SPECIFICATION MANUAL

NEW CHURCH FACILITIES
FIRST ASSEMBLY OF GOD
FAIR OAKS, ARKANSAS

December 20, 2019

ELTON L. ROE, ARCHITECT P.A.
Harrison, Arkansas

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SECTION 00100
SUMMARY AND BIDDER INFORMATION

THE WORK: The work of this Contract comprises construction of a new church facility of single story wood framed construction. Materials include metal fascia, soffits, and siding, faux stone veneer, brick veneer, wood trusses, glue laminated beams, arches, and columns; composition shingle roofing, drywall interior wall and ceiling finishes, acoustical panels, carpet and resilient flooring. Project includes heat pump HVAC systems. Floor area is approximately 12,400 sq. ft. enclosed conditioned space plus exterior walkway and drive-thru canopies.

LOCATION OF THE SITE: The construction site is located on Owner's property located on west side of Hwy. 49 S.; Fair Oaks, Arkansas bounded by CR 505 and CR 512.

CONSTRUCTION CONTRACTING METHOD AND CONTRACTOR SELECTION: The Work shall be constructed under a single prime contract with a fixed-price. Contractor shall be selected by Owner under advisement of Architect based on receipt of competitive bid proposals by invitation only. Lowest bonafide bid of a qualified contractor will have primary consideration but not sole consideration. Owner reserves right to reject any or all bids. Owner's selection of a preferred bid proposal will be subject to negotiation and consideration of Bidder's offering of proposed cost reducing substitutions and/or changes to Contract Documents prior to award of Contract. All such negotiation shall be through Architect and subject to his approval prior to consideration. Prior to such negotiation phase, all Bid Proposals shall be per Plans and Specs. Bid Proposals shall be sealed submittals and will be opened concurrently. Time and place of bid opening shall be as designated in the Invitation to Bid and all Bidders are invited to Bid opening. Notice shall be given to all Bidders of Owner's primary preferred choice of Bid Proposal prior to any negotiation efforts. If a mutually agreeable Contract for Construction cannot be negotiated with first choice Bidder, such bid will be rejected and Owner may choose to enter negotiations with second choice Bidder. This process may be repeated until a successful Construction Contract can be negotiated or a decision is made to reject all Bids. In no case will Owner cross negotiate between Bidders. No set budget for construction has been established and Owner may negotiate on basis of best value under advisement of the Architect.

FORM OF CONSTRUCTION CONTRACT: Form of contract shall be AIA A101 Form of Agreement between Owner and Contractor-Stipulated Sum. Other Documents included in Contract Documents include:

1. AIA 201 General Conditions
2. Supplementary Conditions
3. Drawings

4. Specification Manual
5. Addenda Modifications(if any)
6. Invitation to Bid

THE OWNER: Wherever the term Owner is used in these Contract Documents it refers to Fair Oaks Assembly of God; Fair Oaks, Arkansas.

DELIVERY OF DOCUMENTS: All documents required to be delivered to the Owner shall, unless otherwise directed in writing, be addressed and delivered to Office of the Architect, Owner's Representative Except Bid Proposals may be hand delivered to designated place of bid opening at on or before designated time for receipt of bids. Any notice or demand upon the Owner shall be delivered to Architect or to other representative of the Owner as may be subsequently designated.

THE ARCHITECT: Wherever the term Architect is used in these Contract Documents it refers to Elton Roe, Architect; P.O. Box 2336; Harrison, AR 72602.

THE CONTRACTOR: Wherever the term Contractor is used in these Contract Documents it shall mean the person or persons, company, firm, corporation, or representatives thereof entering into the Contract for Construction of the Work as herein described.

CONTRACT DOCUMENTS: The Drawings, Specifications, General Requirements, General and Supplementary Conditions of the Contract, and the final executed Contract for Construction apply to the Work. All addenda and other modifications to the Contract Documents, Field Orders, and directives in Field Reports issued subsequent to the issue date of the Drawings and Project Specification Manual shall also apply to the Work. The Work of the Contract can be summarized by reference to these related documents which establish scope and intent. The Project is for a complete construction project ready to use and occupy by Owner. Not all incidental items required for a complete project are shown on Plans or included in the Specifications. Contractor shall provide all incidental items normally required for a complete project. No Change Orders or extras will be approved for any item(s) which could be reasonably inferred to be necessary or required as determined solely by the Architect.

OTHER CONDITIONS AND BIDDER INFORMATION:

AIA Document A701 Instructions to Bidders: Document A701 is hereby included by reference and all information contained therein is binding upon Bidders.

Pre-Bid Site Visit: Bidders are required to visit site prior to submitting Bid Proposal to familiarize themselves with site conditions. Site faces public highway with ready access and no appointment will be necessary. No scheduled pre-bid site meeting is scheduled.

Site Topographical Survey and Architectural Finish Grading Plan: Not provided.

Earthwork: All references on Drawings to existing grade shall be considered to be mean average elevation at building site within limits of exterior walls. Finish floor line shall be considered to be 21 inches above such mean average existing grade.

Septic Tank and Disposal Field: Owner has an existing septic tank and disposal field located on north end of site which is to be protected and re-used for connection to building sewer.

BID FORM AND SEALED ENVELOPE: ALL BIDS MUST BE SUBMITTED ON BID FORMS PREPARED BY AND ISSUED BY THE ARCHITECT IN A SEALED ENVELOPE MARKED "BID PROPOSAL-NEW CHURCH FACILITIES-FAIR OAKS ASSEMBLY F GOD." Each bid must be signed in ink and include the full business address of the bidder. Bids submitted by partnerships must be signed in the partnership name by one or more of the general partners. Bids by a corporation must be signed by an officer of the corporation or other person authorized to bind the corporation to the bid. The names and titles of all persons signing shall be typed or printed below their signatures. The original Bid Security and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the Owner and shall be identified with the project Name, the Bidder's name and Address. If the Bid is sent by mail, the sealed envelope should be marked with the notation "BID ENCLOSED" on the face thereof. Method of delivery of any bid is at the sole discretion and risk of the Bidder. Those having their bid delivered by mail or courier should allow sufficient time to ensure receipt of their bid by the time specified. Such bids, having all information stated previously, shall be placed inside another envelope and the outside envelope should be addressed to: Elton Roe, Architect; P.O. Box 2336; Harrison, AR 72602 or 102 E. Bower Ave; Harrison, AR 72601. Neither Owner nor Architect take responsibility for mail or courier delivery time.

Licensing Requirements, State Regulations: General Contractors submitting Bids shall have current Arkansas License of appropriate class for Project and shall so indicate license number on Bid Form. All sub-contractors providing on-site installation must meet the minimum requirements of the Arkansas State Licensing law for Contractors (Act 150 of 1965 with all amendments and revisions). Preferred Bidder may be asked to submit a list of all major trade subcontractors and evidence of their required licensing classification.

Bid Security: All submitted bids shall include a Bid Security with the bid. Make Bid Security payable to "Fair Oaks Assembly of God" in an amount equal to five percent (5%) of the bid sum.

Bid Security may be in the form of a Bid Bond issued by a surety licensed to conduct business in the State of Arkansas, a **Certified Check** or a **Cashier's Check**. Bid security for two lowest bidders will be retained by Owner until award of Contract, rejection of Bid, or expiration of 60 days following bid date. Such bid security is in addition to other required insurance certificates and Performance and Payment bonds, if required. All other bid securities will be returned as soon as possible. If a selected bidder refuses to enter into a contract, the Owner may retain his Security as liquidated damages, but not as a penalty.

Selected Bidder who is invited to enter into a Contract Agreement shall furnish a Performance and Payment Bond, the cost of which is to be included in the Contractor's bid amount. Such bonds shall be for 100% of the contract sum, shall be provided on AIA Document A312™–2010 forms or approved equal, and shall be delivered to the Owner. The bond shall be properly issued by Surety licensed to do business in the State of Arkansas, no later than the time of execution of the Contract Agreement. Failure of bidder to deliver such bond will result in forfeiture of the Bid Security.

Interpretation of Documents: A prospective bidder who is in doubt as to the meaning of any part of the bidding documents or any addenda thereto may submit to the Architect a written Request for Interpretation or Information (RFI) at least seven (7) days prior to bid due date. Any such interpretation will be made by written addendum. **All addenda must be acknowledged on the bid form. Failure to acknowledge all addenda issued on the bid may constitute grounds for rejection of that bid at the discretion of the Owner.**

Bid Submittal and Opening: SEALED BIDS WILL BE RECEIVED IN ACCORDANCE WITH THE "INVITATION TO BID." No Bids received after designated time will be considered. No Bidder shall modify, withdraw, or cancel his Bid or any part thereof for sixty (60) days after the time designated for the receipt of Bids. In case of a difference of sums in written words and figures on the Bid Form, the amount stated in written words shall govern.

Bidder's Representation: By submitting a bid, the bidder warrants that he is familiar with and has assumes full responsibility for having a working knowledge of the Bidding and Construction Documents, project site and local conditions, Federal, State and Local Laws, Ordinances, Rules and Regulations that may in any manner affect Bidder's performance. And further represents that he has correlated his study and observations with the requirements of the Bidding and Construction Documents by congruent reference thereto. Neither Owner or Architect assume responsibility for any misunderstandings or faulty assumptions or conclusions made by Bidder or any of Bidder's representatives, employees or agents prior to the execution of the contract. Sufficient time is being allowed in the Bidding process for clarifications and interpretations of the Bid and Construction Documents as may be needed. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents without exception.

No allowance will subsequently be made to the successful Bidder by reason of any error or omission on his part in preparation of his Bid.

Errors in Bids: Each bidder must carefully examine his bid prior to submission. Failure to do so is at the bidder's risk. He is responsible for any errors therein. Claim of oversight is not a basis for allowing withdrawal of a bid after opening without forfeiture of bid security. Bids must be clear and legible without erasures or obscurity. Strike-outs must clearly show corrected amount above original with modifier's initials and date of modification matching signatory on Bid Form.

Pre-Bid Withdrawal of Bid: Bids may be withdrawn any time prior to the time for the opening of bids.

Costs Incurred in Preparation of Bid: Owner is not liable for any cost incurred by bidder in the preparation of bid.

Evaluation of Bids: Owner under advisement of Architect will evaluate each bid to determine which is the lowest responsive bid taking into consideration all relevant facts including, without limitation, quality, time of performance, probability of performance, and other factors which may be relevant. Owner reserves the right to waive any informalities, to accept any bid, to reject any bid, to reject all bids, or to negotiate contract terms with one or more bidders when such is deemed to be in his best interest. Rejection of any bid will not imply any criticism of the bid or convey an indication that the proposal was deficient and no justification of such action will be offered.

Execution of Contract: Bidders shall be prepared to execute a formal Contract Agreement within ten (10) days after receipt of Notice of Bid Acceptance and to immediately proceed with work upon the issuance of a written Notice to Proceed. Contractor shall perform Work of the Project with an adequate force and adequate equipment to execute and complete the work within the time stipulated.

Completion Time: Time is of the essence with respect to completion of the project. Substantial Completion of the entire project must be achieved within 330 days of Notice to Proceed.

Work Schedule: Owner will not be responsible for any "overtime" cost incurred by Contractor to meet completion schedule. Owner will not permit work on premises on Sundays or religious holidays, or during any regular service times for Church which might disrupt of disturb services.

END OF SECTION

INVITATION TO BID AND INSTRUCTIONS TO BIDDERS

Invitation Date: January 9, 2020
Receiving of Bids Date:January 30, 2020

CONSTRUCTION PROJECT

New Church Facilities
for the
First Assembly of God
Fair Oaks, Arkansas

Fair Oaks Assembly of God will receive sealed bids for the construction of New Church Facilities, until 2:00 P.M., January 30, 2020; at the church offices in Fair Oaks, Arkansas. Bids will be opened and read aloud. The work includes new construction to be let under one prime contract.

The Work of the Contract includes construction of a new church facility of single story wood framed construction. Materials, equipment, and systems generally include: metal fascia, soffits, and siding, faux stone veneer, brick veneer, wood trusses, glue laminated wood structural elements, composition shingle roofing, drywall interior wall and ceiling finishes, acoustical ceiling panels, carpet and resilient sheet flooring, church furnishings and equipment, automatic fire protection system, fire alarm, and heat pump HVAC. Floor area is approximately 12,400 sq. ft. enclosed conditioned space plus exterior walkway and drive-thru canopies.

Requests for Information or Interpretation (RFI) regarding the project or requests for copies of the Bid and Construction Documents should be directed to the office of the Architect:

Elton L. Roe, Architect, P.A.
P.O. Box 2336
Harrison, AR 72602
email: elrarchitect@gmail.com
870-741-3700

Invited General Contractors will be furnished an e-mail Drop Box link to Bid and Construction Documents for overview of Project. Invited Prospective Bidders are asked to respond in a timely manner indicating their intent to bid. Only prospective bidders who register with the Architect as Bidders may submit a bid. Prospective Bidders shall indicate both USPS mailing and physical addresses, E-

mail address for official business communication, contact person, and telephone number.

Any General Contractor interested in being included on the invited bidder list may submit request for consideration to the Architect. After reviewing request, Architect will respond accordingly.

Bidder registration requires a $175 refundable deposit made payable to “Elton Roe, Architect.” Each registered Bidder will be transmitted one printed set of Bid and Construction Documents for their use in preparation of a Bid. A limited conditional copyright license will be granted to registered GC bidders for reproduction and distribution of Construction Documents to sub-contractors for their use in preparing bids including electronic version copies. Distribution of partial sets is not recommended. Registered GC prospective bidders may request additional complete sets of Bid and Construction Documents from the Architect upon submission of additional deposit(s) of $175.00 per set. All deposits are 100% refundable for sets returned in good, re-useable, and unmarked condition within 10 days after bid date. All Registered GC Bidders will receive responses to RFI’s and any Addenda which may be issued. Cut off date and time for submission of RFI’s will be 7 days prior to Bid Date. Architect’s responses to RFI’s will be in the form of Addenda. Architect will only distribute Bid and Construction documents to registered GC Bidders. Each GC Bidder is solely responsible for re-distribution to Sub-Contractors of all Bid and Construction Documents including Addenda. Architect will not distribute documents or communicate directly with any subcontractor. Subcontractors must obtain Bid and Construction Documents from and submit RFI’s through registered GC Bidders. Bidder assumes sole responsibility for maintaining access to all Bid and Construction Documents including Addenda.

For the convenience of sub-contractors, Bid and Construction Documents may also be viewed and prints purchased at the Southern Reprographics at 901 W. 7th St.; Little Rock, AR 72201; telephone: (501) 372-4011. Caution should be exercised to verify that documents viewed or purchased are complete and current with all addenda, if any. Basing bids on partial or incomplete Bid and Construction Documents is not recommended even for subcontract work.

Each GC Bidder must deposit with his bid, a bid security in the amount, form, and subject to the conditions provided in the ”Summary and Bidder Information” Section. No bid may be withdrawn after the scheduled closing time for receipt of bids for a period of sixty (60) days past without forfeiture of bid security.

Owner assumes no obligation to accept the lowest bid and reserves the right to reject any or all bids and to waive any formalities and to defer notice of acceptance or rejection of bids for up to sixty (60) days following bid opening.

During Bid review period, Owner may request additional information regarding Bidder's qualifications, business references, financial statement, list of major trade subcontractors, and any other information which may be relevant to selection of the preferred General Contractor bid proposal.

Upon announcement of Owner's intent, Owner will either accept preferred Bid Proposal or, if necessary due to budgetary constraints, may request to enter into negotiation with preferred General Contractor to explore options for negotiated cost reduction options until an acceptable budget is determined. If unsuccessful, Owner may reject preferred Bid Proposal and repeat this process with another Bidder but not concurrently with other Bidder(s). Under no circumstances will Owner "cross bid" between General Contractors during negotiation phase. Any rejected Bidder's Proposal may not be reconsidered and bid security will be returned.

Upon notice of acceptance of Bid Proposal, successful GC Bidder shall within 5 days submit the final Contract form to the Owner for review and execution.

Bidders shall refer to additional information relative to bidding process in the "Summary and Bidder Information" Section of the Specification Manual.

BID FORM

NEW CHURCH FACILITIES
FIRST ASSEMBLY OF GOD
FAIR OAKS, ARKANSAS

Plans and Specification Manual Issue Date: December 20, 2019

Architect: Elton L. Roe, Harrison, Arkansas

FROM (Bidder):

_____
(Company Name or Corp. Name)

_____
(Physical Address)

_____
(Mail Address)

_____
(City/State/Zip)

_____
(Bus. Phone)

_____
(Bus. E-mail)

TO (Owner):

Fair Oaks Assembly of God
30 CR 505
Mc Croy, AR 72101

1. BID AMOUNT

The Undersigned, having inspected the site and existing conditions affecting the cost of the Work, and having thoroughly reviewed the Contract Documents consisting of Plans and Specification Manual including Invitation to Bid and Instruction to Bidders, Summary and Bidder Information, Bid Form, form of Bid Bond, form of Contract, form of Performance and Payment Bond or Bonds, General Conditions, Supplementary General Conditions, General Requirements, Technical Specification Sections, and Addenda (if any), hereby proposes to furnish all labor, materials, equipment services, and incidentals required to construct the above named project in accordance therewith, for the stipulated sum of:

_____dollars ($_____).

2. ACKNOWLEDGEMENT OF ADDENDA

Bidder Acknowledges Receipt of the Following Addenda and their inclusion in this Bid Proposal:

ADDENDUM NO.:	DATE:
_____	_____
_____	_____
_____	_____
_____	_____

4. ACKNOWLEDGEMENT OF OWNER'S RIGHTS AND PROMISE TO PERFORM
By submitting this bid, Bidder acknowledges the Owner's right to reject any and all bids. If written notice of the acceptance of this Bid is mailed or otherwise communicated or delivered to the undersigned within sixty (60) days after the bid opening, or at any time thereafter before this Bid is withdrawn, the undersigned agrees to execute and deliver a contract in the prescribed form and furnish the required Performance and Payment Bond within ten (5) days after the date of notice of acceptance of Bid.

5. BID SECURITY
Security in the sum of _____ dollars ($_____) in the form of_____ is submitted herewith in accordance with the Specification Manual.

6. LIQUIDATED DAMAGES
If awarded the Contract, the Bidder hereby agrees to fully complete the contract within 330 consecutive calendar days after the date of the "Notice to Proceed" and should he fail to fully complete the work within the above stated time, he shall pay the Owner as liquidated damages and not as a penalty, the sum of $100.00 for each calendar day of delay until the work is completed and accepted.

7. BUSINESS PARTNERS OR CORPORATE OFFICERS:

NAME	TITLE	ADDRESS
_____	_____	_____
_____	_____	_____
_____	_____	_____

8. COMPLIANCE WITH ARKANSAS CONTRACTORS LICENSING LAW
The undersigned bidder certifies compliance with Arkansas Licensing Law for Contractors Act 150 of 1965 and that all required certificates and licenses are in effect and without revocation, expiration, or suspension at date of this proposal including all sub-contractors under his Bid.

9. AUTHORIZED SIGNATURE:
Company DBA or Corporate Name:_____Ark. Corp. No.:_____
Arkansas Contractor's Lic. No.:_____Classification of License:_____

By:_____Printed Name:_____Title:_____Date:_____
(If business is a corporation, attach evidence that signing party has autonomous authority to sign bid proposal form)

SECTION 00700
GENERAL CONDITIONS OF THE CONTRACT

PART 1

1.1 SCOPE OF WORK

A. The Work included under these Specifications consists of furnishing all items, materials, equipment, operations, or systems indicated, scheduled, or specified on the Drawings or in these Specifications including all labor, transportation, temporary facilities, trade mechanic tools, fasteners, expendables, services, and other incidentals accessory to or necessary to performance, completion, and execution of all Work essential to completion of Project in accordance to Contract Documents.

1.2 FORM OF SPECIFICATIONS

A. General Conditions and Division 1 General Requirements apply to every Division of these Specifications.
B. These Specifications are of abbreviated form and contain incomplete sentences. Omission of words or phrases such as “the Contractor shall,” “as noted on Drawings,” “according to Drawings,” “a”, “an”, “the”, and “all” are intentional. Omitted words and phrases shall be supplied by inference.
C. All imperative statements and instructions are directed to Contractor. All portions of Work mentioned by notation, abbreviations, callouts, lists, or schedules regardless of how brief shall be included in the Work of the Contract unless specifically noted otherwise. For repetitive details on the Drawings, certain callouts are not always repeated. Where information is supplied on a typical detail, it shall be inferred on similar detail conditions where not noted.
D. Division of these Specifications into Sections and separate enumeration of the Drawings is not intended to dictate division of the Work by trades or Subcontractors unless specifically indicated otherwise. The Work of the Contract is a total integrated Project and the Contractor shall perform all portions of the Work by respective and congruent reference to all portions of the Drawings and Specifications. Assignment of appropriate trade disciplines or materials and equipment suppliers to portions of the Work shall be the responsibility of the Contractor.
E. Items specified, noted, or scheduled by reference to specific manufacturer’s name and/or product catalog number shall be furnished complete with all accessories and incidentals as indicated in manufacturer’s current published information at the time of Proposal date. Where a manufacturer’s product numbers have been superseded or product offering has been replaced, supply current model and not old stock.

1.3 AIA GENERAL CONDITIONS

A. AIA Document A201-2007, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION is hereby made a part of these Contract Documents by listing.

Contractor shall obtain a copy of this document and become familiar with its contents before submitting his Proposal. Submission of a Proposal is a passive statement that Contractor has referred to this document, all 14 Articles and 39 pages. A copy of this document is available at the office of the Architect for viewing.

End of Section 00700

SECTION 00800
SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

A. All supplementary provisions herein refer to Articles of the AIA Document A201-2007, General Conditions of the Contract for Construction.
B. Where any Article of the AIA General Conditions is supplemented hereby, the provisions of such Article remain in effect with supplemental provision added thereto. Where any article is amended, voided, or superseded hereby, the provisions of such article that are not so amended, voided, or superseded remain in effect.

PART 2 AMENDMENTS TO THE GENERAL CONDITIONS

ARTICLE 1 GENERAL PROVISIONS

1.2.1 Add Section 1.2.1.1 to Section 1.2.1:

1.2.1.1 Drawings are diagrammatic in nature and abbreviated in scope indicating design intent and may not include all incidental items required for performance of Work. Contractor shall supply and install all such necessary items whether or not specifically detailed or called out on Drawings.

1.2.1 Add Section 1.2.1.2 to Section 1.2.1:

1.2.1.2 In the case of conflicts or discrepancies between Drawings and Specifications, or within or among the Contract Documents and not clarified by Addendum, the Architect will determine which takes precedence in accordance to Section 4.2.11, 4.2.12, and 4.2.13

ARTICLE 2 OWNER

2.2.5 Delete Section 2.2.5 and substitute the following:

2.2.5 The Owner shall furnish the Contractor ten (10) copies of the Contract Documents. The Contractor may purchase additional copies at the cost of reproduction, postage, and handling.

ARTICLE 4 ARCHITECT

4.2.2 Add Section 4.2.2.1 to Section 4.2.2:

4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits make necessary by the fault of the Contractor or by defects and deficiencies in the Work.

4.2.7 Add Section 4.2.7.1 to Section 4.2.7:

4.2.7.1 In no case will the Architect's review period on any submittal be less than ten (10) days after receipt of the submittal from the Contractor.

ARTICLE 11 INSURANCE AND BONDS

11.1.1 Delete wording of Section 11.1.1 and substitute the following:

11.1.1 Contractor shall at his expense procure and maintain at a minimum for the duration of the Project and through the one year correction period after Substantial Completion, except as otherwise set forth herein, the types and amounts of insurance described below or as otherwise required by law on all of its operations, in companies registered to do business in the State of Arkansas and having an A.M. Best Rating of A-1X or higher:

A. Worker's Compensation and Employer's Liability Insurance: Contractor shall carry Worker's Compensation Insurance as required by any applicable law or regulation. Employer's Liability Insurance shall be carried in the amounts of no less than $1,000,000 each accident for bodily injury, $1,000,000 for bodily injury by disease, and $1,000,000 each employee for bodily injury by disease.

B. Commercial General Liability Insurance: Written on ISO occurrence form CG 00 01 07 98 (or substitute form providing equivalent coverage) covering operations by or on behalf of the Contractor, providing insurance for bodily injury liability and property damage liability for the limits indicated below and for the following coverages:

1. Premises and Operations
2. Products and completed operations
3. Contractual Liability
4. Broad Form Property Damage (including Completed Operations)
5. Explosion, Collapse, and Underground Hazards
6. Personal Injury Liability and Advertising Injury Liability

Except with respect to bodily injury and property damage included within the products and completed operations hazards, the general aggregate limit shall apply separately to the Contractor's project under this Contract. There shall be no endorsement or modification of the policy limiting the scope of coverage for liability arising from pollution.

Limit of Liability: The Commercial General Liability policy limits shall be not less than $2,000,000 each occurrence (combined single limit for bodily injury) and $5,000,000 aggregate
$1,000,000 each occurrence for damages or destruction of tangible property including loss of use resulting therefrom with limits of:

$2,000,000 aggregate for Products/Completed Operations
$1,000,000 Personal Injury/Advertising Injury
$2,000,000 General Aggregate (provide endorsement to apply to General Aggregate per project).

C. Additional Insured: The Owner, Architect, and all of their officers, directors, and employees, shall be named as Additional Insureds under the Commercial General Liability using ISO Additional Insured Endorsement CG 20 10 or substitute providing equivalent coverage. This endorsement must be stated on the insurance certificate provided to the Owner and a copy of the endorsement confirming coverage should accompany the insurance certificate.

D. Primary Coverage: The Contractor's Commercial General Liability Policy shall apply as primary insurance and any other insurance carried by the Architect or the Owner shall be excess only and will not contribute with the Contractor's insurance. This must be stated on the insurance certificate and a copy of the endorsement confirming coverage should accompany the insurance certificate.

E. Business Automobile Liability Insurance: The policy to be written on ISO form CA 0001, CA 0005, CA 0002, CA 0020, or a substitute form providing equivalent coverage and shall provide coverage for all owned, hired, and non=owned vehicles. The limit of liability shall be at least $2,000,000 combined single limit for Bodily Injury and Property Damage each accident. The policy shall name the Owner, Architect, and all of their officers, directors, Board Members, employees, and agents as Additional Insureds. The Policy shall be endorsed to be primary coverage and any other insurance carried by the Owner or Architect shall be excess only and shall not contribute to the Contractor's insurance. To confirm coverage, a copy of the Additional Insured Endorsement and the Primary Insurance Endorsement should accompany the insurance certificate.

F. Umbrella Excess Liability: Provide minimum of $1,000,000 per occurrence and $1,000,000 aggregate over the above listed coverages. Policy shall "follow-form" of the underlying policies and comply with all insurance requirements of those policies.

G. Waiver of Subrogation: As specified in Section 11.4.7, the Commercial General Liability and Automobile Liability policies shall each contain a waiver of subrogation in favor of the Owner, Architect, and their officers, directors, Board Members, employees, and agents.

H. Certificate of Insurance: Provide standard ACORD or equivalent Certificate of Insurance executed by a duly authorized representative of each insurer to the Owner and Architect before commencing any Work under the Contract. As a prerequisite to final payment, Contractor shall furnish an additional certificate(s) extending insurance coverages beyond Substantial Completion to end of one year corrective work period. Certificate of Insurance shall provide that Contractor's insurance shall remain in force

and not be cancelled or reduced without 30 days written notice to Owner. Failure of Contractor to maintain insurance coverage may result in termination of the Contract at the Owner's option. In the event that the Contractor does not comply with the requirements of this section, the Owner shall have the right, but not the obligation, to provide insurance coverage to protect Owner and Architect and back charge Contractor for the cost. The required insurance shall be subject to the approval of the Architect and Owner. However, approval and acceptance of any insurance certificate shall not relieve the Contractor from responsibilities regarding insurance provisions of this Agreement.

I. Copies of Policies: Furnish three copies of any and all insurance policies required under the Contract within ten days of date of execution of the Contract for Construction.

J. Subcontractors' Insurance: Contractor shall cause each subcontractor to purchase and maintain insurance of the types and amounts specified herein. Limits of such coverage may be reduced only upon written agreement of the Owner. Contractor shall provide Owner copies of insurance certificates for each subcontractor evidencing such coverage. Subcontractor's commercial general liability and business automobile liability insurance shall hame the Owner and Architect as Additional Insureds and have Waiver of Subrogation endorsement added in accord with section 11.4.7.

K. Other Insurance: Owner may require insurance coverage in excess of the types and amounts required herein. Contractor shall attempt in good faith to obtain additional coverage and provide them to Owner for review. Contractor shall purchase any such additional insurance as may be requested by Owner in writing. Owner shall pay for any additional premium for such additional coverage.

11.1.3 Delete existing paragraph 11.1.3 wording in its entirety and insert the following:

11.1.3 These certificates and insurance policies required by section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days prior written notice has been given the Owner. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

11.3.1 Delete Section 11.3.1 in its entirety and substitute the following:

11.3.1 Contractor shall maintain builder's risk insurance and shall file certificates of insurance with the Owner as required by paragraph 11.1 of the General Conditions. The limits of the insurance shall be not less than the following:
1. Property insurance(Builder's Risk) required under AIA General Conditions, Paragraph 11.3, shall be purchased and maintained by the Contractor to cover 100% of

value of Construction Contract plus full value of existing structure and building contents (for renovation projects where applicable). Furnish Owner with certificate of Insurance. Notify Owner 15 days min. in advance of any lapse of insurance coverage. Failure of Contractor to file such certificates of insurance or for submission of non-compliant insurance coverage shall not relieve the Contractor of responsibility for maintaining the specified insurance coverages.

11.3.1.4 Delete Section 11.3.1.4 wording in its entirety and substitute the following:

11.3.1.4 The Contractor shall at the Contractor's expense provide insurance coverage for materials and equipment stored off site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit until such materials and equipment are permanently installed in or attached to the Work.

11.3.1 Add the following Section 11.3.1.6 to Section 11.3.1:

11.3.1.6 The insurance required by Section 11.3 is not intended to cover machinery, tools, or equipment owned or rented by the Contractor that are utilized in the performance of the Work but not incorporated into the Work. The Contractor shall at his expense provide insurance coverage for such items which shall be subject to the provisions of Section 11.3.7.

11.4.1 Delete Section wording in its entirety and substitute the following:

11.4.1 Contractor shall pay premium for and furnish a Statutory Performance Bond and a Labor and Material Payment Bond in full amount of the Contract sum to cover faithful performance of the Contract and payment of all obligations arising there under within seven calendar days after signing of Contract. Furnish bonds in accordance with applicable laws of the state of Arkansas and with sureties approved by Owner and authorized to transact business in state in which project is located. Bond coverage for Project shall be maintained for a period of not less than two (2) years after Substantial Completion.

11.4.1 Add the following SubSections to Section 11.5.1:

11.4.1.1 Furnish Owner through the Architect three (3) copies of required Bonds.

11.4.1.2 Furnish Owner through the Architect three (3) copies of the signed "Contractor's and Resident Local Agents Affidavit of Qualification" form provided in 00101-Proposal Procedure.

11.4.1.3 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.5.1 Add these words after the first sentence: " Testing and inspections are to be paid for by the Contractor unless otherwise provided as stated in individual Specification Sections." Change second sentence as follow: Delete words "Unless otherwise provided" and substitute "Unless otherwise provided for in individual Specification Sections or on Drawings."

End of Section 00800

SECTION 01100
BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Contractor shall furnish all materials, labor, and services required to complete the Project as specified and detailed in the Construction Documents except as specifically excluded herein as “Work by Owner.”

1.2 WORK BY OWNER

A. Owner will furnish equipment, pre-wire low voltage communication, and final install for Surveillance and Security System, Audio-Visual System, Computer System, and Telephone System. GC shall coordinate with Owner for all work by Owner.

1.3 CONTRACTOR’S USE OF PREMISES

A. Limit use of premises to activities and operations directly related to the work of the contract for this Project and work by Owner.

1.4 FUTURE WORK

A. Owner has planned for future expansion of building. GC shall coordinate the Work to facilitate planned future expansion in an expeditious and economical manner with a minimum of disruption or alteration.

1.5 SPECIFICATION CONVENTIONS

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

1.6 CASH ALLOWANCES

Ceramic Tile for Floors: $2.50 per sq. ft. Installation labor, grout, adhesives, and other incidental materials shall be excluded from allowance and included elsewhere in Contractor's bid to provide complete installation.

Resilient Sheet Flooring: $20.00 per sq. yd. Installation labor, adhesives (if any), bases, transition strips, cushion sheets, and other incidental materials shall be excluded from allowance and included elsewhere in Contractor's bid to provide complete installation.

Carpet: $20.00 per sq. yd., Carpet roll goods only. Installation labor, heat seaming tape, tack strips, transition strips, and other incidental materials shall be excluded from allowance and included elsewhere in Contractor's bid to provide complete installation.

1.7 CONTINGENCY ALLOWANCES (Not Used)

1.8 TESTING AND INSPECTION ALLOWANCES (Not Used)

1.9 SCHEDULE OF VALUES

A. Submit schedule on AIA Form G703. Contractor's standard form or electronic media printout will be considered.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

1.10 APPLICATIONS FOR PAYMENT

A. Submit three copies of each application on AIA Form G702 and G703.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Monthly.

1.11 CHANGE PROCEDURES

A. Stipulated Sum/Price Change Order: Based on Proposal Request or Notice of Change and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.

B. Change Order Forms: AIA G701.

1.12 UNIT PRICES (Not Used)

1.13 ALTERNATES (Not Used)

1.14 COORDINATION

A. Coordinate scheduling, submittals, and Work of various sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable.

D. In finished areas, conceal pipes, ducts, and wiring within construction.

1.15 FIELD ENGINEERING

A. Employ experienced instrument technician to locate reference datum and protect survey control and reference points.

B. Establish elevations, lines, and levels and certify elevations and locations of the Work conform with Contract Documents.

C. Verify field measurements are as indicated on shop drawings or as instructed by manufacturer.

1.16 PRECONSTRUCTION MEETINGS

A. Architect/Engineer will schedule pre-construction meeting after Notice of Award for affected parties.

1.17 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at no less than monthly intervals.

B. Preside at meetings, record minutes, and distribute copies within two days to those affected by decisions made.

1.19 CUTTING AND PATCHING

A. Employ original installer to perform cutting and patching new Work; restore Work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Execute cutting, fitting, and patching to complete Work, and to:
1. Fit several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and non-conforming Work.

4. Remove samples of installed Work for testing.
5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Cut masonry and concrete materials using masonry saw or core drill. Restore Work with new Products in accordance with requirements of Contract Documents.

E. Fit Work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

F. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

G Refinish surfaces to match adjacent finishes.

1.20 SUBMITTAL PROCEDURES

H. Submittal form to identify Project, Contractor, subcontractor or supplier; and pertinent Contract Document references.

I. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

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

K. Revise and resubmit submittals as required; identify changes made since previous submittal.

1.21 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement for Architect/Engineer review.

B. Submit revised schedules with each Application for Payment, identifying changes since previous version. Indicate estimated percentage of completion for each item of Work at each submission.

C. Submit horizontal bar chart with separate line for each major section of Work or operation section of Work, identifying first work day of each week.

1.22 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Owner-Contractor Agreement, submit list of major Products proposed for use, with name of manufacturer, trade name, and model number of each product.

1.23 PRODUCT DATA

A. Product Data:
   1. Submitted to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
   2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes as specified.

B. Submit number of copies which Contractor requires, plus two copies which will be retained by Architect/Engineer.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this project.

1.24 SHOP DRAWINGS

Shop Drawings:
Submitted to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes as specified.

Submit number of opaque reproductions Contractor requires, plus two copies which will be retained by Architect/Engineer.

1.25 SAMPLES

Samples for Review:
Submitted to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes as specified.

Samples for Selection:
Submitted to Architect/Engineer for aesthetic, color, or finish selection.

Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns for Architect/Engineer selection.

After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes as specified.

Submit samples to illustrate functional and aesthetic characteristics of Product.

Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns for Architect/Engineer's selection.

1.26 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturer printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.27 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit certifications by manufacturer to Architect/Engineer, in quantities specified for Product Data.

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

1.28 QUALITY CONTROL

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

Comply with manufacturer's instructions.

Comply with specified standards and recognized industry standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

Comply with all statutory codes and construction standards applicable to the Work at the address of project location enforce at time of bidding.

1.29 TOLERANCES

Monitor fabrication and installation tolerance control of installed Products over suppliers, manufacturers, Products, site conditions, and workmanship, to produce acceptable Work. Do not permit tolerances to accumulate.

Comply fully with manufacturer’s recommended tolerances for execution of Work.

1.30 REFERENCE STANDARDS

Conform to reference standards by date current as of date for receiving bids.

When a specified reference standard conflicts with Contract Documents, request clarification from Architect/Engineer before proceeding.

1.31 MOCK-UPS (Not Used)

1.32 SPECIAL INSPECTIONS, TESTING, AND LABORATORY SERVICES

Contractor shall employ, and pay for services of independent firm to perform testing and inspections required by the Contract Documents and applicable building codes.

Independent firm shall perform tests, inspections, and other services as required and submit engineer certified report indicating compliance or non-compliance to specified requirements, applicable codes, and recognized industry standards.

Cooperate with independent firm; furnish samples as requested and provide access, special tools, labor, or other services as needed to perform inspections and/or tests.

Re-testing required because of any non-conformance to specified requirements will be at Contractor’s expense.

1.33 MANUFACTURER’S FIELD SERVICES AND REPORTS

When required, coordinate Work to ensure manufacturer's field services are provided and submit certified report to Architect documenting compliance with manufacturer's instructions and recommendations.

1.34 EXAMINATION

Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

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

1.35 PREPARATION

Clean substrate surfaces prior to applying next material or substance.

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

1.36 TEMPORARY ELECTRICITY

Provide temporary electricity and power outlets for construction operations, connections, branch wiring, distribution boxes, and flexible power cords as required.

Pay all costs for required for provision and use of temporary power.

1.37 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

Provide and maintain temporary lighting for construction operation.

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

Permanent building lighting may be utilized during construction. Repair, clean, and replace outage lamps at end of construction.

1.38 TEMPORARY HEATING AND COOLING

Provide heating and cooling devices and heat and cool as need to maintain specified conditions for construction operations.

Pay cost of energy used.

Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.39 TEMPORARY VENTILATION

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

1.40 TELEPHONE AND FACSIMILE SERVICE

Provide, maintain and pay for telephone and telephone facsimile service to field office at time of project mobilization. Allow Architect/Engineer use of these communication provisions.

1.41 TEMPORARY WATER SERVICE

Provide adequate temporary potable water source for construction operations.

Pay all costs for required installation and use of temporary water service.

1.42 TEMPORARY SANITARY FACILITIES

Provide and maintain required temporary facilities and enclosures. Owner's existing or new facilities may not be used.

Maintain in clean and sanitary condition.

Pay all costs incurred.

1.43 FIELD OFFICES AND SHEDS

Office: Weather tight, with lighting, electrical outlets, heating, and ventilating equipment, and equipped with sturdy furniture and drawing display table. Provide space adequate to accommodate Project Meetings.

1.44 ACCESS ROADS

Provide temporary all weather gravel surface site access roads.

1.45 PARKING

Provide gravel surfaced temporary site for construction personnel.

1.46 PROGRESS CLEANING AND WASTE REMOVAL

Collect and maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition. Comply with all applicable ordinances and laws.
Pay all costs incurred for site waste collection and disposal.

1.47 PROJECT IDENTIFICATION (Not Used)

1.48 BARRIERS AND FENCING

Provide all necessary safety, security, and environmental barriers and fencing required for construction operations.

1.49 ENCLOSURES

Provide temporary weather tight closures to exterior openings to permit acceptable working conditions and protection of the Work.

Provide temporary roofing as required to protect work in progress.

1.50 PROTECTION OF INSTALLED WORK

Protect installed Work and provide special protection where specified in individual specification sections.

Prohibit traffic or storage upon waterproofed or roofed surfaces.

1.51 SECURITY

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

1.52 WATER CONTROL

Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

Provide erosion control.

1.53 POLLUTION AND ENVIRONMENTAL CONTROL

Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

Provide dust control, erosion and sediment control, noise control, pest control and rodent control to allow for proper execution of the Work.

Comply with pollution and environmental control requirements applicable to Work.

1.54 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment review.

Remove underground installations to minimum depth of 2 feet. Grade site as indicated on Drawings.

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

Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.55 PRODUCTS

Products: Means new material, machinery, components, equipment, fixtures, and systems forming Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.

Provide interchangeable components of same manufacture for components being replaced.

1.56 DELIVERY, HANDLING, STORAGE, AND PROTECTION

Deliver, handle, store, and protect Products in accordance with manufacturer's instructions.

1.57 PRODUCT OPTIONS

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

Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for manufacturers not named.

1.58 SUBSTITUTIONS

Architect/Engineer will consider request for Substitutions only within 15 days after date of Owner-Contractor Agreement.

Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

Submit three copies of request for Substitution for Consideration. Limit each request to one proposed Substitution.

1.59 CLOSEOUT PROCEDURES

Submit written certification Contract Documents have been reviewed, Work has been inspected, and Work is complete in accordance with Contract Documents and ready for Architect/Engineer's inspection.

Submit final Application for Payment identifying total adjusted Contract Sum/Price, previous payments, and amount remaining due.

1.60 FINAL CLEANING

Execute final cleaning prior to final inspection.

Clean interior and exterior surfaces exposed to view. Vacuum carpeted and soft surfaces.

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

Replace filters of operating equipment.

Remove waste and surplus materials, rubbish, and construction facilities from site.

1.61 STARTING OF SYSTEMS

Provide seven days notification prior to start-up of each item.

Ensure each piece of equipment or system is ready for operation.

Execute start-up under supervision of responsible persons in accordance with manufacturer's instructions.

Submit written report stating equipment or system has been properly installed and is functioning correctly.

1.62 DEMONSTRATION AND INSTRUCTIONS

Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of final review.

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

Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment.

1.63 TESTING, ADJUSTING, AND BALANCING OF MECHANICAL SYSTEMS AND OTHER MOTORIZED EQUIPMENT

Adjust operating products and equipment to ensure smooth and optimum operation.

Perform testing and balancing of HVAC systems and submit certified report confirming design requirements.

Reports will be submitted by independent firm to Architect in duplicate indicating observation and results of tests and indicating compliance or non-compliance with specified requirements of Contract Documents.

Cooperate with independent firm; furnish assistance as requested.

Re-testing required because of non-conformance to specified requirements will be at Contractor's expense.

1.64 PROTECTING INSTALLED CONSTRUCTION

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

Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

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

Prohibit traffic from landscaped areas.

1.65 PROTECT RECORD DOCUMENTS

Maintain on site one set of Contract Documents to be utilized for record documents.

Record actual revisions to the Work. Record information concurrent with construction progress.

Specifications: Legibly mark and record at each Product section description of actual Products installed.

Record Documents and Shop Drawings: Legibly mark each item to record actual construction.

Submit documents to Architect/Engineer with claim for final Application for Payment.

1.66 OPERATION AND MAINTENANCE DATA

Submit two sets prior to final inspection, bound in 8 ½ x 11 text pages, three D side ring binders with durable plastic covers.

Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.

Internally subdivide binder contents with permanent page dividers, logically organized, with tab titles legibly printed under reinforced laminated plastic tabs.

Contents:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system.
3. Part 3: Project documents and certificates.

1.67 SPARE PARTS AND MAINTENANCE MATERIALS

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

Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

1.68 WARRANTIES

Provide duplicate notarized copies

Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.

Submit prior to final Application for Payment.

1.69 DAILY WORK LOG AND PHOTOGRAPHIC RECORD OF JOB PROGRESS

Contractor shall maintain daily Work Log as Project progresses. Work Log shall be augmented by a photo graphic record on no less than a weekly basis. Copy of both Work Log and Photographic Record shall be shared with Architect on a weekly basis to document progress. Photos shall be of sufficient detail and clarity with appropriate identification and dated to allow assessment of compliance of Work to Construction Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02301
EARTHWORK

PART 1 GENERAL

1.1 WORK INCLUDED

A. Excavation and Trenching.

B. Backfilling and compacting

C. Controlled Structural Fill and Compaction

D. Drainage fill: Granular stone sub-base.

E. Surplus soil and debris removal.

F. Topsoil stockpiling.

G. Imported fill as required (unquantified).

1.2 Geotechnical Engineering Soil Report

A. Soil Report has not been furnished by Owner. Perform all work complying with industry best practice standards to achieve design parameters required by applicable codes and structural notes on Drawings and other sections of these Specifications. All excavation materials are unclassified and unquantified.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Fine Granular Material: Natural stone; washed, free of clay, shale, sand, soil, organic mater.
1. Grading:
    a. Minimum Size: 1/4 inch
    b. Maximum Size 5/8 inch

B. Sand: Natural washed river or crushed natural stone; free of silt, clay, loam, friable or soluble materials, and organic matter.

C. **Required Bearing Capacity: All soil both native and imported fill shall provide a minimum of 1,500 lbs. per sq. ft. structural bearing capacity. Confirm compliance by laboratory tests of soil samples taken from site.**

D. Subsoil: Reused Native (subject to approval), or Imported; free of rock larger than 3 inch size, and debris. Native or Imported material shall be low swell potential fill capable of developing the required bearing capacity when compacted. Submit sample for approval. Utilize approved geo-technical service provider.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A.. Call Local Utility Line Information service not less than three working days before performing Work. Request underground utilities to be located and marked within and surrounding construction areas. Do not proceed with work until marking is completed. Do not disturb existing utilities unless such work is required as an integral part of the Work.

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

C. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

D. Maintain and protect existing utilities to remain.

E. Grade excavation top perimeter to prevent surface water run-off into excavation or to adjacent properties.

3.2 TOP SOIL REMOVAL AND SUBSOIL EXCAVATING

A. Remove topsoil and stock pile in area designated by Project Manager clear of construction operations to be re-used in Landscaping Work.

B. Remove other native soil material that is unsuitable for re-use as fill or top soil or is in excess of that need for construction and dispose offsite in lawful and approved manner.

A. Do not remove wet subsoil. Perform excavation work when subsoil moisture conditions are optimum. Prepare sub-grade by proof rolling, scarifying, aerating and compacting as required to density surface.

B. Remove groundwater by pumping or gravity drains to keep excavations dry. Open time for excavations shall be limited to reduce danger of alteration of moisture content of subsoil.

C. Excavate subsoil required for building foundations, construction operations, and other Work. Excavation for footings and other earth formed poured in place concrete work shall be accurate in size and location, uniform, and consistent with Drawings.

D. Proof roll bearing surfaces. Fill soft spots with sub-soil fill and compact uniformly to 95 percent of maximum density.

E. Correct unauthorized excavation at no cost to Owner.

F. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Architect/Engineer.

G. Stockpile subsoil to be reused in area designated on site. Remove excess subsoil not used from site.

3.5 TRENCHING

A. Excavate for utility and sewer lines, ducts, and as shown on plans or required for project services.

B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

C. Hand trim excavation and leave free of loose matter.

D. Support pipe and conduit during placement and compaction of bedding fill.

E. Backfill trenches to required contours and elevations.

F. Place and compact fill materials as for Backfilling.

3.6 FILLING AND BACKFILLING

A. Fill and/or backfill areas to contours and elevations. Do not use frozen or wet materials.

B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Place fill material in continuous layers and compact as follows:
1.Soil Materials: Maximum 8 inches compacted depth.
2.Fine stone and sand materials: Maximum 4 inches compacted depth

D, Employ placement method so not to disturb or damage foundations, foundation perimeter drainage, foundation damp proofing, foundation waterproofing and protective cover, or utilities in trenches.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

3.8 TESTS

A. Perform laboratory material tests in accordance with ASTM D698.

B. Perform in place compaction tests in accordance with the following: Density Tests: ASTM D1556 or ASTM D2922.

C. Frequency of Tests: As directed. Provide as directed by Architect/Engineer. Services to be paid for by Owner.

D. All Earthwork shall be subject to the approval of a Soils Engineer Designated by Architect prior to the acceptance or continuance of the Work.

3.9 TOLERANCES

1. Top Surface of Exposed Subgrade: Plus or minus one inch.

3.10 SCHEDULE

A. Interior Slab-On-Grade and/or Crawl Spaces: Sub-soil fill, compact uniformly to 95 percent of maximum density; with cover of drainage fill, 4 inches thick, compact uniformly to 95 percent of maximum density.

END OF SECTION

SECTION 02362
TERMITE CONTROL

1. GENERAL

1.1. SUMMARY

A. Section Includes:
   1. Soil treatment for termite control.

1.2. SUBMITTALS

A. Product Data: Submit toxicants to be used, composition by percentage, dilution schedule, intended application rate. Include product label information.

B. Test Reports: Indicate regulatory agency approval reports.

C. Manufacturer's Application Instructions: Indicate caution requirements and in accordance with current product label of chosen pesticide.

D. Certify all work was performed in compliance with all applicable state and federal regulations and meets industry standards for termite control.

1.3. CLOSEOUT SUBMITTALS

A. Project Record Documents: Record date and rate of application, areas of application, and corresponding soil coverage.

1.4. WARRANTY

A. Furnish two (2) year warranty for repairs to building and building contents caused by termites and any re-treatment required. Warranty shall be guaranteed renewable by Owner annually after expiration of initial warranty period.

B. Inspect and report annually to Owner in writing. Notify Owner 30 days prior to expiration of warranty regarding terms of renewal.

2. PRODUCTS

2.1. MATERIALS

A. Manufacturers: Non-proprietary

B. Toxicant Chemical: EPA FIFRA and State approved; synthetically color dyed to permit visual identification of treated soil.

C. Diluent: as recommended by toxicant manufacturer.

2.2. MIXES

A. Mix toxicant to manufacturer's instructions.

3. EXECUTION

3.1. EXAMINATION

A. Verify soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

B. Verify final grading and excavation are complete.

3.2. APPLICATION

A. Apply toxicant at locations indicated in Schedule at end of section.

B. Apply extra treatment to structure penetrations including pipes or ducts, and grounding rods.

C. Re-treat disturbed treated soil with same toxicant as original treatment.

D. When inspection or testing identifies presence of termites, re-treat soil and re-test.

3.3. SCHEDULES

A. Locations:

1. Under Slabs-on-Grade.

2. Crawl Spaces (where applicable).

3. Both Sides of Foundation Surfaces.

4. Soil Within 2 feet of Building Perimeter for Depth of 1 ft.

SECTION 02520
PORTLAND CEMENT CONCRETE PAVING

1PART GENERAL

1 SECTION INCLUDES

A. Concrete sidewalks, curbs, gutters, and drives as shown on Drawings.

2 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301 and Section 03001.

2PART PRODUCTS

3 MATERIALS

A. Concrete Materials: As specified in Section 03001.

4 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94.

B. Provide concrete of the following characteristics:
1. Compressive Strength at 28 days: 4,000 psi.
2. Slump: 3 inches maximum.
3. Air Entrainment: 5 - 7 percent.

3PART EXECUTION

5 EXAMINATION AND PREPARATION

A. Verify gradients and elevations of base.

B. Verify compacted sub-grade is ready to support paving and imposed loads.

C. Moisten substrate to minimize absorption of water from fresh concrete.

6 FORMING

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

B. Place joint filler in joints, vertical in position, in straight lines. Secure to form work.

C. Place contraction joints at 20 foot intervals or as indicated on drawings. Align joints.

D. Place joint filler between paving components and other appurtenances.

7 REINFORCEMENT

A. Place reinforcement at mid-height of slabs-on-grade.

B. Interrupt reinforcement at contraction joints. Place dowels with one end lubricated, the other to bond to concrete.

C. Place dowels to achieve pavement and curb alignment.

8 PLACING CONCRETE

A. Place concrete in accordance with Section 03001.

B. Do not disturb reinforcement or formwork components during concrete placement.

C. Place concrete continuously between predetermined joints.

D. Place bumpers secure.

9 FINISHING

A. Sidewalk, porch and driveway Surfaces: Light broom, radiuses and trowel joint edges.

B. Curbs and Gutters: Light broom.

C. Apply curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

END OF SECTION

SECTION 02905
LANDSCAPING

1 GENERAL

1.1 SECTION INCLUDES

A. Top Soil
B. Grass Seed
C. Nutritive Organic compost/Mulch
D. Erosion Control Cover
E. Maintenance

2 PRODUCTS

2.1 GRASS

A. Seed Mixture: As selected and approved from proprietary blends of varieties recommended for climatic and seasonal conditions and durable low maintenance and hardy growth.

B. Topsoil: Excavated from site and reused.

C. Nutritive Organic Compost/Mulch: Landscaper's non-proprietary blend, undyed, fine graded.

D. Erosion Control Cover: Natural wheat straw

E. Fertilizer: Fifty percent of the elements derived from organic sources, to the following proportions: Nitrogen 10 percent, phosphoric acid 20 percent, soluble potash 10 percent.

3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that required underground utilities work has been completed.

B. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours as shown on finish grading site plan. Make changes in grade gradual. Blend slopes into level areas.

C. Extent of seeded lawn areas shall be all areas where native ground cover has been disturbed, new ground, and additionally areas designated as lawn areas on site plan.

D. Scarify subsoil to a depth of 3 inches.

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

3.2 SEEDING

A. Apply seed at a recommended rate evenly in two intersecting directions.

B. Immediately following seeding, apply agricultural mulch to a thickness of 1/8 inches. Where slopes exceed 1:20, apply erosion control ground cover.

C. Apply water with a fine spray immediately after each area has been mulched.

3.3 MAINTENANCE

A. Mow grass at regular intervals to maintain maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

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

C. Control growth of weeds by mechanical methods. Do not use any pesticides or herbicides.

END OF SECTION

SECTION 03001
CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Formwork, reinforcement, accessories, cast-in-place concrete, finishing and curing.

1.2 SUBMITTALS

A. Shop Drawings: Indicate pertinent dimensioning, reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, support in and spacing devices, lap joint locations, joint tie methods, etc.

B. Mix Design: Materials and proportions, certify compliance with specification.

1.3 QUALITY ASSURANCE

A. Construct and erect concrete formwork in accordance with ACI 301, 318, and 347.

B. Perform concrete reinforcing work in accordance with ACI 301, ACI 318, CRSI 63, 65, and Manual of Practice, and ASTM A184.

C. Perform cast-in-place concrete work in accordance with ACI 301, ACI 318, ACI 305, ACI 306, ACI 308, and ACI 309

PART 2 PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES

A. Plywood: PS 1, C Grade; sound undamaged sheets with clean true edges.

B. Lumber: Y. Pine species; No. 2 grade.

C. Form Ties: Snap-off, metal type of adjustable length, cone type.

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

E. Formed Construction Joints for Slab-on-Grade: Galvanized steel, tongue and groove type profile, knockout holes to receive doweling, full depth of slab.

F. Slab Edge Joint Filler: ASTM D1751, Pre-molded asphaltic board, 1/4 inch.

G. Vapor Retarder: 10 mil thick black polyethylene film, type recommended for below grade application. Two layers of 6 mil plastic may be substituted for one layer of 10 mil. plastic at Contractor's option.

2.2 REINFORCEMENT MATERIALS

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

B. Welded Steel Wire Fabric: ASTM A185, flat sheet panels, unfinished.

C. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for support of reinforcing.

D. Fabricate concrete reinforcing in accordance with ACI 315, ACI 318, ASTM A184, and CRSI 63, 65, and Manual of Practice.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, Normal-Type I Portland type.

B. Fine and Coarse Aggregates: ASTM C33, normal weight or light weight mix C330.

C. Water: Clean and not detrimental to concrete.

D. Air Entrainment Admixture: ASTM C260.

E. Bonding Agent: Latex emulsion type.

F. Non-shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents. Epoxy additive where noted or required.

2.4 COMPOUNDS, HARDENERS, AND SEALERS

A. Chemical Hardener: Chemical type; Seal Hard manufactured by L and M Construction Chemicals, Inc.

2.5 CONCRETE MIX

A. Mix and deliver concrete in accordance with ACI 304 and ASTM C94.

B. Provide concrete of the following strength:
   1. Compressive strength: 3,500 psi (28 day) for earth formed footings, slab on grade, or concealed concrete; 4,000 psi (28 day) for elevated flat slabs and other poured in place formed concrete.
   2. Slump 3 inches maximum except for beams, walls and columns slump may be 4" maximum.

3. Minimum water/cement ratio: .58 by weight for non air entrained, .46 for air entrained.

C. Select admixture proportions for normal weight concrete in accordance with ACI 301 Method 2, ACI 318 and ASTM C330 for light weight mixes.

D. Add air entraining agent to concrete mix for concrete work exposed to exterior.

PART 3 EXECUTION

3.1 FORMWORK ERECTION

A. Erect formwork, shoring and bracing to achieve design requirements.

B. Provide bracing to ensure stability of formwork.

C. Provide chamfer strips on external corners of beams and columns.

D. Apply form release agent to formwork in accordance with manufacturer's instructions, prior to placing for accessories and reinforcement.

E. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent.

F. Clean forms as erection proceeds, to remove foreign matter.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

A. Provide formed openings where required for work to be embedded in and passing through concrete members.

B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install concrete accessories straight, level, and plumb.

D. Place formed construction joint device in floor slab pattern pouring sequence.

E. Place joint filler at perimeter of floor slab, penetrations and isolation joints.

3.3 REINFORCEMENT PLACEMENT

A. Accurately place reinforcement properly supported and secured against displacement conforming to details on drawings. Lap and file bars per ACI code and as noted on Drawings.

B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.

C. Welded Steel Wire Fabric shall **not** be used for slab reinforcement. Utilize steel rebar spaced, lapped, and tied as noted on Drawings.

D. Do not use heat to cut or bend reinforcing steel. Make cuts with shear or saw.

E. Where new concrete is doweled to existing or previously poured work, drill fifty percent oversized holes in existing concrete, clean dust free, insert steel dowels and pack angular space with epoxy type non-shrink grout.

3.4 PLACING CONCRETE

A. Observe keyed joint (KJ) or Sawn Joint (SJ) patterns on Drawings. Avoid "cold" joints where possible. Where unavoidable, prepare abutting surface of previous pour by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instruction.

B. Install plastic vapor retarder under interior slabs on grade. Lap joints minimum 6 inches and seal watertight. Repair damaged vapor retarder with vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.

C. Separate slabs-on-grade from vertical surfaces with 1/4 inch thick joint filler, extended from bottom of slab to within 1/4 inch of finished slab surface.

D. Place concrete continuously between predetermined expansion, control, and construction joints. Do not break or interrupt pour such that cold joints occur.

E. Place floor slabs in alternating checkerboard pattern between keyed joints to minimize contraction cracking.

F. Screed floors slabs-on-grade level or to uniform slopes indicated.

G. Notify Architect five days in advance of any concrete pour and after completion of all formwork and reinforcing to allow time for his inspection.

H. Do not place any concrete until compaction tests have been approved by Architect and all concealed work such as plumbing has been inspected and approved by governing authorities.

3.5 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. For earth supported work, three days min.; for elevated work, seven days minimum.

B. Remove formwork progressively and in accordance with code requirements.

3.6 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Uniformly spread, screed, and float concrete.

C. Steel trowel surfaces which will receive carpeting, resilient flooring, thin set quarry or ceramic tile or which will be left exposed.

D. Maintain surface flatness, with maximum variation of 1/8 inch in 10 ft.

E. In areas with floor drains, maintain floor level at walls and slope surfaces uniformly to drains.

F. Apply concrete hardener-sealer on all floor surfaces. Apply in accordance with manufacturer's instructions. Coordinate with flooring contractor to ensure compatibility with flooring adhesives.

G. Protect floors to receive color stained finish (where scheduled) from physical, mechanical, or chemical damage. Use tarps and/or strippable floor sealer compound. Clean up accidental spills immediately before permanently staining concrete.

3.7 CURING

A. Immediately after placement, protect concrete from premature drying. Keep surface continuously wet as recommended by ACI or other approved method.

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

3.8 FORMED SURFACES FINISHING

A. Provide concrete surfaces to be left exposed with cement/sand float and rubbed finish.

3.9 SAWN CONTROL JOINTS

A. Saw joints in slabs where noted on plans after concrete has cured three days minimum and seven days maximum. Saw cut must penetrate one third depth of slab.

3.10 FIELD QUALITY CONTROL

A. Three (3) Concrete Test Cylinders: Taken for every 100 or less cu. yds. of each class of concrete placed.

B. One (1) Additional Test Cylinder: Taken during cold weather concreting, and be cured on job site under same conditions as concrete it represents.

C. One (1) Slump Test: Taken for each set of test cylinders taken.

3.11 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by Architect/Engineer.

END OF SECTION

SECTION 04100
MORTAR AND MASONRY GROUT

PART 1 GENERAL

1 SECTION INCLUDES

A. Mortar and grout for masonry

2 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

3 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

PART 2 PRODUCTS

4 MATERIALS

A. Masonry Cement: ASTM C91, Type M, S, N, or as required, gray color.

A. Mortar Aggregate: ASTM C144, standard masonry type.

B. Water: Clean and potable.

C. Bonding Agent: Latex type.

5 MORTAR MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S using the Property Method.

A. Mortar for Non-load Bearing Walls and Partitions: ASTM C270, Type N using the Property Method.

B. Mortar for Reinforced Masonry: ASTM C270, Type M using the Property Method.

6 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Do not use anti-freeze compounds to lower the freezing point of mortar.

7 GROUT MIXES

A. Bond Beams, Lintels, and filled hollow core/cavity walls: 3,000 psi (strength at 28 days); 8-10 inches slump; premixed type in accordance with ASTM C94.

8 GROUT MIXING

A. Mix grout in accordance with ASTM C94.

B. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

9 INSTALLATION

A. Install mortar in accordance with premix mortar manufacturer's instructions.

B. Work grout into masonry cores and cavities to eliminate voids. Do not displace reinforcement.

END OF SECTION

SECTION 04301
UNIT MASONRY SYSTEM

1PART GENERAL

1. SECTION INCLUDES

A. Concrete masonry units, reinforcement, anchorage, and accessories.

1.2 REGULATORY REQUIREMENTS

A. Conform to applicable code for requirements for fire rated masonry construction.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

1.5 SUBMITTALS

A. Submit samples of face brick for color and texture selection.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Block Units: ASTM C90, Type I - Moisture Controlled; normal weight.

B. Hollow Non-Load Bearing Block Units: ASTM C129, Type I - Moisture Controlled; medium weight.

C. Concrete Brick Units: ASTM C55 of same Grade, Type, and Weight as block units.

D. Face Brick: King Size, Color as selected from manufacturer’s standard product line.

2.2 REINFORCEMENT AND ANCHORAGE

A. Single Wythe Exterior Wall Joint Reinforcement: Truss type; steel wire, mill galvanized to ASTM A641 Class 3 after fabrication, 3/16 inch side rods with No. 9 cross ties.
   B. Manufacturers: Dur-O-Wal Model: Dur-O-Wal Extra Heavy Truss

B. Multiple Wythe Exterior Wall Joint Reinforcement: Truss type; without moisture drip; adjustable type, steel wire, hot dip galvanized to ASTM A641 Class 3 after fabrication, 3/16 inch side rods with No. 9 cross ties, 3/16 inch eye and pintle.
   1. Manufacturers: Dur-O-Wal Model: Dur-O-Eye Extra Heavy.

C. Single Wythe Interior Wall Reinforcement: Truss type; steel wire, mill galvanized to ASTM A641 class 1 after fabrication, No. 9 side rods with No. 9 cross ties.
   1. Manufacturers: Dur-O-Wal, Model: Dur-O-Wal Truss.

D. Reinforcing Steel: Deformed Bar type, specified in Section 03300; size as noted on plans, uncoated finish.

E. Strap Anchors: Z bent steel shape, 1 ¼ x 8 or 12 inch as required size x 3/16 inch thick, hot dip galvanized to ASTM A123 B2 finish.
   1. Manufacturers: Dur-O-Wal, Model: 3012

F. Masonry Veneer Wall Ties/ Wood Framed Walls: Corrugated strap, locate per code.

2.3 MORTAR AND GROUT

A. Mortar and Grout: As specified in Section 04100.

2.4 FLASHINGS

A. Plastic Flashings: Sheet polyvinyl chloride; 15 mil thick.

B. Lap Sealant: Butyl type as specified in Section 07900.

2.5 ACCESSORIES

A. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding.

B. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials, recommended by masonry unit manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

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

B. Coordinate placement of anchors supplied to other Sections.

3.2 COURSING

A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

B. Concrete Masonry Units:
1. Bond: Running.
2. Coursing: Concrete Masonry Units one unit and one mortar joint to equal 8 inches.
3. Mortar joints: Raked at split face, concave at smooth units.

3.3 PLACING AND BONDING

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

B. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.4 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches oc. Place joint reinforcement continuous in first joint below top of walls.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Reinforce joint corners and intersections with strap anchors 16 inches oc.

3.5 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Install horizontal joint reinforcement 16 inches oc. Place joint reinforcement continuous in first joint below top of walls.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Support and secure reinforcing bars from displacement. Maintain position

within ½ inch of dimensioned position.

D. Reinforce joint corners and intersections with strap anchors 16 inches oc.

3.6 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel are not scheduled.

C. Maintain minimum 12 inch bearing on each side of opening.

3.7 GROUTED COMPONENTS

A. Reinforce bond beam and pilasters as detailed.

B. Support and secure reinforcing bars from displacement. Maintain position within ½ inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

E. All exterior walls shall be 100% solid grouted.

3.8 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

C. Size control joint in accordance with Section 07900 for sealant performance.

D. Form expansion joint as detailed.

3.9 BUILT-IN WORK

A. As work progresses, install built-in metal door and window frames, anchor bolts, plates, and other items to be built in the work furnished by other Sections.

B. Bed anchors of metal frames in adjacent mortar joints. Fill frame voids solid with grout.

3.10 TOLERANCES

A. Maximum Variation from Plumb: ¼ inch per story non-cumulative; ½ inch in two stories or more.

B. Maximum Variation from Level Coursing: ⅛ inch in 3 ft and ¼ inch in 10 ft; ½ inch in 30 ft.

3.11 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.

3.12 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Clean soiled surfaces with cleaning solution.

END OF SECTION

SECTION 04730
ADHERED MANUFACTURED STONE VENEER

PART 1 GENERAL

1. SECTION INCLUDES

A. Manufactured Stone
B. Manufactured Stone setting materials and accessories

2. MANUFACTURER AND INSTALLER

A. Stone Products Manufacturer: 10 years continuous AMSV manufacturing experience. Member of “Masonry Veneer Manufacturer’s Association.”
B. Centurion, Norse, and Coronado, are acceptable manufacturers. Others may be substituted meeting qualifications by prior request and approval compliant to Div. 1 requirements.
C. Installer: 5 Years continuous AMSV installation experience.

3. SUBMITTALS

A. Submit manufacturer's product data sheets including installation instructions.
B. Submit sample of specified products showing blend variation in color, pattern, and texture.
C. Submit evidence of manufacturer and installer qualifications for review.

4. MOCK-UP

A. Erect job site mock-up of every stone veneer and water table condition for approval. Retain approved mock-up for quality control standard.

PART 2 PRODUCTS

2.1 PRODUCTS AND MATERIALS

A. Stone Veneer: 2.0”-3.0” thick (2.5” average thickness), mortarless “dry stack” units. Provide matching corner units. Pattern and color as selected from manufacturer’s standards.

P ART 3 EXECUTION

3.1 INSTALLATION

A. Install per manufacturer’s written instructions.
B. For stone veneer on wood framed walls, apply metal lath over drainage mat and

two layers of Weather Resistant Moisture Barrier (WRMB) attached to exterior wood sheathing of 19/32" min. thickness (Note: 7/16" OSB not approved substrate). Provide weeps thru stone veneer above grade to allow drainage mat to freely drain to outside. Apply scratch coat over lath. Apply masonry mortar bed over scratch coat and bond stone units to mortar bed. Approximate average total thickness of stone lay-up to be 2.5" not including wall sheathing. Coordinate exact lay-up thickness with Architect.

C. For stone veneer on concrete masonry units backer, fully bond stone units in mortar bed without voids where water might accumulate and freeze. Apply mortar bed over scratch coat and metal lath. Approximate average total thickness of stone lay-up to be 2.5". Coordinate exact lay-up thickness with Architect.

D. **Coordinate lay-up patterns and other installation details with Architect prior to ordering materials or performing work. Perform all work to conform to approved job site mock-up.**

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

1 GENERAL

1.1 SUMMARY

A. Section includes structural steel framing members, base plates, plates, grouting under base plates and anchor bolts.

1.2 SUBMITTALS

A. Shop Drawings: Indicate sizes, spacing, and locations of structural members, openings, connections, cambers, loads, and welded connections.

1.3 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC - Specification for Design, Fabrication and Erection of Structural Steel for Buildings.

B. High Strength Bolting: In accordance with AISC - Specification for Structural Joints Using ASTM A325 Bolts.

C. Welding: In accordance with AWS D1.1.

1.4 QUALIFICATIONS

A. Design structural steel under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

2 PRODUCTS

2.1 STRUCTURAL STEEL

A. Structural Steel Members: ASTM A36/A36M.

B. Structural Tubing: ASTM A500, Grade B.

C. Pipe: ASTM A53, Grade B.

D. Bolts, Nuts, and Washers: ASTM A325.

E. Anchor Bolts: ASTM A307.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 7,000 p.s.i at 28 days.

H. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.2 FABRICATION

A. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

B. For embed weld plates exceeding 16” in any dimension, provide 3” min. diameter vent holes along center line to ensure full contact of concrete with bottom of base plate.

2.3 FINISH

A. Prepare and shop prime structural component surfaces in accordance with SSPC SP 2.

B. Do not prime surfaces being fireproofed, field welded, in contact with concrete, or high strength bolted.

3 EXECUTION

3.1 EXAMINATION

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

3.2 ERECTION

A. Allow for erection loads. Install temporary bracing to maintain framing in alignment until completion of erection and installation of permanent bridging and bracing.

B. Field weld components indicated on Drawings and/or shop drawings. Do not field cut or alter structural members without approval of Architect/ Engineer.

D. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

E. Grout under elevated base plates. Provide full contact with steel plate without voids. Utilize double leveling nuts. Provide 1” nominal grout thickness under plates. For vented flush embed weld plates, ensure full contact of concrete with bottom of steel plate. For larger weld plates with vent holes, allow concrete slurry to extrude through holes and screed flush with top of plate.

END OF SECTION

SECTION 05726
HANDRAILS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall mounted wood handrails at stairs and ramps exceeding 1:10.

1.2 SUBMITTALS

A. Shop Drawings: Submit for approval.

PART 2 PRODUCTS

2.1 Handrail: Econorail AW-254 (2 ½" x 4") wood rail with finger grooves with concealed fastener wall brackets at 48" max. O.C.

PART 3 EXECUTION

3.1 Design and Layout: Per applicable building codes

3.2 Installation: Provide structural back-up blocking in light framed construction for wall bracket attachment. Utilize appropriate fasteners and attachment methods to meet applicable code loadings and job conditions

3.3 Stairs: Install wall mount handrails at all stairs exceeding three risers, on one adjacent wall for up to 44 inch width and both sides for widths over 44 inches. Mount 30 inches min. and 38 inches max. vertical dimension above leading edge of tread to top of railing.

3.4 Ramps: Install wall mount handrails at one side only of all ramps exceeding 1:15 slope at a height of 34 inches min. and 38 inches max. vertical dimension above surface of ramp. Extend handrail 1 ft. beyond ramp at top and bottom.

3.5 Stain and apply clear finish to handrails per painting specification requirements, color as selected.

END OF SECTION

SECTION 06103
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes structural floor, wall, and roof framing; built-up structural members; wall and roof sheathing; subfloor sheathing; preservative treatment; sill flashings; and roof curbs and cants; blocking in wall and roof openings; wood furring; concealed wood blocking, and plates.

1.2 QUALITY ASSURANCE

A. Perform all work in conformance to applicable Building Code and Industry Standards of acceptable practice.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

A. Lumber Grading Rules: SPIB.

B. Beam Framing: Stress Group SYP species, No. 2 dense grade, 19 percent maximum moisture content.

C. Joist Framing: Stress Group SYP species, No. 2 grade, 19 percent maximum moisture content.

D. Rafter Framing: Stress Group SYP species, No. 2 grade, 19 percent maximum moisture content.

E. Non-structural Light Framing: Stress Group SYP species, No. 3 grade, 19 percent maximum moisture content.

F. Studding: Stress Group SYP species, No. 2, No. 2 ^{KD}, stud, or construction grade, 19 percent maximum moisture content.

G. Sill Plate: SYP species, Pressure treated, No. 3 grade.

2.2 SHEATHING MATERIALS

A. Roof Decking: ANSI A208.1, APA Oriented Strand Board, wood flakes set with waterproof resin binder; rated sheathing grade; Exposure 1; un-sanded, square edges, 23/32" thickness unless otherwise noted on plans.

B. Wall Sheathing: ANSI A208.1, APA Oriented Strand Board; wood flakes set with waterproof resin binder; rated sheathing grade; un-sanded faces, 19/32 inch thick, exposure 1.

C. Sub-flooring (where noted or required): ANSI A208.1, APA Oriented Strand Board STURD-I-Floor, Tongue and Groove edges at sides, square edge at head joints, 23/32 inch thick for floor framing at 16" o.c; 1 inch thick for floor framing at 24" o.c.; or as noted on drawings.

D. Telephone and Electrical Panel Boards: Plywood Fire retardant treated, 3/4" thick, 4' x 6' min. size.

E. Attic Flooring(where noted or required): 19/32” for 16” centers, 23/32” OSB for 24” centers.

2.3 UNDERLAYMENT MATERIALS

A. Underlayment: APA Oriented Strand Board; wood flakes set with waterproof resin binder; grade; sanded faces. Exposure 1, rated STURD-I-Floor plus, T & G edges, 19/32 inch thickness unless otherwise noted on plans.

2.4 ACCESSORIES

A. Fasteners: Galvanized steel for exterior, high humidity, and treated wood locations, plain finish elsewhere.

B. Die Stamped Connectors: galvanized steel.

C. Structural Framing Connectors and Hangers: Galvanized steel, sized to suit framing conditions.

D. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

E. Sill Gasket on Top of Foundation Wall: Plate width, closed cell foam strip.

F. Subfloor Glue: APA AFG-01, solvent base, waterproof.

G. Building Paper: ASTM D226 No. 15 asphalt felt.

H. Building Wrap: Breathable moisture barrier, reinforced plastic, Tyvek or equal.

2.5 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA Treatment C1 using water borne preservative with 0.25 pcf retention.

PART 3 EXECUTION

3.1 FRAMING

A. Erect wood framing members in accordance with applicable Building code and Industry Standards of acceptable practice. Place members level and plumb. Place horizontal members crown side up.

B. Place sill gasket directly on foundation.

C. Frame double joist headers at floor and ceiling openings. Frame rigidly into joists. Frame double joists under wall studding.

D. All roof rafters and plate connected wood trusses shall be provided with approved wind/seismic anchors at exterior wall bearings.

E. Wall studs shall be continuous un-spliced full height from sill plate to rafter, joist, or truss bearing plate.

F. Built-up wood headers and beams shall be continuous full span without splices.

G. Do not allow joists or rafters to be notched or cut. Provide passage of conduits or plumbing by boring of holes not exceeding 25% of member depth and located within the center 1/3 of member depth.

H. For wall framing, do not allow studs to be notched or cut. Provide for passage of conduits or plumbing by boring of holes not exceeding 50% of member depth with 1 inch min. clear to face of stud.

I. At girder truss bearing points and in wall beam bearing pockets provide maximum number of studs/cripples under bearing.

J. Fasten framing per applicable Building Code.

K. Bridge joists in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.

L. Curb roof openings except where curbs are provided. Construct curb members of single pieces for each side.

3.2 SHEATHING

A. Install subfloor sheathing with longer edge perpendicular to floor framing with end joints staggered. Secure sheet edges over firm bearing. Attach sheathing with subfloor glue and gypsum board screws.

B. Place building paper between underlayment and subflooring.

C. Secure wall sheathing with ends staggered, over firm bearing.

D. Place structural wall sheathing at 100% of building exterior where wood studs are utilized for wall framing. Support all edges and joints with blocking as required.

E. Place building wrap over wall sheathing, weather lap joints and end laps. Utilize wind resistant fasteners. Install per manufacturer's instructions.

F. Install telephone and electrical panel back boards with plywood sheathing material where required. Size back board by 12 inches beyond size of equipment to be mounted.

G. Install sheathing with 1/8 inch head joint space for expansion. Fasten to framing per Manufacturer's recommendations and applicable building codes.

END OF SECTION

SECTION 06173
WOOD TRUSSES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes shop fabricated wood trusses for roof framing; as required on drawings, bridging, bracing, connectors, and anchorage device.

1.2 SYSTEM DESCRIPTION

A. Roof Design Load: Live load of 20 lbs./sq. ft.; collateral load of 5 lbs./sq. ft., with deflection limited to 1/360 of span.

B. Roof Wind Uplift Design Load: Statutory per Building Code; deflection limited to 1: 240 of span.

C. Floor Design Load (where applicable): combined Live load plus dead of 125 lb/sq. ft. for balconies, stages and corridors; 75lbs/sq. ft for other areas. Limit deflection to 1:480 of span.

1.3 SUBMITTALS

A. Shop Drawings: Indicate sizes and spacing of trusses and associated components, web and chord sizes, plate sizes, fastener descriptions and spacings, loads and truss cambers, framed openings, and attachment hardware. Submit design calculations.
Provide truss configurations, bearing and anchor details, bridging and bracing.
Provide schedule of all connections/hangers and fasteners.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:
Lumber Grading Agency: Certified by ALSC.

B. Truss Design, Fabrication, and Installation: In accordance with TPI 1 and TPI HIB-91. Truss Plate Institute BWT-76, HET-80, TPI-85 including Supplement, QST-88.

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

D. Design trusses under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location. All submittals shall bear Engineer's Certification.

PART 2 PRODUCTS

2.1 WOOD TRUSSES

A. Manufacturers: Subject to approval of A/E.

2.2 MATERIALS

A. Lumber Grading Rules: SPIB.

B. Wood Members: Single top and bottom chord: Stress Group Southern Yellow Pine SYP species No. 1 min. grade; 19 percent maximum and 7 percent minimum moisture content. Finger scarfing not permitted. Web members: No. 2 grade min., 19 percent max. and 7 percent min. moisture content. For multi-ply girder truss, face nail single trusses together with 16d nails at 12" o.c.

C. Steel Plate Connectors: TPI 1, Section 6;, galvanized; die stamped with integral teeth.

D. Truss Bridging: Type, size and spacing recommended by truss manufacturer. Provide bridging/blocking at eave bearing for deep heel bottom chord bearing eave condition.

2.3 ACCESSORIES

A. Wood Framing for Openings: softwood lumber, SYP species, No. 2 grade, 19 percent maximum and 7 percent minimum moisture content.

B. Fasteners and Anchors:
Fasteners: Electro galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

C. Hangers and Fasteners: Galvanized steel, size and type to suit application. Refer to "Simpson" Wood Construction Connectors Catalog. Provide schedule of hangers and fasteners required for design.

D. Connectors and Bearing Plates: Plain steel, 1/4 inch thickness.

E. Fasteners: Utilize specific fasteners required by Manufacturer of anchorage device. Do Not Substitute.

F. Provide seismic anchors to attach truss to exterior perimeter wall top plate.

2.4 FABRICATION

A. Fabricate trusses to achieve structural requirements specified.

B. Brace wood trusses for support in accordance with TPI and BWT-76.

C. Furnish bottom and top chord extensions as indicated on Drawings.

D. Fabricate to achieve minimum end bearing of:
2 inches on steel.
2 inches on masonry and concrete.
3 inches on wood

Do not exceed allowable bearing pressure, compression perpendicular to grain, for SPF lumber species of 425 lbs. per sq. in. Where necessary, provide load distributing bearing plates or utilize other devices or methods to limit bearing pressures to allowable limits. Where trusses have interior wall bearing points, check bearing pressure for compliance as well as end bearing points.

E. Frame special sized openings in web framing as detailed or required for coordination with other trades work.

F. Where folding doors are indicated on Plans to be supported by bottom chord(s) of roof trusses design for added bottom chord loading of 200 lbs. per lin. ft. for folding door in addition to other LL, DL, and collateral loads specified. Design folding door support trusses to provide L/480 max. deflection. Where folding door track is directly below and parallel to a single truss, provide 2-ply truss centered above. Where load is distributed between two or more trusses parallel to door, added load may be proportioned between support trusses. For trusses parallel to folding door, provide 2x8 min. bot. chord. Where load is carried by trusses perpendicular to door, design trusses to carry added point load on bottom chord of 400 lb. and design to locate panel point at point load location or provide 2x8 min. bottom chord.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify supports and openings are ready to receive trusses.

3.2 PREPARATION

A. Coordinate placement of bearing support items.

3.3 ERECTION

A. Install trusses in accordance with TPI HIB-91.

B. Set members level and plumb, in correct position.

C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in indicated alignment until completion of erection and installation of permanent bracing.

D. Do not field cut or alter structural members without approval of Architect/ Engineer.

E. Place headers and supports to frame openings.

F. Frame openings between trusses with construction grade lumber.

G. Coordinate placement of decking and/or sheathing with work of this section.

H. Install all hanger, joiner, and anchorage devices per manufacturer's written instructions, shop drawings schedule, and details on plans.

I. Coordinate web member spacing with HVAC contractor to ensure passage of ductwork.

3.4 ERECTION TOLERANCES

Framing Members: 1/4 inch maximum horizontally from indicated position, 1/8" vertically.

END OF SECTION

SECTION 06180
GLUE-LAMINATED WOOD CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pre-engineered glued laminated timber beams, purlins, arches, columns, and steel hardware as required for complete structural system.

1.2 SYSTEM DESCRIPTION

A Design and laminate members to AITC 117 Standard and A190.1. Code and reference standards: AITC Timber Construction Manual.

B. Design Floor Live Load (where applicable): Statutory with deflection limited to 1/480 of span.

C. Design Roof Live Load: 20 lbs/sq ft with deflection limited to 1/240 of span in open areas and 1/360 of span where adjoining other construction

D. Dead load shall be calculated based on weight of laminated wood system and other imposed loads.

E. No reduction for tributary loading permitted.

F. Collateral loading shall be calculated based on 5 lb./sq. ft. minimum allowance.

G. Where windows or doors occur below laminated members, limit deflection to 1/480 of span.

H. Provide camber in beams equal to dead load deflection plus one half of live load deflection unless noted otherwise.

I. Design Wind Load: 110 MPH min. or higher where required by applicable building code. Snow load shall be in accordance with Building Code. Snow drift shall be considered in the design. System design shall include 150 mph wind load reactions for all roof mounted appurtenances.

1.3 SUBMITTALS

Shop Drawings: Indicate framing system, sizes and spacing of members, loads and cambers, bearing and anchor details, bridging and bracing, and framed openings. Submit design calculations with tabulated reactions. Indicate interface with other parts of structure. Note locations of and provision for concentrated superimposed loads where occurring.

Pre-finish stain color samples: Submit manufacturer’s standard color samples of actual stain on pine boards for selection. Representative color images are not acceptable.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with AITC manual of practice.

B. Perform welding Work in accordance with AWS D1.1.

C. Erector: Company specializing in erection of this Work with 5 years min. documented experience and approved by manufacturer.

D. All glulam members shall be marked with “Quality Mark”of the American Institute of Timber Construction. A Certificate of Conformance shall be provided to indicate conformance with ANSI/AITC A190.1.

E. Design structural members under direct supervision of professional Structural Engineer experienced in design of glue laminated structural units, registered in State of Project location. All Submittals shall bear Engineer’s certification including wind/seismic design per building code. Any size notations on architectural plans shall be for limiting parameters (minimums/maximums) and final member sizing shall be by Vendor’s Design Engineer.

1.5 STORAGE, DELIVERY, AND HANDLING

A. Protect members to AITC requirements for individually wrapped.

B. Proper care shall be taken in order to ensure that all materials shall be delivered to site in first-class condition. Architect reserves the right to reject as non-complying such materials and products that do not arrive on job site in first-class condition, properly wrapped to prevent damage and properly identified by appropriate agency stamps.

C. All materials shall be handled and stored on job site to protect from damage. Store off ground and under protective cover to prevent contamination by mud, dirt, water or other materials likely to cause staining or other defects.

PART 2 PRODUCTS

2.1 GLUE-LAMINATED STRUCTURAL UNITS

A Acceptable Manufacturers:

1. Anthony Wood Products Co., El Dorado, AR
2. Structural Wood Systems, Inc., Greenville, AL
3. Substitutions: Permitted only by approval of request for substitution. Lumber: SYP lumber conforming to SPIB grading rules with 12 percent maximum moisture content before fabrication. Design for the following values:
    Bending (F_b): 2.400 psi.
    Tension Parallel to Grain (Ft): 1,150 psi.
    3. Compression Parallel to Grain (F_c): 1,700psi.
    4. Compression Perpendicular to Grain Bottom (F_c): 650 psi.
    5. Compression Perpendicular to Grain Top (F_c): 650 psi.
    6. Horizontal Shear (Fv): 270 psi.
    7. Modulus of Elasticity (E): 1,700,000 psi.

C. Steel Connections and Brackets: ASTM A36 weldable quality, prime components except where cast in concrete.

D. Connector Bolts: ASTM A307 steel cast in concrete.

E. Laminating Adhesive: ASTM D2559 AITC A190.1; Premium grade; for wet condition of service.

F. Wood Stains and Sealers: Manufacturer's standard clear. Stains shall be selected from Manufacturer's Standards.

G. Bearing Plate Anchors: Toggle bolt type for anchorage to hollow masonry, Expansion shield and lag bolt type for anchorage to solid masonry or concrete, Bolts or ballistic fasteners for anchorage to steel.

H. Metal Primer: Manufacturer's standard rust inhibiting.

I. Each member shall be individually wrapped to provide maximum protection from damage during transit and on site storage.

2.2 WOOD TREATMENT

Wood Preservative (Surface Application): Clear, type, as approved by manufacturer. For all members exposed to weather at exterior (where applicable).

B. Shop treat wood materials.

2.3 FABRICATION

A. Fabricate glue laminated structural members in accordance with AITC or APA Architectural grade.

B. Verify dimensions and site conditions prior to fabrication.

C. Cut and fit members accurately to length to achieve tight joint fit.

D. Do not splice or join members in locations other than those indicated without permission.

E. Fabricate steel hardware and connections with joints neatly fitted, welded, and ground smooth.

F. After end trimming, seal with penetrating sealer coat in accordance with AITC or APA requirements. For column or arch bases at bearing plate utilize preservative treatment.

G. Laminated Wood Vendor shall provide semi-concealed connections where possible with a minimum of exposed fasteners and plates. Where moment splices are unavoidable, provide recessed plate in top and bottoms faces of arch profile. Side mounted surface plates will not be approved. Provide base shoes for columns and arches recessed flush with faces of wood member utilizing flush pin connectors. Exposed bolt heads and nuts not permitted.

H. Exposed portions of structural laminated wood components shall be factory stained.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify supports are ready to receive structural members.

B. Verify sufficient end bearing area where members are supported by other work.

3.2 PREPARATION

A. Coordinate placement of bearing and support items.

3.3 ERECTION

Lift members using protective straps to prevent visible damage.

B. Set structural members level and plumb, in correct positions or sloped where indicated.

C. Provide temporary bracing and anchorage to hold members in place until permanently secured and braced. Where permanent bracing relies upon other parts of structure, leave bracing in place as long as necessary to ensure safety.

D. Fit members together accurately without trimming, cutting, or other unauthorized modification.

E. Swab and seal interior wood surfaces of field drilled holes in members with primer/sealer.

3.4 TOLERANCES

A. Framing Members: 1/2 inch horizontally maximum from indicated position, 1/8 inch vertically.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wood I-Joists

B. Oriented Strand Board (OSB) and Laminated Strand Lumber (LSL) Rim Boards

C. Laminated Veneer Lumber (LVL) and Laminated Strand Lumber (LSL) Beams, Headers, and Columns

D. Glue Laminated Beams (GLB)

E. Bridging, bracing, anchorage, hangers, connectors, and fasteners.

1.2 SYSTEM DESCRIPTION

A. Roof Design Load: Live load of 20 lbs./sq. ft. collateral load of, dead load (actual calculated), and 5 lbs./sq. ft. collateral load. Limit total load deflection to 1/360 for drywall ceiling or 1/240 for lay-in ceiling or no ceiling.

B. Floor Design Load (where applicable): Live load of 75 lb./sq. ft. except balconies and corridors to be 125 lbs./sq. ft.; Dead load, actual. Limit total load deflection to 1/480 of span.

1.3 SUBMITTALS

A. Shop Drawings: Indicate framing system product, sizes and spacing, member, loading and camber, framed openings. Submit design calculations and engineer certification. Sizes indicated on plans are minimums. Special bearing and reinforcement conditions and all anchorage and connections shall be fully detailed.

B. Product Data: Provide manufacturer's installation instructions and product information. Include bearing and anchor details, bridging and bracing, hangers and connectors.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:
B. Lumber Grading Agency: Certified by ALSC.
C. Plywood Grading Agency: Certified by APA.

B. Design all structural components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is

located.

C. Provide independent testing laboratory certification on each component. Identify manufacturer and product on printed label affixed to each piece.

1.5 ACCEPTABLE MANUFACTURES

A. Louisiana Pacific; Wilmington, NC

B. Truss Joist MacMillan; Boise, ID

C. International Paper

D. Timberweld

E. Anthony Wood Products

1.6 WARRANTY

A. Manufacturer's standard limited lifetime performance warranty guarantying products to meet specified performance ratings for life of building.

PART 2 PRODUCTS

2.1 WOOD "I" JOIST AND MATCHING RIM BOARDS

A. Web shall be OSB. Top and bottom chord shall be of LVL or kiln-dried solid sawn lumber.

B. Rim boards shall be OSB (Oriented Strand Board) or LSL (Laminated Strand Lumber), of thickness indicated or required.

C. Product series and sizes shall be as indicated on plans or approved shop drawings if not indicated.

2.2 BEAMS, HEADERS, AND COLUMNS

A. Members shall be Laminated Strand Lumber (LSL), manufactured full length un-spliced with all wood fiber strands oriented parallel with length of member.

2.5 ACCESSORIES

A. Adhesive: ASTM D2559; for wet condition of service.

B. Hangers, Connectors, and Fasteners: Galvanized steel, type to suit application

2.6 FABRICATION

A. Fabricate to achieve structural requirements specified.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that supporting structure is ready to receive work and imposed loading.

B. Coordinate placement and installation of bearing, support, and anchorage items.

3.2 STORAGE AND HANDLING

A. Comply with manufacturer's recommendations. Avoid damage to products. Discard any damaged units.

B. Store with adequate support to avoid damaging stress or distortion. Provide adequate weather protection to keep clean and dry.

C. Handle in bundles with weight distributing lift sling to keep units straight.

3.3 ERECTION

A. Install in accordance with Manufacturer's instructions and approved shop drawings. Set structural members level and plumb, in correct position.

B. Make provisions for erection loads and temporary bracing.

C. Do not field cut or alter structural members without approval of Architect/Engineer and as permitted by Manufacturer.

D. Place headers and supports to frame openings required.

E. Do not allow any temporary construction concentrated loading which exceeds design limits.

F. Install temporary erection bracing as required. Install permanent bridging, blocking, and bracing as detailed or required.

G. Ensure joists are kept straight and plumb without rotation prior to application of sheathing.

H. Notify Manufacturer of completion of installation and allow opportunity for inspection prior to enclosure of system components.

I. Provide OSB web stiffeners where required at high load bearing points per manufacturer's recommendations and/or as detailed.
J. Field nailing shall be as prescribed by manufacturer to prevent damage to member by splitting or de-lamination.

END OF SECTION

SECTION 06200
FINISH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes finish carpentry items, hardware, and attachment accessories.
B. Includes Laminated Plastic

1.2 SUBMITTALS

A. Laminated Plastic Samples: Submit full range of manufacturer's standard product line for color, texture, and pattern selection.

B. Product Data: Submit full range of manufacturer's standard cabinet hardware for selection of style and finish.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with AWI Quality Standards, Custom Grade.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Softwood Lumber: PS 20; Graded in accordance with AWI; PSF species, plain sawn, maximum moisture content of 19 percent.

B. Hardwood Lumber: Graded in accordance with AWI; Red Oak species, quarter sawn, maximum moisture content of 11 percent; with mixed grain, of quality suitable for transparent finish.

C. Softwood Plywood: PS 1 Grade B-C; veneer core; SYP face species, rotary cut.

D. Hardwood Plywood: Cabinet Grade; Graded in accordance with AWI II veneer core, type of glue recommended for application; Red Oak face species, rotary cut.

E. Wood Particleboard: ANSI A208.1 Type 1or 2; standard, composed of wood chips, sawdust, or flakes of medium density, made with high waterproof resin binders; of grade to suit application; sanded faces.

F. Plastic Laminate: NEMA LD 3; 0.050 inch General Purpose quality; color, pattern, and surface texture as selected.

2.2 ACCESSORIES

A. Fasteners: Size and type to suit application; Electro galvanized steel for exterior, high humidity and treated wood locations, plain finish elsewhere.

B. Contact Adhesives: Water Base type.

C. Structural Adhesive: Cartridge type, compatible with substrate, capable of achieving durable bond.

D. Primer: Alkyd primer sealer type.

E. Hardware:
1. As noted on Drawings or required for application. Style and finish as selected.
2. Door and Drawer pulls to be wire pulls.
3. Door hinges to be semi-concealed type pivots.
4. Color to be as selected from manufacturer's standards. Include zinc plate, chrome, brushed chrome/alum., bronze anodized, and painted options.
5. Drawer Guides: To be full suspension, side mount, medium weight rated.
6. Adjustable shelf supports: "KV" inserts, fully adjustable.

2.3 FABRICATION

A. Fabricate to AWI Custom standards.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Prime paint surfaces of items or assemblies in contact with cementitious materials, before installation.

3.3 INSTALLATION

B. Install work in accordance with AWI Custom quality standard.

C. Set and secure materials and components in place, plumb and level.

D. Cover exposed edges of shelving with 3/8 inch thick hardwood edging.

E. Apply plastic laminate finishes with adhesive over entire surface. Apply laminate backing sheet on reverse side of plastic laminate finished surfaces.

F. Install hardware in accordance with manufacturer's instructions. Adjust for smooth operation and proper alignment.

3.4 PREPARATION FOR FINISH

A. Sand work smooth and set exposed fasteners. Joinery and surface preparation shall be suitable for semi-transparent stain finish.

3.5 SCHEDULES

A. Interior:
1. Door, Glazed Light, and Pocket Door Frames: Clear fir, prepare for stained finish.
2. Window Sills: Clear fir, prepare for stained finish.
3. Stairs, Balustrades, and Handrails: Clear fir, prepare for stained finish.
4. Moldings, Bases, Casings, and Miscellaneous Trim: Clear fir, prepare for stained finish.
5. Countertops: On-site applied plastic laminate work.

END OF SECTION

SECTION 07210
THERMAL BLANKET BUILDING INSULATION

PART 1 GENERAL

1 SECTION INCLUDES

A. Batt and/or roll fiberglass thermal insulation and vapor retarder in framed exterior walls, roof/ceiling, floor construction as applicable per plans and details on Drawings.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

A. Thermal Insulation: ASTM C665, preformed glass fiber bat or roll insulation conforming to the following:
1. Thermal Resistance: R values or thickness as noted on Drawings. In walls, full thickness of cavity.
2. Facing: Faced on one side with asphalt treated Kraft paper.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install insulation in accordance with insulation manufacturer's instructions.

B. Install thermal insulation tightly fitted in exterior walls, roof, and ceiling spaces without gaps or voids.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

A. Thermal Insulation: ASTM C665, preformed glass fiber conforming to the following:
1. Thermal Resistance: R as noted on drawings.
2. Facing: Faced on one side with asphalt treated Kraft paper.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install insulation in accordance with insulation manufacturer's instructions.

B. Install tightly fitted in exterior walls, roof, and ceiling spaces without gaps or voids.

C. Install thermal insulation with factory applied membrane facing warm side of building spaces. Attach flanges of facing to face of studs in walls and to face of rafter/ceiling joists in cathedral ceilings. Install loose laid friction fit between framing members above ceiling in accessible attic spaces. Install thermal insulation in walls adjoining Garage or other non-heated & cooled spaces such as closets, storage rooms, or mechanical rooms.

END OF SECTION

SECTION 07214
FOAMED-IN-PLACE INSULATION

1. GENERAL

1.1 SECTION INCLUDES

A. Foamed-in-place rigid closed cell polyurethane insulation

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

2. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. International Code Council – International Building Code:

1. Section 2603 Foam Plastic Insulation.

1.3 SUBMITTALS

A. Before commencing work, submit technical data sheets and samples including but not limited to the following:

1. Technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

1. Contractor performing work under this section shall be factory trained applicator. Provide current certificate from manufacturer confirming and statement of experience record in application of spray polyurethane foam insulation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered in manufacturer's original containers clearly labelled with manufacturer's name, product identification, safety information, net weight of contents and expiration date.

B. Material shall be stored in a safe manner and where the temperatures are in the limits specified by the material manufacturer.

C.Empty containers shall be removed from site on a daily basis.

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

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Ventilate insulation application area in accordance with the Spray Foam Coalition's Guidance[1] on best practices for the installation of Spray Polyurethane Foam.

C. Protect adjacent surfaces, windows, equipment and site areas from overspray.

1.7 WARRANTY

A. Provide Manufacturer's limited lifetime Warranty warrantying spray-in-place urethane foam insulation will perform as stated in the Product Technical Data Sheet. This warranty is in effect throughout the life of the building. Warranty shall be to repair or replace any defective Product at the cost of the material only.

2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Acceptable Manufacturer: DEMILEC USA®; 2925 Galleria Dr, Arlington, TX 76011. Tel: (817) 640-4900. Fax: (817) 633-2000. Email: specs@demilecusa.com. Web: http://www.demilecusa.com

B.Substitutions: Equivalent as approved by Architect

C. Requests for substitutions will be considered in accordance with provisions of Division 1.

2.2 SPRAY FOAM INSULATION

A. Spray Applied Rigid Polyurethane Foam Insulation System product: HEATLOK SOY® 200 PLUS Manufactured by DEMILEC USA®, Arlington, TX

2.3 Installation:

A. Attics and Crawlspaces: Passed AC 377 Appendix X compliant NFPA 286. Up to 7-1/2 inches on vertical surfaces and 11-1/2 inches on the underside of roof deck with no intumescent coating

2.4 Physical Properties:

A. Density (ASTM D 1622): 2.1 lb/cf.

B. Thermal Resistance (ASTM C 518): Aged R value per 1 inch

C. Water Vapor Permeance @ 1.2"(ASTME 96-05): < 1 perms (is a vapor barrier per IBC Section 202 definitions at 1.2")

D. Air Permeance @ 75 Pa @ 1" (ASTME 2178-03): 0.02 L/sm^2

E. Compressive Strength (ASTM D 1621): 28.7 psi.

F. Tensile Strength (ASTM D 1623): 46.2 psi

G. Off Gassing Test (VOC Emissions) (CGSB 51.23-92): Pass (no toxic vapor).

H. Surface Burning Characteristics (ASTM E 84) 4 inches: Class I. Flame Spread Index 20, Smoke Developed Index 400.

I. Closed Cell Content (ASTM D2856) : >90%.

J. Flash Point: None

K. Non-toxic, drain safe, water based, non-fuming.

3. EXECUTION

3.1 EXAMINATION OF PROJECT SITE CONDITIONS

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

B. Notify Architect of unsatisfactory preparation before proceeding.

C. Commencement of work outlined in this section shall be considered as acceptance of existing work and conditions.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.

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

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions. Apply as recommended by manufacturer to average thickness indicated on drawings. **Equivalent R rating method of thickness determination is not approved.** Thickness will be probed and measured. Minimum thickness at low spots shall provide no less than 90% of average thickness indicated on Drawings.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07215
RIGID FOAM BOARD INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Rigid Board insulation for installation at locations indicated on Drawings.

1.2 REFERENCES

A. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.

B. ASTM D2842 - Water Absorption of Rigid Cellular Plastics.

PART 2 PRODUCTS

2.1 MANUFACTURERS - INSULATION MATERIALS

A. Dow Chemical Company, Midland, MI: Product: STYROFOAM brand.

B. Substitutions: Comply with provisions of Section 01010.

2.2 INSULATION MATERIALS

A. Extruded Polystyrene Insulation (XPS): ASTM C578 Type VI cellular type, conforming to the following:

1. Board Size: 24 x 96 inch.
2. Board Thickness: 1.5” or as noted on plans.
3. Thermal Resistance: R of 5.0 (ASTM C 518) warranted by manufacturer to retain at least 90% of its published R-value for 15 years.
4. Water Absorption: In accordance with ASTM D272 0.1 percent by volume maximum.
5. Compressive Strength: Minimum 40 psi (ASTM D 1621).
6. Board Edges: Square or tongue and groove edges.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation work.

3.2 INSTALLATION

A. Install on substrates and at locations shown on Drawings. Where perimeter foundation insulation is detailed, apply to vertical surface. Horizontal below slab installation not permitted.

B. Install utilizing method(s) recommended by manufacturer for applications conditions. Cut insulation boards in largest dimensions practicable to minimize joints. Fit tightly and leave no gaps.

3.3 PROTECTION OF FINISHED WORK

A. Do not permit work to be damaged prior to covering insulation.

END OF SECTION

SECTION 07272
WATER RESISTIVE VAPOR PERMEABLE AIR BARRIER

PART 1 - GENERAL

1.1 Included

A. Membrane
B. Adhering, sealing, and flashing tapes, sealants, and adhesives
C. Mechanical fasteners
D. Factory formed adhered corners

1.2 Submittals

A. Manufacturer's product data sheets and installation instructions
B. 12" sq. piece of membrane product

PART 2 - PRODUCTS

2.1 Membrane: Vapro Shield "Wrap Shield" or Tyvek Commercial Building Wrap system with integrated horizontal joint tape. Product shall provide nine month minimum exposed weather and UV resistance while maintaining water resistant performance while construction is in progress prior to application of permanent siding or other exterior wall finish.

2.2 Accessory Products: Manufacturer's proprietary products for integrated performance system.

PART 3 - EXECUTION

3.1 Install products per manufacturer's written instructions utilizing combination of integrated tape, mechanical fasteners, and adhesive joint tapes.

3.2 Flash all door and window openings as a "system" utilizing manufacturer recommended methods and materials.

3.3 Supplement sealing at special conditions with proprietary fluid applied liquid flashing.

3.4 Install membrane system promptly over sound, dry wall sheathing substrate. Do not install over sheathing which has sustained extended exposure to weather elements and has begun to show signs of weathering and/or water damage.

3.5 Leave no open joints where wind could lift membrane and break seal or wind driven rain could penetrate and damage substrate.

END OF SECTION

SECTION 07312
COMPOSITION ROOFING SHINGLES

PART 1 GENERAL

1. SUMMARY

A. Section Includes:
1. Asphalt shingles.
2. Underlayment.
3. Eave and valley protection.
4. Ridge and eave vents (where applicable).
5. Metal flashings and accessories.

1.2 SUBMITTALS

A. Product Data: Submit data indicating material characteristics, and limitations.

B. Samples: Submit two inch samples of each shingle color indicating color range and finish texture/pattern; for color and texture selection.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Steep Roofing Manual.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Do not install eave protection and shingles when surface, ambient air, or wind chill temperatures are below 45 degrees F.

1.5 WARRANTY

A. Furnish 30 year manufacturer warranty for asphalt shingles.

PART 2 PRODUCTS

2.1 ASPHALT SHINGLES

A. Manufacturers:
1. Celotex Corporation
2. Certain Teed Corporation
3. Elk Corporation of America
4. GAF Building Materials Corporation
5. Owens Corning Fiberglas Corp.

B. Product Description: Laminated (Architectural) Asphalt shingles conforming to ASTM D3018, Class A with Type I - Self Sealing, UL Rating of A and Wind Resistance Label, mineral granule surface type; 325 lb/100 sq. ft. weight;

standard self sealing type; square tab, standard interlocking type: color and texture as selected.

2.2 COMPONENTS

A. Eave (Ice Dam) and Valley Protection: Sheet barrier of rubberized asphalt bonded to sheet polyethylene, 40 mil total thickness, with strippable treated release paper. Extend eave protection 30” minimum or as required to extend 12” min. to interior of exterior walls. Valley protection to be 15” each side of centerline.

B. Underlayment: ASTM D226, No. 15 unperforated asphalt saturated felts as recommended for use in waterproofing and in construction of built-up roofs or synthetic synthetic underlayment as approved by roofing shingle manufacturer.

2.3 ACCESSORIES

A. Nails: Standard round wire shingle type hot dipped zinc coated steel type, of sufficient length to penetrate through roof sheathing.

B. Plastic Cement: ASTM D4586, Asphalt type with mineral fiber components, free of toxic solvents, capable of setting within 24 hours at temperatures of 75 degrees F and 50 percent RH.

C. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

D. Flashing Materials:
1. Sheet Flashings: ASTM B209, 0.03 inch thick aluminum; pre-coating of PVC, color as selected.

F. Bituminous Paint: Acid and alkali resistant type; black color.

2.4 FABRICATION

A. Form flashings to profiles indicated on Drawings, and to protect roofing materials from physical damage and shed water.

B. Form flashing sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

C. Hem exposed edges of flashings minimum 1/4 inch on underside.

D. Apply bituminous paint on concealed surfaces of flashings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.

B. Verify roof openings are correctly framed

C. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.2 PREPARATION

A. Fill knot holes and surface cracks with latex filler at areas of bonded eave protection. Cover knot holes with sheet metal.

B. Broom clean deck surfaces under eave protection and underlayment.

3.3 INSTALLATION

A. Eave (Ice Dam) Protection Installation:
   1. Place eave edge and gable edge metal flashings tight with facia boards. Weather lap joints minimum 2 inches and seal with plastic cement. Secure flange with nails.
   2. Apply 4 inch wide band of plastic cement over deck flange of eave edge flashings, and embed minimum 18 inch wide strip of underlayment. Place underlayment starter strip with eave edge flush with face of flashings. Secure in place. Lap ends minimum 6 inches.
   3. Apply lap cement at rate of approximately 1-1/4 gal/100 sq. ft. over underlayment starter strip.
   4. Starting from lower edge of starter strip, lay additional 36 inch wide strips of underlayment in lap cement, to produce two ply membrane. Weather lap piles minimum 19 inches and nail in place. Lap ends minimum 6 inches. Stagger end joints of each consecutive ply.
   5. Extend eave protection membrane minimum 2 ft. up-slope beyond interior face of exterior wall.

B. Protective Underlayment Installation:
   1. Place one ply of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches. Stagger end laps of each consecutive layer. Nail in place.
   2. Place second ply of underlayment over first layer with ends and edges weather lapped minimum 4 inches. Stagger end laps of each consecutive layer. Nail in place.
   3. Install protective underlayment perpendicular to slope of roof and weather lap minimum 4 inches over eave protection.
   4. Weather lap and seal watertight with plastic cement items projecting through or mounted on roof.

C. Valley Protection Installation:
   1. Place rubberized asphalt/polyethylene sheet as valley protection.

2. Apply 4 inch wide band of lap cement along each edge of first ply layer and embed ply of roll roofing minimum 36 inches wide, centered. Place with mineral surface side up. Press into cement to encourage bond and nail in place minimum 18 inches o.c., 1 inch from edges.

D. Metal Flashing and Accessories Installation:
1. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.
2. Secure in place with nails. Conceal fastenings.
3. Flash and seal work weather tight, projecting through or mounted on roofing with plastic cement.

E. Shingle Installation:
1. Place shingles in straight coursing pattern as indicated on Drawings with 5 inch weather exposure to produce double triple thickness over full roof area. Install double triple course of shingles at eaves.
2. Project first course of shingles 3/4 inch beyond fascia boards.
3. Extend shingles ½ inch beyond face of gable edge fascia boards.
4. Extend shingles on both slopes across valley in weave pattern and fasten. Extend shingles minimum of 12 inches beyond valley center line to achieve woven valley, concealing valley protection.
5. Cap hips and ridges with individual shingles, maintaining 5 inch weather exposure. Place to avoid exposed nails.
6. After installation, place two daubs of plastic cement, one inch diameter under each individual shingle tab exposed to weather, to prevent lifting.
7. Install ridge vents centered over ridge.
8. Cap hips and ridges with individual shingles. Place to avoid exposed nails.
9. Coordinate installation of roof mounted components or Work projecting through roof with weather tight placement of Counter-flashings.
10. Complete installation to provide weather tight service.
11. Fasten shingles to decking with hand driven nails, air nailing or staples not permitted.

END OF SECTION

SECTION 07421

FORMED METAL WALL PANELS, SOFFITS, FASCIAS, GUTTERS, AND DOWNSPOUTS

1.GENERAL

1. SECTION INCLUDES

   A. Flush-profile, concealed fastener metal wall panels, with related metal trim, and accessories.

2. QUALITY ASSURANCE

   A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer.

   B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.

   C. Substitutions: Not allowed except as stipulated in Division 01 General Requirements.

   D. Installer Qualifications: Experienced Installer with minimum of five years experience with successfully completed projects of a similar nature and scope.

3. ADMINISTRATIVE REQUIREMENTS

   A. Pre-installation Meeting: Prior to erection of framing, conduct pre-installation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.

      1. Coordinate building framing in relation to metal panel system.
      2. Coordinate openings and penetrations of metal panel system.

4. ACTION SUBMITTALS

   A. Product Data: Manufacturer’s data sheets for specified products. Include data indicating compliance with performance requirements.

   B. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.

   C. Samples for Verification: Provide 12-inch long section of each metal panel profile. Provide color chip verifying color selection.

   D. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.

5. CLOSEOUT SUBMITTALS

   A. Maintenance data.

   B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

6. DELIVERY, STORAGE, AND HANDLING

A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.

1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.
3. Shield foam insulated metal panels from direct sunlight until installation.

7. WARRANTY

A. Special Manufacturer’s Warranty: On manufacturer’s standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within two years from date of Substantial Completion.

B. Special Panel Finish Warranty: On Manufacturer’s standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:

1. **Modified Silicone-Polyester** Two-Coat System:
   a. Color fading in excess of 7 Hunter units per ASTM D2244.
   b. Chalking in excess of No. 6 rating per ASTM D4214.
   c. Failure of adhesion, peeling, checking, or cracking.
   d. Warranty Period: 30 years from date of Substantial Completion.

2.PRODUCTS

1. MANUFACTURER

A. Basis of Design Manufacturer: Central States Manufacturing; Springdale, AR

B. Provide basis of design product, or comparable product approved by Architect prior to bid.

2. PERFORMANCE REQUIREMENTS

A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.

B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:

1. Wind Loads: Determine loads based on statutory uniform pressure, importance factor, exposure category, and wind speed.

2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/120 of the span with no evidence of failure.
3. Seismic Performance: Comply with ASCE 7 Sections 9, "Earthquake Loads."

C. Wall Panel Water Penetration Static Pressure, ASTM E331: No uncontrolled water penetration at a static pressure of 6.24 lb/sq. ft..

D. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

3. FORMED METAL WALL AND SOFFIT PANELS, FASCIAS, GUTTERS, AND DOWNSPOUTS

A. Flush-Profile, Concealed Fastener Metal Wall and Soffit Panels: Structural metal panels consisting of formed metal sheet with vertical panel edges and one intermediate stiffening bead, symmetrically placed, with flush joints between panels, field assembled with nested lapped edges, and attached to supports using concealed fasteners.

1. Wall panels: 12” wide x 1” deep, single rib, solid surface, concealed fastener.

2. Soffit panels: 12” wide x 1” deep, single rib, alternating perforated vented and non-venting solid panels, concealed fasteners.

3. Fascia: Formed metal clad over wood, stepped profile. Gutters: 6” x 5” boxed profile as detailed.

4. Downspouts: 5” x 4” concealed attachment to wall.

5. Flashing, Trim, and Molding Accessories: Both standard and custom formed as required for complete installation as noted and detailed on Plans.

6. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50, pre-painted by the coil-coating process per ASTM A755/ A755M

a. Nominal Thickness: 24 gage coated thickness, smooth surface.

1) Exterior Finish: “Fluropon”

2) Color: As selected by Architect from manufacturer's standard colors

4. MISCELLANEOUS MATERIALS

A. General: Provide complete metal panel assemblies incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings as shown on Drawings or required for complete installation. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.

B. Flashing and Trim: Match material, thickness, and finish of metal panels.

C. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.

D. Panel Sealants:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Concealed Joint Sealants: Non-curing butyl, AAMA 809.2.
3. Elastomeric Joint Sealants: Urethane sealant, single-component, ASTM C920 Type S, Grade NS, Class 25
4. Foam Tape: Manufacturer's standard self-adhering type.

5. FABRICATION

A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.

B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

6. FINISHES

A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

B. Modified Silicone-Polyester Two-Coat System: 0.20 – 0.25 mil primer with 0.7 – 0.8 mil color coat.

3.EXECUTION

1. EXAMINATION

A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.

1. Inspect framing that will support insulated metal panels to determine if support components are installed as indicated on approved shop drawings and are within tolerances acceptable to metal panel manufacturer and installer. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.

B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

2. METAL PANEL INSTALLATION

A. Concealed-Fastener Formed Metal Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.

B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading flange. Snap-fit back flange of subsequent panel into secured flange of previous panel. Where indicated, fasten panels together through flush-fitted panel sides.

1. Cut panels in field where required using manufacturer's recommended methods.
2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.

C. Attach panel flashing trim pieces to supports using recommended fasteners and joint sealers.

D. Joint Sealers: Install liquid sealants where indicated and where required for weatherproof performance of metal panel assemblies.

1. Seal panel base assembly, openings, panel head joints, and perimeter joints using joint sealers indicated in manufacturer's instructions.
2. Seal perimeter joints between window and door openings and adjacent panels using elastomeric joint sealer.
3. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealants."

3. ACCESSORY INSTALLATION

A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

4. CLEANING AND PROTECTION

A. Clean finished surfaces as recommended by metal panel manufacturer.

B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION

SECTION 07620
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1 SECTION INCLUDES

A. Coping, parapet, and cap flashings.

B. Counter flashings over base flashings, roof mounted equipment, and vent stacks.

2 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
   1. NRCA (National Roofing Contractors Association) - Roofing Manual.
   2. SMACNA - Architectural Sheet Metal Manual.

3 STORAGE AND HANDLING

A. Stack preformed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation.

PART 2 PRODUCTS

4 SHEET MATERIALS

A. Galvanized Steel: ASTM A446, Grade A, G90 26 gage core steel.

B. Aluminum Sheet: ASTM B209, 3003 alloy, H14 temper; .032 inch thick; plain shop pre-coated with Kynar 500 enamel paint coating of selected color to match finish.

5 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.

B. Underlayment: No. 15 asphalt saturated roofing felt.

C. Protective Backing Paint: Bituminous.

D. Slip Sheet: Rosin sized building paper.

E. Sealant: Acrylic, 50 yr. silicone.

F. Bedding Compound: Rubber-asphalt type.

G. Plastic Cement: Asphaltic base cement.

H. Reglets: Surface mounted, galvanized steel face and ends covered with plastic tape.

6 FABRICATION

A. Form components true to shape, accurate in size, square, and free from distortion or defects. Form pieces in longest practical lengths.

B. Fabricate cleats and starter strips of same material as sheet, inter-lockable with sheet.

C. Hem exposed edges on underside ½ inch; miter and seam corners. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

D. Fabricate flashings to allow toe to extend 2 inches over roofing or counter flashing. Return and brake edges.

E. Form material with standing seam.

F. Form sheet metal pans with up stand, and flanges. Fill pans watertight with plastic cement.

G. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

PART 3 EXECUTION

7 EXAMINATION AND PREPARATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, counter flashing and reglets in place, and nailing strips located.

8 INSTALLATION

A. Conform to applicable details in SMACNA and NRCA manual.

B. Install starter and edge strips, and cleats.

C. Install surface mounted reglets. Seal top of reglets with sealant. Insert flashings to form tight fit. Seal flashings into reglets with sealant.

D. Apply plastic cement compound between metal work and felt flashings.

E. Fit components tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

F. Seal metal joints watertight.

END OF SECTION

SECTION 07900
JOINT SEALERS

PART 1 GENERAL

1 SECTION INCLUDES

A. Preparing sealant substrate surfaces.

B. Sealant and joint backing.

2 SYSTEM DESCRIPTION

A. System performance to achieve moisture and air tight joint seals.

3 QUALITY ASSURANCE

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

4 ENVIRONMENTAL REQUIREMENTS

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

PART 2 PRODUCTS

5 SEALANTS

A. Acrylic Sealant: ASTM C920, Grade B single component, solvent curing, non-staining, non-bleeding, non-sagging; white color:
   1. Elongation Capability 7.5 to 12 percent
   2. Service Temperature Range -13 to 180 degrees F
   3. Shore A Hardness Range 25 to 50

B. Butyl Sealant: ASTM C920, single component, solvent release, non-skinning, non-sagging, black or grey color, non-hardening.
   1. Elongation Capability 7 to 10 percent
   2. Service Temperature Range -13 to 180 degrees F
   3. Shore A Hardness Range 10 to 30

C. Advanced Polymer Sealant (APS) (Titebond Weathermaster): Complies with: ASTM C920, Type S, Grade NS, Class 25; Use NT, M, G, and A; ASTM C719, ASTM D412, ASTM C661, ASTM C679, ASTM C510; non-staining, non-bleeding, non-sagging type; color as selected, permanently flexible, solvent and isocyanates free, VOC compliant (except translucent), low odor, UV resistant, paintable with latex paint within 1 hour (exception: Translucent is not paintable).

1. Elongation Capability: 40 percent
2. Service Temperature Range: -75 to 300 degrees F.
3. Extrusion/Application Temperature: 0 deg. F min.
4. Shrinkage: 1%
5. Gap filling: 1”
6. Colors: Translucent , White, 200+ colors.

6 ACCESSORIES

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

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

C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.

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

PART 3 EXECUTION

7 EXAMINATION AND PREPARATION

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

B. Remove loose materials and foreign matter which might impair adhesion of sealant.

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

D. Perform preparation in accordance with manufacturers recommendations.

8 INSTALLATION

A. Clean and prime seal (where required) joints in accordance with manufacturer's instructions.

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

C. Measure joint dimensions and size materials to achieve required width/depth ratios.

D. Install joint backing to achieve a neck dimension no greater than ⅓ the joint width.

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

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

G. Tool joints concave.

9 SCHEDULE

	Location	Type	Color
A.	Window and door frame perimeter, siding & trim	Int.: Acrylic Ext.: APS	To match window/door frame
B.	Interior trim	Acrylic	White
C.	Control Joints, exterior	APS	To match adjacent surfaces
D.	Under Thresholds	Butyl	Black
E.	Countertops, Plumbing Fixtures	APS	To match item

END OF SECTION

SECTION 08110
STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel doors and frames;

B. Interior borrowed light frames.

C. Louvers.

1.2 SUBMITTALS

A. Shop Drawings: Indicate door and frame profiles, dimensions, construction, internal reinforcement, cut-outs for glazing, louvers, and finish.

B. Product Data: Indicate door and frame configurations, location of cut-outs for hardware reinforcement.

C. Samples: For color selection of factory pre-finished items.

1.3 QUALITY ASSURANCE

A. Conform to the following:
   B. SDI-100 - Standard Steel Doors and Frames.
   C. DHI - Door Hardware Institute - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
   D. Fire Rated Door and Frame Construction: ASTM E152, NFPA 252, UL 10B, NFPA 80.
   E. Handicapped: ANSI A117.1.

1.4 FIELD MEASUREMENTS

A. Vendor/Contractor shall take actual field dimensions of openings, wall thicknesses, and other critical information prior to fabrication for each door and frame opening. Coordinate submittals based on such field measurements and notations. Notify Architect of any substantial deviation from plans.

PART 2 PRODUCTS

2.1 ACCESSORIES

A. Louvers: Extruded aluminum material, pre-painted, color as selected.

B. Silencers: Resilient rubber.

C. Re-moveable Stops: Rolled steel channel shape.

D. Bituminous Coating: Fibered asphalt emulsion.

E. Primer: Zinc chromate type.

2.2 FABRICATION - DOORS

A. Astragals for Double Doors (except exit doors): Steel Z shaped, specifically for double doors.

B. Fabricate doors with hardware reinforcement welded in place.

C. Attach fire rated label to each door unit where scheduled or otherwise required.

D. Close top and bottom edge of exterior doors with inverted steel channel closure. Seal joints watertight.

E. Configure exterior doors with special profile to receive recessed weatherstripping.

2.3 FABRICATION - FRAMES

A. Fabricate frames as welded unit or for knock down field assembly as scheduled.

B. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

C. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.

D. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

E. Prepare frame for silencers and install.

F. Fabricate frames to suit masonry wall coursing with 4 inch head member.

2.4 FINISH

A. Steel Sheet: Galvanized to ASTM A525 G60.

B. Primer: Air dried.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors and frames in accordance with ANSI/SDI-100

B. Coordinate installation of doors and frames with installation of hardware specified elsewhere.

C. Coordinate with adjoining wall construction for frame anchor placement.

D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

E. Install door louvers, plumb and level.

F. Coordinate installation of glass and glazing.

G. Touch up factory pre-finished surfaces where damaged or scratched.

3.2 TOLERANCES

A. Maximum Diagonal Distortion: ⅛ inch measured with straight edge, corner to corner.

3.3 SCHEDULE

A. (SEE DRAWINGS)

END OF SECTION

SECTION 08211
WOOD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wood Doors

B. Vision Panels

C. Louvers (where noted or required)

1.2 QUALITY ASSURANCE

A. Perform work in accordance with the following:
ANSI/NWWDA I.S.1.

B. Fire Door Construction: Conform to ASTM E152, NFPA 252, and UL 10B, as applicable. Installed Door Assembly: Conform to NFPA 80 for fire rated class as scheduled or required.

1.3 WARRANTY

A. Provide warranty of the following term:
Interior Doors: Lifetime.

B. Include coverage for de-lamination of veneer, warping beyond specified installation tolerances, and defective materials.

1.4 SUBMITTALS

A. Shop Drawings and Product Information for approval.

PART 2 PRODUCTS

2.1 DOOR CONSTRUCTION

Provide following door types where scheduled on Drawings:

A. Particle Core (PC): Solid particle core bonded to stiles and rails and face skins. 1 3/8” hardwood stiles and rails, ANSI 208.1 compliant.

B. Commercial Hollow Core (CHC): Bonded honey comb core, 2 ½” stiles and rails, 2 1/2” lock blocks.

C. 20 Minute Fire Door Particle Core (FD20P): Solid particle core bonded to stiles and rails and face skins.

D. 45/60/90 Minute Fire Doors Mineral Core, (FD45/60/90): 5" bottom rail, 2" top rail, 5" x 18" lock block, 1 1/4" stiles, mineral core.

2.2 FLUSH DOOR FACING

A. Wood Veneer: ANSI/NWWDA Custom grade; Ash or Red Oak species wood (as selected), rotary sliced with random match grain, for transparent finish.

B. Adhesive: ANSI/NWWDA, Type I.

2.3 ACCESSORIES

A. Metal Louvers: (where noted on HVAC plans) Roll formed steel material, pre-painted finish to color selected.

B. Vision Panels: conform to UL requirements for fire doors. Provide wood molding for non-fire rated.

2.4 FABRICATION

A. Fabricate non-rated doors in accordance with ANSI/NWWDA I.S.1 requirements.

B. Fabricate fire rated doors in accordance with ANSI/NWWDA I.S.1 and to UL requirements. Attach fire rating label to door edge.

C. Fabricate doors with hardware reinforcement blocking in place.

D. Factory machine doors for finish hardware.

E. Factory pre- fit doors for frame opening dimensions identified on shop drawings.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors in accordance with manufacturer's instructions requirements.

B. Coordinate installation of glass and glazing.

C. Install door louvers, where scheduled and noted, plumb and level.

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

E. Adjust door for smooth and balanced door movement.

3.2 INSTALLATION TOLERANCES

A. Conform to ANSI/NWWDA requirements for fit and clearance tolerances and maximum diagonal distortion.

B. SCHEDULE (SEE DRAWINGS)

END OF SECTION

SECTION 08311
ACCESS DOORS AND PANELS

1. GENERAL

1.1. SUMMARY

A.Section Includes:

1. Attic Access Panels

1.2. SUBMITTALS

A. Product Data: Submit manufacturer's product information and installation instructions.

B. Test Reports: None required

C. Shop Drawings: Submit dimensioned scale shop drawings indicating unit size, rough opening, and mounting details customized for this project application.

2. PRODUCTS

2.1 ATTIC ACCESS PANEL

A. Manufacturer: Best Access Doors; Wilmington, DE
B. Product Description: BA-AHD, Stainless Steel, 1" face flange; continuous piano hinged, full frame and door structure, removable door, non-fire rated. Finish: brushed finish stainless steel, Latch: dual cam latch. Full perimeter neoprene gasket.
C. Size: 22" x 30" (to fit between wood roof trusses spaced 24" o.c.)

D. 3.-EXECUTION

2.1. EXAMINATION AND COORDINATION

A. Coordinate with other trades to ensure rough opening is properly prepared and sized. Confirm job conditions are acceptable prior to installation.

B. Install per manufacturer's instructions. Align square and plumb. Secure anchorage adequately to substrate.

2.2. SCHEDULES

A. Locations and Quantity: See Plans

END OF SECTION

SECTION 08410
ALUMINUM STOREFRONT ENTRANCES AND TUBE FRAMED WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum doors, frames and glazed lights.

B. Aluminum Tube Framed Fixed Glass Windows

C. Glass

D. Door hardware and accessories

1.2 SUBMITTALS

A. Shop Drawings: Indicate system and component dimensions; components within assembly; framed openings requirements and tolerances; anchorage and fasteners; glass and in fills; door hardware requirements; and affected related work.

B. Samples: Manufacturer's standard full range color samples for aluminum finishes.

1.3 FIELD MEASUREMENTS

A. Vendor/Contractor shall take actual field dimensions of openings, wall thicknesses, and other critical information prior to fabrication for each door as frame opening. Coordinate submittals based on such field measurements and notations. Notify Architect of any substantial deviation from plans.

PART 2 PRODUCTS

2.1 MATERIALS

A. Extruded Aluminum: ASTM B221; AA-6063-T5 alloy, natural anodized finish.

B. Steel Sections (where required): Structural shapes to suit mullion sections; prime painted; concealed.

C. Primer: Zinc chromate for shop application and field touch-up.

D. Fasteners: Stainless steel.

E. Sealant and Backing Materials: As specified in Section 07900.

2.2 FABRICATED COMPONENTS

A. Frames: Profile size as scheduled on drawings, flush glazing stops.

B. Reinforced Mullion: (Where shown or required) Profile size as scheduled on drawings or required, of aluminum with internal reinforcement of structural steel section.

C. Doors: 1 3/4” inches thick.

D. Flashings: .50 inch thick aluminum, finish to match mullion sections where exposed.

2.3 GLASS AND GLAZING MATERIALS

A. Glass and Glazing Materials: As specified in Section 08800 and as scheduled on drawings, provide safety type glazing materials, where required by applicable codes.

2.4 HARDWARE AND ACCESSORIES

A. Items as scheduled on drawings and required of manufacturer's standard type to suit application, finish to match aluminum sections.

B. Weather stripping and thresholds as required for weather-tight seal. Paired doors shall have center meeting rail rub weather stripping.

2.5 FABRICATION

A. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly.

B. Accurately and rigidly fit and secure joints and corners, flush, hairline, and weatherproof.

C. Arrange fasteners, attachments, and jointing to ensure concealment from view.

D. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.

2.6 FINISHES

A. Aluminum Surfaces: Electrostatic powder coat paint, color as selected from manufacturer’s standard full line color range.

B. Concealed Steel Items: Prime paint.

C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors, frames, glazing, hardware and flashings in accordance with manufacturer's instructions AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Use anchorage devices to securely attach frame assembly to structure.

C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

E. Install glass in accordance with Section 08800, using exterior combination dry method of glazing.

F. Install perimeter sealant, backing materials, and installation requirements in accordance with Section 07900.

3.2 SCHEDULE (SEE DRAWINGS)

END OF SECTION

SECTION 08705
DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for doors including but not limited to hinges, locks, latches, strikes, stops, push plates, pulls, closers, panic exit devices.

B. Thresholds, weatherstripping, and seals.

1.2 SUBMITTALS

A. Shop Drawings, Product Data, and Schedule: Indicate locations and mounting heights of each type of hardware. Provide Code compliant products suitable for application and service intended.

B. Operating and Maintenance Instructions: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. Hardware Supplier: Company specializing in supplying commercial door hardware approved by manufacturer.

1.4 COORDINATION

A. Coordinate work of this section with other directly affected sections requiring any integral reinforcement for door hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually. Label and identify package with door opening code to match schedule.

1.6 MAINTENANCE

A. Provide maintenance services on door closers for one year from Date of Substantial Completion.

B. Provide special wrenches and tools applicable to each different or special hardware component.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide locksets by "Schlage", "Corbin","Russwin","Sargent", or equal.

2.2 KEYING

A. Door Locks: Keyed in like-groups, Grand master keyed, and control keying with removable core cylinders. Coordinate with Owner's existing where applicable.

B. Supply 2 change keys for each lock and 2 master keys.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that doors and frames are ready to receive work and dimensions are as indicated.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions. Use templates provided by hardware item manufacturer.

END OF SECTION

SECTION 08801
GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Glass and glazing for sections referencing this section for Products and installation.

1.2 SYSTEM DESCRIPTION

A. Glass and glazing materials of this section shall provide continuity of building enclosure air barrier and vapor retarder.

B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with FGMA Glazing Manual, FGMA Sealant Manual, and SIGMA for glazing installation methods.

PART 2 PRODUCTS

2.1 FLAT GLASS MATERIALS

A. Float Glass (Type FG-A): Clear, Low-E, 3/16 inch minimum thickness.

B. Safety Glass (Type FG-B): Clear; fully tempered or laminated with plastic interlayer; conforming to ANSI Z97.1; ¼ inch thick-minimum.

C. Mirror Glass (Type FG-H): Clear type with copper and silver coating, organic overcoating, arised edges, ¼ inch thick -minimum.

D. Insulating Glass Units: Manufacturer's standard with ½" spacer, clear, Low-E

E. Fire Rated Glass (where noted or required): Clear, tempered, fire rated for opening protective requirements.

2.2 GLAZING COMPOUNDS

A. Silicone Sealant (Type GC-F): ASTM C920, Type S, Grade NS, single component; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25; color as selected.

2.3 GLAZING ACCESSORIES

A. Mirror Attachment Accessories: Stainless steel clips. Mirror adhesive, chemically compatible with mirror coating and wall substrate.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that openings for glazing are correctly sized, within tolerance, and glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.2 INSTALLATION - MIRRORS

A. Set mirrors with clips. Anchor rigidly to wall construction.

B. Place plumb and level without visible distortion.

C. Provide mirrors full width of all lavatory counters continuous from top of back splash to 6 ft. min. above finish floor. At Handicap Lavatory countertops, set bottom of mirror at ADA height of 40” max. above finished floor.

3.3 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass, mirrors, and adjacent surfaces.

3.4 SCHEDULE (SEE DRAWINGS)

END OF SECTION

SECTION 09260
GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Acoustic insulation at rest rooms, private offices, and at other locations noted on plans.

B. Gypsum board with taped and sanded joint treatment.

C. Texture finish.

D. Resilient Furring Channels(where noted or required)

E. Accessories

1.2 SYSTEM DESCRIPTION

A. Acoustic Attenuation for Identified Interior Partitions: 50 STC in accordance with ASTM E90.

B. Conform to applicable code for fire rated assemblies where noted or required.

PART 2 PRODUCTS

2.1 GYPSUM BOARD SYSTEM

A. Gypsum Board Types: ⅝ inch thick, maximum permissible length; ends square cut, tapered edges; unless noted otherwise as follows:

1. Fire Rated Type 'X': ASTM C36 fire resistive UL rated. 5/8" thick. Use walls and ceilings in all areas not noted, scheduled, or specified otherwise.
2. Fire Rated Type 'X,' Water Resistant (WR): ASTM 630, 5/8" thick. Use on all "wet" walls at plumbing fixtures. Extend 12" min. beyond width of bathing tubs or showers and beyond edge of wall mounted plumbing fixtures. Use full height floor to ceiling at bathing areas and lower 48" of "wet" walls in restrooms and at any wall mounted plumbing fixtures. Note: Sinks and Lavatories mounted in countertops with 4" min. high back splash do not require water resistant gypsum board.
3. Fire Rated Type 'X,' Abuse Resistant (AR): ASTM C36, 5/8" thick. Use where noted or scheduled.
4. Fire Rated Type 'X,' Maximum Abuse Impact and Abrasion Resistant (AR-Max): ASTM C1278, ASTM E136, 5/8" thick. Use where noted or scheduled.

2.2 ACCESSORIES

A. Acoustical Insulation: ASTM C665, preformed mineral wool, friction fit type, un-faced, full thickness of wall framing.

A. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.

B. Corner Beads and Control Joints: Plastic, radiused edge at corners.

C. Edge Trim: GA 201 and GA 216, Type LC bead.

D. Joint Materials: ASTM C475, GA 201 and GA 216, reinforcing tape, joint compound, adhesive, and water.

E. Fasteners: ASTM C1002 Type S12 hardened screws.

F. Textured Finish Materials: Latex based texturing material, containing fine aggregate.

PART 3 EXECUTION

3.1 INSTALLATION - ACOUSTICAL ACCESSORIES

A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

B. Install acoustical insulation full thick in walls surrounding toilet rooms, offices, classrooms, meeting/assembly rooms, and other areas as noted on Drawings or required to improve sound transfer resistance where noise transfer would be objectionable.

C. Install acoustical sealant within partitions in accordance with manufacturer's instructions.

3.2 INSTALLATION - GYPSUM BOARD

A. Install gypsum board in accordance with GA-201, GA-216 and GA-600 and manufacturer's instructions.

B. Fasten gypsum board to furring or framing with screws.

C. Place control joints consistent with lines of building spaces as indicated or directed and as required to avoid stress cracks.

D. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

E. Treat cut edges and holes in moisture resistant gypsum board with sealant.

F. Give notice to Architect ten days in advance of drywall installation work.

3.3 JOINT TREATMENT

A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

3.4 TOLERANCES

A. Maximum Variation from True Flatness: ⅛ inch in 10 feet in any direction.

END OF SECTION

SECTION 09301
CERAMIC TILE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. All work and materials required to furnish and install ceramic tile as indicated on the drawings.

1.2 QUALITY ASSURANCE

A. Use quality and skilled tile installers who are thoroughly trained and experienced in the installation methods being specified.

B. Work shall be executed and tested in accordance with ANSI A108.1.

1.3 SUBMITTALS

A. The manufacturer shall assure that all the tile being used is in compliance with ANSI A 137.1.

B. Submit a 12" min. square sample of each color, pattern and type of tile being specified.

1.4 PRODUCT HANDLING

A. The cartons should be delivered to the job site unopened and undamaged with all labels intact.

B. Keep tile cartons dry.

1.5 ENVIRONMENTAL PROJECT CONDITIONS

A. Maintain environmental conditions during and after the installation in accordance with reference standards and accordance with manufacturer's printed recommendations.

PART 2 PRODUCTS

2.1 TILE

A. The tile shall be manufactured in accordance with the published specification of ANSI A 137.1.

B. The tile shall be: As selected by Owner

C. Provide the trims of the same or coordinating colors, size and finish of the adjacent flat tile.

2.2 SETTING MATERIALS

A. Consult the Tile Council of America's Handbook for Ceramic Tile Installation or the Ceramic Tile Institute for the specifications to properly install ceramic tile. Consult the manufacturer of premixed setting materials for correct installation procedures. NOTE: Organic adhesive not permitted for floor setting.

2.3 GROUT MATERIALS

A. The grout chosen should conform to the Group Specification Guide published in the Tile Council of America's Handbook for Ceramic Tile Installation. Refer to the grout manufacturer for more specific information regarding the grout and method chosen for the installation.

2.4 SEALANTS

A. Use sealants in control joints that meet FSTT-S-001543 Class A or B (COM-NBS).

2.5 THRESHOLDS AND EDGE STRIPS

A. Provide thresholds or edge strips to provide for a proper transition between the tile and other adjacent surfaces.

PART 3 EXECUTION

3.1 ACCEPTABILITY OF SURFACE

A. Before installation of ceramic tile confirm he substrate surface does not exceed surface flatness variations in excess of: Floors - 1/8" in 10'.

B. The substrate surface must be free of all loose dirt, oil, grease, wax, dust, or curing compounds. If the substrate contains these materials, sand blast, grind, or sand to remove the materials and scarify the surface.

3.2 LAYOUT

A. Locate all movement or expansion joints prior to determining the layout of the tile.

B. Layout all tile work so as to minimize cuts less than one-half tile in size.

C. Layout all tile work so that cuts in both walls and floors are to be least conspicuous.
D. Align all floor and wall joints to give straight and uniform grout lines.

3.3 METHOD

A. On Dimensionally Stable Concrete Subfloor: ANSI A108.1

3.4 GROUTING

A. Follow grout manufacturer's recommendations as to grouting procedures and precautions.

B. Remove all grout haze, observing grout manufacturer's recommendations as to the use of various cleaners.

C. Thoroughly rinse all tile work before and after the use of cleaners and chemicals, if required.

3.5 PROTECTION OF TILE SURFACE

A. Finished installation should be free of all chipped, cracked, defective, or un-bonded tile.

B. Cover all tile floors with heavy duty construction or kraft paper masked in place to avoid stains or damage from construction traffic.

C. No foot and wheel traffic can use the floor for a minimum of 3 days, preferable 7 days.

D. Place large, flat sheets of wood in high traffic areas to protect newly tiled floor.

END OF SECTION

SECTION 09502
ACOUSTICAL PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Acoustical panels applied to drywall substrate where noted or scheduled on drawings.

B. Fiber glass sound mat.

C. Resilient channels

1.2 MANUFACTURER

A. Tectum, P.O. Box 920, Newark, Ohio 43055

1.3 DELIVERY AND STORAGE

A. Store product in a dry place. Do not place in contact with floors. Panel packages must be protected against marring, soil, or damage during storage and installation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Tectum panels
1. Panels shall be 1" (nominal) thickness.
2. The edges shall be beveled/square.
3. Finish shall be white, factory paint finish. **Do not field paint as this diminishes acoustical value.**
4. Widths shall be 32" with lengths of up to 12' (nominal).

PART 3 EXECUTION

3.1 INSTALLATION

A. Panels shall be installed in the pattern shown on the drawings and in accordance with the recommendations of the manufacturer. Coordinate layout with Architect. Stagger head joints in open areas.

B. Acoustical panel materials shall be installed by screw application. Utilize white painted head screws. Apply on resilient furring strips at 24” o.c. Adhere 1” nominal thickness fiberglass insulation in furred space.

C. Installation of the acoustical material shall be made when the building temperature and humidity conditions closely approximate the interior conditions which will exist when a building is occupied and shall be continuously

maintained at stabilized condition until Owner's occupancy.

END OF SECTION

SECTION 09654
RESILIENT LINOLEUM FLOORING AND BASES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.

B. Related Documents

1. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.

1.02 REFERENCES

A. Armstrong Flooring Technical Manuals

1. Armstrong Flooring Guaranteed Installation Systems manual, F-5061
2. Armstrong Flooring Maintenance Recommendations and Procedures, manual, F-8663

B. ASTM International:

1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
2. ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
4. ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring
5. ASTM F 1861 Standard Specification for Resilient Wall Base
6. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
7. ASTM F 2034 Standard Specification for Sheet Linoleum Floor Covering
8. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

C. National Fire Protection Association (NFPA):

1. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
2. NFPA 258 Standard Test Method for Measuring the Smoke Generated by Solid Materials

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage, or failure.

B. Administrative Requirements

1. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.
2. Pre-installation Testing: Conduct pre-installation testing as follows: moisture tests, bond test, and pH test

C. Sequencing and Scheduling

1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.
2. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

1.04 SUBMITTALS

A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions (latest edition of Armstrong Flooring Guaranteed Installation Systems manual, F-5061.) for flooring and accessories.

B. Submit the manufacturer's standard samples showing the required colors for flooring, welding rods, and applicable accessories.

C. Submit Safety Data Sheets (SDS) available for flooring products, adhesives, weld rod, patching/ leveling compounds, floor finishes (polishes) and cleaning agents.

D. If required by AOJ, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

E. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
2. Warranty: Warranty documents specified herein

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.

B. Select an installer who is competent in the installation of Armstrong linoleum sheet flooring

C. Engage installers certified as Armstrong Commercial Flooring Certified Installers

1. Confirm installer's certification by requesting their credentials

D. Fire Performance Characteristics: Provide resilient linoleum sheet flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:

1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I
2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Deliver materials in good condition to the job site in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

C. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF and a maximum temperature of 85ºF for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF in areas where work is completed. Protect all materials from the direct flow of heat from heating fixtures and appliances. Comply with manufacturer's written instructions for project conditions.

1.08 LIMITED WARRANTY

A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreeing to repair or replace resilient flooring that fails within the warranty period.
B. Limited Warranty Period: 5 years
C. The Limited Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Resilient sheet flooring, wall base, adhesives and accessories:

1. Armstrong Flooring, Inc., 2500 Columbia Avenue, Lancaster, PA 17604 www.armstrongflooring.com/commercial
2. Manufacturer must have a headquarters in the United States of America.

2.02 RESILIENT SHEET FLOORING MATERIALS

A. Provide Linoleum Sheet Flooring: Marmorette
B. Description: The product shall consist of a polyurethane-coated homogeneous mixture of linoleum cement (linseed oil, natural tree resins, drying oil catalysts), wood flour, limestone, color pigments mixed and calendared onto a jute fabric backing. Colors and pattern detail shall be dispersed throughout the thickness of the wear layer.

1. Linoleum sheet shall conform to the requirements of ASTM F 2034, Type I, "Standard Specification for Sheet Linoleum Floor Covering Without Backing"
2. Pattern and Color: color selected from the range currently available from Armstrong Flooring, Inc.
3. Width: 6 ft. 7 in.
4. Length: Up to 98.4 ft.
5. Thickness: 0.100 in.

C. Seam Adhesive: Provide Seam Adhesive at seams as recommended by the resilient flooring manufacturer.]

2.03 PRODUCT SUBSTITUTION

A. Substitutions: Substitutions permitted only by pre-bid approval compliant with Division 1 requirements.

2.04 WALL BASE MATERIALS

A. Top set wall base: Provide 1/8 in. thick, 4 in. high Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861

2.05 ADHESIVES

A. Provide Armstrong Linoleum Adhesive and Wall Base Adhesive as recommended by the flooring manufacturer.
B. Provide Seam Adhesive at floor seams as recommended by the resilient flooring manufacturer].

2.06 ACCESSORIES

A. For patching, smoothing, and leveling subfloors utilize product as recommended by manufacturer appropriate for job conditions.

B. Provide resilient transition strips, edge strips and thresholds of appropriate width and thickness, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

PART 3 - EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog, installation instructions, and product carton instructions for installation and maintenance procedures as needed.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

B. Visually inspect flooring materials, adhesives and accessories prior to installation. Flooring material with visual defects shall not be installed and shall not be considered as a legitimate claim.

C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.03 PREPARATION

A. Subfloor Preparation: Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects.

B. Subfloor Cleaning: The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, sealers, release agents, curing compounds, residual adhesive, adhesive removers and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants are present on the substrate they must be mechanically removed prior to the installation of the flooring material. Refer to the manufacturer's instruction manual and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.

C. Perform subfloor moisture testing in accordance with ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs and Bond Tests as recommended by manufacturer to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Relative humidity shall not exceed 90%. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

D. Concrete pH Testing: Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained.

3.04 INSTALLATION OF FLOORING

A. Install flooring in strict accordance with manufacturer's written instructions.

B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

C. Scribe, cut, and fit or flash cove to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

D. Adhere flooring to the subfloor without cracks, voids, raising and puckering at the seams. Roll with a 100-pound roller in the field areas. Hand-roll flooring at the perimeter and the seams to assure adhesion. Refer to specific rolling instructions of the flooring manufacturer.

E. Lay flooring to provide a minimum number of seams. Avoid cross seams, filler pieces, and strips. Match edges for color shading and pattern at the seams in compliance with the manufacturer's recommendations.

F. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.05 INSTALLATION OF ACCESSORIES

A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

3.06 CLEANING

A. Perform initial and on-going maintenance according to manufacturer's instructions.

3.07 PROTECTION

A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

END OF SECTION

SECTION 09680
CARPET

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Carpet.

1.2 SUBMITTALS:

A. Submit product samples and data for approval and color/pattern selection.

PART 2 PRODUCTS

2.1 CARPET MATERIALS

A. Carpet: 26oz min. face wt. acrylic commercial textured multi-level loop, bonded backing, complying with applicable codes for combustibility/flame/smoke rating.
B. Indoor/Outdoor Carpet: 22oz min face wt. level loop, bonded.

2.2 ACCESSORIES

A. Sub-floor Filler: type recommended by carpet manufacturer.
B. Adhesive: Waterproof, strippable type, recommended by carpet manufacturer
C. Edge Strips: resilient type, color as selected.

2.3 SUBMITTALS

A. Submit samples for selection of a minimum of three domestic manufacturers from stock product lines. Show full range of colors, patterns, and textures available. Samples shall be 12” min. sq.
B. Submit product data sheets for all samples.
C. If satisfactory selection cannot be made from initial submittal, repeat submittal process until final selection is made.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that substrate surfaces are smooth and flat with maximum variation in ¼ inch in 10 ft are ready to receive work.
B. Fill minor or local low spots and other defects with sub-floor filler.
C. Vacuum floor surfaces.

3.2 INSTALLATION - CARPET ADHESIVE APPLIED

A. Apply carpet and adhesive in accordance with manufacturers' instructions.
B. Verify carpet match before cutting to ensure minimal variation between dye lots.
C. Double cut carpet, to ensure seam and pattern match. Make cuts straight, true, and un-frayed.
D. Locate seams in area of least traffic.
E. Join seams by hot adhesive tape method. Form seams straight, not overlapped or

peaked, and free of gaps.
F. Lay carpet tight and flat on sub-floor, well fastened at edges, with a uniform appearance. Provide monolithic color, pattern, and texture match within any one area.
G. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.
H. Cut and fit carpet around interruptions.
I. Fit carpet tight to intersection with vertical surfaces without gaps.

J. Where wall bases are scheduled, cut carpet tight to walls. Fit carpet tight to vertical interruptions, leaving no gaps.

3.3 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.
B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09901
PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation and field application of paints and coatings.

1.2 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

1.3 MANUFACTURER

A. Paint: Sherwin-Williams, Glidden, Behr, Cabot Stains, or approved equal.

1.4 SUBMITTALS

A. Product Data for each product proposed to be incorporated into the Work.

B. Color chart of manufacturer’s full color selection range for each product for selection.

1.5 SAMPLES

A. Field apply 4’ sq. sample of all paint, stain, and varnish finishes on actual material substrate for field approval by Architect. Retain approved samples on site for a quality control reference.

PART 2 PRODUCTS

2.1 MATERIALS

A. Coatings: Ready mixed except field catalyzed coatings of good flow and brushing properties, capable of drying or curing free of streaks or sags.
B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials required to achieve the finishes specified.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that substrate conditions are ready to receive work.
B. Measure moisture content of porous surfaces using an electronic moisture meter.
C. Do not apply finishes unless moisture content is less than 12 percent.

D. Correct minor defects and clean surfaces which affect work of this Section.
E. Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

F. Gypsum Board Surfaces: Fill minor defects with latex compounds. Spot prime defects after repair.
G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
H. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove foreign matter. Remove oil and grease.
I. Uncoated Ferrous Surfaces: Remove scale by wire brushing, sandblasting, clean by washing with solvent. Apply treatment of phosphoric acid solution. Prime paint after repairs.
J. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust, hand clean, clean surfaces with solvent. Prime bare steel surfaces.
K. Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
L. Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.
M. Seal top and bottom edges of doors Doors with same finish as faces.

3.2 APPLICATION

A. Apply products in accordance with manufacturer's written instructions.
B. Sand transparent finishes lightly between coats to achieve required finish.
C. Where clear finishes are required, tint fillers to match wood.
D. Back prime interior and wood work scheduled to receive paint finish with primer paint.
E. Back prime interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

3.3 FINISHING METAL EQUIPMENT AND FABRICATIONS

A. Paint shop primed equipment and fabrications.

B. Remove unfinished louvers, grilles, covers, and access panels and paint separately. Paint dampers exposed behind louvers, grilles, to match face panels.

C. Prime and paint vents, sleeves, roof jacks, exposed piping, ductwork, conduits, hangers, brackets, collars and supports at building exterior or at interior finished spaces to match adjacent finishes or color as selected by Architect.

D. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line.

E. Paint both sides and edges of plywood backboards.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

G. Do not paint over manufacturer's name plate or other permanent labels of identifiers. Remove all other temporary labels prior to painting.

3.4 CLEANING

A. As work proceeds, promptly remove finishes where spilled, splashed, or spattered.

3.5 SHOP PRIMED ITEMS FOR SITE FINISHING

A. Metal Shop Primed Fabrications: Exposed surfaces of lintels, handrails, guard rails, base plates, shoes, saddles, and connector plates, steel door frames and doors: Two coats of Semi-gloss Enamel

3.6 EXTERIOR SURFACES

A. Steel-Un-primed: One coat of ferrous metal primer, Two coats Semi-gloss Enamel

3.7 INTERIOR SURFACES

A. Wood Painted: One coat of Primer, Two coats of Lo Sheen (egg shell) Enamel

B. Wood Transparent:
1.Filler coat (for open grained wood only).
2.One coat of Stain
3.One coat of sealer
4.Two coats of Interior Varnish

A. Concrete, Concrete Block, and Gypsum Board in Kitchen and Bath Rooms:
1. One coat Sealer
2. Two coats of Eggshell Finish enamel

B. Steel, Un-primed:
1. One coat of Primer
2. Two coats of Semi-gloss Enamel

C. Steel, Primed:
1. Touchup original primer.

2. Two coats of Semi-gloss Enamel

F. Gypsum Board (other than kitchen and restrooms):
3. One coat of Sealer
4. Two coats of Flat Finish Latex Wall Paint

3.8 SCHEDULE OF COLORS

D. Architect will issue a painting schedule indicating product/color selections and scope of application for project. Do not order materials or perform any finish painting work until a fully coordinated and approved schedule of painting is issued.

END OF SECTION

SECTION 09910
PROJECTION SCREEN PAINT

PART 1 - GENERAL

1.1 Section Includes
A. Screen Paint

1.2 System Description
A. High contrast/high reflectance projection screen paintcoating system applied to smooth drywall substrate.

1.3 Quality Assurance
A. Application shall be by professional painter.

1.4 Submittals
A. Product information
B. Color sample, 6” sq. of final top coat.

PART 2 - MATERIALS

2.1 Screen Paint
A. Digital Image Professional Grade two step projection screen paint system. Maximum contrast, gray color, 1.8 gain.
B. Base Coat: 2 coats of gray Pro Grade Base coat.
C. Top Coat: 2 coats of gray Reflective Pro Grade Top coat.

PART 3 - EXECUTION

3.1 Inspection and Acceptance of Substrate
A. Inspect drywall substrate to receive projection screen. Paint system. Check for flatness and smoothness. No texturing or “orange peeling” allowed. Smooth plate surface with no more than 1/16” variation in 48”. Notify G.C. of any drywall substrate defects. Do not proceed until corrected.
B. Initiating screen paint work shall constitute acceptance of substrate.

3.2 Application
A. Comply with projection screen paint manufacturer’s instructions.
B. Apply by spray method.
C. Base and top coats require two coats each. Allow time between coats for complete drying (6 hrs. minimum in ideal atmospheric conditions, longer in high humidity and cooler temperatures).
D. Note manufacturer’s instructions on shaking top coat paint to mix reflective particles and need to apply immediately before settlement of particles.

E. Apply spray in uniform manner utilizing parallel overlapping lines. Cross pattern in subsequent coats. Do not allow paint to run, spatter or skip.
F. Comply with general application requirements of Section 0900 Painting, for paint trade work.

END OF SECTION

SECTION 10156
TOILET COMPARTMENTS AND URINAL SCREENS

PART 1 GENERAL

1.1 INCLUDES

A. Toilet Compartments and Urinal Screens where shown on plans, with all hardware and fittings required for complete installation.

1.2 SUBMITTALS

A. Shop Drawings for approval

B. Samples for color selection

C. Product information

1.3 REGULATORY REQUIREMENTS

A. Conform to ANSI A117.1 and applicable code for provisions for the physically handicapped.

1.4 WARRANTY

A. Manufacturer’s standard 15 year.

PART 2 PRODUCT

2.1 MANUFACTURER/PRODUCTS

A. Toilet compartments and urinal screens are floor mounted overhead braced as manufactured by COMTEC INDUSTRIES, Moosic, PA.; Series S200

2.2 MATERIALS

A. Doors, panels, and pilasters to be constructed of 1" thick solid HDPE resin, with edges uniformly machined to a 1/4" radius, water resistant, non-absorbent. Color, pattern, and texture to be homogeneous throughout. All doors, panels, and pilasters to be covered with protective masking.

B. Panels, doors, and pilasters to be 55" high and anchored with continuous plastic wall brackets.

C. Doors to be mounted to pilasters with an integral hinge. Equip each door with one coat hook/bumper, chrome plated, and one aluminum slide latch (handicapped doors also require one door pull and door stop).

D. Pilasters to be overhead braced with an aluminum head rail.

E. Integral Hinges to be fabricated from the door and the pilaster with no exposed metal parts. Hinge mechanism is to be integrated into the door and pilaster.

F. Plastic Wall Brackets are to be 54" long and made of heavy-duty extruded PVC resin. Panels to be through-bolted into brackets with stainless steel, tamper resistant hex bolts.

G. Plastic Pilaster Shoes to be 3" high and made of one-piece molded HDPE. Pilaster shoes to be through-bolted onto pilaster with stainless steel, tamper resistant hex bolts.

H. Latches to be fabricated from heavy-duty extruded aluminum (6463-T5 alloy). Latch is to be mounted to the door with stainless steel, tamper resistant hex bolts.

I. Head rail to be made of heavy-duty extruded aluminum (6463-T5 alloy) with bright-dip anodized finish. Head rail to be anti-grip and attached to the top of the pilasters with stainless steel, tamper resistant torx screws.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that opening dimensions and plumbing fixture and rough-in locations are as indicated on shop drawings.

3.2 INSTALLATION

A. Install partition components secure, plumb, and level in accordance with manufacturer’s instructions.

B. Attach panel brackets securely using anchor devices.

C. Provide adjustment for height variations with threaded rods through steel saddles. Conceal fastenings with pilaster shoes.

D. Equip each door with two hinges, one door latch, and one coat hook and bumper.

E. Adjust and align door hardware so that free movement is attained.

END OF SECTION

SECTION 10441
PLASTIC SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Engraved plastic signs.

1.2 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People.

1.3 SUBMITTALS

A. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.

B. Samples: Submit two sample signs, 12 X 3 inch in size illustrating type, style, letter font, and method of attachment. Submit full range of color samples for selection.

C. Manufacturer's Installation Instructions: Include installation template and attachment devices.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code and ANSI A117.1 for requirements for the physically handicapped.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to ensure damage free condition.

B. Package signs, labeled in name groups.

C. Store adhesive attachment tape at ambient room temperatures.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install signs when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

2PART PRODUCTS

1.7 ENGRAVED SIGNS

A. Engraved Signs: Laminated colored plastic; lettering engraved through face to expose core color:
1. Face Color: Color as selected.
2. Core Color: White.
3. Total Thickness: ⅛ inch.
4. Height: 3 inches.
5. Edges: Beveled.
6. Character Font: Helvetica.

1.8 ACCESSORIES

A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install signs after doors and surfaces are finished, in locations as directed.

3.3 SCHEDULES

A. SEE SCHEDULE ON DRAWINGS

END OF SECTION

SECTION 10522
FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire Extinguishers

B. Extinguisher Cabinets

1.2 UL-LISTED PRODUCTS

A. Provide new portable fire extinguishers, cabinets and accessories which are UL-Listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

1.3 DESCRIPTION

A. Provide fire extinguishers for each extinguisher cabinet and other locations indicated, or required by regulatory authority. Colors and finishes selected from manufacturer's standard which comply with requirements of governing authorities. Unless otherwise indicated, provide multi-purpose dry chemical type; 5 lb. nominal capacity. Provide brackets as required. Mount with base 48" above finish floor.

1.4 SUBMITTALS

A. Submit shop drawings and manufacturer’s product data for approval. Indicate locations, mounting requirements, rough-in provisions. Obtain local Fire Marshall approval for all locations and fire appliance type/rating.

B. Submit manufacturer’s standard color chart for selection.

PART 2 PRODUCTS

2.1 FIRE EXTINGUISHER CABINETS

A. Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.

B. Provide standard steel box, suitable for mounting conditions and fully recessed in walls of sufficient depth. Where walls are not of sufficient depth for full recessed type, provide semi-recessed. Surface mounted type permitted only where indicated or where recessed mounting is not possible.

C. Exposed trim shall be one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge.

D. Door shall be flush style. Door and trim shall be pre-finished, painted, or anodized aluminum, color as selected.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, to comply with applicable regulations of governing authorities. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions. Where exact location of surface-mounted cabinets and bracket mounted fire extinguishers is not indicated, locate type 2A fire extinguishers in fire exit corridors to provide 3,000 sq. ft. max. coverage for each appliance and 75 ft. max. travel distance from most remote location in coverage area. Provide Type K rated fire extinguisher in kitchen area within 30 ft. of cooking equipment (where applicable).

3.2 IDENTIFICATION

A. Identify fire extinguisher in cabinet with lettering spelling “FIRE EXTINGUISHER” painted on door by silk-screen process. Provide lettering on door as selected from manufacturer's standard letter sizes, styles, colors and layouts.

END OF SECTION

SECTION 10801
TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Toilet and washroom accessories.

B. Grab bars.

C. Diaper changing Stations.

1.2 REGULATORY REQUIREMENTS

A. Conform to applicable code for installing work in conformance with ANSI A117.1 for accessibility for the physically handicapped. .

1.3 SUBMITTALS

A. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods, rough-in requirements, and power requirements (where applicable).

PART 2 PRODUCTS

2.1 MATERIALS

A. Sheet Steel: ASTM A366.

B. Stainless Steel Sheet: ASTM A167 Type 304.

C. Tubing: ASTM A269 stainless steel.

D. Fasteners, Screws, and Bolts: Hot dip galvanized steel or stainless steel.

2.2 FABRICATION

A. Form surfaces without distortion. Weld and grind joints smooth.

B. Shop assemble components and package with anchors and fittings.

C. Back paint components to prevent electrolysis.

D. Provide steel anchor plates, adapters, and anchor components for installation.

E. Hot dip galvanize exposed and painted ferrous metal and fastening devices.

2.3 FINISHES

A. Chrome/Nickel Plating: ASTM B456, Type SC 2; satin finish.

B. Stainless Steel: No. 4 satin luster finish.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify exact location of accessories for installation. Deliver inserts and rough-in frames to site. Provide templates and rough-in measurements as required.

3.2 INSTALLATION

A. Install fixtures, accessories and items in accordance with manufacturers' instructions. Comply with ADA requirements as applicable. Install plumb and level, securely and rigidly anchored to substrate.

3.3 SCHEDULE

ITEM	MODEL #	FINISH
Toilet Tissue Dispenser 2-roll controlled delivery (one per W.C. stall)	Bradley 5224	Satin Chrome
Napkin Disposal & shelf (one per women's W.C.)	Bradley 4791-15	Stainless Steel
Grab Bars, 42” long (horizontal, adjacent wall), 36” long (horizontal, back wall), and 18” (vertical, adjacent wall) 1 1/4” dia. (One set per H/C W.C. stall)	Bradley 832001-18,36,42	Satin Chrome
Diaper Changing Table (where shown on plan)	Four D Small Comforts #605	Polyethylene Plastic

END OF SECTION

SECTION 11043
BAPTISTRY AND STEEPLE

PART 1 GENERAL

1.1 SUBMITTAL

A. Submit manufacturer's standard colors for selection. Submit manufacturer's shop drawings, specifications, installation instructions, operation and maintenance instructions as applicable.

B. Warranty: Complete Unit to be guaranteed for five (5) years.

1.2 INCLUDED

A. Baptistry: Unit conforming to Drawings

B. Steeple: As noted and/or detailed on Drawings

PART 2 PRODUCTS

2.1 GENERAL

A. Materials and Construction: Fabricate units of laminated fiberglass resin with integral color coat to form homogeneous structure. Furnish complete with all hardware and accessories as required for complete installation. Baptistry shall be internally braced, free standing type requiring no additional external lateral bracing when filled with water. Provide safety non-slip walking surfaces and rounded corners on step nosings and ledges.

B. Style and Configuration: Provide manufacturer's standard model and series indicated or if not indicated, conform to general design intent as indicated on drawing as to size, configuration, and details.

C. Baptistry Plumbing and Control Equipment: Provide fully automatic system package including all components for complete baptistry installation. Special switch panel supplied with unit to have light to indicate function activated. Switching to "ON" closes drain and opens water valve, automatically shutting off water when at proper level and turning heater on. Heater thermostat maintains proper water temperature. Water level shall be automatically maintained. When switch is turned to "DRAIN" the heater is positively turned off along with the water fill valve and the solenoid drain valve is opened. Controls operate on 24 volt current from transformer. Controls shall provide positive protection for heater against low water or dry fire burnout conditions at all times.

D. Baptistry Water Heater and Circulator: Provide UL listed 5.5 KW at 1-60-240 water heater with a 1/2 HP circulation pump and all plumbing connections for indoor use. Provide voltage compatible with building power system. Provide circuit protection to comply with manufacturer's recommendation and NEC.

E. Accessories: Provide baptistry cover constructed of 3" expanded polystyrene with a unitized aluminum frame and 29 oz, vinyl cover.

2.2 MANUFACTURER AND PRODUCT

A. Manufacturer: Fiberglass Specialties

B. Baptistry Unit to provide double entry steps and code compliant tread and riser pattern.

C. Steeple to be fitted with lighting protection and grounding electrode cable to earth ground. Route grounding electrode concealed.

2.3 QUALITY ASSURANCE: All electrical components to bear UL label.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in strict conformance to manufacturer's recommendations. Repair any damage to finish color coat in approved manner with factory type materials and methods.

B. Install baptistry unit level and plumb in all directions to assure proper drainage. Trim out unit to allow for expansion and contraction. Do not caulk perimeter edges at finish wall. Provide suitable metal or wood trim.

C. Install in compliance to all applicable requirements of National Plumbing Code and National Electrical Code.

D. Provide Ground Fault Current Interrupting breaker on power circuit to Baptistry control , heater, and pump

END OF SECTION

SECTION 12350
CHURCH PEWS AND CHANCEL FURNITURE

Part 1 General

1.1 INCLUDED

A. Pews
B. Chairs
C. Pulpit
D. Benches
E. Accessories

1.2 SUBMITTALS

A. Shop Drawings: For approval. Plan shall be drawn to 1/4" = 1' - 0" scale. Show precise layout of all furniture conforming to architectural plan and code requirements. Comply with statutory requirements for pew/chair spacing, aisles, and cross aisles, and wheel chair stations. Where sloping floor occurs, layout seating rows perpendicular to slope. Scribe pew bases to match slope. Maintain architectural layout geometry shown on Plans. Utilize given reference points for dimensioning. Base shop drawings on actual field measurements taken by factory representative. Architectural Drawings indicate intent and geometry of arrangement but are not intended to used for fabrication purposes.
B. Field Mockup: Prior to fabrication and following Shop Drawing approval, manufacturer's representative shall make full scale chalk line mockup in place on floor for final approval.
C. Product Data, Material, and Finish Samples: Submit complete Manufacturer's standard base price point product line for selection. Samples shall be of actual wood finishes on real wood chips and genuine fabric swatches. Photo representation not acceptable.
D. Sample Chair and Pew: Manufacturer shall fabricate and deliver to job site full scale sample mockup of selected Chair/Pew style, upholstery, and finish for confirmation of order prior to fabrication. Sample(s) shall remain in Owner's possession for verification and reference standard until installation is complete.

1.3 MANUFACTURER

A. Acceptable Manufacturers: J & H Church Furnishings; Pindall, AR; Imperial Woodworks, Inc.; Waco TX.

PART 2 PRODUCTS

1.1 GENERAL

A. Pew end caps, bases, and trim shall be of select clear red oak. Ends shall be 2 1/4" thick edge glued. Seat backs and cushion platform bottoms shall be of 3/4" continuous plywood with hardwood frames. Seat cushions shall be of 2" high density foam with wrapped bottom front edge and hardwood top cap rail. Cushions and backs to be nylon upholstery covered.
B. Chancel Furniture shall be of select clear red oak.
C. Chairs shall be of bent laminated northern hard wood, foam padded and nylon upholstery fabric covered. Chairs shall be interlocking and stackable.
D. Both pews and chairs shall be furnished with book racks, cup holders, card and pencil holders, and other miscellaneous and incidental items as required for complete, functional installation.

PART 3 EXECUTION

3.1 FABRICATION

A. Fabricate all items and components to meet highest industry stands for workmanship and materials.

3.2 INSTALLATION

A. Installation shall be by manufacturer's authorized installers skilled in trade. Comply with manufacturer's written instructions and recommendations.
B. Utilize concealed anchorage for pew bases.

3.3 PROTECTION AND CLEANING

A. Protect from soiling and physical damage. Touch-up minor surface blemishes to match factory finish. Other damaged work shall be repaired or replaced to provide damage free installation.
B. Clean finished installation fee of dust, marks, or soiling.

END OF SECTION

SECTION 15051
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Mechanical basic requirements.
B. Electric Motors.
C. Identification.

1.2 SYSTEM DESCRIPTION

A. Provide complete and fully operational systems with facilities and services to meet requirements indicated and in accord with applicable codes and ordinances.

1.3 REGULATORY REQUIREMENTS

A. Conform to all local and state regulations.
B. Obtain permits, plan review, and inspections from authority having jurisdiction.

PART 2 PRODUCTS

2.1 ELECTRIC MOTORS

A. Electric Service: Refer to Division 16 for required electrical characteristics.
B. Motors: Continuous operation in 40 degrees C environment, and for temperature rise to ANSI/NEMA MG 1 limits.
C. Single Phase Motors: Split phase for less than ½ Hp. Capacitor start for ½ Hp and larger.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

END OF SECTION

SECTION 15250
MECHANICAL INSULATION

PART 1 GENERAL

1.1 WORK INCLUDED

A. Above ground domestic water piping insulation
B. Underground domestic hot water piping insulation
C. Interior air duct acoustical/thermal liner
D. Exterior duct wrap insulation
E. Refrigerant piping insulation
F. Cooling condensate drain insulation

1.2 RELATED WORK

A. General Mechanical Requirements
B. Domestic Water Piping System
C. Low Pressure Ductwork and Accessories

1.3 QUALITY ASSURANCE

A. Perform installation in accordance with MICA, Commercial and Industrial Insulation Standards.
B. Follow manufacturer's directions on adhesive application, fastener spacing, etc.

PART 2 PRODUCTS

2.1 MATERIALS

A. Glass fiber type equal to Owens-Corning Fiberglass 23ASJ/SSL for ½" and greater thickness.

1. K-factor no greater than 0.24
2. Jacket permeance no greater than 0.02 perms.
3. Self sealing laps on longitudinal and transverse joints of all service jacket.
4. J-M "Zeston" PVC fitting covers over Fiberglass inserts for valves and fittings. Provide 25/50 flame/smoke rating when used in air plenums.

B. Flexible elastomeric pipe insulation equal to Armstrong "Armaflex" for ½" and less thickness.

1. Use proper adhesive.

2. Use sheets cut and molded around valves and fittings.
3. Do not use in air plenums unless 25/50 flame/smoke rated.

C. Acoustical Fiberglass interior duct liner with 1 ½ lb. density and coated face. Meet UL 181 on erosion tests and NFPA 90A on flame/smoke rating.

D. Flexible Fiberglass exterior duct wrap equal to FRK-25.
1.K-factor no greater than 0.3.
2.3/4 lb. density.
3.Foil reinforced kraft (FRK) vapor barrier.

E. Foam/vinyl safety covers for drains & supply lines equal to Plumberex “Handy-Shield.

1. White vinyl cover over insulating foam liner.
1. Locking strap with re-closeable sealing strips and weep seam.
2. Meet Federal Std. 4.19.4 GSA and ANSI A117-1-1980.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that piping and ductwork has been pressure tested, inspected, and approved before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer’s instruction.

B. Continue insulation and vapor barrier through penetrations.

C. Piping Insulation

1. Neatly finish insulation at supports, protrusions, and interruptions.
2. Provide insulated dual temperature pipes or cold pipes conveying fluids below ambient temperature with vapor barrier jackets. Finish with glass cloth and vapor barrier adhesive. Insulate complete system.
3. For insulated pipes conveying fluids above ambient temperature, provide standard jackets. Bevel and seal ends of insulation at equipment, flanges, and unions.

4. Provide insert between support shield and piping on piping 2 inches diameter or larger. Fabricate of cork or other heavy density insulating material

suitable for temperature, not less than 6 inches long.

5. For pipe exposed in mechanical equipment rooms or in finished spaces below 10 feet above finished floor, finish with PVC jacket and fitting covers.
6. Successfully perform all leak tests prior to applying insulation.
7. Provide aluminum sheet metal jacket over insulation exposed outdoors above grade. Use rivets and seal joints watertight.
8. Provide approved coating of mastic over piping insulation jackets installed underground and make waterproof and puncture resistant.
9. Insure surfaces are clean and dry prior to installing insulation.

D. Thermal Ductwork Insulation:

1. Provide insulated ductwork conveying air below ambient temperature with thermal ductwork insulation and vapor barrier jacket.
2. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging.
4. Neatly finish insulation at hangers or other protrusion. Seal vapor barrier joints in duct wrap with FRK duct tape.
5. All supply and return air systems installed in any unconditioned space shall be insulated with a minimum of 2" thickness, 3/4 lb. density wrap, or 1" thickness, 1 ½ lb. density liner.

E. Acoustic and Thermal Duct Liner Insulation:

F. Adhere insulation with adhesive for 100 percent coverage.

1. Secure insulation with mechanical liner fasteners. Refer to SMACNA Standards for spacing.
2. Seal liner surface penetrations with adhesive.

3.3 PIPING INSULATION SCHEDULE

A. Glass Fiber Insulation

Domestic Hot and Cold Water above ceilings	Pipe Thickness ½ inch
Domestic hot water in walls and below floor slab	Pipe Thickness ½ inch

B. Cellular Foam

Refrigerant Suction	Pipe Thickness 3/4 inch

Refrigerant Hot Gas Pipe Thickness 3/4 inch

3.4 DUCTWORK INSULATION SCHEDULE

Duct Type	External		Internal	
	Insulation Thickness (Inches)	Type	Insulation Thickness (Inches)	Type
Circular Supply Ducts at building interior	2	Flexible Glass Fiber	0	NA
Rectangular Supply Ducts at building interior	2	Flexible or Rigid Glass Fiber	0	NA
Rectangular Supply Ducts at building exterior	0		2	Thermal Liner
Return Ducts at building interior, conditioned spaces	1	Flexible or Rigid Glass Fiber	0	NA
Circular Return Ducts at building interior, unconditioned spaces	2	Flexible Glass Fiber	0	NA
Rectangular Return Ducts at building interior, unconditioned spaces	2	Flexible or Rigid Glass Fiber	0	NA
Return Ducts at building exterior	0		2	Thermal Liner
Supply Plenums	0		1	Thermal Insulation
Return Plenums	0		1	Acoustical Insulation

END OF SECTION

SECTION 15303
AUTOMATIC WET PIPE SPRINKLER FIRE PROTECTION SYSTEM AND FIRE WATER SUPPLY SYSTEM

1PART GENERAL

1 SECTION INCLUDES

A. Automatic Sprinkler System, wet pipe type.
B. Fire Water Supply including but not limited to well, pump, distribution main piping, Jockey Pump, Pump house, Power Supply, and Automatic Controls.
C. Fire hydrant(s) as required by AHJ.
D. Fire Department Connection (FDC)

1.2 SUBMITTALS

A. Submittals: Submit shop drawings and product data to Authority Having Jurisdiction (AHJ) and Owner's insurance underwriter for approval. Submit proof of approval to Architect/Engineer.

B. Shop Drawings: Indicate detailed pipe layout, supports, components, accessories, sizes, and hydraulic calculations for both building sprinkler system and site fire protection water supply system.

C. Product Data: Provide data for pipe materials used, valves, manufacturer's catalogue sheet for equipment indicating rough-in size, finish, accessories, pump type, capacity, power requirements, certified pump curves, and NPSH.

D. Operation and Maintenance Instruction: Include components of system, servicing requirements, record drawings, inspection data, and parts lists.

E. Extra Materials: Provide extra sprinkler heads, wrenches, and metal storage cabinet.

F. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds code requirements.

G. Design to allow future expansion. Provide branch stub outs and valves to facilitate future work in coordinated manner.

1.3 QUALITY ASSURANCE

A. Sprinkler Systems: Conform to NFPA 13 and and all state and local codes.

B. Must be Hydraulic calculated to most remote area.

C. Perform flow test prior to design.

D. Equipment and Components: Bear UL label or marking.

E. Specialist Firm: Company specializing in sprinkler systems with five years minimum experience.

F. Design: Under direct supervision of a Professional Engineer experienced in design of this work and licensed at the place where the Project is located.

PART 2 PRODUCTS

2.1 PIPE

A. Steel Pipe: ASTM A53, ASTM A120, ANSI/ASTM A135, or ANSI/ASME B36.10, Schedule 10 or 40 black. Utilize schedule 40 for branches.
   1. Cast Iron Fittings: ANSI/ASME B16.1, flanges and fittings; ANSI/ASME B16.4, screwed fittings.
   2. Malleable Iron Fittings: ANSI/ASME B16.3, screwed type; ANSI/ASTM A47.
   3. Mechanical Grooved Couplings: Malleable iron housing, “C” shaped composition sealing gasket, steel bolts, nuts, and washers.

C. HANGERS: Pipe hangers may be either clevis or adjustable swivel type. They must be the correct size for each pipe. All hanger spacing must not exceed NFPA spacing. When hangers are installed on wood construction, they should be by either drive screws or lag bolts. When hangers are installed on steel construction, these should have a set screw with lock nut.

2.2 GATE VALVES

A. Up to and Including 2 Inches: Bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge or disc, solder or threaded ends.

B. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, solid wedge, flanged or grooved ends.

2.3 BUTTERFLY VALVES

A. Bronze body, stainless steel disc, resilient replaceable seat, threaded ends, extended neck, handwheel and gear drive and integral indicating device.

B. Cast or ductile iron body, chrome plated ductile iron disc, resilient replaceable EPDM seat, wafer or lug ends, extended neck, handwheel and gear drive and integral indicating device.

2.4 CHECK VALVES

A. Up to and Including 2 Inches: Bronze swing disc, solder or screwed ends.

B. Over 2 Inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends.

C. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer or flanged ends.

2.5 DRAIN VALVES

A. Bronze compression stop with nipple and cap or hose thread.

B. Brass ball valve with cap and chain, ¾ inch hose thread.

2.6 SPRINKLER HEADS

A. Drywall and Suspended Ceiling Type: Semi-Recessed pendant type with chrome plated finish, and matching escutcheon.

B. Exposed Structure Area Type and Concealed Spaces Above Ceilings: Standard upright type with chrome plated finish.

C. Sidewall Type: Recessed horizontal sidewall type chrome plated finish with matching escutcheon.

D. Temperature of heads to be 165 degrees F except near heaters where will be 212 degrees F.

2.7 SPRINKLER PIPING SPECIALTIES

A. ALARM VALVE: The Alarm Valve should have U1 and FV approval. The Alarm Valve should have the following trim: Retard Chamber, Gauges, Water Motor Gong and Test Trim Package. Alarm Valve must have two inch drain that runs to outside of building (bell drain included).

B. Water Flow Switch: Vane type switch with two contacts.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

B. Ream pipe and tube ends to full inside diameter. Remove burrs and bevel plain end ferrous pipe.

C. Remove scale and foreign material, inside and outside, before assembly.

D. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetration to maintain fire resistance equivalent to fire separation required.

E. Place pipe runs to minimize obstruction to other work. Offset around ductwork. Place piping in concealed spaces above finished ceilings.

F. Provide gate valves for shut-off or isolating service. Where approved, use butterfly valves instead of gate valves.

G. Provide drain valves at main shut-off valves, low points of piping and apparatus.

H. Connect system to water source ahead of domestic water connection with double check valve assembly.

I. Protection:
   1. Apply temporary tape or paper cover to ensure sprinkler heads do not receive paint finish.
   2. Ensure concealed sprinkler head cover plates do not receive field paint finish.

J. Interface sprinkler system with building fire and smoke alarm system.

K. Flush entire piping system of foreign matter.

L. Hydrostatically test entire system according to MFPA 13 or 15 requirements. Certification of test to be submitted to Architect prior to acceptance. Copies must be sent to Fire Marshall and Owner's insurance company.

END OF SECTION

SECTION 15404
PLUMBING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe and pipe fittings, valves.
B. Plumbing Specialities: clean-outs, back-flow preventers, water hammer arresters, thermostatic mixing valves, hose bibs/hydrants.
C. Plumbing Fixtures.
D. Plumbing Equipment.

1.2 SUBMITTALS

A. Product Data: Provide for plumbing specialities, fixtures, and equipment.

PART 2 PRODUCTS

2.1 SANITARY SEWER PIPING, BURIED BEYOND BUILDING

A. PVC Pipe: ASTM D3033 or D3034, SDR 35, with elastomeric gaskets.

2.2 SANITARY SEWER PIPING, BURIED AND ABOVE GRADE, WITHIN BUILDING

A. State and Locally Approved Material.

2.3 WATER PIPING, BURIED BEYOND BUILDING

A. State and Locally approved material

2.4 WATER PIPING, BURIED UNDER BUILDING

A. State and Locally approved material.

2.5 WATER PIPING, ABOVE GRADE

A. State and Locally approved material.

2.6 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under: malleable iron unions for threaded ferrous piping; bronze unions for soldered copper pipe joints.
B. Grooved and Shouldered Pipe End Couplings: Malleable iron housing; "C" shape composition sealing gasket; steel bolts, nuts, and washers.

C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.7 GLOBE VALVES

A. Up to 2 Inches: Bronze body, rising stem and handwheel, inside screw, renewable composition disc, solder or screwed ends, with back seating capacity.

2.8 BALL VALVES

A. Up to 2 Inches: Bronze or stainless steel body, stainless steel ball, Teflon seats and stuffing box ring, lever handle, solder or threaded ends.

2.9 RELIEF VALVES

A. Bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

2.10 CLEAN-OUTS

A. Floor: Lacquered cast iron, two piece body with double drainage flange, weep holes, reversible clamping collar, and adjustable nickel-bronze strainer, round striated cover in service areas and round depressed cover to accept floor finish in finished floor areas.
B. Wall: Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

2.11 WATER HAMMER ARRESTERS

A. PDI WH-201, pre-charged suitable for operation in temperature range -100 to 300 degrees F (-73 to 149 degrees C) and maximum 250 psig (1700 kPa) working pressure.

2.12 HOSE BIBS/HYDRANTS

A. Wall Hydrant: Non-freeze, self-draining type with chrome plated wall plate hose thread spout, removable key, and vacuum breaker.

2.13 PLUMBING FIXTURES AND EQUIPMENT

A. See Plumbing Fixture and Equipment Schedule on Plans.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.
B. Remove scale and dirt, on inside and outside piping before assembly.
C. Prepare piping connections to equipment with flanges or unions.
D. Review millwork shop drawings. Confirm location and size of plumbing and openings before rough-in and installation.
E. Verify adjacent construction is ready to receive rough-in work of this Section.

3.2 INSTALLATION

A. Provide dielectric connections wherever jointing dissimilar metals.
B. Install piping to conserve building space and not interfere with use of space. Group piping whenever practical at common elevations.
C. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
D. Provide clearance for installation of insulation and access to valves and fittings.
E. Slope water piping and arrange to drain at low points.
F. Install specialties in accordance with manufacturer's instructions.
G. Extend clean-outs to finished floor or wall surface. Lubricate threaded clean-out plugs with mixture of graphite and linseed oil. Ensure clearance at clean-out for rodding of drainage system.
H. Install water hammer arresters for each plumbing group run-out.
I. Install each fixture with chrome plated rigid or flexible supplies with screwdriver stops, reducers, and escutcheons.
J. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
K. Install water heaters in accordance with manufacturer's instructions and to applicable industry standard requirements. Coordinate with plumbing piping and related work to achieve quite operating system free of water hammer.
L. Route temperature and pressure relief valve piping to floor drain, utility sink, or on gap trap drain. Provide cut off valve on supply and unions.
M. Provide cut off valves in accessible locations for each plumbing group and at origination of each below slab branch feeder line. Provide access doors and locate for installation by others.

3.3 APPLICATION

A. Use grooved mechanical couplings and fasteners, and dielectric connections only in accessible locations.
B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install globe valves for throttling, bypass, or manual flow control services.

3.4 SERVICE CONNECTIONS

A. Provide sanitary sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

END OF SECTION

SECTION 15786
SPLIT SYSTEM HEAT PUMPS

1PART GENERAL

1. WORK INCLUDED

A. Outdoor Heat Pump Units with compressors and fans.

B. Indoor Heat Pump Units with matching coil and blower.

C. Unit controls and safety devices

D. Refrigerant Piping

E. Accessories

1.2 SUBMITTALS

A. Submit shop drawings and product data showing dimensions, connections, arrangement, accessories and controls. Submit manufacturer's installation instructions, descriptive literature, operating instructions and maintenance data.

B. Submit Manufacturer’s Data Sheets on each unit and all accessories to be furnished. Clearly indicate optional features to be furnished and all electrical requirements. Include detailed installation instructions and dimensions.

C. Submit Shop Drawings on special mounting arrangements if not included in standard installation instructions.

1.3 OPERATING EFFICIENCY

A. Provide unit and coil combination to achieve a SEER rating of 13 minimum or as scheduled.

1.4 QUALITY ASSURANCE

A. Test and rate cooling capacities in accordance with ARI Standard 210.

1.5 WARRANTY

A. Provide manufacturer's standard commercial, 10 year minimum, parts and labor warranty.

PART 2 PRODUCTS

2.1 PRODUCTS

A. Provide units as scheduled on drawings or approved equal.

2.2 AIR FILTERS

A. One inch (1") thick cotton and synthetic blend extended surface, disposable type arranged for easy service. Provide external filter rack accessible from furnace/ air handler closet.

2.3 THERMOSTAT

A. Provide low voltage automatic 7 day programmable heating/cooling thermostat for each system, Honeywell T7300 with communicating sub-base.

2.4 OUTDOOR UNITS

A. Provide low ambient and high and low pressure controls. Provide timed off cycle switch.

B. Include all motor starters, overloads, and contactors, and provide 24 volt control transformer.

C. Furnish with 20 gauge zinc-coated steel casing with baked enamel finish.

D. Provide hermetically sealed compressor(s).

E. Fans to be direct drive balanced propeller fans with weatherproof motors.

F. Provide fully gasketed and insulated (1" of 1 lb. density) evaporator coil casing. Provide insulated drain pan.

H. Provide type K copper refrigerant piping sized per manufacturers recommendation.

2.5 INDOOR COILS

A. Provide thermostatic expansion valve. Provide matching coil for furnace and condensing unit specified. Locate on return side of air handler. Provide P-trap in condensate drain. Provide plastic drain pan with gravity emergency drain to conspicuous location. DO NOT ROUTE TO PLUMBING DWV PIPING.

2.6 SYSTEM

A. All components to be of same manufacturer and shall be approved matching combinations.

2.7 ELECTRIC HEAT AIR HANDLERS

A. Multi-speed drive blower. Variable speed not approved.
B. Provide optional high static blower for duct runs over 30 lin. ft.
C. Auxiliary heat shall be equivalent to nominal BTUH heating capacity of heat pump at standard ARI conditions.
D. Air handler and auxiliary heat unit to be single circuit with internal circuit breaker protection for individual components.

2.8 ACCEPTABLE MANUFACTURERS

A. Acceptable Manufacturers: Rheem, Ruud, Carrier, York, Lennox, or other approved domestic USA manufacturer.
B. System manufacturer shall have local franchised dealer service provider within 25 mi. radius.

2.9 BOOSTER FAN

A. For duct runs exceeding 50 lin. ft. duct run or .5” static pressure, provide in-line axial blower booster fan of equal or greater cfm capacity to offset pressure loss in duct run.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide refrigeration line sets sized to suit application. Route in PVC pipe sleeve through walls and roof or install in 6” dia. PVC pipe conduit below slabs with long sweep elbows. Route concealed. Protect from physical damage. Insulate continuously. Seal around. **Exposed rise or lateral run on exterior walls not permitted.**

B. Mount exterior heat pump section on poured in place 4" thick reinforced concrete pad. Pre-fab pads not permitted. Thicken edge of pad to 8" and reinforce perimeter with 1-No. 4 bar.

C. Installation shall comply with all applicable state and local codes.

D. Route condensate drain to DWV air gap trap, utility sink, or floor drain where approved by local AHJ. Coordinate location and quantity of drains with plumbing contractor. Route drain lines concealed, insulate above ceilings.

E. For attic mounted air handlers with coil above finished ceilings, provide emergency overflow pan with 3" high lip and 1" dia. PVC overflow drain line. Provide float switch to shut unit down if water depth in pan exceeds 1".

F. Twinned furnace/air handler units must be interlocked for simultaneous operation.

G. Provide installation and connect refrigerant piping, electric power, and control wiring for proper operation.

H. Limit all refrigerant piping to 50' in length where possible. For piping over 50' in length, increase pipe sizes one pipe size.

END OF SECTION

SECTION 15880
AIR DISTRIBUTION

Part 1 GENERAL

1.1 SECTION INCLUDES

A. Ductwork and ductwork accessories.

B. Volume control dampers.

C. Fire dampers.

D. Flexible duct connections.

C. Diffusers, boots, registers, grilles.

E. Louvers.

F. Air devices including louvers and dampers

G. In-Line Duct Silencers

1.2 RELATED WORK

A. General Mechanical Requirements
B. Mechanical Insulation

1.3 SUBMITTALS

A. Product Data: Provide for manufactured products and assemblies.
B. Operating and Maintenance Instructions: Include instructions for lubrication, and spare parts lists.
C. Samples: Submit color chart of Manufacturer's standard colors for selection for all air devices.
D. Submit Manufacturer's Data Sheets on air devices, dampers, louvers, flexible duct, duct silencers, take-off fittings, and other manufactured items.
E. Shop Drawings: Complete ductwork layouts, fittings, and air devices including plenums, splitters, takeoffs, transitions, elbows, etc.

1.4 QUALITY ASSURANCE

A. Fabricate ductwork in compliance with SMACNA Low Pressure Duct Standard and NFPA 90A.

Part 2 PRODUCTS

2.1 SHEET METAL DUCTS

A. Use galvanized steel lock forming quality with 1.25 ounces per square foot zinc coating on each side.
B. Use rivets or sheet metal screws for fasteners.
C. Use non-hardening water and fire resistant sealant for all joints and seams.

2.2 FLEXIBLE DUCTS

A. Flexible spiral wound duct with 1" insulation and vapor barrier. Insulation conductance at 75 degree F, no greater than 0.23 btu/hr. sf. deg. Vapor transmission of vapor barrier no greater than 0.1 perms. Maximum flex duct length to be limited to 48".

2.3 AIR DEVICES

A. Registers/Grilles/Diffusers: As scheduled and noted on drawings. Color as selected. Coordinate mounting with ceiling, floor, or wall construction and finish.
B. Louvers: 2 inches deep with blades on 45 degree slope, heavy channel frame, bird screen with ½ inch square mesh.
   23480.Material: 12 gage thick extruded aluminum.
   2. Finish: Factory baked enamel fluorpolymer spray finish, color to be selected.
   3. Installation: Exterior flat flange.

2.4 DUCTWORK ACCESSORIES

A. Turning Vanes: Provide double thickness airfoil type turning vanes at all rectangular elbows. Perforated, internally insulated blades shall be used on ducts 20" and wider.
B. Take off Fittings: Where round duct takes off from rectangular duct, provide Cody or Wilkins Takeoff fitting or shop made equivalent. Direct taps not permitted.
C. Flexible Connections: Neoprene coated flameproof fabric tightly crimped into metal edging strips. Attach to ductwork and equipment with sheet metal screws. Provide at duct/plenum connection to all motorized blower cabinets or furnaces.

D. Access Doors: Provide where required for maintenance and inspection. Fabricate of galvanized steel with gaskets and quick fastening locking devices. Provide double thickness insulated door in insulated ductwork.
E. Fire Dampers (where required): Where ductwork penetrates fire rated wall, ceiling, or floor and/or where indicated on Drawings, provide type B fire damper of the curtain type with fusible link with 90% free area of duct. Select fusible link for 160 degree F. unless shown otherwise. Provide access doors at all fire dampers.
F. Duct Silencers: Provide proprietary manufactured in line duct silencer located within 5 ft. of air handler outlet connection and before first take off or branch.

Part 3 EXECUTION

3.1 DUCTWORK FABRICATION

A. Fabricate of sheet steel and support in accordance with SMACNA HVAC Duct Construction Standards except as otherwise indicated. Utilize lock seam joint construction.
B. Construct T's, bends, and elbows with minimum radius of 1 1/2 times width of duct on center line. Where not possible increase duct size 25% and provide mitered elbow with airfoil type turning vanes.
C. Duct sizes shown on drawings are clear inside dimensions. For internally insulated ducts, increase sheet metal size to allow for thickness of insulation. Change duct sizes gradually, not exceeding 30 degrees divergence and 45 degrees convergence.
D. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
E. Fiberglass duct board not permitted. Flexible ductwork not permitted except as specifically allowed herein.
F. Fabricate Volume Control Dampers in accordance with SMACNA HVAC Duct Construction Standards and as indicated.
G. Fabricate splitter dampers of material same gage as duct to 24 inches size in either direction, and two gages heavier for larger sizes. Secure with continuous hinge or rod. Operate with minimum 1/4 inch diameter rod.
H. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where width exceeds 30 inches provide regulator at both ends.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Provide back-draft dampers on discharge of exhaust fans and as indicated.
C. Prevent passage of unfiltered air around filters with felt, rubber, or neoprene gaskets.
D. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
E. Connect lay-in diffusers in suspended ceilings (where applicable) to low pressure ducts with 5 feet maximum length of flexible duct. Hold in place with strap or clamp.
F. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
G. Provide fire dampers at locations indicated or required by codes and regulatory authority. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
H. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.
I. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access.
J. Coordinate location of air outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
K. Paint ductwork visible behind air outlets and inlets matte black.

L. Where duct sizes are not indicated, provide sizing to maintain 1,000 fpm max. air velocity in main supply ducts, 900 fpm in branch supply ducts, and 800 fpm in return ducts.
M. Where diffuser/grille sizes are not indicated, provide sizing to maintain 600 fpm max. at supplies and 400 fpm max. at returns.
N. Coordinate duct routing and sizing with building structurals and spaces available. Proportional sizing may be adjusted to provide equivalent friction for equal air volume where necessary due to space limitations. Where unavoidable conflicts arise, notify Architect who will issue a field directive to resolve. Do not install any ductwork prior to coordination and/or issuance of conflict resolution.
O. Circular branch takeoffs from rectangular ducts shall be made with factory type transition fitting by “Wikins”, “Cody”, or Alco/Standex to provide smooth air flow with minimum friction/pressure loss. Direct taps are not permitted except where starter tap size is 50% greater than duct size required with reducer transition fitting to duct size.
P. Duct sizes shall not decrease upstream.
Q. Duct sizes indicated on plans are net free inside dimensions clear of internal insulation (if any).
R. Use flexible duct (6' min. - 8' max. length) for final connection to supply air devices only in lay-in ceiling. Connect with strap or clamp.
S. Use flexible fabric connections at each fan and air handling device.
T. Verify locations required of outlets and make adjustments to coordinate with architectural features, lighting fixtures, etc.
U. Adjust air devices for proper throw distance and direction.
V. Seal all longitudinal and transverse joints with foil type duct tape.

3.3 FABRICATION

A. Provide proper duct reinforcing with angles or cross breaks per SMACNA Standard, insulate.
B. Lap metal ducts with interior lapped edge downstream of air flow direction.
C. Make transitions gradually with convergence no greater than 30 degrees and divergence no greater than 45 degrees.
D. Rigidly construct ducts with tight joints free from vibration, rattles, or air noise. Audible leaks shall be sealed with approved sealant.
E. Construct plenums of galvanized panels suitably reinforced and diagonally braced.

END OF SECTION

SECTION 16050
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding.
B. Connection of utilization equipment.
C. Supports.
D. Identification.

1.2 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.
B. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.

1.3 PROJECT CONDITIONS

A. Verify field measurements and circuiting arrangements are as shown on Drawings.
B. Verify removal of existing electric work.
C. Report discrepancies to Architect/Engineer before disturbing existing installation.

1.4 COORDINATION

A. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other Sections to determine connection locations and requirements.
B. Sequence rough-in of electrical connections to coordinate with installation and start-up of equipment furnished under other Sections.

PART 2 PRODUCTS

2.1 GROUNDING MATERIALS

A. Ground Rod: Copper-clad steel, ¾ inch diameter 10 feet length.
B. Mechanical Connectors: Bronze.

2.2 BASIC MATERIALS

A. Steel channel: Galvanized or painted steel.
B. Miscellaneous Hardware: Treat for corrosion resistance.
C. Nameplates: Engraved three-layer laminated plastic black letters on white background. For equipment embossed adhesive tape labels, with 3/16 inch white letters on black background for branch circuit breaker identification.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Install ground electrodes at locations indicated. Install additional rod electrodes as required to meet Regulatory Requirement.

C. Provide bonding to meet Regulatory Requirements.

D. Provide grounding conductor in raceways to all enclosures, receptacles, lighting fixtures, etc. Separate neutral and grounding conductor at point of main disconnect.

E. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.

F. Verify that wiring and outlet rough-in work is complete and that equipment is ready for electrical connection, wiring, and energization.

G. Make wiring connections in control panel or in wiring compartment of pre-wired equipment. Provide interconnecting wiring where indicated.

H. Install and connect disconnect switches, controllers, control stations, and control devices as indicated.

I. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit in damp or wet locations.

J. Install pre-fabricated cord set where connection with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.

K. Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.

L. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.

M. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using anchorage devices approved for structural conditions.

N. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete

surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.

O. Do not fasten supports to piping, ceiling support wires, ductwork, mechanical equipment, or conduit.

P. Do not use powder-actuated anchors.

Q. Do not drill structural steel members.

R. Fabricate supports from structural steel or steel channel.

S. Install free-standing electrical equipment on concrete pads.

T. Install surface-mounted cabinets and panel boards with minimum of four anchors.

U. Provide steel channel supports to stand cabinets 1 inch off wall in wet locations.

V. Bridge studs top and bottom with channels to support flush-mounted cabinets and panel boards in stud walls.

W. Do not cut, drill, or notch any structural member without specific written approval.

Exception: In wood framed construction, studs and joists may be drilled in center one third of member depth, diameter of hole not to exceed one fourth (25%) of member size, and one inch minimum clearance from edge of member. Less than one inch clearance may be permitted from edges by written permission if protective metal splice plates are utilized such as Simpson type “SS”, however, no cutting or alteration of wood trusses or other engineered structural wood products will be permitted.

X. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as indicated or scheduled.

Y. Degrease and clean surfaces to receive nameplates and tape labels.

Z. Secure nameplates to equipment fronts using screws, rivets, or adhesive, with edges parallel to equipment lines. Secure nameplate to inside face of recessed panel board doors in finished locations.

AA. Use nameplates, pressure sensitive tape labels, to identify individual switches and circuit breakers, and loads served.

BB. Use nameplates with ¼ inch, engraved type, to identify distribution and control equipment.

CC. Install wire markers on each conductor in panel board gutters, pull boxes, junction boxes, and at load connections.

DD. Use branch circuit or feeder number to identify power and lighting circuits.

EE. Provide type written or machine printed circuit schedule for each branch circuit panel. Identify and describe load served. Hand written schedule not permitted.

END OF SECTION

SECTION 16110
RACEWAYS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Conduit and fittings.
B. Surface raceway.
C. Wireway.
D. Electrical boxes.
E. Service fittings.

1.2 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.
B. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.

PART 2 PRODUCTS

2.2 APPLICATION/RACEWAY TYPE REQUIRED:

A. Underground Installations More than Five Feet From Foundation Wall: Non-Metallic Rigid conduit. Provide concrete encasement where indicated.
B. Installations In or Under Concrete Slab on grade, or Underground Within Five Feet C. From Foundation Wall: Non-Metallic Rigid conduit. Provide concrete encasement where indicated.
D. In Slab Above Grade: Electrical metallic tubing, with concrete-tight fittings for 1 ¼" or smaller conduit.
E. Exposed Outdoor Locations: intermediate metal conduit. For 1 ½" or larger, F.Electrical metallic tubing. For 1 ¼" or smaller, use threaded or rain tight fittings.
G. Wet Interior Locations: For 1 ½" or larger, intermediate metal conduit. For 1 ¼" or smaller, Electrical metallic tubing. Use threaded or rain tight fittings for metal conduit.
H. Concealed Dry Interior Locations: intermediate metal conduit or electrical metallic tubing.
I. Exposed Dry Interior Locations: intermediate metal conduit. Electrical metallic

2.3 Minimum Raceway sizing

A. Minimum Size Conduit: ½-inch.
B. Minimum Size Conduit below slabs: 1-inch.
C. Maximum Size Conduit in Slabs: ¾ inch.

2.4 CONDUIT AND FITTINGS

A. Conduit:
1. Metal Conduit and Tubing: Galvanized steel.
2. Flexible Conduit: Steel.
3. Liquidtight Flexible Conduit: Flexible conduit with PVC jacket.
4. Plastic Conduit and Tubing: NEMA TC 2; PVC. Use Schedule 40 conduit.

B. Conduit Fittings:
1. Metal Fittings and Conduit Bodies: NEMA FB 1.
2. Plastic Fittings and Conduit Bodies: NEMA TC 3.

2.5 WIREWAY AND AUXILIARY GUTTERS

A. Wireway: General purpose or Raintight type wireway, as noted or required on drawings.
Size: as indicated on Drawings.
B. Cover: Screw cover.
C. Finish: Rust inhibiting primer coating with gray enamel finish.

2.6 ELECTRICAL BOXES

A. Boxes:
Sheet Metal: NEMA OS 1; Galvanized steel.
Cast Metal: Aluminum, deep type, gasket cover, threaded hubs.

B. Floor Boxes for Installation in Poured Concrete Floors: Fully adjustable, cast iron, or formed steel.

C. Hinged Cover Enclosures: NEMA 250; Type 1, steel enclosure with manufacturer's standard enamel finish and continuous hinge cover, held closed by flush latch operable by screwdriver.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that supporting surfaces are ready to receive work.

B. Electrical boxes, outlets, and switches are shown on Drawings in approximate locations, unless dimensioned. Verify location prior to rough-in.

3.2 INSTALLATION

A. Arrange conduit to maintain headroom and to present neat appearance.

B. Route exposed raceway parallel and perpendicular to walls and adjacent piping.

C. Maintain minimum 6 inch clearance to piping and 12 inch clearance to heat surfaces such as flues and heating appliances.

D. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings.

E. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.

F. Group in parallel runs where practical. Use rack constructed of steel channel.

G. Maintain spacing between raceways or derate circuit ampacities to NFPA 70 requirements.

H. Use conduit hangers and clamps; do not fasten with wire or perforated pipe straps.

I. Use conduit bodies to make sharp changes in direction.

J. Terminate conduit stubs with insulated bushings.

K. Use suitable caps to protect installed raceway against entrance of dirt and moisture.

L. Provide No. 12 AWG insulated conductor or suitable pull string in empty raceways, except sleeves and nipples.

M. Install expansion joints where raceway crosses building expansion joints.

N. Install plastic conduit and tubing in accordance with manufacturer's instructions.

O. Install surface metal raceway in accordance with manufacturer's instructions.

P. Use flat-head screws or clips and straps suitable for the purpose, to fasten channel to surfaces. Mount plumb and level.

Q. Use suitable insulated bushings and inserts at connections to outlets and corner fittings in metal raceway.

R. Use fittings and accessories designed for use with raceway system.

S. Install auxiliary gutter and wireway in accordance with manufacturer's instructions.

T. Install electrical boxes as shown on the drawings, and as required for splices, taps, wire pulling, equipment connections and regulatory requirements.

U. Use cast outlet box in exterior locations exposed to weather and wet locations.

V. Use hinged cover enclosure for interior pull and junction box larger than 12 inches in any dimension.

W. Locate and install electrical boxes to allow access. Provide access panels if required.

X. Locate and install electrical boxes to maintain headroom and to present neat mechanical appearance.

Y. Install pull boxes and junction boxes above accessible ceilings or in unfinished areas.

Z. Provide knockout closures for unused openings.

AA. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

BB. Coordinate mounting heights and locations of outlets above counters and bac k splashes.

CC. Install lighting outlets to locate luminaries as shown on plans.

DD. Use recessed outlet boxes in finished areas and where indicated.

EE. Secure boxes to interior wall and partition studs, accurately position to allow for surface finish thickness.

FF. Use adjustable steel channel fasteners for flush ceiling outlet boxes.

GG. Locate boxes in masonry walls to require cutting corner only. Coordinate masonry cutting to achieve neat openings for boxes.

HH. Do not install boxes back-to-back in walls; provide 6 inches separation, minimum; except provide 24 inches separation, minimum in acoustic-rated walls.

II. Do not damage insulation.

JJ. Install floor boxes in accordance with manufacturer's instructions.

KK. Set boxes level and flush with finish flooring material.

LL. Use cast floor boxes for installations in slab on grade.

MM. Install service fittings in accordance with manufacturer's instructions.

END OF SECTION

SECTION 16120
WIRE AND CABLE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wire and cable.
B. Wiring devices.
C. Service fittings.

1.2 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

1.3 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.
B. Furnish products listed by UL or other testing firm acceptable to authority having jurisdiction.

PART 2 PRODUCTS

2.1 WIRING METHODS

A. All wiring shall be installed in raceway.
B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet; and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

2.2 WIRE AND CABLE

A. Line Voltage Building Wire:

1. Feeders and Branch Circuits: Copper conductor, 600 volt insulation, THHN/THWN.

2.3 WIRING DEVICES AND WALL PLATES

A. Single Pole Switch:
Commercial Spec Grade, 20 amp, 120/277V, Ivory- Hubbell CSB120I
B. Double Pole Switch:
Commercial Spec Grade, 20 amp, 120/277V, Ivory- Hubbell CSB220I

C. Three-way Switch:
Commercial Spec Grade, 20 amp, 120/277V, Ivory-Hubbell CSB320I

D. Four-way Switch:
Commercial Spec Grade, 20 amp, 120/277V, Ivory-Hubbell CSB420I

E. Single Convenience Receptacle:
Heavy Duty, Spec Grade, 20 amp, 125V, Ivory-Hubbell HBL5361I

F. Duplex Convenience Receptacle:
1. Compact Spec Grade, 15 amp, 125V, Ivory- Hubbell HBL5242I
2. Compact Spec Grade, 20 amp, 125V, Ivory-Hubblell HBL5342I (where noted on Drawings by subscript 20A)

G. GFCI Duplex Convenience Receptacle (Provide at all interior locations where noted on Drawings by subscript GFCI and all convenience outlets in kitchens, restrooms, baths, janitor closets, nurseries, garages, all exterior locations, and other wet areas required by NFPA 70):

1. HD Spec Grade, 15 amp, 125V, Ivory-Hubbell GF5262I
2. HD Spec Grade, 20 amp, 125V, Brown-Hubbell GF5362 (all exterior locations)

Exception: Where feeder circuit wiring is protected by a GFIC Circuit Breaker,a non-GFIC receptacle may be substituted.

H. Tamper Resistant Duplex Convenience Receptacle (Provide at all pre-school areas, nurseries, and other areas required by NFPA 70, where both tamper resistant and GFIC is required provide combination TR/GFIC type):

1. Residential Grade, 15 amp, 125V, Ivory-Hubbell RR15SITR
2. Residential Grade, 15 amp, 125V, Ivory-Hubbell GFTR15I (Combination TR/GFIC)

I. Decorative Cover Plate (all interior locations):
Smooth nylon, break resistant, color matched to device

J. Weatherproof Cover Plate (at exterior locations):
Gasketed cast metal plate with hinged gasketed device cover.

K. Exterior Junction Box Cover Plate: Smooth cast metal with gasket.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that interior of building is physically protected from weather.

B. Verify that mechanical work which is likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

3.2 INSTALLATION

A. Neatly train and secure wiring inside boxes, equipment, and panel boards.

B. Use wire pulling lubricant for pulling 4 AWG and larger wires.

C. Support cables above accessible ceilings to keep them from resting on ceiling tiles.

D. Make splices, taps, and terminations to carry full capacity of conductors without perceptible temperature rise.

E. Terminate spare conductors with electrical tape.

F. Install wiring devices in accordance with manufacturer's instructions.

G. Install wall switches 42 inches above floor, OFF position down. Install convenience receptacles 18 inches above floor or 6 inches above counter/backsplash.

H. Install specific purpose receptacles at heights shown on Drawings.

I. Install cord and attachment plug caps on equipment under the provisions of Section 16050. Size cord for connected load and rating of branch circuit over-current protection.

J. Install wall plates flush and level.

K. Install decorative nylon plates on switch, receptacle, and blank outlets in finished areas. Use jumbo size plates for outlets installed in masonry walls. Color of plates shall be standard white, ivory, or brown as selected. **Obtain color selection for each room prior to installing devices.**

L. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

END OF SECTION

SECTION 16400
POWER SERVICE AND DISTRIBUTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Service entrance and metering.
B. Enclosed switches.
C. Grounding.
D. Panelboards.
E. Load Centers
F. Enclosed circuit breakers.
G. Fuses.
H. Contactors.
I. Relays
J. Service entrance conduit(s) from transformer to service disconnect.
K. Transformer pad.

1.2 SYSTEM DESCRIPTION

A. Electric Service System: As noted scheduled, and detailed on Drawings.

1.3 SUBMITTALS

A. Shop Drawings: Indicate relevant information on switchboards, panelboards and load centers.

B. Product Data: Provide data on enclosed switches and circuit breakers, fuses, and circuit breakers.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of Utility Company.

PART 2 PRODUCTS

2.1 ENCLOSED SWITCHES

A. Enclosed Switch Assemblies: NEMA KS 1; Type GD for up to 600 amps, Type HD for over 600 amps.
B. Fuse clips: Designed to accommodate Class L for up to 600 amps, J for over 600 amps.
C. Enclosures: As indicated on Drawings or required for application.

2.2 FUSES (where noted or required)

A. Fuses 600 Amperes and Less: Dual element, current limiting, one-time fuse, 600 volt, UL Class as scheduled on Drawings.
B. Fuses Larger Than 600 Amperes: Current limiting, one time fuse, 600 volt, UL Class L.

C. Fuse Interrupting Rating: 100,000 RMS for up to 600 amps, 200,000 RMS for over 600 amps, or as scheduled on drawings.

2.3 GROUNDING MATERIALS

A. Ground Rods: Copper-encased steel, ¾ inch diameter, minimum length 10 feet.
B. Clamps: Bronze.

2.4 MAIN AND DISTRIBUTION PANELBOARDS: NEMA PB 1; circuit breaker type. Enclosure: as noted on drawings.

A. Provide surface cabinet front with screw cover and hinged door.
B. Bus: Aluminum.
C. Ground Bus: Aluminum.
D. Voltage: as noted on drawings.
E. Minimum Integrated Equipment Rating: as scheduled on drawings but not less than the following:
   1. 65K min. for Main Disconnects or Panelboards of 1,000-2,000 Amps total connected rating(s) within 75' of service transformer and for Disconnects or Panelboards within 20' downstream of such disconnect or panelboard
   2. 22 K min. for Main Disconnects of 1,000-2,000 Amps total connected rating(s) over 75' from service transformer, for Main Disconnects or Panelboards of 400-800 Amps total connected rating(s) within 50' of service transformer, and for Distribution Panelboards within 20' down stream of such main disconnects or panelboards.
   3. 10 K min. for all other panelboards.

2.5 LIGHTING AND APPLIANCE BRANCH CIRCUIT LOAD CENTERS: NEMA PB 1; circuit breaker type. Enclosure: NEMA PB 1; Type 1. Provide flush or surface cabinet front as noted or required. Bus: Aluminum bus. Ground Bus: Aluminum. Voltage: as noted on drawings. Minimum Integrated Equipment Rating: 10 K.

2.6 WORKING SPACE: Provide adequate working space in panelboards and load centers for conduit entrances and wiring.

2.7 ENCLOSED CIRCUIT BREAKERS

A. Circuit Breaker: NEMA AB 1. Molded case circuit breaker (MCCB)
   1. Voltage, Interrupt Rating, and Enclosure as indicated on drawings.

2.8 CONTACTORS AND RELAYS AND MISCELLANEOUS EQUIPMENT AND DEVICES

A. Where multiple circuits are controlled by single switch or switching device such as time clock or photo cell or auxiliary contacts provide appropriately sized and configured contactor. Where control circuit and/or

control device is not compatible in rating with controlled load provide suitable relay device.

B. Provide all power equipment and devices incidental to complete operable system as would normally be required for service and function intended whether or not specifically identified or shown.

C. Coordinate sizes and characteristics of equipment and devices.

PART 3 EXECUTION

3.1 POWER SERVICE

A. Make arrangements with Utility Company to obtain permanent electric service to the Project.

B. Provide concrete pad for Utility transformer under provisions of Section 03001. Provide pad dimensions and details to Utility requirements.
C. Provide conduits, ditching, and equipment as required by Utility company.
D. Coordinate all details of service requirements with Utility Company.
E. Pay all fees and contributions to Utility Company required excluding Owners deposit.

3.2 INSTALLATION

A. Install Utility services in accordance with Utility Company instructions.
Underground: Install service entrance conduits from Utility Company's pad-mounted transformer to building service entrance equipment.

B. Install equipment in accordance with manufacturer's instructions.

C. Install proper fuses in each fused switch.

D. Provide grounding and bonding to NFPA 70.
Supplementary Grounding Electrode: Use driven ground rod in main service equipment area.
Provide separate, insulated equipment grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, bus, or bushing.
Provide grounding and bonding at Utility Company's metering equipment and pad-mounted transformer.
Use 6 AWG minimum size, copper conductor to bond communications system grounding conductor to nearest effectively grounded metallic water pipe or separate grounding electrode.

E. Install panelboards and load centers to NEMA PB 1.1.
F. Provide additional spare conduits from each lighting and appliance distribution panelboard/load center to accessible location and cap for future extension as follows:
1. for up to 200 amp panels: 2 - ¾", 1 - 1"
2. for 400 amp thru 600 amp = 2 - 1", 1 - 1 ¼"

3. for 800 amp and over: 2 - 1", 1 - 1 ½", 1 - 2"

3.3 COORDINATION

A. Verify panelboard mounting depths and sizes as well as conduit rough-in space requirements and conduit routing. Notify Architect of any conflicts or restrictions with building walls, structure, other systems, or equipment prior to ordering equipment and roughing-in. Comply with resolution directive.

3.4 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Measure ground resistance from system neutral connection at service entrance to convenient ground reference point by passing minimum current of 10 amperes DC and measuring voltage drop. Maximum resistance: 10 ohms.

3.5 CLEANING

A. Clean equipment finishes to remove paint and concrete splatters. Touch-up primer.

3.6 LABELING

A. Install permanent labels, engraved laminated markers, identifying Panels, Switches, Junction Boxes and other distribution equipment at both interior and exterior locations. Hand written marking or pressure sensitive labels not approved.

B. At interior side of all panel doors, apply permanently legible machine labeled circuit identifier index. Hand written index not approved.

END OF SECTION

SECTION 16500
LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Luminaires.
B. Lamps.
C. Drivers
D. Poles and brackets.
E. Exit Signs.
F. Emergency lighting units.

1.2 SUBMITTALS
A. Product Data: Provide product data for each luminaire and lighting unit.
B. Operating and Maintenance Instructions: Provide maintenance and operating instructions for battery powered lighting units.

1.3 REGULATORY REQUIREMENTS
A. Conform to requirements of ANSI/NFPA 70.
B. Conform to requirements of NFPA 101.
C. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.

PART 2 PRODUCTS

2.1 LUMINAIRES AND LAMPHOLDERS
A. Luminaire Schedule: Product requirements for each luminaire and lampholder are specified in luminaire schedule on Drawings.

B. Accessories: Provide required accessories for mounting and operation of each luminaire as indicated.
C. Recessed Luminaires: Provide trim type suitable for ceiling system in which luminaire is to be installed.
1. Thermal Protection: Provide thermal protection devices to meet NFPA 70 requirements.
2. Surface Luminaires: Provide spacers and brackets required for mounting.
3. Pendant Luminaires: Provide swivel hangers, pendant rods, tubes, and chains as required to install luminaire at indicated height or, if not indicated, as directed by Architect.

2.2 LAMPS
A. Description:

1. LED Edison Base Lamps: 125 volts, output lumens, color temperature, and type as scheduled
2. ReflectorLamp Beam Patterns: Conform to ANSI C78.379 as scheduled or required for application.

2.3 BALLASTS AND DRIVERS

A. Provide driver suitable for use under installation conditions for each luminaire.
B. Voltage: As scheduled or required for application.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

Examine adjacent surfaces to determine that surfaces are ready to receive work.

3.2 INSTALLATION

A. Install luminaires and accessories in accordance with manufacturers instructions.
B. Provide pendant accessory to mount suspended luminaires and exit signs at height Indicated. Use swivel hanger on sloped ceilings.
C. Install recessed luminaires to permit removal from below.

D. Luminaire Pole Bases: Construct as indicated on Drawings. Install poles on bases plumb; provide for adjustment. Install lamps in luminaires and lamp holders.

E. Install fixtures located in ceiling areas with direct attachment to structure independent of finished ceiling. For lay-in troffers in grid ceilings, provide suspension hangers to structure above independent of ceiling grid. Utilize hardware and anchorage devices adequate for fixture weight.

F. Locate fixtures in ceiling areas equally and proportionally spaced, as indicated, or as directed by Architect to achieve best visual effect.

3.3 ADJUSTING AND CLEANING

A. Align luminaires and clean lenses and diffusers at completion of work.
B. Aim adjustable luminaires and lampholders as indicated or as directed.
C. Adjust directional arrows on exit signs to meet approval of authority having jurisdiction.
D. Clean paint splatters, dirt and debris from installed luminaires. Touch up finishes at completion of work.
F. Replace or Relamp luminaires which have failed lamps at completion of work.

END OF SECTION

SECTION 16670 - LIGHTNING PROTECTION

PART I: GENERAL

1.01 Scope: Furnish all labor, materials, and items of service required to complete a functional and unobtrusive lightning protection system approved by the Architect in strict accordance with the specifications and contract drawings. If any departure from the contract or submittal drawings covered below are deemed necessary by the contractor, details of such departures and reasons therefore shall be submitted to the architect for approval. No such departures shall be made without the prior written approval of the architect.

1.02 Reference Standards: The following standards of the latest issue form a part of this specification:
(A) Lightning Protection Institute Standard LPI-175;
(B) National Fire Protection Association Code NFPA 780 (2011 ed.);
(C) Underwriters' Laboratories Standards UL96A and UL96.

1.03 Quality Assurance: The system shall conform to the above cited standards. The system furnished shall be the standard product of a single, UL listed manufacturer regularly engaged in the production of lightning protection systems and shall be the manufacturer's latest approved design. All material specified is manufactured by Thompson Lightning Protection, Inc., 901 Sibley Highway, St. Paul, Minnesota, 55118, or approved equal.

1.04 Submittals: Complete shop drawings shall be prepared by the manufacturer and submitted to the architect for approval prior to start of work. System installer shall submit to the architect an original, project specific, notarized certification from the equipment manufacturer verifying their qualifications as a lightning protection installer. Samples and catalog data shall be submitted to the architect for approval upon request.

PART 2: PRODUCTS

2.01 Standard: All equipment shall be factory inspected, approved, and properly labeled in accordance with LPI and UL requirements. All equipment shall be new, the product of a single manufacturer, and of a design and construction to suit the application where used.

2.02 Equipment: All materials shall be copper or copper alloy and of the size, weight, and construction for use on steel framed buildings in accordance with LPI, UL, and NFPA requirements for Class I structures per manufacturer recommendations. All main conductors shall be copper, 29 strands 17 gauge, Cat. No. 29X. Air terminals shall be solid copper of 3/8" diameter, Cat. No. 52, 662, etc., and shall project 10" minimum above the object to be protected. Locate and space according to LPI, UL, and NFPA requirements. Air terminal bases shall be of cast bronze with bolt pressure cable

connections and shall be securely mounted with stainless steel screws or bolts, Cat. No. 690X, 678, 611, etc., as required. Crimp type connectors at bases are not acceptable. Ground rods shall be a minimum of 5/8" in diameter and 10' long, Cat. No. TL 5810. They shall be connected to the system with a two-bolt cast bronze clamp, Cat. No. 231, having a minimum length of 1-1/2" and employing stainless steel cap screws. Cable fasteners shall be substantial in construction electrolytically compatible with the conductor and mounting surface and shall be spaced according to LPI, UL, and NFPA code requirements, Cat. No. 730,166, etc. Bonding devices, cable splicers, and miscellaneous connectors shall be of cast bronze with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable. Splicers similar to Cat. No. 423B, 705, 706, etc., bonding devices similar to Cat. No. 702, 704, 551, 142, 561,142X, etc. All miscellaneous bolts, nuts, and screws shall be stainless steel. Connections to structural steel shall be made with bonding plates of cast bronze with bolt tension cable clamps, Cat. No. 639, 701X, 702, etc.

3.01 Installation: The installation shall be accomplished by an experienced installer who is a Certified Master Installer of the LPI or working under the direct supervision of the manufacturer as listed above or their authorized LPI Certified Master Installer representative. All equipment shall be installed in a neat workmanlike manner in the most inconspicuous manner possible. The electrically continuous steel frame of the building shall serve as the down conductors for the lightning protection system. The number, size, type, and location of grounds and connections to steel at roof and grade level shall be as required by NFPA, UL, and LPI Code requirements. A complete cable system with related air terminals, splicers, and bonds, etc., shall be used on the roof. Downlead cables to steel frame from the cable roof system shall not be brought directly through the roof. Through-roof connectors with solid rods or conduit through approved flashings shall be utilized for this purpose. Copper equipment shall not be connected to alu-minum surfaces except by means of an approved bimetal transition fitting. Where system components are to be mounted on coping caps, metal roofs, or mechanical equipment, etc. constructed of aluminum, galvanized, or galvalume coated steel, aluminum components equal to those specified here shall be used. Balance of system to remain copper as specified.

3.02 Coordination: The Installer will work with other trades to insure a correct, neat, and unobtrusive installation. The lightning protection installer shall assure a sound bond to the main water service and interconnection with other building ground systems, including both telephone and electrical. Arresters shall be installed on the power and telephone service by either the utility or the electrical contractor as applicable. All final flashing and sealing of lightning protection system roof penetrations and any special provisions required by the roofing manufacturer i.e. additional buffer strips, pads, membrane strips, etc. associated with mounting lightning protection equipment shall be furnished and installed by the roofing contractor in compliance with the roofing system in use. A copy of the lightning protection system shop drawings shall be forwarded by the architect to the roof contractor for coordination purposes.

3.03 Completion: The lightning protection installer shall secure and deliver the LPI System Certification to the architect for the owner upon completion of the installation. The contractor shall also submit copies of as-built shop drawings with LPI Certified System Application.

End of Section

SECTION 16700
EMPTY CONDUIT SYSTEMS

PART 1 GENERAL

1.1 Included are empty conduits coordinated and installed per plans and **SECTION 16700**other Owner furnished documents to facilitate installation of other Work of the Project and as noted below and described herein.

A. Audio-Visual/Theatrical Lighting System Controls

B. Telephone System

C. Fire Alarm System

D. Surveillance and Intrusion Detection Alarm System

E. Entry Door Lock Control and Intercom System.

PART 2 PRODUCTS

2.1 Conduits shall be metallic raceway

PART 3 EXECUTION

3.1 Conduit Installation

A. Terminate conduits with boxes fitted with blank covers, multi-gang where multiple runs terminate at same location.

B. Provide pul wire in all empty conduit runs.

C. Coordinate layout, routing and exact requirements with Owner, from Owner furnished data, and with Owner's designated independent Contractor for other work of the Project.

END OF SECTION

SECTION 16701
FIRE ALARM SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Fire alarm and smoke detection system.

1.2 SUBMITTALS
A. Shop Drawings: Fire alarm and smoke detection system wiring diagrams.
B. Product Data: Each fire alarm and smoke detection component.
C. Maintenance and Operating Instructions: Fire alarm and smoke detection system.

1.3 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70.
B. Furnish products listed by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction.
C. Comply with requirements of local and State authorities.

PART 2 PRODUCTS

2.1 FIRE ALARM SYSTEM
A. Fire Alarm and Smoke Detection System:
Design to NFPA 72. Meet requirements for automatic addressable fire alarm system.
B. Provide smoke detection system performance to NFPA 72E.
C. System Supervision: Electrically supervised alarm initiating and alarm signaling circuits.

2.2 Components:
A. Control Panel: Modular control panel in flush wall mounted enclosure.
B. Power supply: Include battery operated emergency power supply with capacity for operating system in standby mode for 24 hours followed by alarm mode for 5 minutes.
C. Auxiliary Relays: Provide sufficient auxiliary relay contacts to provide accessory functions specified and indicated.
D. Manual Station: Semi-Flush mounted, single action manual station with break-glass rod.
E. Ceiling Mounted Smoke Detector: NFPA 72E; ionization type.
F. Duct Mounted Smoke Detector: NFPA 72E; ionization type with auxiliary SPDT relay contact, duct sampling tubes extending width of duct, in duct-mounted housing.
G. Alarm Bells: NFPA 72G; Electric vibrating, stroke, 8 inch bell. Provide integral strobe lamp and flasher.

H. Remote Annunciator: Flush wall mounted enclosure.

I. Door Release: Match coil voltage to fire alarm system control panel requirements.

J. Fire Alarm and Smoke Detection System Cable: Non-power limited fire-protective signaling cable, copper conductor, 150 volt insulation rated 60 degrees C. Power limited fire-protective signaling cable, copper conductor, 300 volts insulation rated 105 degrees C. Power limited fire-protective signaling cable for fire and smoke characteristics, copper conductor, 300 volts insulation rated 105 degrees C, suitable for use in air handling ducts, hollow spaces used as

K. Heat Detector: NFPA 72E, single circuit, 194 degrees F rating.

2.3 SYSTEM DESIGN

Provide for system expandability for future additions as indicated on Plan.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install fire alarm systems in accordance with manufacturer's instructions.

B. Install manual station with operating handle 4 feet 6 inches above floor. Install audible and visual signal devices 7 feet 6 inches.

C. Install fire alarm system wiring in conduit.

D. Mount end-of-line device in box with last device or separate box adjacent to last device in circuit.

E. Make conduit and wiring connections to door release devices, sprinkler flow switches, sprinkler valve tamper switches, fire suppression system control panels, and duct smoke detectors as applicable or required.

F. Interface installation of door holders with doors and frames to achieve proper operation and avoid interference.

G. Interface installation of fire alarm with fire protection system.

3.2 FIELD QUALITY CONTROL

A. Perform field inspection and testing of fire alarm and smoke detection system. Inspect and test to NFPA 72H and local fire service requirements.Include description of testing and results in test report.

END OF SECTION

SECTION 16900
CONTROLS

1 PART GENERAL

1. SECTION INCLUDES

A. Photocells.

B. Relays, contactors.

C. Time switches.

2. SUBMITTALS

A. Product Data: Include data for each control device specified, scheduled, or required for service intended.

B. Operating and Maintenance Instructions: Adjusting, repairing, and cleaning each control device specified.

3. REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed by UL or other testing firm acceptable to authority having jurisdiction.

2 PART PRODUCTS

4. PHOTOCELL SWITCH

A. Description: Photocell switch with the following ratings:
1. Contact Ratings: 10 amperes at 150 volts.

B. Enclosure: Gasketed, cast aluminum box with conduit hub.

2.2 RELAYS, CONTACTORS

A. Provide type and quantity required for circuits controlled.

B. Heavy duty, continuous duty rated, amperage and voltage rating as required.

2.3 TIME SWITCH

Description: Clock timer, electronic programmable 365 day. Astronomical type. Auto sync with world time and daylight savings time. Battery backup to keep settings.

Ratings: as scheduled on drawings or required for application.

Enclosure: Type 1.

3 PART EXECUTION

INSTALLATION

Install Work in accordance with manufacturer's instructions.

Connect control devices to systems controlled, to achieve proper system operation.

ADJUSTING

Adjust and clock timers to achieve specified system operation.

END OF SECTION