise type; 4½ x 4½ inch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; McKinney.
   c. Bommer Industries, Inc.
   d. Hager Hinge Co.
   e. Stanley Security Solutions.

2. Interior Type: ANSI A8111; steel. (McKinney T4A3786, Bommer BB5004, Hager BB1168, Ives 5BB1 HW, Stanley FBB168)

B. Exit Devices: UL 305; ANSI A156.3, Grade 1; rim type.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Von Duprin.
   b. Assa Abloy Electronic Security Hardware; Securitron.
   c. Dorma USA, Inc.
   d. Sargent Manufacturing Co.
   e. Stanley Security Solutions; Precision.

2. Cylinder Trim: ANSI 04 function with cylinder and dogging cylinder; exterior pull specified separately. (Sargent 16-8804, Von Duprin CD99NL-OP, Dorma 9300CD-04, Precision 2103CD)

3. Fire Exit Devices with Electric Lock: Lever electrically unlocked, fail secure; with cylinder. (Sargent 12-8574, Von Duprin E99LF-FSE, Dorma F9300-LFSC, Precision FE2108)
   a. Lever Trim: Sargent ETL; Von Duprin 996L06; Dorma YR; Precision 4900A.
   b. Power Supply: Voltage and amperage as required for application. (Sargent 3500 series, Von Duprin PS900 series, Dorma ES100, Precision ELR150 series)
   c. Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-10, Dorma ES105, Securitron EPT series, Precision EPT-12C, or concealed circuit hinge by hinge supplier)

4. Electrically Actuated Exit: Electric latch retraction and dogging, with latch monitor switch; with power supply, controller, and power transfer.
   a. Exit Only: Exterior pull specified separately. (Sargent 55-56-8810, Von Duprin LX-QEL99EO, Dorma 9300-MLR-LM, Precision ELR-LS2101)
   b. Power Supply: Voltage, amperage, and control circuits as required for application; signal switch and time delay for control of door operator. (Sargent 3500 series, Von Duprin PS900 series, Dorma PS500 series, Precision ELR150 series)

c. Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-2, Dorma ES105, Securitron EPT series, Precision EPT-12C, or concealed circuit hinge by hinge supplier)

5. Removable Mullions: Keyed type with interchangeable core cylinder; aluminum. (Sargent 63-L980 series, Von Duprin KRxx54 series, Dorma 1300KR series)

C. Closers: ANSI A156.4, Grade 1; rated for 10 million cycles.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; LCN Closers.
   b. Dorma USA, Inc.
   c. Sargent Manufacturing Co.
   d. Stanley Security Solutions.

2. Parallel Stop Type: Push side mounting. (Sargent 351-PS, LCN 4111-3077CNS, Dorma 8916-DS, Stanley D-4550S)

D. Overhead Stops and Holder/Stops: Extruded track, slide, arm, and frame bracket.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Glynn-Johnson.
   b. Dorma USA, Inc.
   c. Rixson Specialty Door Controls.
   d. Sargent Manufacturing Co.

2. Concealed Stop: Sargent 698S; Glynn-Johnson 104S; Rixson 1-336; Dorma 912S.

E. Plates and Trim:

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; Rockwood.
   c. Baldwin Hardware Manufacturing Corp.
   d. Hiawatha, Inc.
   e. Sargent Manufacturing Co.

2. Kickplates: Stainless steel, 0.050 inch thick, 8 inch height; 2 inches less than door width. (Rockwood K1050, Ives 8400)

3. Pulls for Aluminum Doors: 1 inch diameter, 3½ inch projection, with 90 degree offset; minimum 9 inch mounting spacing. (Rockwood BF157A, Sargent 862, Ives 8190-0)

F. Contact Switches: Low voltage SPDT switch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Schlage.
   b. Assa Abloy Electronic Security Hardware.
   c. Folger Adam Security, Inc.
   d. GE Interlogix; Sentrol.

e. Sargent Manufacturing Co.

2. Swing Doors: Concealed mounting. (Sargent 3287, Sentrol 1076, Schlage 679-05 series)

3. Conduit: In accordance with Division 26.

G. Control Wiring: Furnish low voltage wiring for electrically operated components; in accordance with manufacturer's recommendations.

2.03 KEYING:

A. Door Locks: Master keyed to existing system; field verify prior to submitting bid. Key doors to match existing keys provided by Owner.

B. Include construction master keying.

C. Include control keying with removable core cylinders.
   1. Provide temporary construction cores, keyed alike, for all doors which must be locked during construction. Provide temporary plastic covers for locks not equipped with construction cores.

D. Supply keys in the following quantities:
   1. Construction master keys as required by Contractor, plus 4 keys for Owner and Architect.
   2. 4 keys for each master key and change key, except as otherwise noted.
      a. Provide minimum 2 keys per keyed cylinder.
   3. 2 control keys and 5 extra cylinder cores.

E. Key dogging cylinders and removable mullion cylinders alike to other cylinders at each door, unless noted otherwise.

2.04 FINISHES:

A. Hinges, Exit Devices and Pulls: US 26D; BHMA 626.

B. Cylinder Cores: US 15; BHMA 619; or match cylinder housing.

C. Removable Mullions: Finish to match storefront framing.

D. Closers: Painted enamel finish.
   1. Hollow Metal Doors: Aluminum powder coat; BHMA 689.
   2. Aluminum Doors: Finish to match storefront framing.

E. Plates and Stops: US 32D; BHMA 630.

F. Thresholds: Clear anodized aluminum.

G. Weatherstrips and Sweeps: Clear anodized aluminum.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings and as instructed by manufacturer.

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

3.02 INSTALLATION:

A. Install hardware in accordance with manufacturer's instructions.

B. Use templates provided by hardware item manufacturer.

C. Hardware Mounting Heights: In accordance with DHI.

D. Kickplates: Mount on push side of door, flush with bottom of door, unless specifically indicated. Center between frame stops.

E. Contact Switches: Coordinate location and installation with security system installer. Maintain gap distance between switch and magnet as recommended by manufacturer for proper operation.

F. Low Voltage Control Wiring: Install in accordance with manufacturer's recommendations.

3.03 ADJUSTING:

A. Adjust hardware for smooth operation.

B. Adjust hardware to provide operating and door opening forces in accordance with ADA and NFPA, maximum 5 lbf for non-rated interior doors.

3.04 PROTECTION OF FINISHED WORK:

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

3.05 SCHEDULE:

A. Set No. 1: Door 139A.
   1. Automatic door operator as specified in Section 08 7113 (RHR leaf).
   2. Exit Device (RHR Leaf): Electrically actuated exit only type.
   3. Exit Device (LHR Leaf): Cylinder trim.
   4. Removable mullion.
   5. Overhead stop (RHR leaf).
   6. Pulls (2).
   7. Contact switches (2).

8. Balance of hardware by aluminum door supplier, including threshold, sweeps, and closer with stop (LHR leaf).
9. Sequence of Operation (RHR Leaf): Interconnect with key switch specified in Section 08 7113 to disconnect power to exterior door operator actuator when switch is in "off" position. When switch is in "on" position, shunt door contact, retract exit device latch, and enable exterior actuator. Interior actuator shall shunt door contact, retract exit device latch, and open door.

B. Set No. 2: Door 139B.
1. Butts (3): Interior type.
2. Fire Exit Device: Electric lock type.
3. Closer: Parallel stop type.
4. Kickplate.
5. Sequence of Operation: Proximity reader shall unlock lever.

END OF SECTION

SECTION 08 7113 – AUTOMATIC DOOR OPERATORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Automatic door operators and controls.
   2. Low voltage control wiring.

B. Related Sections:
   1. Section 05 5000 – Metal Fabrications: Steel bollard posts.
   2. Section 08 4113 – Aluminum Entrances and Storefronts: Entrance doors and frames.
   3. Section 08 7100 – Door Hardware.
   4. Division 26 – Electrical: Power supply to operator; installation of low voltage wiring.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide details of fabrication, finishing, hardware, operators, accessories, and other components of the work. Include rough-in diagrams, wiring diagrams, parts lists, and maintenance instructions.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with ANSI A156.19 and UL 325.

B. Perform Work in accordance with AAMA MCWM-1 and AAMA SFM-1.

C. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum five years documented experience.

D. Installer: Company specializing in performing the work of this Section with minimum three years documented experience; approved by manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Handle Products of this section in accordance with AAMA Curtain Wall Manual #10.

B. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

PART 2 PRODUCTS

2.01 AUTOMATIC DOOR OPERATORS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Overhead Door Corporation; Horton Automatics; Series 7000 EasyAccess Operator.
   2. Besam Automated Entrance Systems, Inc.
   3. Dorma Architectural Hardware.
   4. Allegion PLC; LCN Closers, 9540 series.
   5. Record USA.

B. Electric Operating Mechanism: Low energy, self contained, electromechanical design with DC motor and reduction gearing; closing speed controlled mechanically by gear train and dynamically by braking action of electric motor.

C. Operating Modes: Switch selectable between the following modes:
   1. Manual/Automatic: Manual operation when pushed open; automatic opening when actuated by pushbutton switch.
   2. Automatic: Automatic opening by either pushing the door manually to activate automatic operation or by pushbutton switch.

D. In the event of power failure, door shall be manually operable with controlled spring close, with maximum 50 lbf force to set door in motion.

E. Adjustments:
   1. Opening Speed: 3 to 5 seconds.
   2. Closing Speed: 3 to 5 seconds.
   3. Time Delay Before Closing: 2 to 30 seconds; initially adjusted to 5 seconds.

F. Opening and Closing Force: Maximum 15 pounds of force, applied at 2 inches out from lock stile of door, shall be sufficient to stop the door when operating in either direction.

G. Automatic Reset: When door is stopped for one second, opening force shall be turned off and operator shall be reset and ready to receive another opening signal.

H. Operator Housing: Extruded aluminum cover, 4 x 6 inches, full width of door, with end caps; finish to match storefront framing.

I. Controls:
   1. Push Plate Actuators: 4½ inch square or 6 inch round stainless steel with engraved blue filled international symbol of accessibility; weather resistant switch. (Horton C1260 series; LCN 7930-390)
   2. On-Off Key Switches: Maintained contact type to remove power to exterior actuator in “off” position. (Horton C529)

2.02 ACCESSORIES:

A. Control Wiring: Furnish low voltage wiring in accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that doors, framing, and adjoining materials are ready to receive work of this Section.

3.02 INSTALLATION:

A. Install operators and controls in accordance with manufacturer's instructions.

B. Mounting Height for Controls: 40 inches to top of back box, unless indicated otherwise.

C. Install control wiring from controls to operator and key switch. Verify key switch mounting location with Owner.

D. Coordinate electric power wiring with Division 26.

3.03 ADJUSTING: In accordance with Section 01 7000.

A. Adjust moving parts for smooth operation.

B. Verify proper operation of all modes and features.

C. Set selection switch for manual/automatic operation.

END OF SECTION

SECTION 08 8000 – GLAZING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Annealed glass.
   2. Insulating glass units.
   3. Safety glazing.
   4. Fire-rated glazing.
   5. Glazing accessories.

B. Related Sections:
   1. Section 07 9200 – Joint Sealants.
   2. Section 08 1100 – Metal Doors and Frames.
   3. Section 08 4113 – Aluminum Entrances and Storefronts.
   4. Section 08 5200 – Wood Windows.

1.02 DESIGN REQUIREMENTS:

A. Size glazing in accordance with ASTM E1300 to withstand dead loads and positive and negative live loads acting normal to the plane of glazing in accordance with applicable building code.

B. Limit glazing deflection to ¾ inch or flexure limit of glazing with full recovery, whichever is less.

1.03 QUALITY ASSURANCE:

A. Each glass lite shall bear the manufacturer's label designating the type and thickness of glass.
   1. Permanently identify each lite of tempered glass with identification etched or ceramic-fired on the glass and visible when the unit is installed.

B. Provide safety glazing in accordance with ANSI Z97.1.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver glazing with manufacturer's labels intact. Do not remove label until glazing has been installed.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Each lite of glass and each sealed glass unit shall have a 10 year manufacturer warranty against defects, including but not limited to seal failure, interpane dusting or misting.

PART 2 PRODUCTS

2.01 GLASS:

A. Manufacturers and Fabricators: In accordance with Section 01 6000.
   1. Vitro Architectural Glass.
   2. AGC Flat Glass North America, Inc.
   3. Guardian Industries Corp.
   4. Oldcastle BuildingEnvelope.
   5. Pilkington North America, Inc.
   6. Viracon, Inc.

B. Annealed Glass: ASTM C1036, Type I, Class 1, Quality q3; clear.

C. Low-Emissivity Coated Glass: ASTM C1036, Type I, Class 1, Quality q3; clear annealed float glass with pyrolitic coating. (Vitro Solarban 60; Guardian SN68; AGC Comfort Ti-AC40)

D. Fire-Rated Glazing: CPSC 16 CFR 1201; fireresistance rating as scheduled; Category I or Category II, as required by location and size.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Pilkington North America, Inc.; Pyrodur and Pyrostop.
      b. Safti First.
      c. Schott North America, Inc.
      d. Technical Glass Products, Inc.; FireLite.
      e. Vetrotech Saint-Gobain; Keralite.
   2. Type: Clear unpolished fire-resistive glass.
      a. Thickness: 3/16 inch, or as required by fireresistance rating.
      b. Each panel of fire-rated glazing shall be permanently labeled for use in approved labeled opening protectives.
      c. For locations scheduled for safety glazing, provide impact resistant type with surface applied film.
   3. Glazing Sealant: As recommended by glazing manufacturer for application and fireresistance rating.

2.02 GLAZING ACCESSORIES:

A. Setting Blocks: ASTM C864, neoprene, 80 to 90 Shore A durometer hardness; compatible with sealant materials; length 4 inches, width of glazing rabbet space less 1/16 inch, height required for glazing method, pane weight, and pane area.

B. Spacer Shims: ASTM C864, neoprene, 50 to 60 Shore A durometer hardness; compatible with sealant materials; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.

C. Glazing Tape: Butyl compound tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation.

D. Glazing Splines and Glazing Gaskets: ASTM C864 and ASTM D2287, resilient polyvinyl chloride, extruded shape to fit glazing channel retaining slot; black color.

E. Glazing Clips: Manufacturer's standard type.

F. Sealants: As specified in Section 07 9200.

2.03 FABRICATION:

A. Tempered Glass:

1. Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening.

2. Grind and polish exposed edges, where indicated, prior to tempering.

3. Fully temper float glass materials in accordance with ASTM C1048, Kind FT.

B. Sealed Insulating Glass Units: Provide unit edge seals meeting requirements of ASTM E773, with aluminum spacers having mitered corners, and silicone sealant for glass-to-spacer seals. Where tempered glass is indicated, both outer and inner panes shall be tempered. Where low-emissivity coated glass is indicated, coating shall be on interior surface of outer pane unless specifically noted.

1. Insulating Glass Units:
   a. Outer Pane: ¼ inch thick; low-emissivity coated glass.
   b. Air Space: ½ inch thick; dehydrated, hermetically sealed.
   c. Inner Pane: ¼ inch thick; clear annealed glass.
   d. Solar Heat Gain Coefficient (SHGC): NFRC 200; maximum 0.39.
   e. Visible Light Transmittance: NFRC 200; minimum 68%.

2. Insulating Glass Units for Wood Windows: Vitro Intercept I. G. units.
   a. Outer Pane: 1/8 inch thick; low-emissivity coated glass.
   b. Air Space: 3/8 inch thick; dehydrated, hermetically sealed, argon gas filled.
   c. Inner Pane: 1/8 inch thick; clear annealed glass.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Inspect all openings prior to commencing work to verify that conditions do not interfere with proper glazing installation.

B. Verify glazing sizes in comparison with opening size to confirm that adequate clearances in accordance with Flat Glass Marketing Association (FGMA) standards are maintained on all four edges at perimeter, and that stops are of proper size.

C. Verify that glazing channels and recesses are clean and free of obstructions, that weeps are clear, and that channels and recesses are ready for glazing.

3.02 PREPARATION:

A. Clean contact surfaces to receive sealant with solvent; wipe dry.

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

C. Prime surfaces to receive sealant in accordance with sealant manufacturer's instructions.

3.03 INSTALLATION:

A. Perform glazing work in accordance with FGMA standards and glazing manufacturer's recommendations.

B. Exercise care in cutting and handling of glass to have clean cut edges, free of any defects or damage which would interfere with the installation.

C. Replace all glass broken or damaged in the process of the work. Replace glass which is cracked or broken by others at the expense of the party causing damage.

D. Installation Methods: As scheduled at the end of this Section, and in accordance with recommendations of manufacturers of doors, windows and framing systems.

1. Exterior Dry Method (Tape and Gasket Spline):
   a. Apply glazing tape or spline to glass; butt-joint tape edges; seal joints with sealant.
   b. Locate setting blocks in accordance with Insulating Glass Manufacturers Alliance (IGMA) TM-3000.
   c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   d. Install removable stops without displacing glazing tape or spline; apply pressure for full continuous contact.
   e. Trim sight-exposed tape flush with stop.

2. Interior Wet/Dry Method (Tape and Sealant):
   a. Apply glazing tape to glass; butt-joint tape edges; seal joints with sealant.
   b. Place setting blocks with edge blocks maximum 6 inches from glass edges and intermediate blocks at ¼ points of glass panel length.
   c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   d. Install removable stops without displacing glazing tape; insert spacer strips between glazing and applied stops; terminate spacer strips ¼ inch below sight line; apply pressure for full continuous contact.

e. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing and to uniform line flush with sight line; tool sealant surface smooth.
f. Trim sight-exposed tape flush with stop.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove excess glazing materials and sealants immediately after glazing operation is completed.

B. Remove labels from glass immediately after Substantial Completion.

3.05 SCHEDULE:

A. Safety Glazing: Provide tempered glass at the following locations, at locations required by applicable building code, and where indicated:
   1. In ingress and egress doors.
   2. In fixed panels having a glazed area in excess of 9 square feet with the lowest edge less than 18 inches above the finish floor level or walking surface within 36 inches of such glazing.
      a. Safety glazing is not required when glazed panels have a horizontal mullion located between 24 and 36 inches above the walking surfaces.
   3. In fixed or operable panels adjacent to a door and within the same plane as the door whose nearest vertical edge is within 24 inches of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface.

B. Installation Methods:
   1. Hollow Metal Doors: Wet/Dry method.
   2. Aluminum Entrances and Storefronts: Dry method.
   3. Wood Windows: Factory glazed.

END OF SECTION

SECTION 09 2900 – GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Interior gypsum board.
   2. Sheathing boards.
   3. Gypsum board finishing.

B. Related Sections:
   1. Section 05 4000 – Cold Formed Metal Framing: Load bearing metal framing.
   2. Section 09 9000 – Painting and Coating.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with ANSI A97.1.

1.03 REGULATORY REQUIREMENTS:

A. Conform to applicable building code, GA 600, and ASTM E119 for fire rated assemblies.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials in enclosed areas, protected from damage, moisture, and exposure to the elements. Protect ready-mixed joint compounds from freezing.

B. Store panels in a flat, horizontal position. Prevent damage to edges, ends and surfaces of panels. Do not allow panel storage area to exceed 70 percent relative humidity.

C. Do not install panels damaged by moisture or mold, including those with surface contamination, discoloration, swelling, or warping.

D. Exercise caution to prevent damage to windows, doors, floors and other finished work.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Provide temporary heat, ventilation, and dehumidification in accordance with Section 01 5000 and GA 236 upon beginning gypsum board installation and continuously until finishing is complete and joint compound is fully cured. Maintain ambient temperature between 60 degrees F and 80 degrees F. Maintain relative humidity below 50 percent at 60 degrees F and 70 percent at 80 degrees F.

B. Gypsum Sheathing: Apply brick veneer within one month after sheathing installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. CertainTeed Corp.

B. Continental Building Products.

C. Georgia-Pacific Corp.

D. National Gypsum Company, Gold Bond Building Products.

E. USG Corp.

2.02 GYPSUM BOARD:

A. Interior Gypsum Panels: ASTM C1396; tapered edge; 48 inch width, 5/8 inch typical thickness, lengths as long as practical to minimize number of joints.
   1. Fire-Rated Panels: Type X; 5/8 inch typical thickness. Install fire-rated panels at all fire rated assemblies.

B. Glass Mat Faced Gypsum Sheathing: ASTM C1177; square edge; 48 inch width, lengths as long as practical to minimize number of joints; ½ inch thick.

2.03 FASTENERS:

A. Fasteners: ASTM C954 or C1002; bugle head screws; minimum length in accordance with GA 216.
   1. Gypsum Panels to Steel Framing: Type S.
   2. Gypsum Sheathing to Steel Framing: Type S-12; corrosion resistant coating with minimum 800 hour salt spray resistance in accordance with ASTM B117.

2.04 FINISHING MATERIALS:

A. Joint Tape: Cross-fibered paper or self-adhesive fiberglass mesh.

B. Joint Compound: ASTM C475; mix in accordance with manufacturer's recommendations.
   1. Use only setting-type joint compounds for Level 1 and Level 2 finish applications.

C. Corner Bead and Trim: ASTM C1047; galvanized steel.

D. Tearaway Bead and Trim: Rigid vinyl L bead with 5/16 inch tearoff leg.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Trim-Tex, Inc.
      b. Vinyl Corp.

E. Control Joint: Roll-formed zinc or extruded PVC.

2.05 ACCESSORIES:

A. Building Wrap at Exterior Sheathing: ASTM D226, Type II; No. 30 asphalt saturated felt.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that framing members are plumb and aligned to permit panel installation in a true surface plane.

B. Verify that all work of other trades which will be concealed or covered by this work has been completed and approved. Such work may include, but not be limited to, blocking, insulation, mechanical piping and ductwork, and electrical boxes, conduit, raceway and cable.

3.02 PANEL APPLICATION:

A. Apply panels in accordance with ASTM C840, GA 216, and manufacturer's recommendations.

B. Position panel ends and edges over framing members, except when joints are at right angles to framing members or when end joints are back-blocked.

C. Apply ceiling panels before wall panels. Extend ceiling board into corners and make firm contact with top plate.

D. Apply wall panels perpendicular to studs with end joints positioned over studs. Use maximum practical lengths to minimize end joints.

E. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses, with joints on opposite sides of a partition placed on different studs.

F. Attach panels to framing members with power-driven screws; draw panels tight to framing. Space fasteners not less than 3/8 inch from edges and ends of panels, and 12 inches o.c. along each framing member in field of panels. Drive fasteners in field of panels first, working toward ends and edges. Drive fastener heads slightly below surface of panels in a uniform dimple without breaking face paper.

   1. Maximum Fastener Spacing at Gypsum Sheathing: 8 inches o.c.

G. Cut ends, edges, scribe or make cutouts within field of panels with knife and straight edge; square and true to required dimension.

H. Install trim at internal and external angles formed by the intersection of panels with adjacent panels or other surfaces. Apply corner bead to external corners in accordance with manufacturer's directions.

I. Control Joints: Provide separate framing members on each side of joint.

1. Locations: Position to intersect door and window openings where possible. Coordinate with items indicated to be applied to wall surface.
   a. Aligned with control joints and expansion joints in masonry substrate or building structure.
   b. Where dissimilar substrates meet without change in surface plane.
   c. Where board surface forms L, U or T shape.
   d. Maximum 30 feet o.c. in all directions.
2. Where control joints occur in fire rated construction, follow GA 234 and manufacturer's instructions to maintain required fire and sound separation.

3.03 FINISHING:

A. Provide surfaces with finishes as scheduled, in accordance with the GA 214 definitions of finishes.

B. Level 0: No finishing required.

C. Level 1: One coat fire-tape application.
   1. Board Joints and Interior Angles: Pre-fill abutting tapered panel V-grooves flush with joint compound; wipe off excess. Apply compound in thin uniform layer. Apply joint tape centered over joint and embedded in compound, with sufficient compound remaining under tape to provide proper bond. Fold and embed tape in interior angles to provide true angle.
   2. Fasteners: Cover fastener heads with one coat of joint compound; wipe off excess.

D. Level 2: One coat application.
   1. Board Joints and Interior Angles: Finish as specified for Level 1. Follow immediately with thin skim coat to embed tape.
   2. Fasteners: Finish as specified for Level 1.
   3. Bead and Trim: Apply one coat of joint compound over flanges; wipe off excess and apply a thin coat of joint compound over flanges.

E. Level 3: Two coat application.
   1. Finish as specified for Level 2. When first coat is thoroughly dry, apply second coat of compound, extending slightly beyond first coat into face of board. Do not allow finish coat to protrude beyond plane of surface.
   2. Board Joints and Interior Angles: Fill panel taper flush with surface; cover tape and feather out at least two inches beyond first coat. On joints with no taper, cover the tape and feather out at least four inches on each side of tape.

F. Level 4: Three coat application.
   1. Apply final coat of joint compound feathered out over the dry second coat.

G. Final Finishing (Not Required for Levels 0, 1 and 2):
   1. Sand between coats where necessary and following final coat, to provide flat, smooth surface ready for priming and decoration; free of ridges, tool marks and sanding grooves. Do not abrade adjacent face-paper surfaces.
   2. Inspect finished surfaces and repair all defects, ridges, cracks, blisters, pits, checks, discolorations, and damaged spots.
   3. Ridges: Sand ridges to reinforcing tape without cutting through tape. Fill concave areas on both sides of ridge with topping compound. After fill is dry, blend in topping compound over repaired area.
   4. Cracks: Fill cracks with compound and finish smooth and flush.

3.04 CLEANING:

A. At completion of the work of this section, remove all debris and excess materials. Remove all joint compound from floor and leave all areas broom clean.

3.05 SCHEDULE OF FINISHES:

A. Surfaces Above Suspended Ceilings: Level 1.

B. Gypsum Board Indicated to Receive Paint: Level 4.

C. Sheathing Panels Indicated to Receive Brick Veneer: Apply sealant to joints and fasteners in accordance with Section 07 9200; trowel flat.

D. Surfaces Not Otherwise Scheduled: Level 3.

END OF SECTION

SECTION 09 5100 – ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Suspended metal grid ceiling system and perimeter trim.
   2. Acoustic panels.

B. Related Sections:
   1. Section 21 1300 – Fire Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
   2. Section 23 3700 – Air Outlets and Inlets.
   3. Section 26 5000 – Lighting.

1.02 SYSTEM DESCRIPTION:

A. Design Requirements for Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/240 of span.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, and interrelation of mechanical and electrical items related to system.

B. Product Data: Provide data on metal grid system components, acoustic units, and accessories.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Indicate recommendations for cleaning and refinishing acoustic units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

1.05 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 1 percent of total area of extra panels to Owner, for each type of acoustic unit and ceiling panel; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Conform to CISCA Acoustical Ceilings: Use and Practice.

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 installing the Products specified in this section with minimum three years documented experience.

D. Regulatory Requirements: Conform to applicable building code for combustibility requirements for materials.

1.07 PROJECT CONDITIONS:

A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, interior wet work is dry, and overhead work is completed, tested, and approved.

B. Maintain uniform temperature of minimum 55 degrees F and maximum 70 degrees F, and maximum humidity of 75 percent, for minimum 25 hours prior to, during, and 25 hours after acoustic unit installation.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's warranty that humidity resistant ceiling panels will be free from sagging or warping for a period of 10 years from Substantial Completion.

PART 2 PRODUCTS

2.01 SUSPENSION SYSTEM MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. Rockfon; Chicago Metallic.
   4. USG Interiors, Inc.

B. Exposed Non-fire Rated Steel Grid: ASTM C635, intermediate duty; exposed T; commercial quality cold rolled steel with G30 hot dipped galvanized coating; components die cut and interlocking. (Armstrong Prelude; Chicago Metallic 200 Snap Grid System; USG Donn DX)
   1. Exposed Grid Surface Width: 15/16 inch.
   2. Grid Finish: White steel cap.

C. Accessories: Stabilizer bars, clips, splices, perimeter moldings, and other accessories required for suspended grid system.

D. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

2.02 ACOUSTIC UNIT MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.

   1. Armstrong World Industries, Inc.

   2. CertainTeed Corporation.

3. USG Interiors, Inc.

B. Acoustic Ceiling Panels: ASTM E1264, Type III, Form 1; mineral fiber panels; fine texture; 24 x 24 inches, ¾ inch thick; angled tegular reveal lay-in edge. (Armstrong Cirrus 584; CertainTeed Cashmere CM-454; USG Eclipse 76775)

1. Fire Hazard Classification: ASTM E84, Class A.
   a. Flame Spread Rating: Maximum 25.
   b. Smoke Developed Rating: Maximum 10.
2. Humidity Resistance: Designed to withstand temperature of 104 degrees F and 90% relative humidity without visible sag.
3. Surface Color: White.

2.03 ACCESSORIES:

A. Touch-up Paint: Type and color to match acoustic and grid units.

B. Concealed Hold-Down Clips: Armstrong Universal Hold Down Clip or equal by suspension system manufacturer.

C. Hanger Wire: Steel, minimum 12 gauge.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION OF LAY-IN GRID SUSPENSION SYSTEM:

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions.

B. Locate system on room axis according to reflected ceiling plan, to a balanced grid design with edge units no less than 50 percent of acoustic unit size.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Install main runners at 48 inches o.c. at right angles to structural framing, with cross tees at 24 inches o.c. spanning between main runners.

E. Hang suspension system from building structure independent of metal deck, walls, columns, ducts, pipes, and conduit. Install hangers at maximum 48 inches o.c. Provide supplemental steel framing, sized to carry imposed loads, where required to maintain specified hanger spacing.

F. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Perimeter Molding:
   1. Install edge molding at intersection of ceiling and vertical surfaces.
   2. Secure edge molding to substrate with screw anchors through holes provided in vertical leg, at maximum 3 inches from each end and maximum 16 inches o.c.
   3. Use longest practical lengths.
   4. Miter corners to provide hairline joints. Cope exposed flanges of intersecting members, so that faces will be flush.
   5. Provide at junctions with other interruptions.

3.03 INSTALLATION OF ACOUSTIC CEILING PANELS:

A. Install units in accordance with manufacturer's instructions.

B. Fit units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Install units after work above ceiling is complete.

D. Install units level, in uniform plane, and free from twist, warp, and dents.

E. Cut units to fit irregular grid and perimeter edge trim. Cut edges to match factory edge treatment. Field paint exposed edges to match factory edges.

F. Install concealed hold-down clips to retain panels tight to grid system at the following locations:
   1. Within 48 inches of HVAC supply diffusers.
   2. Within 8 feet of exterior doors.

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6800 – CARPETING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Modular carpet.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary dehumidification.
   2. Section 06 2000 – Finish Carpentry: Wood base.

1.02 PERFORMANCE REQUIREMENTS:

A. Modular Tile Dimensional Stability: Maximum 0.15 percent.

B. Colorfastness to Crocking: American Association of Textile Chemists and Colorists (AATCC) 165; minimum Class 4 color transfer, wet and dry.

C. Colorfastness to Light: AATCC 16E; minimum Grade 4 color change after exposure of 40 AFU.

D. Electrostatic Propensity: AATCC 134 Step Method; maximum 3.0 Kv.

E. Flammability:
   1. Methenamine Pill Test: ASTM D2859; pass.
   2. Radiant Panel Test: ASTM E648; Class I.
   3. Smoke Density: ASTM E662; maximum 450 corrected optical density (flaming mode).

F. Indoor Air Quality: Carpet and Rug Institute (CRI) Green Label Plus.

G. Static Coefficient of Friction: Minimum 0.60.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: CRI 104 Section 6; indicate layout, direction of pile and pattern, and location of edge moldings.

B. Product Data: Indicate physical and performance characteristics, sizes, and method of installation.

C. Samples: Submit complete sets of color swatches for the proposed style and pattern.

D. Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Include manufacturer's cleaning and spot removal recommendations for each type of carpet.

B. Extra Materials: Provide minimum one case of each style and color, with protective covering for storage, identified with appropriate labels.

1.05 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience; manufacturer's authorized dealer or distributor.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. In areas to receive flooring, maintain room temperatures at minimum 70 degrees F for 48 hours prior to, during and 48 hours following application. Materials shall be conditioned at application temperature and humidity at least 24 hours prior to, during and 48 hours following application.

B. Ventilate installation area during installation and for 3 days after installation.

1.07 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's standard commercial wear warranty, minimum 10 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Tarkett Industries, Inc.

B. Atlas Carpet Mills.

C. J & J Industries, Inc.

2.02 MODULAR CARPET:

A. Style: Tarkett "Abrasive Action II."

1. Construction: Patterned loop pile.
2. Backing: Closed cell cushion. (Tandus ER3)
3. Size: 24 x 24 inch.
4. Yarn: 100% nylon.
   a. Soil Retardant Treatment: AATCC 189; minimum 350 ppm fluorine on pile fiber of 3 separate tests.
5. Pile Thickness: ASTM D418; 0.187 inch.
6. Yarn Weight: ASTM D5848; 24 oz/sq yd.
7. Gauge: 1/12.
8. Stitches per Inch: 8.0.

9. Color: As selected.

2.03 ACCESSORIES:

A. Cushion: Closed cell sheet rubber; nominal thickness ¼ inch; CRI Green Label Plus.

B. Installation Adhesives and Seam Sealers: As recommended by carpet manufacturer for substrate type; CRI Green Label Plus.

C. Edge Trim at Tile: Extruded aluminum with clear anodized finish and perforated anchoring leg; vertical leg to match tile thickness. (Schlüter Schiene AE series).

D. Transition at Resilient Flooring or Exposed Concrete: Rubber for glue down installation; butting gauge as required for flooring materials.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Field verify room dimensions at building site before ordering or cutting material.

B. Verify that floor surfaces are smooth and flat, within specified surface tolerances, free from grease or foreign matter, free from concrete dust or powder, and ready to receive work.

C. Verify that concrete floors are aged minimum 60 days and are ready for flooring installation by testing for alkalinity and moisture emission rate in accordance with ASTM F1869. Obtain instructions if test results are not within specified limits.
   1. Moisture Emission Rate: Maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria.
   2. Alkalinity: pH range of 5 to 9.

D. Installation of flooring indicates acceptance of substrate conditions including responsibility for defects after installation.

3.02 PREPARATION:

A. Remove subfloor ridges, bumps and high spots. Fill minor or local low spots, cracks, joints, holes and other defects with latex filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

C. Remove wax or silicone-type curing compounds prior to application of adhesive.

D. Vacuum clean substrate.

3.03 MODULAR CARPET INSTALLATION:

A. Install carpet by experienced carpet layers in an approved manner in accordance with carpet manufacturer's written instructions and CRI 104 Section 14.

B. Verify carpet match to ensure minimal variation between dye lots.

C. Install carpet tight and flat on subfloor, with uniform appearance, using the quarter-turn installation pattern, or as selected.

D. Apply pressure sensitive adhesive to substrate uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

E. Roll with appropriate roller for complete contact of adhesive to carpet backing.

F. Cut edges straight and true, and seal in accordance with manufacturer's instructions to form permanently non-raveling joints and seams.

G. Trim carpet neatly at walls and around interruptions. Make cuts straight, true, and unfrayed.

H. Install edge trim or transition at door openings, where floor covering material changes, where carpet edges do not abut a vertical surface, and where indicated on the Drawings.

I. Installer is responsible for the accuracy of measurement and fit.

3.04 CLEANING:

A. Package and label remnants and usable scrap in appropriate wrappings; leave at job site where directed. Remove all scraps smaller than 10 square feet and dispose of in a legal manner.

B. Remove excess adhesive without damage from floor, base and wall surfaces.

C. Perform final cleaning in accordance with Section 01 7700. Vacuum flooring thoroughly and leave in clean and acceptable condition, free from spots, dirt or soil, and without tears, frayed or pulled tufts.

3.05 PROTECTION:

A. Protect installed flooring in accordance with Section 01 7000 and CRI 104 Section 16.

B. Do not permit traffic over unprotected floor surface.

C. Apply appropriate protective non-staining building paper covering over finished flooring areas during construction. Immediately prior to Substantial Completion, remove protective coverings and all debris from the site and dispose of in a legal manner.

END OF SECTION

SECTION 09 9000 – PAINTING AND COATING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Exterior painting.
   2. Interior painting.

B. Related Sections:
   1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under other sections.
   2. Section 05 5000 – Metal Fabrications.
   3. Section 05 5100 – Metal Stairs.
   4. Section 05 5133 – Metal Ladders.
   5. Section 06 2000 – Finish Carpentry.
   6. Section 06 6000 – Plastic Fabrications.
   7. Section 07 9200 – Joint Sealants.
   8. Section 08 1100 – Metal Doors and Frames.
   9. Section 08 5200 – Wood Windows.
   10. Section 09 2900 – Gypsum Board.
   11. Divisions 21 to 28: Facility services piping and equipment.
   12. Examine the above sections and all other sections of this specification and become familiar with their provisions regarding painting. All surfaces left unfinished by the requirements of other sections shall be painted or finished as part of this work, except as specifically indicated.

1.02 SYSTEM DESCRIPTION:

A. Paint all primed surfaces, and all surfaces not prefinished. The following categories of work are not included as part of field-applied finish work unless specifically indicated:
   1. Prefinished and factory finished items, or where installer finishing is specified.
   2. Concealed surfaces in generally inaccessible areas.
   3. Materials or areas scheduled or indicated as unfinished.
   4. Finished metal surfaces, including anodized and fluoropolymer finishes, and non-ferrous metals unless otherwise indicated.
   5. Operating parts.
   6. Glass.
   7. Acoustic ceiling panels.
   8. Concrete flatwork.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Do not begin work or deliver products to project site prior to approval of submittals.

B. Product Data: Indicate product characteristics, surface preparation, compatible primers and topcoats, recommended wet and dry film thickness, storage and handling requirements and recommendations, application methods, and cautions.

C. Color Selections: Obtain color schedule from Architect. If proposed manufacturer is different from that identified on color schedule, prepare and submit two samples 6 inches square of each color and sheen required on properly prepared and identified paint-out cards or hardboard.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Include schedule of each product, sheen, color, and location.

1.05 QUALITY ASSURANCE:

A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats.

B. Material Quality: Provide best quality grade of specified types of coatings as regularly produced by approved manufacturers. Claims relating to unsuitability of specified products, or inability to produce first-class work with specified products, must be submitted to Architect in writing.

C. Mock-Up: Prepare job site mock-up of each substrate and each paint system specified, using approved products and manufacturer recommended application methods.
   1. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard prior to proceeding with remainder of work.
   2. Maintain mock-up during construction for workmanship comparison. Mock-up may be incorporated into final construction upon Owner's approval.

1.06 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver products to the project site in original, unopened containers with all labels intact and legible at time of use.

B. Store materials at minimum ambient temperature of 45 degrees F in well ventilated area. Follow manufacturer's requirements for maximum temperatures.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. VOC Content: ASTM D3960; comply with the most restrictive of the following requirements:
   1. Ozone Transport Commission (OTC) Model Rule.
   2. Applicable federal, state and local regulations.

B. Protect materials from freezing before, during, and after application.

C. Apply water-based paints only when temperatures of surfaces to be painted and ambient temperatures are between 50 degrees F and 90 degrees F.

D. Apply solvent-thinned paints only when temperature of surfaces to be painted and ambient temperatures are between 45 degrees F and 95 degrees F.

E. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 80%, or to damp or wet surfaces.

F. Apply interior finish painting only when ambient temperature is above 60 degrees F; after painting, maintain ambient temperature above 60 degrees F to prevent condensation.

G. Provide adequate continuous ventilation to maintain humidity below dew point of coldest surface.

PART 2 PRODUCTS

2.01 PAINT AND STAIN MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.

1. Sherwin-Williams Co.
2. ICI Paints.
3. Benjamin Moore & Co.
4. PPG Architectural Finishes, Inc.
5. Pratt & Lambert.
6. Tnemec Co., Inc.

B. Materials scheduled below are products of Sherwin-Williams Co. (abbreviated S-W) unless noted otherwise. Proprietary names used to designate materials are not intended to imply that products of named manufacturers are required to the exclusion of others. Equivalent products of other manufacturers listed above are also acceptable.

C. Provide primers and compatible finish coats by the same manufacturer.

D. Color Pigments: Pure, non-fading, applicable types to suit substrates and applications indicated.

E. Primers:

1. Industrial Primer: S-W DTM Acrylic Primer/Finish (B66W1).
2. Latex Primer: S-W PrepRite Problock Latex Primer (B51W20).
3. Metal Primer:
   a. Aluminum and Galvanized:
      (1) Gloss Finishes: S-W DTM Wash Primer (B71Y1).

(2) Other Finishes: S-W Pro-Cryl Universal Primer (B66-310).

b. Non-Galvanized Ferrous Metals: S-W Pro-Cryl Universal Primer (B66-310).

4. Wall Primer: S-W ProMar 200 Interior Latex Primer (B28W8200) or ProMar 200 Zero VOC Interior Latex Primer (B28W02600).

5. Wood Primer: S-W Premium Wall & Wood Interior Latex Primer (B28W8111).

F. Finish Coats:

1. Acrylic Coatings:
   a. Acrylic Latex Semi-Gloss Coating: S-W Pro Industrial Acrylic Semi-Gloss (B66-650).
   b. Acrylic Gloss Coating: S-W DTM Acrylic Gloss Coating (B66-100).

2. Alkyd Gloss Enamel: S-W Waterbased Industrial Enamel (B53-300).

3. Latex Coatings:
   a. Latex Eggshell Enamel: S-W ProMar 200 Interior Latex Eg-Shel (B20W2200) or ProMar 200 Zero VOC Interior Latex Eg-Shel (B20-2600).
   b. Latex Semi-Gloss Enamel: S-W ProMar 200 Interior Latex Semi-Gloss (B31W2200) or ProMar 200 Zero VOC Interior Latex Semi-Gloss (B31-2600).
   c. Latex Gloss: S-W A-100 Exterior Latex Gloss (A8).

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that the work of all other trades is correct and complete so that paint application may properly commence.

B. Verify substrate conditions are acceptable for product application in accordance with manufacturer's instructions.

C. Painting of surface indicates Contractor's acceptance of surface and responsibility for paint failure.

3.02 PREPARATION:

A. Protection:

1. Remove electrical plates, hardware, light fixture trim, fittings, and similar items not scheduled to receive paint, prior to surface preparation or finishing. Mask in place items that cannot be removed.

2. Spot prime exposed metals such as bolts, nails, and welds which are to receive paint. Clean all metal work, smooth and prime if necessary where rusting or scaling occurs.

3. Remove dirt, dust, grease, mildew and other contaminants from all surfaces scheduled to be painted or finished.

B. Surface Preparation: In addition to the following general requirements, follow specific recommendations of the manufacturer for each finish system and substrate application.

1. Interior Wood (Opaque Finish): Repair damaged spots, fill voids and holes with wood putty, and sand completely.
2. Exterior Plastic Fabrications: Countersink nail heads. Caulk nail heads and joints or cracks with latex caulk. Sand rough areas and wipe clean.
3. Steel: Remove mill scale, rust, grease, dirt and dust, by hand scraping, wire brushing, power tool scraping, or sandblasting.
4. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Sand and feather edges to smooth surface. Clean areas with solvent; spot prime bare metal areas.
5. Galvanized Surfaces: Acid etch or clean thoroughly with a grease cutting solvent such as mineral spirits.
6. Aluminum: Remove surface contamination by steam, high pressure detergent wash or solvent washing. Apply acid primer or acid etch. Apply paint immediately following cleaning and etching.
7. Gypsum Board: Verify that surfaces are free of sanding dust, and that joint compound is thoroughly dry. Prime metal corner beads with metal primer before applying latex coatings. Fill minor defects with finishing compound; spot prime.
8. Previously Painted Surfaces: Remove all blistered, peeling and scaling paint to a sound substrate. Remove heavy chalk by scrubbing with soap and water. Sand glossy areas and dust clean. Clean and spot prime failed areas. Use soap and water on protected areas such as eaves and ceilings to remove invisible residues. Rinse clean and let dry. Remove and kill existing surface mildew before applying paint.
   a. Test sample area for compatibility, adhesion and film integrity; report in writing conditions that may affect proper application, appearance or performance.

3.03 PAINT APPLICATION:

A. Apply paint using spray, roller or brush unless otherwise specified or restricted. Method selected must be in accordance with manufacturer's recommendations, suitable for intended surface and finish.

B. Do not open containers until required for use. Stir materials thoroughly and keep at uniform consistency during application.
   1. Mix multiple-component products in accordance with manufacturer's instructions.

C. Apply minimum two finish coats, unless otherwise indicated, in addition to field or shop applied prime coat.
   1. Allow sufficient drying time between coats in accordance with manufacturer's recommendations.
   2. Thinning: In accordance with the manufacturer's recommendations; adhere strictly to manufacturer's recommended spreading rate and dry or wet mil thickness per coat.
   3. Apply each coat to uniform finish without runs, sags, brush or roller marks, skips, ropiness or other defects.
   4. Tint primer and undercoats of paint approximately ½ to ¾ depth of final color.
   5. Sand and dust lightly between coats to achieve smooth finish.
   6. Clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
   7. Back prime concealed wood surfaces with primer prior to installation.
   8. Touch-up suction spots between coats.
   9. Refinish surfaces affected by refitting work.
   10. Apply additional coat wherever there are voids, imperfections or lap marks.

D. Paint exposed steel lintels prior to installation of door, window, storefront, or louver.

E. Wood and Hollow Metal Doors:
   1. Seal, prime and finish coat top, bottom and edges of doors prior to door installation, same as door face.
   2. Finish glazing stops to match door face.

F. Exposed Mechanical and Electrical Equipment: Paint same color as used on walls or ceilings of room. Do not paint equipment or materials in unfinished areas.
   1. Remove and paint separately from adjacent surfaces all unfinished grilles, louvers, access panels, and covers.
   2. Prime and paint exposed pipes, ducts, covers, conduit, boxes, hangers, brackets and collars, including insulated items, except where items are plated or prefinished.
   3. Paint dampers and baffles behind grilles or in convectors to match face panels. Paint visible surfaces of ducts behind air outlets and inlets flat black.
   4. Do not paint over name plates or joints in moving parts of equipment.

G. Where walls with fire or smoke requirements are indicated on Drawings, apply the legend "LIFE SAFETY ASSEMBLY – PROTECT ALL OPENINGS" at maximum 15 foot horizontal spacing on both sides of the wall approximately one foot above finish ceiling, using 3 inch high red stenciled letters or preprinted decals. Verify location, spacing, size, wording, color, and method of application with authorities having jurisdiction.

3.04 TOUCH-UP:

A. Do all touch-up work that may be required throughout the project.

B. Apply materials in accordance with manufacturer's recommendations for adequate coverage, waterproofing, and weather resistance. If the specified number of coats do not achieve adequate coverage, waterproofing, and weather resistance, apply additional coats at no additional cost until acceptable performance and finish are obtained.

3.05 CLEANING:

A. Perform progress cleaning in accordance with Section 01 7000. Remove discarded paint materials, rubbish, cans, and soiled or used rags from the project site at the end of each work day. Use every precaution to avoid the danger of fire.

B. At completion of painting work, remove surplus paint materials and debris from the project site, and leave work areas in a clean and finished condition.

C. Perform final cleaning in accordance with Section 01 7700. Clean window glass and other paint-spattered surfaces. Remove spattered paint by approved methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.06 PROTECTION:

A. Protect surfaces and objects inside and outside the building, including lawns, shrubbery, and adjacent properties against damage; repair damage to adjacent surfaces.

B. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct damage by cleaning, repairing, or replacing as required to match existing.

C. Exercise care and provide protection for adjacent prefinished or unfinished items, moving parts or assemblies, sprinkler heads, valves, motors, machinery, and related items. Provide all required covering, masking tape, and other protective materials.

D. Provide "wet paint" signs as required to protect newly painted finishes.

E. Following completion of painting in each area, promptly reinstall all items removed for protection.

F. After completion of painting operations, remove temporary protective materials, including those provided by others for protection of their work.

3.07 SCHEDULE:

A. Items scheduled herein to be painted are not intended to be all inclusive and are listed only as a guide to material type and exposure. Additional items indicated on the Drawings or in the Specifications shall receive applicable finishes, unless otherwise noted.

B. Exterior Metals: Exposed structural and miscellaneous galvanized and non-galvanized ferrous metal and aluminum items; lintels, conduit, electrical boxes, and related items.

1. Factory Primed Surfaces: Clean, sand, and touch-up with compatible primer wherever necessary before applying finish coats.
2. Unprimed Non-Galvanized Ferrous Metal Surfaces: Apply one coat industrial primer (6.0 mils wet, 3.0 mils dry).
3. Apply two finish coats acrylic gloss coating (8.0 mils wet, 3.0 mils dry per coat).

C. Exterior Plastic Fabrications: Verify compatibility with manufacturer prior to application.

1. Apply one coat latex primer (4.0 mils wet, 1.4 mils dry).
2. Apply two finish coats latex gloss enamel (4.0 mils wet, 1.3 mils dry per coat).

D. Interior Metals: Clean, sand, and touch-up factory primed surfaces with compatible primer wherever necessary before applying finish coats.

1. General Building Components: Hollow metal doors and frames, and related items.
   a. Apply one coat metal primer (5.0 mils wet, 2.0 mils dry).
   b. Apply two finish coats acrylic latex semi-gloss coating (6.0 mils wet, 2.1 mils dry per coat).
2. Mechanical and Electrical Components: Exposed piping and conduit, electrical panel covers, and related items.
   a. Apply one coat metal primer (7.5 mils wet, 3.0 mils dry).
   b. Apply two finish coats alkyd gloss enamel (4.5 mils wet, 1.6 mils dry per coat).

E. Interior Wood (Opaque Finish):

1. Apply one coat wood primer (4.0 mils wet, 1.8 mils dry).
2. After thoroughly drying, sand lightly before applying finish coats.
3. Apply two finish coats latex semi-gloss enamel (4.0 mils wet, 1.3 mils dry per coat).

F. Interior Gypsum Board:

1. Apply one coat wall primer (4.0 mils wet, 1.1 mils dry).
2. Apply two finish coats eggshell enamel (4.0 mils wet, 1.6 mils dry per coat).

END OF SECTION

SECTION 21 0500 – COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Materials and installation methods applicable to all Sections of Division 21.
   2. Identification.
   3. Testing and inspection.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating.

PART 2 PRODUCTS

2.01 IDENTIFICATION MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Allen Systems, Inc.
   2. W.H. Brady Company.
   3. Seton Name Plate Co.

B. Service Identification: Contractor's option from the following:
   1. Stenciled characters, 1 inch high. Provide one coat of clear lacquer or varnish over the stencils.
   2. Pipe Markers: Snap-around type; preprinted vinyl, color coded per ANSI A13.1, with name of piping system; arrows to indicate flow direction; with nylon ties for pipe sizes 6 inch and larger.

C. Valve Tags: Polished brass, 2 inch diameter, with stamped numbers and letters to identify serial number and service designation; with chain and corrosion resistant S-hook.

D. Engraved Plastic Nameplates: 1 x 3 x 1/16 inch thick minimum size; white engraved letters on black background; minimum ¼ inch high lettering.

PART 3 EXECUTION

3.01 PAINTING:

A. Finish painting of piping shall be done in accordance with Section 09 9000. Damage to finish painting shall be repaired at the expense of the party causing the damage.

B. Refinish factory primed or finished components damaged during shipping or installation. Remove rust, prime, and paint per manufacturer's recommendations for finish equal to original.

3.02 IDENTIFICATION:

A. Identify piping, valves, equipment and controls in accordance with ANSI A13.1. Verify numbering system with Owner; coordinate with existing identification system, where present.

B. Piping: Identify each pipe in exposed or accessible space (except architecturally finished spaces) at each major change of direction, at 20 foot intervals in straight runs, each branch connection, each riser, equipment connections, and both sides of walls.

C. Valve Tags: Securely fasten tags to all valves and cocks, chained to hand wheel, on main lines and branches, and at switches, equipment, and controls. Indicate piping system and purpose of valve; indicate whether valve is normally closed (N.C.) or normally open (N.O.) in service; indicate direction of flow.

3.03 TESTING AND INSPECTION:

A. Refer to individual Sections for specific tests required for each system.

B. Pay for all required tests and inspections. Furnish labor, materials, and instruments; bear other costs in connection with all tests.

C. Notice of Tests: Give written notice in ample time to all concerned of date when tests will be conducted.

D. Prior Tests: Concealed or insulated work shall remain uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved by the Architect.

E. All piping systems shall be tested before piping is concealed, covered, or insulated. Before testing pipe systems, remove or otherwise protect from damage the components which are not designed to withstand the pressures used in testing piping.

F. Adjustments, Repairs, and Retests:
   1. Make adjustments, repairs, and alterations as required to meet specified test results.
   2. Correct defects disclosed by tests or inspection, and replace defective parts when directed.
   3. In replacing defective parts, use only new materials; in the case of pipe, replace with same length as defective piece.
   4. Caulking of screwed joints or peening of welds is not permitted.
   5. Repeat tests after defects have been corrected and parts replaced, as directed and until pronounced satisfactory.

G. Responsibility for Damage: Bear the cost of repairs and restoration of the work of other Contractors damaged by the tests or cutting required in connection with the tests.

END OF SECTION

SECTION 21 1100 – FIRE SUPPRESSION PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Piping materials and installation methods applicable to all fire suppression work.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 07 9200 – Joint Sealants.
   3. Section 21 0500 – Common Work Results for Fire Suppression.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials, dielectric fittings, mechanical sleeve seals, piping specialties. Indicate materials, sizes, dimensions and types.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Valve Directories: Include in Operation and Maintenance binders. For each piping system, indicate identification (correlated with record documents), location and purpose of each valve.

1.04 QUALITY ASSURANCE:

A. Pipe: Identify with marking including size, material classification, and ASTM specification. Include water pressure rating and potable water certification where applicable.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Procedures: Conform to ASME SEC IX, AWS D1.1, NCPWB Procedure Specifications for Pipe Welding, and applicable state labor regulations.

D. Welders Certification: In accordance with ASME SEC IX and NCPWB.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store piping and specialties elevated above grade, protected from moisture and dirt.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 PIPE AND PIPE FITTINGS:

A. Refer to individual specification Sections for piping materials, fittings and related requirements for specific piping systems.

B. Pipe Threads: ANSI B1.20.1.

C. Pipe Flanges:
   1. Full Face Type: Class 125, cast iron and cast bronze.
   2. Narrow Face Type: Class 250, cast iron and cast steel.
   3. Gasket Materials: ANSI B16.21, nonmetallic, flat, non-asbestos.
   4. Bolts and Nuts: ANSI B18.2.1.

D. Welding Materials: AWS B2.1.

2.02 PIPING SPECIALTIES:

A. Pipe Hangers and Supports: NFPA 13.

B. Unions For Steel Pipe:
   1. Sizes to 2 Inch: Class 150 malleable iron unions with ground joint brass to iron seat, galvanized or black.
   2. Sizes 2½ Inch and Over (Welded): Class 150 malleable iron forged steel slip-on flanges, preformed neoprene gaskets, and carbon steel bolts.
   3. Sizes 2½ Inch and Over (Screwed): Class 150 malleable iron threaded steel flanges, galvanized or black, preformed neoprene gaskets, and carbon steel bolts.

C. Dielectric Unions:
   1. Sizes to 2 Inch: Steel body and nut with insulating gasket (250 lb at 210 degrees F) and copper connector. (EPCO Models FX, EA, and FB)
   2. Sizes 2½ Inch and Over: Cast iron body flanges with insulating gasket (250 lb at 210 degrees F) and copper connector. (EPCO Model GX and GA)

D. Floor, Wall, and Ceiling Plates (Escutcheons):
   1. Finished Areas: Chrome plated brass.
   2. Unfinished and Concealed Areas: Stamped brass, split hinged type.

E. Pipe Sleeves:
   1. Existing Construction: 22 gauge galvanized steel.
   2. Interior Stud Walls: 22 gauge galvanized steel.
   3. Exterior Walls: Galvanized steel pipe, ASTM A53, Type E, Grade A, Schedule 40.

F. Mechanical Sleeve Seals: Interlocking rubber link type, shaped to continuously fill annular space between pipe and sleeve; with connecting bolts and pressure plates.

PART 3 EXECUTION

3.01 PIPING INSTALLATION:

A. Verify piping and tubing is round and straight prior to installation. Prevent deformation during cutting and threading. Do not permit tool marks on exposed piping in finished areas.

B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

C. Remove scale and foreign material from inside and outside before assembly.

D. Prepare piping connections to equipment with flanges or unions, arranged for quick disconnect for maintenance.
   1. Pipe Size 2 Inch and Smaller: Install unions adjacent to each valve on the downstream side, and at connection to each piece of equipment.
   2. Pipe Size 2½ Inch and Larger: Install unions adjacent to flanged valves on the downstream side, and at connection to each piece of equipment supplied with flanged pipe connections.
   3. Use the same material and finish as the piping system.
   4. Use non-conducting dielectric connections wherever joining dissimilar metals.
   5. Do not use unions or flanged unions in straight runs of pipe or in concealed locations except for flanged valve applications.

E. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

F. Install piping to conserve building space, to not interfere with use of space and other work, and to maintain required headroom and clearances for equipment, door swings, ceiling panel removal, and related conditions.

G. Place piping in concealed spaces above finished ceilings. In areas without finish ceilings, route piping through spaces in open web joists, trusses, or girders.

H. Conceal vertical piping in stud wall cavities, furred wall spaces, pipe chases, and masonry cores where possible. Except in unfinished spaces, obtain approval prior to installing exposed piping.

I. Group piping whenever practical at common elevations. When installing piping in parallel, leave sufficient space between pipe lines to facilitate future work on any line.

J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Utilize offsets, changes in direction and expansion loops, constructed to allow maximum anticipated variation in piping length.

K. Hang and support piping in accordance with NFPA 13. Provide clearance in hangers and from structure and other equipment for access to valves and fittings.

L. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level. Pipe drains to mop sink, floor drain, or similar approved location.

M. Prime coat and prepare for finish painting exposed pipe, fittings, supports, and accessories scheduled for field painting. Refer to Section 09 9000. Components located in pipe shafts and suspended ceiling spaces are not considered exposed. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to weld.

N. Do not penetrate building structural members unless indicated.

O. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

P. Die cut threaded joints with full cut standard taper pipe threads with non-toxic joint compound applied to male threads only.

Q. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

R. Install unions downstream of valves and at equipment or apparatus connections.

S. Clean and flush piping systems prior to testing system or connecting equipment.

3.02 JOINING PIPE AND FITTINGS:

A. Threaded Joints: Right hand tapered national pipe threads; pipe joint compound on male threads only.

B. Welded Joints: In accordance with ASME SEC IX and NCPWB.

3.03 PIPE SLEEVES:

A. Provide sleeves and escutcheons when penetrating walls and partitions. Cut escutcheons as necessary to fit in close quarters.

B. Size sleeves to provide minimum ¾ inch clearance around all sides of piping.

C. Maintain sleeves plumb, level, and in proper position throughout construction.

D. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required, in accordance with Section 07 8400. Seal penetrations through non-rated assemblies with sealant in accordance with Section 07 9200.

E. Interior Masonry Wall Sleeves: Install sleeves reamed and finished flush with wall.

F. Stud Wall Sleeves: Terminate ends flush with wall.

END OF SECTION

SECTION 21 1300 – FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Wet-pipe sprinkler system.
   2. System design, installation, and certification.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating: Painting of exposed piping.
   2. Section 21 0500 – Common Work Results for Fire Suppression.
   3. Section 21 1100 – Fire Suppression Piping.

1.02 SYSTEM DESCRIPTION:

A. Extend existing system to provide coverage for building addition areas.

B. Determine volume and pressure of incoming water supply from water flow test data. If test data is not available, contact local fire and water departments to verify that design minimum water supply and pressure is readily available at the base of the riser.

C. Provide the number and size of risers required by the system protection area limitations of NFPA 13.

D. Provide system components rated for 175 psi working pressure.

E. System Design Criteria:

   1. General Building Areas:
      a. Occupancy Classification: NFPA 13 light hazard.
      b. Density: 0.10 gpm per sq ft over the most remote 1500 sq ft.
      c. Hose Stream Allowance: 100 gpm.
      d. Sprinkler Temperature Ratings: In accordance with NFPA 13.
      e. Protection Area Per Sprinkler:
         (1) Areas With Ceilings: Maximum 225 sq ft.
         (2) Areas Without Ceilings: Maximum 168 sq ft.

   2. Lay out sprinklers symmetrically in an equal grid pattern to achieve overall consistency and rhythm of spacings (for example, 10 x 12 ft) which will not be interrupted by lighting fixtures or ceiling grid. Sprinkler head spacing may be shortened or lengthened only at perimeter walls, at bulkheads, or at changes in ceiling heights.
      a. In areas with 24 x 24 inch ceiling panels, center sprinkler heads in panels.

   3. Maximum protection area per sprinkler may be increased in accordance with NFPA 13 where extended coverage sprinkler heads are used.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturer's catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

B. Water Flow Test Data: Provide identification of person conducting test; date and time; location of hydrants where flow was taken, and where static and residual pressure readings were recorded; size of main supplying these hydrants; and results of test, giving size and number of hydrant butts flowed.

C. Shop Drawings: Submit the number of sets required for plan approval, approved by local fire department and Owner's insurance underwriter; drawn to an indicated scale, on sheets of uniform size, with plan of each floor; showing the following data:
   1. Name of Owner and occupant; location, including street address; point of compass; name and address of contractor.
   2. Ceiling construction; layout of finished ceiling areas indicating sprinkler locations coordinated with ceiling installation and HVAC and electrical installations.
   3. Full height cross section.
   4. Location of fire rated construction; location of partitions.
   5. Occupancy of each area or room; location and size of concealed spaces, closets, and toilet rooms; questionable small enclosures in which no sprinklers are to be installed.
   6. Size of city main in street, pressure and whether dead-end or circulating, and if dead-end, direction and distance to nearest circulating main, city main test results.
   7. Make, type, and nominal orifice size of sprinkler; temperature rating and location of high-temperature sprinklers.
   8. Total area protected by each system; number of sprinklers on riser.
   9. Make, type, model, and size of alarm valve.
   10. Type and location of alarm horn.
   11. Pipe type and schedule of wall thickness.
   12. Nominal pipe size and cutting lengths of pipe (or center to center dimensions).
   13. Location and size of riser nipples.
   14. Type of fittings and joints and location of all welds and bends.
   15. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable.
   16. All control valves, check valves, backflow prevention devices, drain pipes, and test connections.
   17. Underground pipe size, length, location, weight, material, point of connection to city main; the type of valves, meters, and valve pits; and the depth that top of the pipe is laid below grade.
   18. Provisions for flushing.
   19. For hydraulically designed systems, the material to be included on the hydraulic data nameplate.
   20. Hydraulic calculations.

D. Coordinate with Architect for submittal of shop drawings and hydraulic calculations to plan approval agency in accordance with Section 01 4000. Submit shop drawings and hydraulic calculations to all other authorities having jurisdiction for approval. Submit proof of approval to Architect.
   1. Local fire department.
   2. Local building department.
   3. Owner's insurance underwriter.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations. Provide Contractor's Material and Test Certificate.

B. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service provider.

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

D. Extra Materials:
   1. Provide extra sprinklers under provisions of NFPA 13.
   2. Provide suitable wrenches for each sprinkler type.
   3. Provide metal storage cabinet located adjacent to alarm valve.

1.05 QUALITY ASSURANCE:

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

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience; licensed as a sprinkler system installer at the place where the project is located.

C. Designer Qualifications: Design system under direct supervision of a person experienced in design of this work and licensed as a sprinkler system designer at the place where the project is located.

1.06 REGULATORY REQUIREMENTS:

A. Conform to UL Fire Resistance Directory and FM Approval Guide, state and local codes, local fire department and water department requirements, and requirements of Owner's insurance underwriter.

B. Perform Work in accordance with NFPA 13.

C. Perform Work in accordance with NFPA 231 where applicable.

D. Equipment and Components: Bear UL and FM label or marking.

E. Welding Materials and Procedures: Conform to AWS B2.1.

1.07 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

B. Provide temporary protective coating on cast iron and steel valves.

PART 2 PRODUCTS

2.01 SPRINKLERS:

A. Sprinkler Heads: All brass body; nominal ½ inch orifice; temperature rated for specific area hazard. Extended coverage sprinkler heads are acceptable.
   1. Finished Spaces With Ceilings: Match existing.

2.02 PIPING:

A. Above Grade Piping: Steel pipe.
   1. ASTM A135, Light Wall, Schedule 10.
      a. Pipe Sizes to 5 Inch: UL listed.
      b. Welded Steel Fittings: ASME B16.9, wrought steel, buttwelded.
      c. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers.
   2. ASTM A53 or ASTM A135, Schedule 40, black.
      a. Cast Iron Fittings:
         (1) Pipe Sizes to 6 Inch: ASME B16.4, threaded fittings.
      b. Welded Steel Fittings, Mechanical Grooved Couplings, or Mechanical Formed Fittings: Submit substitution request in accordance with Section 01 6000, including evidence that governing authorities and codes permit the use of the requested method of coupling.

2.03 PIPING SPECIALTIES:

A. Valves:
   1. Gate Valves (Sizes to 2½ Inch): Class 125, 175 psi WWP; MSS SP80; bronze body and trim, solid wedge or disc, threaded ends, rising stem, handwheel.
   2. Check Valves (Sizes to 2½ Inch): Class 125, 175 psi WWP; MSS SP80, bronze body and swing disc, rubber seat, threaded ends.
   3. Detector Check Valves: Type approved by local water utility, with bypass meter. Coordinate installation with local water utility.
   4. Drain Valves: Angle valve with bronze body, bronze trim, rising stem and handwheel, screw-in bonnet, integral seat, renewable disc.

B. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with pressure retard chamber and variable pressure trim; with test and drain valve.

C. Supervisory Switches: Suitable for attachment to valve, with ¾ inch tapped conduit entrance; weatherproof die cast aluminum housing with red enamel finish.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to beginning shop fabrication of piping, field verify dimensions and conditions and coordinate work with other trades. Minor adjustments to scheduled dimensions, such as ceiling heights, may be made prior to fabrication without an adjustment to the Contract Sum.

3.02 PIPING INSTALLATION:

A. Install piping in accordance with NFPA 13 and Section 21 1100.

B. Provide drain valves at main shut-off valves, low points of piping and apparatus.

C. Provide inspector's test valve in remote part of system; pipe discharge to building exterior.

D. Provide minimum 24 x 24 inch precast concrete splash block at each drain and test valve discharge at the building exterior.

E. Provide anchorages for tees, plugs, caps, bands, and hydrants in accordance with NFPA 24. After installation, apply corrosion-retarding coating to surfaces of rods and clamps.

3.03 SYSTEM INSTALLATION:

A. Install system components in accordance with NFPA 13.

B. Install equipment in accordance with manufacturer's instructions.

C. Connect system to existing sprinkler piping.

D. Pipe drain valve to outside, with minimum 4 ft of piping beyond valve; terminate with elbow turned down.

E. Flush entire piping system of foreign matter, using approved procedures to inhibit microbially influenced corrosion.

F. Install identification signs on riser and all valves in accordance with NFPA standards.

G. Hydraulic Design Information Sign: Provide metal or rigid plastic sign, permanently marked, secured to the alarm valve with corrosion-resistant wire or chain, indicating the following design criteria:
   1. The design area and density requirements of each system.
   2. The system or systems controlled by the riser.

3. Required flow and pressure demand at the base of the riser.
4. Occupancy classification.
5. Hose stream demand.

3.04 TESTING:

A. Flush and hydrostatically test all systems, using domestic water. Provide additional tests and inspections required for approval.

B. Require testing be witnessed by all authorities having jurisdiction.

END OF SECTION

SECTION 23 0500 – COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Materials and installation methods applicable to all Sections of Division 23.
   2. Testing and inspection.

B. Related Sections:
   1. Section 23 0593 – Testing, Adjusting, and Balancing.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 HVAC EQUIPMENT START-UP, INSPECTION, AND TRAINING:

A. Appoint, employ, and pay for services of an independent firm acceptable to Architect and Owner to perform testing, adjusting, and balancing as specified in Section 23 0593. The independent firm shall promptly submit reports to Architect, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

B. Install new disposable type filters at Substantial Completion. Thoroughly clean permanent type filters.

C. Alteration Projects: Provide start-up and inspection services on existing equipment. Check proper air flow, air filters, heat and cooling operation, economizer operation and sequence of operation. Clean coils and other components where accumulated dirt may degrade performance. Submit a written start-up report to the Architect. In the event of incompatible, damaged, or defective parts, notify the Architect and obtain proper authorization before making repairs. Costs incurred as a result of defective existing parts are the responsibility of the Owner.

3.02 TESTING AND INSPECTION:

A. Refer to individual Sections for specific tests required for each system.

B. Pay for all required tests and inspections. Furnish labor, materials, and instruments; bear other costs in connection with all tests.

C. Notice of Tests: Give written notice in ample time to all concerned of date when tests will be conducted.

D. Prior Tests: Concealed or insulated work shall remain uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved by the Architect.

E. Adjustments, Repairs, and Retests:
   1. Make adjustments, repairs, and alterations as required to meet specified test results.
   2. Correct defects disclosed by tests or inspection, and replace defective parts when directed.
   3. In replacing defective parts, use only new materials.
   4. Caulking of screwed joints or peening of welds is not permitted.
   5. Repeat tests after defects have been corrected and parts replaced, as directed and until pronounced satisfactory.

F. Responsibility for Damage: Bear the cost of repairs and restoration of the work of other Contractors damaged by the tests or cutting required in connection with the tests.

END OF SECTION

SECTION 23 0593 – TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Test, adjust, and balance HVAC air distribution systems.

B. Related Sections:
   1. Section 23 0500 – Common Work Results for HVAC.
   2. Section 23 3100 – HVAC Ducts.
   3. Section 23 3700 – Air Outlets and Inlets.

1.02 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record test data on a copy of the latest revised set of drawings.

B. Balance Report: Include line diagram of each supply system. Record initial filter pressure drops and calibration of instruments. Include confirmation of the volume circulated during full cooling cycles. Record design data and observed data to facilitate comparisons.
   1. The final report shall be certified by a Professional Engineer or member of AABC specializing in the field of air and water testing and who is not affiliated with any firm involved in the construction of the project.

C. Air Balance Data:
   1. Equipment: Manufacturer and model; size; arrangement, discharge, and class; total cfm, static pressure (external and total), and percent outside air; motor HP, voltage, phase, RPM, and full load amps (all phases); location and mark number; inlet and outlet dry bulb and wet bulb temperatures; starter heater element data; drive and belt data; outside temperature and wind velocity.
   2. Duct Systems: Duct size and location of traverse; number of readings; velocity measurements; average velocity, temperature and static pressure; actual cfm.
   3. Individual Air Terminals: Manufacturer and model; location and mark number; applicable calculation factors for velocity and capacity; cfm and thermal capacities; electrical data.

D. Where design capacities cannot be obtained, specifically note conditions in first section of report. Describe specific problem, actions attempted to solve problem, and recommendations for further action to solve problem.

1.03 QUALITY ASSURANCE:

A. Balancing Agency: Member of Associated Air Balance Council, or an independent firm specializing in balancing of systems whose principals are Professional

Engineers. All personnel shall be regular employees experienced and technically trained specifically in the total balancing of HVAC systems.

B. Perform HVAC systems balancing in accordance with AABC standards.

C. Provide labor, engineering and test equipment required to adjust and balance heating, ventilating, and air conditioning.

D. Permanently mark final settings of splitters, dampers, and other adjustment devices so that adjustment can be restored if disturbed at any time.

PART 2 PRODUCTS

2.01 EQUIPMENT:

A. Furnish required test equipment. Verify calibration of instruments prior to beginning work.

PART 3 EXECUTION

3.01 GENERAL PROCEDURES:

A. Adjust and balance the existing HVAC system under conditions approximating actual operation.

B. Check each piece of equipment for proper lubrication, drive rotation, belt tension, control sequence, and other conditions which may cause damage.

C. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify wiring and support components for equipment are complete and tested.

E. Install at each piece of HVAC equipment a data sheet enclosed in a clear plastic holder securely attached to the equipment or wall in immediate area, showing significant operating temperatures, pressures, amperes, voltage, brake horsepower, and other relevant data.

F. Any changes required for final balancing results as determined by Balancing Agency will be provided for the installers, who shall supply and install such equipment under their contractual obligations. Such changes may include, but are not limited to, the changing of pulleys, belts, dampers, or adding dampers or access holes.

3.02 AIR DISTRIBUTION SYSTEMS BALANCE PROCEDURE:

A. Measure air volumes in duct system by the pitot tube duct traverse method across the entire cross-sectional area (usually a minimum of 16 readings). Indicate locations of readings on record drawings and cross reference to report. Record static pressure and air temperature at the traverse point.

B. Pressure test supply and return duct systems; verify that leakage rate is within permissible values.

C. Seal test holes with permanent type snap-in plugs when test is complete. Do not use duct tape to seal test holes. Do not make test holes in flexible duct or flexible equipment connectors.

D. Regulate air volumes by adjusting splitter dampers and branch duct dampers to obtain required quantities of supply and return air. Utilize dampers at grilles, registers, and diffusers for fine adjustments only. Adjustment shall not create objectionable air patterns, drafts, or sound levels. Do not use devices other than dampers to adjust air volume.

E. Adjust air volume at terminals within 10 percent of the individual requirements specified. Measure air volume at each air outlet and inlet by methods approved or recommended by the manufacturer of the terminal device.

F. Regulate total air delivery of fan systems by adjusting fan speed, motor speed, or fan blade pitch. Do not load drive motors above the corrected full load amperage rating.

G. Plug instrument test holes with permanent closure on completion of work.

3.03 PROTECTION:

A. Repair or replace finished work damaged during the performance of this work.

END OF SECTION

SECTION 23 0700 – HVAC INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Thermal insulation for HVAC ductwork.

B. Related Sections:
   1. Section 23 0500 – Common Work Results for HVAC.
   2. Section 23 3100 – HVAC Ducts.

1.02 DEFINITIONS:

A. Concealed: Below grade or hidden from sight in normally inaccessible areas such as areas above suspended ceilings, and similar locations.

B. Exposed: Not concealed. Exception: Pipe chases 24 inches and wider shall be considered exposed.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide list of materials and fastenings to be used for each system. Include general description, fire ratings, and installation instructions.

1.04 QUALITY ASSURANCE:

A. Fire and Smoke Hazard Ratings: ASTM E84.
   1. Flame Spread: Maximum 25.
   2. Smoke Developed: Maximum 50.

B. Thermal Conductivity: ASTM C335; maximum K value for each product listed with product description.

C. Accessories such as cements, fitting covers, and pressure sensitive tape shall have the same component ratings as listed above.

D. Paper laminate jackets shall be permanently fire and smoke resistant. Chemicals used for treating paper in jacket laminates shall not be water soluble and shall be unaffected by water and humidity.

PART 2 PRODUCTS

2.01 DUCTWORK INSULATION MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Johns Manville.
   2. CertainTeed Corporation.
   3. Knauf Fiber Glass.
   4. Owens-Corning Fiberglas Corporation.

B. External Duct Insulation:
   1. Concealed Locations Above Ceilings: ASTM C553, Type II, Class F-1; flexible fiberglass blanket; formaldehyde-free; maximum K value 0.25 at 75 degrees F. (Johns Manville Microlite 150)
   2. Facing: ASTM C1136; foil-scrim-kraft vapor retardant type; aluminum foil reinforced with fiberglass yarn and laminated with fire-resistant adhesive to kraft paper.

C. Seam Tape: To match facing finish.

PART 3 EXECUTION

3.01 INSTALLATION OF EXTERNAL DUCTWORK INSULATION:

A. Flexible Insulation: Apply insulation to clean, dry, tightly sealed ducts with edges tightly butted. Overlap facing minimum 2 inches at seams. Secure seams with outward clinching staples at 6 inches o.c.; seal seam with pressure-sensitive tape. At underside of ducts greater than 24 inches wide, secure insulation with mechanical fasteners and speed clips spaces 18 inches o.c.; cut fasteners flush with surface and seal with seam tape.

B. Where reinforcing angles are greater than the insulation thickness specified, increase insulation thickness equal to the angle depth.

3.02 DUCTWORK INSULATION SCHEDULE:

A. Insulate all ductwork unless otherwise indicated. Maintain visibility and accessibility of testing laboratory labels, equipment nameplates, and access panels.

B. Schedule of Ductwork to be Externally Insulated:
   1. Supply Ducts (except in plenums): 1½ inch thickness.

END OF SECTION

SECTION 23 3100 – HVAC DUCTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Ductwork materials, construction, supports, and cleaning.
   2. Ductwork accessories.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 07 9200 – Joint Sealants.
   3. Section 23 0500 – Common Work Results for HVAC.
   4. Section 23 0700 – HVAC Insulation.
   5. Section 23 0900 – Testing, Adjusting, and Balancing.
   6. Section 23 3700 – Air Outlets and Inlets.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with SMACNA Standards.

B. Construct ductwork to NFPA 90A and NFPA 90B standards as applicable.

1.03 QUALIFICATIONS:

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

B. Installer: Company specializing in performing the work of this section with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Protect dampers from damage to operating linkages and blades.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 METAL DUCT MATERIALS:

A. Galvanized Sheet Steel: ASTM A653, lock forming quality; G60 zinc coating in accordance with ASTM A90.

B. Fasteners: Rivets, bolts, or sheet metal screws.

C. Sealant: Water resistant, fire resistive, compatible with mating materials; UL listed.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Carlisle HVAC Products; Hardcast Iron-Grip 601.
      b. Design Polymerics; DP 1010.
      c. McGill AirSeal LLC; Uni-Seal.
   2. Flame Spread Rating: Maximum 10.
   3. Smoke Developed Rating: 0.

2.02 DUCTWORK FABRICATION:

A. Fabricate and support in accordance with SMACNA Standards, and as indicated.

B. Minimum Sheet Metal Thickness: In accordance with SMACNA Standards and applicable mechanical code.

C. Provide duct material, gauges, reinforcing, and sealing for minimum 2.0 inch pressure class unless otherwise indicated.

D. Construct tees, bends, and elbows with radius of not less than 1½ times width of duct on centerline. Where not possible and where rectangular elbows are used, provide air foil turning vanes.

E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

F. Fabricate continuously welded round and oval duct fittings two gauges heavier than duct gauges indicated in SMACNA Standards. Joints shall be minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.

G. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

2.03 DUCTWORK ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Greenheck Corp.
   2. American Warming & Ventilating.
   3. Ductmate Industries, Inc.
   4. Ruskin Manufacturing.
   5. Vent Products Co., Inc.

B. Duct Hangers and Supports: In accordance with SMACNA standards.
   1. All hanger strap material shall be galvanized.

2. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

C. Air Turning Devices/Extractors: Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

D. Volume Control Dampers: Fabricate in accordance with SMACNA Standards.

1. Single Blade Dampers:
   a. For Round Duct Sizes Less Than 16 Inch Diameter: Ruskin CDRS25; Vent Products 5301.
   b. For Rectangular Duct Sizes Less Than 12 Inches High: Ruskin CD35; Vent Products 5101.

2. Quadrants: Provide locking, indicating quadrant regulators.
   a. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
   b. Where rod lengths exceed 30 inches, provide regulator at both ends.

E. Duct Test Holes:

1. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

F. Flexible Duct Connections: Fabric crimped into metal edging strip; fabricate in accordance with SMACNA Standards.

1. Fabric For Interior Connections: NFPA 90A, UL listed, fire retardant neoprene coated woven glass fiber fabric, minimum density 30 oz/sq yd.

2. Net Fabric Width: Approximately 3 inches wide.

3. Metal: 3 inch wide, 24 gauge thick galvanized steel.

PART 3 EXECUTION

3.01 DUCTWORK INSTALLATION:

A. Install in accordance with manufacturer's instructions.

B. Install and seal ducts in accordance with SMACNA Standards. Allow assembled components to cure for at least 48 hours before pressure testing for leaks.
   1. Joint Seals: Class B, unless noted otherwise.

C. Insulate ductwork in accordance with Section 23 0700.

D. Duct sizes indicated are inside clear dimensions unless specifically indicated.

E. Support ductwork from structural building framing, plumb and parallel to building lines.
   1. Support ducts from structural steel framing and joists using welded studs or C-clamps with retaining clip attached to the steel. At open web joists, support at panel points only. Do not support ductwork from metal deck.
   2. Do not exceed maximum hanger spacing per SMACNA.
   3. Hangers shall be readily removable.

F. Install ductwork to conserve building space, to not interfere with use of space and other work, and to maintain required headroom and clearances for ceiling panel removal and related conditions.

G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.

H. Use double nuts and lock washers on threaded rod supports.

I. Connect diffusers to low pressure ducts with 4 foot maximum length of flexible duct held in place with strap or clamp.

J. Connect flexible ducts to rigid ducts with draw bands. Install flexible ducts as straight as practical with total of bends not to exceed 90 degrees. Install in a fully extended condition free of sags and kinks, using 2 feet minimum length.

K. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

L. Seal terminations and butt joints of ducts and plenums with building components.

M. Seal penetrations of wall and floor assemblies to achieve fire resistance equivalent to fire separation required, in accordance with Section 07 8400. Seal penetrations through non-rated assemblies with sealant in accordance with Section 07 9200.

N. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and SMACNA Standards.

O. Provide duct test holes where indicated and required for testing and balancing purposes.

P. Provide balancing dampers where branches are taken from larger ducts and as required for air balancing. Install minimum 2 duct widths from duct take-off.

Q. Provide balancing dampers on duct take-off to diffusers, regardless of whether dampers are specified as part of the diffuser assembly.

R. Verify operation of all dampers from fully closed to fully open; adjust to eliminate binding and interference. Clean and lubricate moving parts.

3.02 CLEANING:

A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment

which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.

END OF SECTION

SECTION 23 3700 – AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Ceiling diffusers.

B. Related Sections:
   1. Section 23 0500 – Common Work Results for HVAC.
   2. Section 23 0900 – Testing, Adjusting, and Balancing.
   3. Section 23 3100 – HVAC Ducts.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate type, size, finish, mounting details, installation instructions, and noise level.

1.03 QUALITY ASSURANCE:

A. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Price Industries.

B. Carnes Company, Inc.

C. Dynamics Corporation of America, Anemostat Products Division.

D. Krueger.

E. Lindab, Inc.

F. Titus.

2.02 AIR OUTLETS:

A. Square Ceiling Diffusers: Adjustable vanes to discharge air in four way pattern; formed aluminum construction with concentric cones; white finish. (Price ASCDA-4C series; Titus TMSA-AA series; or as required to match existing)
   1. Frame: Inverted T-bar.
   2. Accessories: Opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting and sprinkler arrangements.

C. Install diffusers to ductwork with air tight connection.

D. Provide edge gaskets for surface mounted components; install tight to finish mounting surfaces to prevent leakage.

END OF SECTION

SECTION 23 8240 – ELECTRIC RESISTANCE HEATING UNITS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Wall fan-forced electric heaters.

B. Related Sections:
   1. Section 26 0500 – Common Work Results for Electrical.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate catalog cut sheets, manufacturer's installation instructions, and wiring diagrams.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Marley Engineered Products, Q-Mark Division.

B. Marley Engineered Products, Berko Division.

C. Chromalox, Inc.

D. Dayton Electric Manufacturing Co.

E. Markel Electric Products, Inc.

2.02 WALL FAN-FORCED HEATERS:

A. Heaters: Heavy duty, tamper resistant, fully recessed.

B. Grille: Minimum 16 gauge steel, with closely spaced downflow discharge bars; with attachment screws at bottom of grille frame to discourage tampering.

C. Finish: Duranodic baked enamel, brown color, with satin finished aluminum frame.

D. Thermostat: Adjustment range between 40 degrees F and 90 degrees F, with manually set "no heat" position; tamper resistant, adjusted by inserting narrow blade screwdriver through front bar grille.

E. Heating Elements: Steel finned metal sheath elements.

F. Fan Motor: Totally enclosed and permanently lubricated for long life and low maintenance.

G. Overheat Protection: Automatic reset thermal overheat protector to disconnect power in event of overheating due to accidental blockage.

H. Fan Delay Switch: Built-in fan delay switch to energize fan motor only after elements are heated to prevent discharge of unheated air. When heat shuts off, switch shall de-energize fan motor only after residual heat has been dissipated.

I. Disconnect: Built-in double-pole disconnect switch.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install products in accordance with manufacturer's installation instructions.

B. Wire components to circuits indicated, in accordance with manufacturer's wiring diagrams.

END OF SECTION

SECTION 26 0500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Materials and installation methods applicable to all Sections of Divisions 26 through 28.
   2. Identification.
   3. Painting.
   4. Testing.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary lighting and power.
   2. Section 07 8400 – Firestopping.
   3. Section 07 9200 – Joint Sealants.
   4. Section 09 9000 – Painting and Coating.
   5. Section 26 0526 – Grounding and Bonding.

1.02 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of components and circuits; indicate routing of conduits, locations and elevations of outlets, circuit numbers of all lighting and power circuits, panel schedules, grounding system components and electrodes, and other pertinent information.

1.03 QUALITY ASSURANCE:

A. Regulatory Requirements and Reference Standards: Comply with applicable requirements of ANSI, ASTM, AWS, FM, NEMA, NFPA, OSHA, UL, in addition to specific applications listed in individual Sections.

B. All electrical materials shall be UL listed for the use intended and shall bear the label of approval.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Supplemental Support Framing: Light gauge galvanized steel channel framing systems or other approved components. Supports composed of channel iron, conduit, wire or other non-approved material are not acceptable.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Tyco Electrical & Metal Products; Unistrut.
      b. Eaton B-Line; 4Dimension.

c. Thomas & Betts; Superstrut.

B. Identification Nameplates: Laminated phenolic with white engraved letters on black background; 1 x 3 x 1/16 inch thick minimum size. Use 1/16 inch thick material for plates up to 2 x 4 inch size; for larger sizes use 1/8 inch thick material.

1. Copy: Include name of equipment, the specific unit number, and reference to "ON," "OFF," or other instructions as applicable.

2. Lettering: Condensed Gothic; minimum size ¼ inch high, 4 letters per inch; increase letter size to ¾ inch high on largest plates. The space between lines shall be equal to the width of the letters.

C. Identification Labels: Plastic stick-on adhesive type.

1. Arc Flash Hazard Labels: Minimum 3½ x 5 inch.

2. Where surface contaminants or other conditions make permanent adhesion unlikely, apply label to 1/8 inch thick clear plastic back plate installed to the mounting surface with permanent fasteners.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are as indicated.

B. Examine work of other trades which comes in contact with or is covered by electrical work. Do not attach to, cover up, or finish against defective work.

C. Verify with the Architect the fire rating requirements of walls and floors to be breached by conduit, cable, raceway or other penetrations.

3.02 INSTALLATION:

A. Furnish and install fixtures and equipment to make a complete and working system as indicated in the Contract Documents. This includes wiring requirements from the service entrance to and including final outlets, fixtures, and equipment. Furnish necessary outlets and connections to equipment and controls furnished by others.

B. Electrical work shall be installed by journeyman electricians under the direct supervision of a competent supervisor. At no time shall electrical work be without the immediate on-the-job supervision of a journeyman electrician.

C. Lay out and arrange system components to provide ease of maintenance and replacement without major disassembly of adjacent components.

D. Properly attend the electrical work during the progress of adjacent construction to prevent misalignments or damage to the electrical work.

E. Furnish all material and labor to install and accomplish supports, braces, steel, inserts, anchors, chases, sleeves, holes, and other work required to accomplish the Electrical

Work in accordance with the requirements of the applicable Sections, without relying upon other trades or inferring anything that is mentioned in other Divisions, unless it is specifically noted in the Contract Documents to be furnished or provided by others.

F. Perform cutting and patching required for proper and complete installation of the electrical work, in accordance with Section 01 7000.

G. Rough-in and provide final electrical connections for all equipment indicated on the Drawings, including equipment installed by others. Electrical outlets and approximate loads for the various items of equipment are noted on the Drawings. Verify exact locations of outlets serving various equipment units, and verify the equipment manufacturer's required circuit termination methods (e.g., blank box, plug-in, receptacles, etc.) to best suit requirements for each equipment item.
   1. Motors for building utility equipment furnished and installed by other trades shall be connected by the Electrical installer.
   2. If a specific item is indicated on both Electrical Drawings and other Drawings, request clarification in accordance with the Instructions to Bidders and Section 01 3100.

H. Provide through-penetration firestops in accordance with Section 07 8400. Seal openings around conduits or in sleeves for conduits penetrating fire-rated assemblies at both sides of the penetration. Seal penetrations through non-rated assemblies with sealant in accordance with Section 07 9200.

I. Furnish and install appropriate sleeves and hangers required for the electrical work.
   1. Do not attach conduits, cables, boxes, devices, or other components, to wires that support ceiling suspension system.
   2. Recessed lighting fixtures and other components attached to or suspended from grid ceilings shall be supported from the main T-bars, not the intermediate T-bars.

J. Check and tighten all plates, covers, doors, and trims used in conjunction with electrical equipment. All outlet openings not receiving a device shall be provided with a blank plate. There shall be no "open" boxes.

K. Balance load on feeders and main switch to within 10% under maximum load conditions.

3.03 IDENTIFICATION:

A. Equipment and Controls: Identify electrical equipment, disconnects, pull boxes, junction boxes, and associated items with nameplates securely fastened with screws.
   1. Junction boxes, pull boxes, and future use raceways in unfinished areas may be hand lettered with marking pen; indicate circuit or other identification.

B. Panelboards: Provide typewritten directory indicating location, service and purpose of each switch or breaker. Install directory in durable framed enclosure and mount in location directed by Owner.

C. Arc Flash Hazard Labels: Install permanent arc flash hazard labels at each electrical distribution point, located to be clearly visible to qualified persons before examination, adjustment, servicing or maintenance of equipment. Required locations include all panelboards, enclosures, disconnects, and other locations identified in NFPA 70.

3.04 PAINTING:

A. Prepare exposed fittings, boxes, and supports for painting by removing oil, grease and dirt. Prevent scratching or defacing of electrical apparatus and devices.

B. Refinish electrical equipment damaged during shipping or installation. Remove rust, prime, and paint per manufacturer's recommendations for finish equal to original.

C. Finish painting of electrical equipment and exposed conduit, unless otherwise indicated, shall be done under Section 09 9000. Exposed conduit installed after finish painting is complete shall be painted to match adjacent finish by the painter at the expense of the Electrical Contractor.

D. In the event of damage to finish painting caused by the work of this Contractor, the necessary repainting shall be done by the painter at this Contractor's expense.

E. Coordinate with Section 09 9000 for installation of cover plates and other items installed adjacent to painted surfaces. Do not install such items until painting and finishing work in the room or space is complete.

3.05 TESTING:

A. Refer to individual Sections for specific tests required for each system.

B. Pay for all required tests and inspections. Furnish labor, materials, and instruments; bear other costs in connection with all tests.

C. Notice of Tests: Give written notice in ample time to all concerned of date when tests will be conducted.

D. Prior Tests: Concealed work shall remain uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved by the Architect.

E. Acceptance Testing: Demonstrate the compliance of the installation with the Contract Documents, NEC, and specified standards. Tests shall include operation of lights and equipment, continuity of the conduit system, grounding resistance and insulation resistance measurements on not more than ten representative circuits and any other circuits for which a justifiable reason exists for such tests. Furnish all labor and testing equipment for the performance of these tests.
   1. Inspect and test in accordance with International Electrical Testing Association (NETA) Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (ATS), except Section 4.
   2. Perform inspections and tests listed in NETA ATS, Section 7.3.1.
   3. Adjust all equipment to proper operating condition.

4. All wiring shall be tested and approved free of defective insulation and unintentional grounds.
5. All system, equipment and other intentional grounds shall be proved to have sufficiently low resistance for proper service.
6. Megger Test: Test all wiring and connections for continuity and grounds. If the insulation resistance test indicates the possibility of faulty insulation, locate the conductor containing such faulty insulation, replace same with new, and demonstrate by further test the elimination of such fault.
7. Record feeder load currents and line voltages measured at each transformer, switchboard, and panelboard. Adjust single phase load connections to balance feeder loads. Provide the Owner with a complete copy of all load and voltage records.
8. Prior to substantial completion, turn on all equipment in the building including lighting, and using an amprobe, read the current drawn on each hot leg of feeder supplying each distribution panel. If the current in any one leg varies more than 5 percent plus or minus, from the arithmetic average of the current in all the hot legs, reconnect the branch circuits to obtain a balanced loading.

F. Adjustments, Repairs, and Retests:
1. Make adjustments, repairs, and alterations as required to meet specified test results.
2. Correct defects disclosed by tests or inspection, and replace defective parts when directed.
3. In replacing defective parts, use only new materials.
4. Repeat tests after defects have been corrected and parts replaced, as directed and until pronounced satisfactory.

G. Responsibility for Damage: Bear the cost of repairs and restoration of the work of other Contractors damaged by the tests or cutting required in connection with the tests.

END OF SECTION

SECTION 26 0519 – CONDUCTORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Building wire and cable, 600 Volts or less.

B. Related Sections:
   1. Section 26 0500 – Common Work Results for Electrical.
   2. Section 26 0533 – Raceway and Boxes.

1.02 QUALITY ASSURANCE:

A. Comply with applicable requirements of ASTM B1, B2, B3, B8, and D4247; FS A-A-59544; IEEE 82 and 241; NEMA WC 70; UL 83 and 486A.

B. Provide products which are ETL listed and labeled.

PART 2 PRODUCTS

2.01 BUILDING WIRE AND CABLE:

A. Manufacturers: In accordance with Section 01 6000.
   1. Aetna Insulated Wire, LLC.
   2. Encore Wire.
   3. Prysmian Group.
   4. Southwire Co.

B. Conductors: Copper, 600 Volt rated; minimum size 12 AWG for power and lighting circuits, and 14 AWG for control circuits.
   1. Sizes 10 AWG to 14 AWG: Type THHN/THWN, solid or stranded, with color impregnated insulation.
   2. Sizes 8 AWG and Larger: Type XHHW, stranded.
      a. Provide color impregnated insulation, or tape conductor ends with solid color electrical tape for minimum 3 inches at terminations and boxes.

C. Metal-Clad Cable: Type MC; insulated copper conductors, minimum size 12 AWG for power and lighting circuits, and 14 AWG for control circuits.

D. Provide wire and cable in full factory lengths of minimum 500 feet, on original reels or in boxes, new and unused.

2.02 ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. 3M Electrical Products.
   2. Buchanan Construction Products, Inc.
   3. Ideal Industries, Inc.

4. Thomas & Betts Corp.

B. Joint Connectors: UL listed; suitable for insulation temperature rating provided.
   1. Conductor Sizes 8 AWG to 14 AWG: Preinsulated locking connectors. (3M Scotchlok)
   2. Conductor Sizes 6 AWG and Larger: Pressure type mechanical connectors, insulated with three layers half-lapped electrical tape. (3M Scotch No. 33)
   3. Wet Locations and Exterior Junction Boxes: Twist and seal water resistant connectors. (Ideal Twister DB Plus or Buchanan BTS)

C. Terminal Connections: Solderless pressure type lugs and connectors. (Thomas & Betts Sta-Kon or 3M Scotchlok)

D. Identification Tape: Epoxy film. (3M Scotchcode Epoxy)

E. Wire Pulling Lubricant: UL listed.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that work likely to damage installation has been completed.

B. Verify that raceway installation is complete and supported before installing wire and cable.

3.02 INSTALLATION:

A. Install cable in accordance with NECA Standard of Installation.

B. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

C. Branch Circuits Longer Than 75 Feet: Adjust conductor size in accordance with NFPA 70 requirements for voltage drop calculations.

D. Installation in Conduit and Raceway: Pull all conductors into raceway at same time. Do not injure insulation or conductor. Examine insulation during installation; discard sections of wire and cable with damaged insulation.

   1. Swab conduits free of moisture, dirt, and foreign materials before pulling wire. Replace damaged conduit.

   2. Use wire pulling lubricant for building wire sizes 4 AWG and larger.

E. Open Wiring Without Conduit or Raceway:

   1. Install all wiring in conduit or raceway unless specifically permitted by NFPA 70 for the following purposes:
      a. Type MC cable for branch circuits in existing construction.
      b. Low voltage wiring for electronic safety and security systems in accordance with Division 28.

2. Wiring systems otherwise approved for open wiring shall be installed in conduit at the following locations:
   a. Exposed locations below bottom of joists in areas without ceilings.
   b. Exposed areas subject to abuse.
   c. Areas above non-accessible ceilings.
3. Verify plenum rating requirements.
   a. All space above finished ceilings shall be considered plenum space unless otherwise noted.
   b. Install all non-plenum rated cables in conduit.
4. Route wiring in orderly manner; straight, plumb and parallel to building structure.
   a. Neatly bunch, bundle, and tie groups of cables at maximum 12 inches o.c.
   b. Support bundles separately from cable ties, at maximum 24 inches o.c. except where specifically approved for greater spacing up to 36 inches o.c.
   c. Support cables above accessible ceilings, using spring metal clips or plastic cable ties to support cables from structure or ceiling suspension system at maximum 5 feet o.c. Do not rest cable on ceiling panels, light fixtures, ductwork, piping or equipment.
5. Protect exposed cable from damage.
   a. Provide metal conduit sleeves for concrete and masonry penetrations. Provide bushings or grommets for metal stud penetrations.
   b. Observe minimum bend radius and tension limitations, and other restrictions specified by the cable manufacturer.
   c. Where cable stress cannot be avoided, use wire mesh grips to distribute the strain over a longer length of cable.
   d. Prevent pinching, binding, crimping, sharp bends, twists, gouges, cuts, or other forms of physical or electrical characteristic damage.

F. Joints and Splices:
1. Do not splice conductors except where indicated on the Drawings or specifically approved.
2. Make joints and splices only at boxes and enclosures in accessible locations.
3. Clean conductor surfaces before installing lugs and connectors.
4. Make splices, taps and terminations to carry full ampacity of conductors with no perceptible temperature rise.

G. Neatly train and lace wiring inside boxes, equipment, and panelboards.
1. Protect free ends and loops of wire at boxes and enclosures by blank covers or other approved means until the interior painting and finishing work is complete.
2. Coil service loops and additional cable lengths at 200 percent of the minimum bend radius; secure coil with cable ties and attach to nearby support.

3. Test and permanently tag by circuit number each end of each control wire and circuit wire, except neutrals, using numbered identification tape.

H. Color code multi-wire branch circuits in accordance with NFPA 70.

1. 120/208 Volt:
   a. Phase Conductors: Black, red, and blue.
   b. Neutral: White.
   c. Ground: Green.

2. 277/480 Volt:
   a. Phase Conductors: Brown, orange, and yellow.
   b. Neutral: Gray.
   c. Ground: Green.

3. The identified neutral shall be insulated throughout and grounded only at the service entrance equipment (not individual panels).

4. Arrange phase conductors at equipment connections in sequence from front to rear, top to bottom, or left to right when facing established front of equipment.

I. Install a green ground wire, sized in accordance with NEC, in all flexible conduit, isolated from the neutral wire.

J. Branch circuits shall be installed with a dedicated neutral wire from the circuit source to the load connection.

END OF SECTION

SECTION 26 0526 – GROUNDING AND BONDING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Grounding for electrical systems.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 26 0500 – Common Work Results for Electrical.
   3. Section 26 0519 – Conductors.

1.02 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Companies regularly engaged in manufacture of electrical connectors, terminals and fittings, of types and ratings required, and ancillary grounding materials, including stranded cable, copper braid and bus, ground rods and plate electrodes, whose products have been in satisfactory use in similar service for minimum three years.

B. Regulatory Requirements and Reference Standards: Comply with applicable requirements of NFPA 70, UL 467 and 869, and IEEE 142 and 241.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Provide cables, wires, connectors, terminals (solderless lugs), grounding rods/electrodes and plate electrodes, bonding jumper braid, surge arresters, and additional accessories needed for a complete installation. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE, and established industry standards for applications indicated.

B. Grounding Conductors: Insulated copper, size to meet NFPA 70 requirements.

C. Splices and Terminations:
   1. Clamps and Pressure Connectors: In accordance with Section 26 0519.
   2. Welded Connections: Exothermic type.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install grounding and bonding system to meet regulatory requirements.

B. Solidly ground all conduit systems, switch boxes, cabinets, motor frames, fixtures, and all other permanently installed equipment in accordance with NFPA 70 to form a

continuous, permanent and effective grounding system. Expansion joints and metal raceway sections shall be bonded. Provide grounding conductors.

C. Install an insulated ground wire, sized in accordance with NEC Article 250, in all feeder, branch circuit and lighting circuit raceways.

D. Install separate ground wire, isolated from neutral, in all flexible conduits and connections to motors; sized in accordance with NEC Table 250.122, minimum size No. 12 AWG.

E. Install a green bonding jumper between the outlet box and the receptacle grounding terminal on flush mounted receptacles.

F. Utilize grounding bushings on each conduit which is not bonded to a grounded enclosure by means of properly installed conduit nuts, one on each side of the enclosure panel, properly tightened to cut through the panel paint and make bare metal-to-metal contact.

G. Install grounding bonding jumpers across building expansion joints and conduit expansion fittings.

3.02 FIELD QUALITY CONTROL:

A. Demonstrate by testing that the electrical service grounding system to earth resistance value is 10 Ohms or less, utilizing a clamp-on or 3 point fall of potential tester.

B. Demonstrate by testing that the electrical service grounding system resistance from any grounded non-current-carrying conductor in the system to the electrical service entrance neutral/ground bonding conductor is less than 0.1 Ohms.

END OF SECTION

SECTION 26 0533 – RACEWAY AND BOXES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Conduit and fittings.
   2. Boxes and enclosures.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 07 9200 – Joint Sealants.
   3. Section 26 0500 – Common Work Results for Electrical.

1.02 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Provide temporary end caps and closures on conduit and fittings. Maintain in place until installation.

B. Protect conduit and raceway systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 CONDUIT AND FITTINGS:

A. Rigid Steel Conduit: ANSI C80.5; UL 6; hot-dipped galvanized or electro-galvanized, inside and outside; bichromate finish; with zinc coated threads.
   1. Fittings, Couplings and Bushings: Threaded type.

B. Intermediate Metal Conduit (IMC): UL 1242; hot-dipped galvanized.
   1. Fittings, Couplings and Bushings: Split type, compression type, or set-screw type; concrete-tight.

C. Electrical Metallic Tubing (EMT): ANSI C80.3; UL 797; electro-galvanized; smooth aluminum lacquer or enamel interior coating; threadless.
   1. Fittings, Couplings and Bushings: Compression type or set-screw type; concrete-tight; indenter type devices are not acceptable.

D. Flexible Metallic Conduit: UL 1; hot-dip galvanized.
   1. Fittings, Couplings and Bushings: Steel or malleable iron.

2.02 BOXES:

A. Concealed Boxes: Galvanized steel, with cover as required; with knockouts.
   1. Size:
      a. Conduit Size to ¾ Inch: 4 inch square. (Universal 52C50 or Raco 785)
      b. Conduit Size 1 Inch and Larger: 4-11/16 inch square. (Raco 839)

2. Depth: As required by code for number of conductors.
3. Provide extension rings for flush boxes in stud wall construction.

B. Pull Boxes: Galvanized steel, size to suit application; with cover secured by corrosion resistant screws; with knockouts.
1. Sizes 4½ inches Square and Smaller: Blank covers to match switch plates.
2. Sizes 5 Inches Square and Larger: Baked enamel finish to match electrical panel fronts.

2.03 ENCLOSURES:

A. Indoor Locations: NEMA 250, Type 1.

2.04 ACCESSORIES:

A. Anchors and Fasteners:
1. Beam clamps or welded fasteners on steel structural elements.
2. Toggle bolts in gypsum board partitions.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Size conduits in accordance with NFPA 70 for the number and size of conductors to be run in the conduit.

B. Minimum Conduit Size:
1. EMT Conduit: ½ inch; do not fill more than 25 percent.
2. Other Conduit Types: ¾ inch.

C. Verify conduit is round and straight prior to installation. Prevent deformation during cutting and threading.

D. Ream conduit ends. Remove burrs.

E. Completely and thoroughly swab raceway before installing wire.

F. Conduit Locations and Routing:
1. Route conduit in orderly manner, plumb and parallel to building structure.
2. Install conduit to conserve building space, to not interfere with use of space and other work, and to maintain required headroom and clearances for equipment, door swings, and related conditions. Do not run conduit on or directly in front of access doors, removable panels, or equipment.
3. Place conduit in concealed spaces above finished ceilings.
4. In areas without finish ceilings, route conduit through spaces in open web joists, trusses, or girders, supported against the underside of the top chord.
5. Conceal vertical conduit in stud wall cavities where possible. Except in unfinished spaces, obtain approval prior to installing exposed conduit.

6. Group conduit whenever practical at common elevations. When installing conduit in parallel, leave sufficient space to facilitate future work on any conduit.
7. Do not group conduit with fire suppression or other piping systems. Locate conduit above piping where possible.
8. Maintain minimum 6 inch clearance from hot piping and surfaces including domestic hot water lines.
9. Do not mount conduit on equipment except where necessary to connect electrical devices mounted on the equipment. Provide 18 inches of flexible conduit in all runs "bridging" vibration mountings.
10. Do not penetrate building structural members unless indicated.

G. Hangers and Supports:
1. Secure conduit to building structure at maximum 8 foot intervals.
2. Support surface mounted conduit runs with galvanized pipe straps. Fasten pipe straps to masonry surfaces with self-drilling anchors or toggle bolts. Fasten pipe straps to wood or sheet metal surfaces with pan head sheet metal screws.
3. Support suspended conduit runs with minimum ¼ inch threaded rod and galvanized conduit hangers. Attach hanger rod to structural steel with steel C-clamps, and to wood with suitable sized lag screws and angles. Multiple parallel conduit runs may be supported on trapeze hangers constructed of steel rod hangers and structural channel. Threaded rod hangers shall include 3 nuts jam-locked to rigidly support the conduit. DO NOT suspend conduit, light fixtures, or devices from metal deck.

H. Sleeves: Provide sleeves and escutcheons when penetrating foundations, floors, walls and partitions. Cut escutcheons as necessary to fit in close quarters.
1. Size sleeves to provide minimum ¾ inch clearance around all sides of conduits.
2. Maintain sleeves plumb, level, and in proper position throughout construction. Inspect sleeves in cast-in-place concrete during and after concrete pour and correct any deviation from proper position.
3. Seal conduit and sleeve penetrations to achieve fire resistance equivalent to fire separation required, in accordance with Section 07 8400. Seal penetrations through non-rated assemblies with sealant in accordance with Section 07 9200.

I. Boxes and Enclosures:
1. Wall outlets shall be plumb and accurately aligned in rows. Mount ceiling boxes symmetrical with walls, beams or tiles. Coordinate outlet box locations with exposed or existing features.
2. Locate switch boxes maximum 6 inches from door jamb in stud wall construction.
3. Do not install boxes back-to-back.
4. Provide minimum 3/8 inch center studs in boxes for direct fixture mounting. Provide special fixture hangers or auxiliary supports where fixture weight requires additional support.
5. Close openings in outlet boxes during gypsum board finishing with plain paper or slip on plastic or metal plates. Do not use newspaper.

6. Provide pull boxes and junction boxes where required, located to be accessible after completion of the project. Do not locate pull boxes in finished spaces without the specific approval of the Architect.
7. Secure conduit to boxes with double locknuts and bushings.

J. Prime coat and prepare for finish painting exposed conduit, fittings, supports, and accessories scheduled for field painting. Refer to Section 09 9000. Components located in suspended ceiling spaces are not considered exposed. Where support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to weld.

K. When installing more than one conduit system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings.

L. Seal around and within conduits where they pass through exterior walls and where they enter exterior fixtures.

M. Install 1/8 inch diameter nylon pull rope in all empty conduits.

3.02 CONDUIT LOCATION SCHEDULE:

A. Branch Circuits Above Grade:
1. Exposed Locations Locations Subject to Physical Damage: Rigid steel conduit or IMC. This category includes mechanical and electrical equipment rooms, chases, and all locations within 8 feet above floor.
2. Concealed Locations in Stud Walls and Above Ceilings: EMT.
3. Rigid steel conduit or IMC may be used at locations scheduled for EMT.

B. Final Connections:
1. Equipment: Flexible metallic conduit.
2. Recessed Light Fixtures: Flexible metallic conduit; maximum length 6 feet.

3.03 OUTLET BOX MOUNTING HEIGHT SCHEDULE:

A. Unless otherwise indicated, mount outlet boxes at the following distance above finish floor. Verify locations with ADA requirements.

B. Switches and Disconnects: 48 inches to top of box.

C. Receptacles: 16 inches to bottom of box or 48 inches to top of box.

D. Access Control System Readers: 48 inches to top of box.

E. Automatic Door Operator Controls: Refer to Section 08 7113.

END OF SECTION

SECTION 26 2726 – WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Switches and receptacles.
   2. Cover plates.

B. Related Sections:
   1. Section 26 0500 – Common Work Results for Electrical.
   2. Section 26 0533 – Raceway and Boxes.
   3. Section 26 5000 – Lighting.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for all materials furnished under this Section.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. General Electric; GE Wiring Devices & Specialty Products.

B. Hubbell Wiring Device - Kellems.

C. Leviton Manufacturing Co., Inc.

D. Legrand North America, LLC; Pass & Seymour.

2.02 WIRING DEVICES:

A. Line Voltage Switches: NEMA WD 1, extra heavy duty industrial grade, AC only general-use snap switch.
   1. Manual Switches: 20 amp, 120-277 volt, quiet toggle type; single pole, or as indicated. (Hubbell HBL1220 series; Pass & Seymour PS20AC series)

B. Receptacles: NEMA WD 1, extra heavy duty industrial grade; configuration in accordance with NEMA WD 6.
   1. Wall Receptacles: 20 amp, 120 volt, 3 wire self-grounding type, with wrap-around mounting strap; duplex type, or as indicated. (Hubbell HBL5300 series; Leviton 5362 series; Pass & Seymour 5362A series)

C. Color: Gray.

2.03 COVER PLATES:

A. Finished and Unfinished Areas: Type 302 or 430 stainless steel, non-magnetic, satin finish.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are as indicated.

B. Verify that openings are neatly cut and will be completely covered by cover plates.

3.02 INSTALLATION:

A. Install devices plumb and level. Install single pole toggle switches with OFF position down.

B. Unless receptacles and outlets are specifically indicated to be switch controlled, connect to branch circuits ahead of local switches.

C. Install cover plates for switches and receptacles. Install blank cover plates on outlet boxes without devices. Use jumbo size plates where necessary to completely cover wall openings.

3.03 FIELD QUALITY CONTROL:

A. Verify that each receptacle is energized; test for proper polarity. Operate each wall switch with circuit energized and verify proper operation.

END OF SECTION

SECTION 26 5000 – LIGHTING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Light fixtures.

B. Related Sections:
   1. Section 26 0500 – Common Work Results for Electrical.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit for each specified product, including each fixture type; indicate accessories.

B. Photometric Data: For fixtures other than the Basis of Design, provide IES files.

1.03 REGULATORY REQUIREMENTS:

A. Provide products complying with Energy Policy Act (EPACT) and applicable energy code.

B. Comply with applicable building code for flame spread and smoke density generation requirements for lenses.

1.04 WARRANTY: In accordance with Section 01 7700.

A. LED Fixtures: 3 years for all components including drivers.

PART 2 PRODUCTS

2.01 LIGHT FIXTURES:

A. Manufacturers: As listed for each fixture type. The first model number listed is the Basis of Design.
   1. Substitutions: Refer to Section 01 6000.

B. General Requirements:
   1. Surface mounted fixtures in finished areas shall contain no visible knockouts.
   2. Mounting hardware shall be concealed where feasible. Exposed fasteners, where approved, shall be flush with adjacent surface with matching finish.

C. LED Fixtures: IES LM-79; IES LM-80; minimum 70 percent initial lumens maintained at 50,000 hours; minimum 80 CRI; voltage, wattage, color temperature, and lumens as scheduled.
   1. Low Profile Volumetric Troffers: Steel housing, 2½ inch maximum height; white painted reflector with curved acrylic ribbed diffuser; trim for installation in T-bar ceiling grid; size as scheduled. (Lithonia BLT series)

D. Exit and Egress Lighting: Provide components for complete and operable system in accordance with applicable building code; with built-in battery, charger, and automatic transfer relay to provide 90 minutes of emergency battery operation during total power failure.
   1. Exit Lights: White thermoplastic housing; LED lamps; stencil face with diffuse red letters and knockout arrows; single face; universal mounting; nickel-cadmium battery. (Lithonia LQMSW3R-ELN series; McPhilben VERW-EM series; Sure-Lites LPX-70-RWH series)
   2. Emergency Units: White thermoplastic housing; two adjustable LED lamp heads; lithium iron phosphate battery. (Lithonia ELM6 series)

PART 3 EXECUTION

3.01 INSTALLATION OF LIGHT FIXTURES:

A. Install light fixtures and accessories in accordance with manufacturer's instructions.

B. Verify installation conditions, spacing between fixtures, and clearances from fixtures to adjacent construction, with manufacturer's requirements.

C. Support light fixtures heavier than 50 lbs. directly and securely from building structural members. Where necessary to span building structural members, support light fixtures from steel channel or approved supplemental framing in accordance with Section 26 0500, directly and securely attached to building structural members. Do not use wood or wire supporting members.

D. Do not support conduit or fixtures from metal deck.

E. Where recessed fixtures are installed in suspended ceilings, secure fixture to ceiling grid.

F. Where recessed fixtures are installed in suspended ceilings, provide outlet boxes adjacent to each fixture outlet to permit each fixture to be adjusted to fit ceiling pattern and to permit "feed through" wiring.
   1. Wire troffers to outlet boxes with Type THHN wire in flexible metallic conduit; maximum 6 foot length.

G. Exit and Egress Lighting: Run wiring in conduits separate from all other wiring. Connect to normal lighting circuits ahead of all local switches.

3.02 FIELD QUALITY CONTROL:

A. Test lighting for normal operation and illumination.

B. Test emergency lighting for illumination and normal power/battery power transfer.

3.03 CLEANING:

A. Remove labels visible after installation of fixture, except UL labels.

B. Clean photometric control surfaces as recommended by manufacturer.

C. Final Cleaning: Clean light fixtures immediately prior to Substantial Completion; remove dirt, bugs, debris, stains, rust and foreign materials. Replace components operating at less than the mean rated lumen output.

END OF SECTION

SECTION 28 1000 – ACCESS CONTROL AND INTRUSION DETECTION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Access control system proximity readers.
   2. Cable.

B. Related Sections:
   1. Section 08 7100 – Door Hardware.
   2. Section 26 0500 – Common Work Results for Electrical.
   3. Section 26 0519 – Conductors.
   4. Section 26 0533 – Raceway and Boxes.

1.02 SYSTEM DESCRIPTION:

A. Access Control: Provide new proximity reader to interface with existing system. Proximity reader activation of door shall unlock door.

B. Intrusion Detection: Connect new door contacts to existing system.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Data sheet for each item, with model numbers.

B. Wiring Diagram: Indicate wire size, type, and number of wires. Indicate maximum length to devices from control units.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Firms regularly engaged in the installation of security alarm systems, with minimum 5 years experience.
   1. Each supplier shall hold current, valid franchises for the equipment furnished by them.

B. Regulatory Requirements and Reference Standards: Comply with applicable requirements of NFPA 70 and FCC Part 15.
   1. Comply with applicable requirements of UL 294, 609, 1610, and 1635.
   2. Provide products which are UL listed and labeled.

PART 2 PRODUCTS

2.01 COMPONENTS:

A. Access Control Proximity Readers: Match existing.

B. Door Contacts: As specified in Section 08 7100.

C. Cable: CMP plenum rated PVC jacket; match existing wire size and number of conductors, or as required.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Furnish and install components in accordance with the manufacturer's instructions; provide interconnecting cables, relays, and materials.

B. Wire system to manufacturer's requirements.

C. Install wiring in accordance with Sections 260519. Wiring shall be in conduit in areas with inaccessible or exposed ceilings. Devices shall include a back box with conduit stubbed to accessible ceiling area. Conduits shall be minimum ¾ inch, sized per NEC requirements.
   1. Observe minimum bend radius and tension limitations, etc., as specified by the cable manufacturer when installing the cables.
   2. Cables that require service loops or additional length shall be coiled at 200% of their recommended minimum bend radius. The coil shall then be cable tied and attached to a nearby support.
   3. Identify cables at both ends with cable designation of equipment or outlet connection.
   4. Cable identification shall be by means of permanently applied, preprinted heat shrink tubing type wire markers, located within 6 inches of the termination. Use only manufacturer's approved type heat gun to shrink the wire markers.
   5. Provide adequate length of conductors. Bundle, lace and train the conductors to terminal points with no excess. Provide and use lacing bars.

D. System shall be configured, programmed and fully operational at Substantial Completion. Verify with the Owner exact zoning and programming.

3.02 FIELD QUALITY CONTROL:

A. Inspection: Make observations to verify that interconnecting wires and terminals are identified.

B. Testing: Rectify deficiencies indicated by tests and completely re-test work affected by such deficiencies at Contractor's expense. Verify by the system test that the total system meets requirements and complies with applicable standards.

END OF SECTION

SECTION 31 2000 – EARTH MOVING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Excavating and backfilling for footings and foundations.
   2. Compaction.
   3. Rough grading and finish grading.

B. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 01 7000 – Execution Requirements: Field engineering.
   3. Section 03 3000 – Cast-In-Place Concrete: Concrete fill for overexcavated areas.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Fill material shall be approved by the Architect and testing firm's Soils Engineer prior to delivery.

1.03 QUALITY ASSURANCE:

A. Excavator Qualifications: Trained in underground utility protection.

1.04 PROJECT CONDITIONS:

A. Safety: For the security or safety of persons in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America and the safety regulations of the Division of Industrial Compliance of the State of Ohio shall be followed when specifically applicable, or by similarity of operation or as necessary for adequate protection.

B. Maintain in place adequate structures, barricades, guards, warning lights, and other protection required by OSHA and other public authorities at cutting and filling and excavation and hazards created by this work, including shoring, bracing, planking, fences and forming as required.

C. Exercise due care and diligence in all cutting, digging, and backfilling operations. Protect from damage overhead and underground site features that are to remain, including utility piping, trees, buildings, fences and property. Bear responsibility for, and replacement costs of, all damage arising from all operations connected with this work.

D. Carefully maintain benchmarks and other reference points; if disturbed or destroyed, replace as directed.

1.05 WARRANTY:

A. The Contractor shall be responsible for the condition of all trenches for a period of one year from the date of Substantial Completion.

PART 2 PRODUCTS

2.01 FILL MATERIAL:

A. Granular Fill Under Slabs and Walks: ODOT 304; crushed stone or gravel.

B. Granular Backfill for Foundations (Except Under Slabs and Walks): ODOT 703.01, No. 57.

C. Soil Materials: ASTM D2487, soil classification groups CL, GW, GP, GM, SW, SP, and SM.

1. Material shall be free of trash, refuse, waste, mulch, brush, leaves, grass and weeds, cinders, ashes, vegetable or organic matter, shale, large stones or masonry, frozen material, earth with an exceptionally high void content, deleterious matter, lumber or other debris. Fill material shall have a laboratory dry density of minimum 100 lbs/cu ft and shall contain no material larger than 6 inches in any dimension, and no rock or gravel larger than 2 inches in any dimension.

2. On-Site Soil Materials: Fill and backfill material for areas not otherwise indicated shall be material excavated in connection with the work, insofar as sufficient quantities of material of satisfactory character are available. Where excavated material is insufficient, provide off-site soil material.

D. Topsoil: ODOT 653 and ASTM D5268; fertile, friable, surface soil containing natural loam; organic content ranging between 5% and 20%; free of stones larger than ½ inch in any dimension; free of extraneous or toxic matter harmful to plant growth; obtained from well-drained sites where soil occurs in depth of 4 inches or more.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to the work of this Section, inspect the site and become familiar with all portions of the work within this section.

B. Where existing ground elevations or existing utility locations are indicated, these are believed to be reasonably correct, but do not purport to be absolutely so, and are presented only as an approximation.

C. Site Conditions: If suitable bearing for foundation is not encountered at the depth indicated on the Drawings, immediately notify the Architect and do not proceed further until instructions are given.

3.02 PREPARATION:

A. Notification: Notify Owner and applicable utilities and utilities protection services at least two full working days prior to commencing work. Mark site to indicate proposed excavation area.

B. Protection of Utilities: Preserve in operating condition all active utilities traversing the site unless specifically indicated to be removed.

C. Provide construction layout staking in accordance with Section 01 7000 and ODOT 623.

D. Place stakes or other approved markers for visual indication of construction limits and site disturbance boundaries.

E. Where removal or abandonment of utilities is indicated or required, disconnect, remove, cap and plug utility services. Notify affected utility companies in advance and obtain approval before starting this work.

F. Place markers to indicated location of disconnected services. Identify service lines and capping locations on Project Record Documents.

3.03 EXCAVATING:

A. Excavate as required for the dimensions and elevations indicated. Excavation shall extend a sufficient distance to allow for placing and removal of forms, inspections, installation of services and related construction activities. Excavations carried below indicated depths will not be permitted except when authorized by the Architect.

B. Stockpile excavated material in approved locations that will not endanger the work or obstruct traffic or drainage flow.

C. Unless indicated otherwise, remove existing foundation walls, footings, and concrete floor slabs within building areas and paved areas to minimum 12 inches below subgrade. Remove existing foundations to minimum 12 inches below finish grade in other areas. Remove all other obstructions as required within the developed areas.

D. Remove vegetation and topsoil, including surface fill with high organic and debris content, from the proposed developed areas.

E. Excavating for Footings:

1. Cut footing excavations to a flat bottom comprised of firm soil undisturbed by the method of excavating. Sides of the excavation may be used to form footing concrete; perform final trimming and cleaning of bottoms and sides of excavations immediately prior to placing concrete.

2. Unauthorized excavation below bottom of footing elevations given shall be filled with lean concrete in accordance with Section 03 3000.

3. Do not permit a new footing to bear directly on an old existing footing or other rigid body when the new footing is otherwise soil supported.

4. Do not permit soil from footing excavations to be wasted and loosely spread in areas of floor slab or pavement support.
5. Footings shall be founded in the undisturbed virgin soils or engineered fill unless otherwise approved.

F. Rock Excavation:

1. Definition: Rock excavation includes boulders and solid masonry, exceeding 12 cubic feet in volume, which requires removal by drilling and blasting, wedging, sledging or barring, or breaking up with a power operated hand tool. Rock excavation does not include soft or disintegrated rock which can be removed with a hand pick or power operated excavator or shovel, or back hoe of ¾ cubic yard capacity; loose, shaken or previously blasted rock or broken stone; or rock beyond the minimum limits of measurement, which may fall into the excavation.
2. Where trench excavation is made in rock or boulders, excavate trenches minimum 6 inches below the pipe barrel for pipes 24 inches in diameter or less, and 9 inches for pipes larger than 24 inches in diameter. Bed pipe in compacted granular material placed on the trench bottom in accordance with the piping installation requirements.
3. Perform drilling and blasting, where necessary, in accordance with ODOT 208. Contractor shall satisfy all claims for damages resulting from blasting and shall fully indemnify Owner and Architect from such claims.

3.04 FILLING, BACKFILLING AND COMPACTING:

A. Subgrade Preparation and Compaction: Prior to placing fill or backfill, proof compact subgrade under slabs with pneumatic or sheeps-foot compactor in accordance with ODOT 204. Where soft areas are encountered, excavate unsuitable material to the depth directed by the testing firm's Soils Engineer and replace with granular fill. Provide moisture control in accordance with ODOT 203; where necessary, reduce excess moisture using the following method:

1. Scarify subgrade to a depth of 12 inches; aerate and dry to within 2% of optimum moisture content; recompact to minimum 95% of maximum laboratory dry density in accordance with ASTM D1557.

B. General Filling and Backfilling:

1. Carefully place and compact fill material to ensure firm support and to prevent future displacement.
2. Do not place frozen fill material, or place fill material on frozen or snow-covered surfaces.
3. Fill excess cuts under slabs with approved compacted fill material.

4. Place structural fills in layers of maximum 8 inches for the full width of the cross section. Thoroughly compact each layer with sheeps-foot roller with 200 psi rating.
5. Bring grades to underside of their respective surfacing. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given or between such points and existing finished grades. Abrupt changes in slopes shall be rounded. Slope grades slightly away from buildings.

C. Backfilling for Foundations: Backfill around foundation walls immediately after walls have thoroughly set and drainage piping, where scheduled, is in place. Backfill around walls with stone to within two feet of finish grade; fill remainder of excavation with topsoil. Where concrete work occurs next to the foundation wall, backfill with stone in compacted layers to the underside of the slab or paving

D. Compacting:

1. Fill material placed in layers shall be within 2% of the optimum moisture content before compacting. Material which displays a pronounced deformation under construction equipment shall not exceed the optimum moisture content.
   a. Expedite drying of wet soil by use of plows, discs, harrows or other approved methods.
   b. Add water to dry soil, uniformly distributed by sprinkling wagons, pressure distributors, or other approved equipment. Manipulate material to secure a uniform moisture content throughout the layer.
2. Compact each layer of fill material to the following minimum percentage of maximum laboratory dry density as determined in accordance with the test method indicated.
   a. Granular Fill and Backfill under Slabs: ASTM D1557; 96%.
   b. Granular Backfill for Foundations: ASTM D698; 98%.
   c. Site Grading: In accordance with ODOT 203.
3. Compact areas with approved equipment of design, weight, and quantity to obtain required density. Consolidate and compact areas inaccessible to a roller by mechanical tampers. Operate equipment in such manner that hardpan cemented gravel, clay, or other chunky soil material will be broken in the layer.

3.05 SITE GRADING AND DRAINAGE:

A. Control grading so that ground is pitched to prevent water from running into excavated areas. Maintain pits, trenches, and excavations free of water at all times.

B. Take all control measures necessary to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas throughout the entire period of the Contract, in accordance with ODOT SS 832 and applicable requirements of authorities having jurisdiction.

C. Rough Grading:

1. Fill and compact areas as specified.
2. Rough grade all areas to required subgrade, smooth and free from irregular surface changes. At lawn areas, rough grade to 4 inches below finish grade.
3. Tolerances:
   a. Building Areas: ½ inch in 10 feet.
   b. Walks, Lawns, and Unpaved Areas: 0.10 foot.
4. Roll all cut areas; check for soft, yielding material. Where such areas are encountered and cannot be satisfactorily stabilized by moisture control and compaction, excavate unstable material to extent directed by the testing firm's Soils Engineer; fill and compact as required.

D. Final Grading:

1. Repair and reestablish rough grades to specified tolerances where eroded, rutted, settled, or decompacted due to construction operations or weather conditions; reshape and recompact to required density.
2. Where surface elevations are not indicated, grade to drain with a minimum surface slope of 1 percent.
3. Compact exposed subgrade to 95% ASTM D698, Method D maximum dry density near optimum moisture content.
4. Remove stones, gravel, slag aggregate, and other objects 1 inch diameter and larger; remove roots, brush, wire, and other objects which may hinder fine grading operations.
5. Refill and compact excavations showing evidence of shrinkage, settlement, or wash.

E. Remove from the site and dispose of all debris and excess earth, and all excavated material not required or not suitable for fill.

3.06 FIELD QUALITY CONTROL:

A. Subsurface soil investigation reports were not conducted for this project. If deemed necessary, such an investigation shall take place with costs borne by the Owner.

B. Testing firm will perform testing of excavating and backfilling in accordance with Section 01 4520.

C. The footing excavations are to be inspected by the testing firm's Soils Engineer during construction and immediately prior to placement of concrete, to establish that the soil bearing conditions over the entire bearing area are in accordance with the minimum soil bearing pressure stated on the Drawings.

END OF SECTION

SECTION 31 6615 – HELICAL FOUNDATION PILES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Helical piles for axial structural support.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 31 2000 – Earth Moving.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate product numbers and designations, maximum allowable strengths in compression and tension, number of piles and allowable capacities, installation depth and number of sections, number and diameter of helical bearing plates, capacity to installation torque ratio, minimum final installation torque, and corrosion protection coating on components.

B. Submittals for Information:

   1. Installer Certificates: Submit evidence of approval, authorization, or license from manufacturer to install specified system. Include list of completed projects with project names and addresses, number and type of piles installed, and architect and owner contact information. Include documentation of specified training.

   2. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 5 years.

   3. Design Calculations: Indicate minimum installation depth, soil bearing and pullout capacity, and lateral resistance if applicable; estimated pile head movement at design loads; considerations for down-drag, buckling, and expansive soils, as applicable; reduction in shaft dimension and strength due to sacrificial thickness anticipated based on corrosion loss over the design life for project soil conditions.

   4. Test Equipment Calibration Certificates: Name and contact information of independent testing agency performing calibration, description and serial number of device calibrated, and date of calibration within the previous 12 months.

   5. Load Test Reports: Submit within 1 week after completion of load tests. Indicate the following:
      a. Name of project and Contractor; date, time, and duration of test.
      b. Location of test pile by grid location, diagram, or assigned identification number.
      c. ASTM test procedure; deviations from procedure, if any.
      d. Description of calibrated testing equipment and test set-up.

e. Type and configuration of pile including lead section, number and type of extension sections, and manufacturer's product identification numbers.
f. Load steps and duration of each load increment.
g. Cumulative pile-head movement at each load step.
h. Comments pertaining to test procedure, equipment adjustments, or other relevant information.
i. If a load test fails the acceptance criteria, propose changes based on the results of the tests.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Installation Records: Submit within 48 hours after completion of installation. Indicate the following:
1. Name of project, Contractor, and installer's project superintendent; date and time of installation.
2. Name and model of installation equipment; type of torque indicator used.
3. Location of each pile by grid location, diagram, or assigned identification number.
4. Type and configuration of each lead section and extension section with length of shaft and number and size of helical bearing plates.
5. Installation duration and observations.
6. Total length installed.
7. Final elevation of top of shaft and cut-off length, if any.
8. Final plumbness or inclination of shaft.
9. Installation torque at minimum three-foot depth intervals.
10. Final installation torque.
11. Comments pertaining to interruptions, obstructions, or other relevant information.
12. Verified axial load capacity.

1.04 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in manufacturing and distributing foundation systems and components, with minimum 10 years experience in design and manufacture of helical piles.

B. Installer Qualifications: Company specializing in foundations and pile installation, including the installation of helical piles on minimum 10 projects.
1. Installer's Project Superintendent shall have experience in supervising the installation of helical piles on minimum 5 projects within the last 5 years, and shall have completed the pile manufacturer's training course.

C. Design helical piles and related components under direct supervision of a Professional Engineer with minimum 10 years experience in the design of this work and licensed at the place where the Project is located.
1. The Engineer shall maintain Professional Liability Insurance to protect against claims arising from negligent acts, errors, or omissions, in the amount not less than $1,000,000 per claim and in the annual aggregate.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store products on wood pallets or supports to prevent ground contact.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Hubbell, Inc.; Chance Civil Construction.

B. Earth Contact Products, LLC.

C. Helical Pier Systems, Ltd.

D. Magnum Piering, Inc.

2.02 MATERIALS:

A. Structural Tubing: ASTM A450 or ASTM A500; minimum 3 inch nominal diameter.

B. Pipe: ASTM A53, Grade B; minimum 3 inch nominal diameter.

C. Structural Steel Plates, Bars, and Other Shapes: ASTM A36 or ASTM A572, Grade 50.

D. Connection Pins: ASME B18.2.1, SAE Grade 8.

2.03 COMPONENTS:

A. Helical Piles, Brackets, and Related Components: Size and type as required to support design loads indicated on Drawings.
   1. Lead Sections: Central shaft fabricated from structural tubing or pipe, with a tapered end and one or more helical bearing plates affixed to the shaft.
   2. Extension Sections: Sections that follow the Lead Section into the ground and extend the pile to the appropriate depth. Extension Sections consist of a central shaft fabricated from structural tubing or pipe, and may have helical bearing plates affixed to the shaft.
   3. Brackets: Cap plate, angle, thread bar, or other termination device that is bolted or welded to the end of a pile after completion of installation to facilitate attachment to structures or embedment in cast-in-place concrete.

B. Corrosion Protection: Depending on project requirements and soil corrosivity, components shall be hot dip galvanized after fabrication in accordance with ASTM A123 or ASTM A153 as applicable.

2.04 EQUIPMENT:

A. The installation equipment shall be capable of applying adequate downward pressure (crowd) and torque simultaneously to ensure normal advancement of the piles. The equipment shall be capable of maintaining proper alignment and position.

B. Torque Motor: Rotary type, hydraulic power driven; torque capacity 15 percent greater than the minimum final installation torque required for the project. The torque motor shall have clockwise and counter-clockwise rotation capability, and continuously adjustable RPM. Percussion drilling equipment will not be permitted. The connection between the torque motor and the installation rig shall have no more than two pivot hinges oriented 90 degrees from each other.

C. Drive Tool: The connection between the torque motor and pile shall be in-line, straight, and rigid, and shall consist of a hexagonal, square, or round kelly bar adapter and helical shaft socket. The drive tool shall be manufactured by the pile manufacturer.

D. Connection Pins: The central shaft of the pile shall be attached to the drive tool by smooth tapered pins matching the number and diameter of the specified shaft connection bolts. The connection pins shall be maintained in good condition and safe to operate at all times. The pins shall be regularly inspected for wear and deformation, and replaced with new pins when worn or damaged.

E. Torque Indicator: A torque indicator shall be used to measure installation torque during installation. The torque indicator can be an integral part of the installation equipment or externally mounted in-line with the installation tooling. The torque indicator shall be capable of torque measurements with a sensitivity of 500 ft-lb or less. Torque indicators shall have been calibrated within 1 year prior to start of Work. Torque indicators that are an integral part of the installation equipment shall be calibrated on-site. Torque indicators that are mounted in-line with the installation tooling shall be calibrated either on-site or at an appropriately equipped test facility. Indicators that measure torque as a function of hydraulic pressure shall be recalibrated following any maintenance performed on the torque motor. Torque indicators shall be recalibrated if reasonable doubt exists as to the accuracy of the torque measurements

2.05 FABRICATION:

A. Helical bearing plates shall be attached to central shafts via fillet welds continuous on top and bottom and around the leading edges. Helical bearing plates shall be cold pressed into a near perfect helical shape that when affixed to the central shaft are perpendicular with the central shaft, of uniform pitch, and such that the leading and trailing edges are within 3/8 inch of parallel. Average helical pitch shall be within plus or minus ¼ inch of the thickness of the helical bearing plate plus 3 inches.

B. Shaft connections between sections shall consist of an external sleeve connection or a welded connection. External sleeve connections shall be in-line, straight and rigid and shall have a maximum tolerable slack of 1/16-inch. Welded connections shall consist of a full penetration groove weld all around the central shaft. Shaft connections shall have a flexural strength at least as great as the shaft itself.

1. Bolts: Bolt holes through the external sleeve and central shaft shall have a diameter 1/16 inch greater than the bolt diameter. Bolts and nuts used to join

sections at the shaft connections shall be bare steel, epoxy coated, or zinc coated to match the corrosion protection used for the central shaft. All bolts shall be securely snug tightened.

2. Plug Welds: External sleeve connections may be made using plug welds matching the diameter and number of bolt holes.
3. External Sleeve: Structural tubing outer sleeve shall be welded to the central shaft by a continuous fillet weld all around. The fillet weld shall have a throat thickness equal to the external sleeve tube thickness.

C. Brackets shall be affixed to the end of Helical Piles and Helical Anchors via bolts, plug welds, or continuous penetration welds meeting the requirements for shaft connections.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Inspect the site and become familiar with existing conditions prior to starting work.

B. Determine by probing or testing the exact location of known underground utilities and buried structures within a distance from the pile equal to three times the maximum helix diameter.

C. If conditions are encountered that would prevent proper installation of piers, immediately notify the Architect and do not proceed further until instructions are given.

3.02 PREPARATION:

A. Notification: Notify Owner and applicable utilities and utilities protection services at least two full working days prior to commencing work.

B. Protection of Utilities: Preserve in operating condition all active utilities indicated or encountered.

C. Protect existing structures; provide bracing, shoring, and other work as necessary to prevent movement or damage.

3.03 INSTALLATION:

A. Perform excavation, backfill, and compaction in accordance with Section 31 2000.

B. Install piles and brackets in accordance with manufacturer's instructions and design calculations, at locations and to elevations indicated.

C. Connect the lead section to the torque motor using the drive tool and connection pins. Position and align the lead section at the location and to the inclination shown on the Drawings and crowd the pilot point into the soil. Advance the lead section and continue to add extension sections to achieve the required capacity and depth. All

sections shall be advanced into the soil in a smooth, continuous manner at a rate of rotation between 10 and 40 revolutions per minute. Snug tight all coupling bolts.

D. Apply sufficient constant axial force (crowd) while rotating piles into the ground to ensure that the pile advances into the ground a distance equal to at least 80% of the blade pitch per revolution during normal advancement.

E. Do not exceed the manufacturer's torsional strength rating of the pile during installation.

F. Bolt hole elongation due to torsion of the shaft at the drive tool shall be limited to ¼ inch. Uninstall, remove, and discard components with bolt hole damage exceeding this criterion.

G. Isolate all components including the shaft and bracket from making direct electrical contact with concrete reinforcing bars or other non-galvanized metal objects, since these contacts may alter corrosion rates.

H. Advance the pile until the following criteria are satisfied:
   1. Axial capacity is verified by achieving the required final installation torque.
   2. Minimum depth is obtained. The minimum depth shall be as shown on the Drawings, that which corresponds to the planned bearing stratum, or the depth at which the final installation torque is measured, whichever is greater.

I. If the torsional strength rating of the pile or the maximum torque of the installation equipment has been reached or rotation of the shaft with little or no advancement occurs prior to achieving the minimum depth required, the Contractor shall have the following options:
   1. Terminate the installation at the depth obtained subject to the review and acceptance of the Architect and Owner.
   2. Remove the pile and install a new one with fewer or smaller diameter helical bearing plates or with dual cutting edge helical bearing plates. The new helical configuration shall be subject to review and acceptance of the manufacturer, Architect, and Owner.
   3. Remove the pile, pre-drill a 4 inch diameter pilot hole in the same location, and reinstall the pile.
   4. If the obstruction is shallow, remove the pile and remove the obstruction by surface excavation. Backfill and compact the resulting excavation and reinstall the pile.
   5. Remove the pile and relocate 1 foot to either side of the installation location, subject to the review and acceptance of Architect and Owner.
   6. Reverse the direction of torque, back out the pile a distance of 1 to 2 feet, and attempt to reinstall by decreasing crowd and augering through the obstruction.
   7. Remove the pile and sever the uppermost helical bearing plate from the lead section if more than one helical bearing plate is in use, or reshape the helical bearing plates to create a special tapered edge by cutting with a band saw. Reinstall the anchor or pile with revised helical bearing plate configuration.

J. If the final installation torque is not achieved at the contract length, the Contractor shall have the following options:
   1. Install the pile deeper using additional extension sections until the maximum depth is achieved.
   2. Remove the pile and install a new one with additional or larger diameter helical bearing plates.
   3. Decrease the rated load capacity of the pile and install additional piles. The rated capacity and additional unit location shall be subject to the review and acceptance of the Architect and Owner.

K. Where a pile installed in the same location as a pile that has been removed, the top-most helix of the new pile shall be terminated minimum 3 feet beyond the terminating depth of the original pile.

L. When the required capacity and depth of a pile is obtained, adjust the elevation of the top end of the shaft to the elevation shown on the Drawings or as required. This adjustment may consist of cutting off the top of the shaft and drilling new holes to facilitate installation of brackets to the orientation shown on the Drawings. Alternatively, installation may continue until the final elevation and orientation of the pre-drilled bolt holes are in alignment. Do not reverse the direction of torque and back out the pile to obtain the final elevation.

3.04 FIELD QUALITY CONTROL:

A. Testing firm will observe installation of minimum 10 percent of the piles in accordance with Section 01 4520.

B. Failure to achieve proper torque and capacity shall result in Contractor replacing piles and related components as appropriate to support the required loads.

C. Tolerances:
   1. Centerline of pile shall be within 3 inches of indicated plan location.
   2. Top elevation of pile shall be within 1 inch of the design vertical elevation.
   3. Tolerance for departure from installation and orientation angles shall be ±2 degrees.
   4. Tolerances for bracket assembly placement shall be ±1 inch in both directions perpendicular to the shaft and ±¼ inch in a direction parallel with the shaft.

D. Compression Tests: ASTM D1143; quick test procedure.
   1. Load tests shall be performed by the Contractor and observed and documented by the testing firm's Soils Engineer.
   2. The piles to be tested shall be determined by the testing firm's Soils Engineer, and shall be representative of the installation methods, procedures, equipment, products, and final installation torque of the remaining piles.
   3. The maximum test load shall be 200 percent of the allowable load, unless indicated otherwise.

4. A load test will be deemed acceptable provided the maximum test load is applied without pile failure and the deflection of the pile head at the design load is less than 1 inch. Failure is defined when continuous jacking is required to maintain the load.

E. If a load test fails the acceptance criteria, the Contractor shall modify the pile design or installation methods and retest the modified pile, as directed by the testing firm's Soils Engineer. These modifications include, but are not limited to, de-rating the load capacity, modifying the installation methods and equipment, increasing the minimum final installation torque, changing the helical configuration, or changing the product. Modifications that require changes to the structure shall have prior review and acceptance of the Owner. Modifications of design or construction procedures, and any retesting required, shall be at the Contractor's expense.

END OF SECTION

SECTION 32 9200 – LAWNS AND GRASS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Preparation, fertilizing, and seeding indicated areas including the following:
   1. Building perimeter.
   2. Material storage areas.
   3. Site areas disturbed as a result of construction.

B. Related Sections:
   1. Section 31 2000 – Earth Moving: Rough and final grading; removal of stones during grading operations.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Fertilizer: ODOT 659.04; dry or liquid type; 10-20-10 analysis.

B. Lime: ODOT 659.03; agricultural ground limestone.

C. Seed for Lawn Areas: ODOT 659.09, Class 1. Verify grass seed mixture with Owner prior to purchasing materials.
   1. Kentucky Bluegrass: 30% by weight.
   2. Creeping Red Fescue: 30% by weight.
   3. Annual Ryegrass: 20% by weight.
   4. Perennial Ryegrass: 20% by weight.

D. Mulch: ODOT 659.14; wheat or oat straw, free of seeds and foreign matter.

PART 3 EXECUTION

3.01 PREPARATION:

A. Machine cultivate soil evenly to provide a firm seed bed four inches deep, free of hard clumps. No heavy objects except necessary lawn making equipment shall be moved over the lawn areas after the soil is prepared, unless it is again loosened and graded.

B. Remove stones, roots, brush, wire, and other foreign materials and objects larger than one inch in thickness or diameter.

C. Repair eroded areas to indicated grade elevations, with smooth transitions to adjacent areas. Hand rake adjacent to building where necessary.

3.02 FERTILIZER APPLICATION:

A. Apply fertilizer at a uniform rate of 20 pounds per 1000 square feet. Apply lime at a uniform rate of 92 pounds per 1000 square feet. Incorporate fertilizer and lime into subgrade to a minimum depth of two inches by discing, harrowing, or other approved methods.

B. At Contractor's option, fertilizer may be applied together with seed by mechanical machine spreading.

3.03 SEEDING:

A. Apply seed at a total rate of 10 pounds per 1000 square feet of area, in two equal applications at right angles to each other.

B. Mulch seeded areas at a rate of 100 pounds per 1000 square feet of area within 48 hours after seeding is completed. After application, cut straw into the seedbed using a disc roller; wet down to prevent displacement.

C. Perform seeding between April 1 and June 1, or between August 15 and November 1, unless otherwise approved.

D. Do not sow seed or spread mulch when wind speed exceeds 5 mph.

E. Rolling: Immediately after seeding, firm entire area with a roller not exceeding 90 lbs per foot of roller width. Rolling is not required for hydroseeded areas, areas seeded with cultipacker-type seeder, or slopes in excess of 3 to 1.

3.04 LAWN ESTABLISHMENT AND MAINTENANCE:

A. Provide continued proper care of lawn areas for minimum 60 days and as long as necessary to establish a uniformly close stand of grasses, free of weeds and undesirable grasses, with bare spots no larger than 6 inch diameter totaling a maximum of 2 percent of the entire lawn area.

B. Mowing: When average grass height reaches 3½ inches, mow lawn areas with approved mowing equipment to a height of 2 inches; continue mowing at maximum 7 day intervals during growing seasons until Substantial Completion.

C. Weeding: Uproot and remove weeds and other undesirable vegetation.

D. Refertilization: Where areas are designated for refertilization, apply fertilizer between August 15 and October 15 during a period when the grass is dry.

E. Reseeding: Where areas are designated for reseeding, apply seed at a rate of 4 pounds per 1000 square feet of area, in a manner which will cause minimum disturbance to existing grass, and at a minimum 15 degree angle from the direction of prior seeding.

3.05 PROTECTION:

A. Protect all other finished areas during the work of this section.

B. Keep paved areas clean. Remove dirt, debris, waste materials, equipment and unused materials. Leave the grounds in a clean and orderly condition at the completion of the work.

C. Protect finished lawn areas against damage, including erosion and washouts. Promptly repair damaged areas.

END OF SECTION