



Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia Master Agreement

Order Date: 2020-07-24

CORRECT ORDER NUMBER
MUST APPEAR ON ALL PACKAGES,
INVOICES, AND SHIPPING PAPERS.
QUESTIONS CONCERNING THIS
ORDER SHOULD BE DIRECTED TO
THE DEPARTMENT CONTACT.

CRFQ DEV 21X11

Order Number: CMA 0307 7432 DEV2100000002	Procurement Folder: 703553B
Document Name: Reconstruction of Stick Built Homes	Reason for Modification:
Document Description: CENTRALIZED MASTER AGREEMENT	
Procurement Type: Central Master Agreement	
Buyer Name: Dusty J Smith	
Telephone: (304) 558-2063	
Email: dusty.j.smith@wv.gov	
Shipping Method: Best Way	Effective Start Date: 2020-08-01
Free on Board: FOB Dest, Freight Prepaid	Effective End Date: 2021-07-31

VENDOR	DEPARTMENT CONTACT
Vendor Customer Code: VS0000021044 Persons Services Corp. 4474 Halls Mill Rd Mobile AL 36693-5622 US Vendor Contact Phone: (251) 660-0132 Extension: Discount Percentage: 0.0000 Discount Days: 0	Requestor Name: Kelli D Compton Requestor Phone: (304) 558-2234 Requestor Email: kelli.d.compton@wv.gov

INVOICE TO	SHIP TO
PROCUREMENT OFFICER WV DEVELOPMENT OFFICE ADMINISTRATION 1900 KANAWHA BLVD E BLDG 3 SUITE 800 CHARLESTON WV 25305-0311 US	STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US

AGENCY COPY

Total Order Amount

Open End

DAS 7/27/2020

PURCHASING DIVISION AUTHORIZATION

SIGNED BY:

DATE:

ELECTRONIC SIGNATURE ON FILE

ATTORNEY GENERAL APPROVAL AS TO FORM

SIGNED BY:

DATE:

ELECTRONIC SIGNATURE ON FILE

ENCUMBRANCE CERTIFICATION

SIGNED BY:

DATE:

ELECTRONIC SIGNATURE ON FILE

Extended Description:**Construction Contract**

The Vendor: Persons Services Corp., agrees to the construction contract with the agency, The West Virginia Department of Commerce, Development Office to establish a contract for reconstruction of Stick Built Homes, per the bid requirements, specifications, terms and conditions, the information from Addendum No. 01, dated: 05/26/2020; Addendum No. 02, dated 08/03/2020, the vendor's submitted and accepted bid on: 08/10/2020, incorporated herein by reference and made part of.

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
1	95122101			EA	\$124,992.000000
Service From		Service To			

Commodity Line Description: FIXED RATE 2 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC

Extended Description:

FIXED RATE 2 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
2	95122101			EA	\$127,260.000000
Service From		Service To			

Commodity Line Description: FIXED RATE 2 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS

Extended Description:

FIXED RATE 2 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
3	95122101			EA	\$153,800.000000
Service From		Service To			

Commodity Line Description: FIXED RATE 3 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC

Extended Description:

FIXED RATE 3 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC HOME (INCLUDES ALL OPTIONS)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
4	95122101			EA	\$158,300.000000
Service From		Service To			

Commodity Line Description: FIXED RATE 3 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS

Extended Description:

FIXED RATE 3 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS HOME (INCLUDES ALL OPTIONS)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
5	95122101			EA	\$167,762.000000
Service From		Service To			

Commodity Line Description: FIXED RATE 4 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC HOME

Extended Description:

FIXED RATE 4 BEDROOM/ 2 BATHROOM SINGLE FAMILY ELECTRIC HOME

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
6	95122101			EA	\$189,050.000000
	Service From	Service To			

Commodity Line Description: FIXED RATE 4 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS

Extended Description:
FIXED RATE 4 BEDROOM/ 2 BATHROOM SINGLE FAMILY NATURAL GAS

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
7	95122101			EA	\$12,500.000000
	Service From	Service To			

Commodity Line Description: HOME ACCESSIBILITY INTERIOR MODIFICATIONS

Extended Description:
HOME ACCESSIBILITY INTERIOR MODIFICATIONS

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
8	95122101			LF	\$195.000000
	Service From	Service To			

Commodity Line Description: HOME ACCESSIBILITY EXTERIOR MODIFICATIONS (INCLUDES)

Extended Description:
HOME ACCESSIBILITY EXTERIOR MODIFICATIONS (INCLUDES RAMPS AND LANDINGS)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
9	95122101			EA	\$10,500.000000
	Service From	Service To			

Commodity Line Description: HVAC INSTALLATION (INCLUDES ELEVATED STAND)

Extended Description:
HVAC INSTALLATION (INCLUDES ELEVATED STAND)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
10	95122101			EA	\$14,400.000000
	Service From	Service To			

Commodity Line Description: FIXED RATE FOOTER AND FOUNDATION - GROUND LEVEL TO 40"

Extended Description:
FIXED RATE FOOTER AND FOUNDATION - GROUND LEVEL TO 40"

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
11	95122101			EA	\$4,500.000000
	Service From	Service To			

Commodity Line Description: ADDITIONAL FOUNDATION ABOVE 40" FROM GROUND LEVEL PER COURSE

Extended Description:
ADDITIONAL FOUNDATION ABOVE 40" FROM GROUND LEVEL (PER COURSE OF BLOCK)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
12	95122101			EA	\$18,900.000000
	Service From	Service To			

Commodity Line Description: FIXED RATE FOOTER AND FOUNDATION - GROUND LEVEL TO 40"

Extended Description:
FIXED RATE FOOTER AND FOUNDATION - GROUND LEVEL TO 40 INCHES (INCLUDES SLOPED OR UNEVEN TERRAIN)(PROPERTIES IN FLOODPLAIN ONLY)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
13	95122101			EA	\$4,500.000000
	Service From	Service To			

Commodity Line Description: ADDITIONAL FOUNDATION ABOVE 40" FROM GROUND LEVEL PER COURSE

Extended Description:
ADDITIONAL FOUNDATION ABOVE 40" FROM GROUND LEVEL (PER COURSE OF BLOCK) (PROPERTIES IN FLOODPLAIN ONLY)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
14	95122101			SF	\$8.000000
	Service From	Service To			

Commodity Line Description: DEMOLITION OF EXISTING STRUCTURES

Extended Description:
DEMOLITION OF EXISTING STRUCTURES

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
15	95122101			CY	\$25.000000
	Service From	Service To			

Commodity Line Description: REMOVAL OF MUNICIPAL AND PERSONALWASTE

Extended Description:
REMOVAL OF MUNICIPAL AND PERSONALWASTE OR WODDY AND VEGATATIVE DEBRIS

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
16	95122101			EA	\$1,000.000000
	Service From	Service To			

Commodity Line Description: TESTING OF EXISTING SEPTIC SYSTEMS FOR SERVICEABILITY

Extended Description:
TESTING OF EXISTING SEPTIC SYSTEMS FOR SERVICEABILITY

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
17	95122101			EA	\$8,750.000000
Service From		Service To			

Commodity Line Description: DRAINING, REMOVAL, AND INSTALLATION OF NEW SEPTIC SYSTEMS

Extended Description:
DRAINING, REMOVAL, AND INSTALLATION OF NEW SEPTIC SYSTEMS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
18	95122101			EA	\$1,250.000000
Service From		Service To			

Commodity Line Description: TESTING, SEALING, FILLING IN, AND/OR CAPPING OF UNDERGROUND

Extended Description:
TESTING, SEALING, FILLING IN, AND/OR CAPPING OF UNDERGROUND WELLS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
19	95122101			EA	\$1,750.000000
Service From		Service To			

Commodity Line Description: REPAIR OF SERVICEABLE AND POTABLE EXISTING UNDERGROUND

Extended Description:
REPAIR OF SERVICEABLE AND POTABLE EXISTING UNDERGROUND WATER WELLS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
20	95122101			LF	\$277.780000
	Service From	Service To			

Commodity Line Description: DRILLING AND INSTALLATION OF NEW UNDERGROUND WELLS

Extended Description:
DRILLING AND INSTALLATION OF NEW UNDERGROUND WELLS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
21	95122101			EA	\$650.000000
	Service From	Service To			

Commodity Line Description: INSPECTION, SAMPLING, TESTING, AND DOCUMENTATION OF ASBESTO

Extended Description:

INSPECTION, SAMPLING, TESTING, AND DOCUMENTATION OF ASBESTO CONTAINING MATERIALS OF ALL STRUCTURES (INCLUDES PREVIOUSLY DEMOLISHED STRUCTURES THAT HAVE REMAINED ON SITE)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
22	95122101			SF	\$10.000000
	Service From	Service To			

Commodity Line Description: REMOVAL, CONTAINMENT, AND TRANSPORTATION OF ASBESTOS CONTAIN

Extended Description:

REMOVAL, CONTAINMENT, AND TRANSPORTATION OF ASBESTOS CONTAINING MATERIALS TO AN APPROVED AND PROPERLY LICENSED SANITARY LANDFILL

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
23	95122101			EA	\$650.000000
	Service From	Service To			

Commodity Line Description: INSPECTION, SAMPLING, TESTING, AND DOCUMENTATION

Extended Description:

INSPECTION, SAMPLING, TESTING, AND DOCUMENTATION OF HAZARDOUS MATERIALS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
24	95122101			TON	\$115.000000
	Service From	Service To			

Commodity Line Description: REMOVAL, CONTAINMENT, AND TRANSPORTATION OF HAZARDOUS MATER

Extended Description:

REMOVAL, CONTAINMENT, AND TRANSPORTATION OF HAZARDOUS MATERIALS TO AN APPROVED AND PROPERLY LICENSED SANITARY LANDFILL

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
25	95122101			EA	\$1,350.000000
	Service From	Service To			

Commodity Line Description: REMOVAL OF EXTERNAL PROPANE OR FUEL OIL TANKS (AS REQUIRED)

Extended Description:

REMOVAL OF EXTERNAL PROPANE OR FUEL OIL TANKS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
26	95122101			EA	\$1,250.000000
	Service From	Service To			

Commodity Line Description: INSTALLATION OR REPLACEMENT OF UTILITY POLES (AS REQUIRED)

Extended Description:
INSTALLATION OR REPLACEMENT OF UTILITY POLES (AS REQUIRED) LICENSED SANITARY LANDFILL

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
27	95122101			EA	\$3,500.000000
	Service From	Service To			

Commodity Line Description: INSTALLATION OF REPLACEMENT OF ELECTRIC METERS

Extended Description:
INSTALLATION OF REPLACEMENT OF ELECTRIC METERS AND / OR SERVICE ENTRANCES (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
28	95122101			HOUR	\$225.000000
	Service From	Service To			

Commodity Line Description: RENTAL OF HEAVY CONSTRUCTION EQUIPMENT (HYDROLIC EXCAVATOR,

Extended Description:
RENTAL OF HEAVY CONSTRUCTION EQUIPMENT (HYDROLIC EXCAVATOR, D5 EQUIVALENT OR LARGER BULLDOZER, 2 1/2 YARD LOADER OR LARGER)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
29	95122101			CY	\$28.000000
	Service From	Service To			

Commodity Line Description: PROPERTY MITIGATION - FILL DIRT (AS REQUIRED)

Extended Description:
PROPERTY MITIGATION - FILL DIRT (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
30	95122101			TON	\$85.000000
	Service From	Service To			

Commodity Line Description: PROPERTY MITIGATION - STONE FOR GROUND ELEVATION

Extended Description:
PROPERTY MITIGATION - STONE FOR GROUND ELEVATION (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
31	95122101			LF	\$25.000000
	Service From	Service To			

Commodity Line Description: PROPERTY MITIGATION - WATER DRAINAGE

Extended Description:
PROPERTY MITIGATION - WATER DRAINAGE (FRENCH DRAIN, DRAINAGE DITCH, ETC.) (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
32	95122101			LF	\$222.220000
	Service From	Service To			

Commodity Line Description: PROPERTY MITIGATION -RETAINING WALL BELOW 6 FEET IN VERTICAL

Extended Description:
PROPERTY MITIGATION -RETAINING WALL BELOW 6 FEET IN VERTICAL HEIGHT (INCLUDES FOOTER AND DRAINAGE)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
33	95122101			LF	\$52.000000
	Service From	Service To			

Commodity Line Description: DITCH CULVERTS (AS REQUIRED)

Extended Description:
DITCH CULVERTS (AS REQUIRED)

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
34	95122101			TON	\$45.000000
	Service From	Service To			

Commodity Line Description: GRAVEL FOR ROAD/ DRIVEWAY ACCESS (AS REQUIRED

Extended Description:
GRAVEL FOR ROAD/ DRIVEWAY ACCESS (AS REQUIRED

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
35	95122101			LF	\$18.000000
	Service From	Service To			

Commodity Line Description: ADDITIONAL WATER LINE BEYOND 350 LINEAR FEET

Extended Description:
ADDITIONAL WATER LINE BEYOND 350 LINEAR FEET

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
36	95122101			LF	\$22.000000
	Service From	Service To			

Commodity Line Description: ADDITIONAL NATURAL GAS LINE BEYOND 350 LINEAR FEET

Extended Description:
ADDITIONAL NATURAL GAS LINE BEYOND 350 LINEAR FEET

Line	Commodity Code	Manufacturer	Model No	Unit	Unit Price
37	95122101			LF	\$20.000000
Service From		Service To			

Commodity Line Description: ADDITIONAL SEWAGE LINE BEYOND 350 LINEAR FEET

Extended Description:
ADDITIONAL SEWAGE LINE BEYOND 350 LINEAR FEET

GENERAL TERMS AND CONDITIONS:

1. CONTRACTUAL AGREEMENT: Issuance of a Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. DEFINITIONS: As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.

2.1. "Agency" or "Agencies" means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

2.2. "Bid" or "Proposal" means the vendors submitted response to this solicitation.

2.3. "Contract" means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.

2.4. "Director" means the Director of the West Virginia Department of Administration, Purchasing Division.

2.5. "Purchasing Division" means the West Virginia Department of Administration, Purchasing Division.

2.6. "Award Document" means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.

2.7. "Solicitation" means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.

2.8. "State" means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

2.9. "Vendor" or "Vendors" means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

☒ **Term Contract**

Initial Contract Term: This Contract becomes effective on 08/01/2020 and extends for a period of One year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal should be delivered to the Agency and then submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to Three successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

☐ **Alternate Renewal Term** – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

☐ **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within _____ days.

☐ **Fixed Period Contract with Renewals:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

☐ **One Time Purchase:** The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

☐ **Other:** See attached.

4. NOTICE TO PROCEED: Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. QUANTITIES: The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

☒ **Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

☐ **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

☐ **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

☐ **One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. EMERGENCY PURCHASES: The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute of breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

7. REQUIRED DOCUMENTS: All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

☒ **BID BOND (Construction Only):** Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

☐ **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract. The performance bond must be received by the Purchasing Division prior to Contract award.

☐ **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

☐ **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

☐ **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits upon request and in a form acceptable to the State. The request may be prior to or after contract award at the State's sole discretion.

☐

☐

☐

☐

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications regardless of whether or not that requirement is listed above.

8. INSURANCE: The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

☒ **Commercial General Liability Insurance** in at least an amount of: 1,000,000 per occurrence.

☒ **Automobile Liability Insurance** in at least an amount of: 1,000,000 per occurrence.

☐ **Professional/Malpractice/Errors and Omission Insurance** in at least an amount of: _____ per occurrence. Notwithstanding the foregoing, Vendor's are not required to list the State as an additional insured for this type of policy.

☐ **Commercial Crime and Third Party Fidelity Insurance** in an amount of: _____ per occurrence.

☐ **Cyber Liability Insurance** in an amount of: _____ per occurrence.

☒ **Bullders Risk Insurance** in an amount equal to 100% of the amount of the Contract.

☐ **Pollution Insurance** in an amount of: _____ per occurrence.

☐ **Aircraft Liability** in an amount of: _____ per occurrence.

☐☐☐☐

Notwithstanding anything contained in this section to the contrary, the Director of the Purchasing Division reserves the right to waive the requirement that the State be named as an additional insured on one or more of the Vendor's insurance policies if the Director finds that doing so is in the State's best interest.

9. WORKERS' COMPENSATION INSURANCE: The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

10. [Reserved]

11. LIQUIDATED DAMAGES: This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

☐ _____ for _____

☒ Liquidated Damages Contained in the Specifications

12. ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

13. PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

14. PAYMENT IN ARREARS: Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

15. PAYMENT METHODS: Vendor must accept payment by electronic funds transfer and P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

16. TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

17. ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

18. FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

19. CANCELLATION: The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-5.2.b.

20. TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

21. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

22. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

23. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

24. MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.

25. WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

26. SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

27. ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments.

28. WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

29. STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

30. PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

31. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

32. LICENSING: In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

33. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

34. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

35. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

36. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

37. PURCHASING AFFIDAVIT: In accordance with West Virginia Code §§ 5A-3-10a and 5-22-1(i), the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State. Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Purchasing Division affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

38. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE: This Contract may be utilized by other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"), provided that both the Other Government Entity and the Vendor agree. Any extension of this Contract to the aforementioned Other Government Entities must be on the same prices, terms, and conditions as those offered and agreed to in this Contract, provided that such extension is in compliance with the applicable laws, rules, and ordinances of the Other Government Entity. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

39. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

40. REPORTS: Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

☐ Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

☐ Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

41. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Revised 01/09/2020

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

42. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open hearth, basic oxygen, electric furnace, Bessemer or other steel making process. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:
- c. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- d. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

43. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a

“substantial labor surplus area”, as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products. This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

44. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE: W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$1 million, the vendor must submit to the Agency a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-award interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

45. PROHIBITION AGAINST USED OR REFURBISHED: Unless expressly permitted in the solicitation published by the State, Vendor must provide new, unused commodities, and is prohibited from supplying used or refurbished commodities, in fulfilling its responsibilities under this Contract.

ADDITIONAL TERMS AND CONDITIONS (Construction Contracts Only)

1. CONTRACTOR'S LICENSE: West Virginia Code § 21-11-2 requires that all persons desiring to perform contracting work in this state be licensed. The West Virginia Contractors Licensing Board is empowered to issue the contractor's license. Applications for a contractor's license may be made by contacting the West Virginia Division of Labor. West Virginia Code § 21-11-11 requires any prospective Vendor to include the contractor's license number on its bid. If an apparent low bidder fails to submit a license number in accordance with this section, the Purchasing Division will promptly request by telephone and electronic mail that the low bidder and the second low bidder provide the license number within one business day of the request. Failure of the bidder to provide the license number within one business day of receiving the request shall result in disqualification of the bid. Vendors should include a contractor's license number in the space provided below.

Contractor's Name: Persons Services Corp.

Contractor's License No.: WV- WV059586

The apparent successful Vendor must furnish a copy of its contractor's license prior to the issuance of a contract award document.

2. DRUG-FREE WORKPLACE AFFIDAVIT: W. Va. Code § 21-1D-5 provides that any solicitation for a public improvement contract requires each Vendor that submits a bid for the work to submit an affidavit that the Vendor has a written plan for a drug-free workplace policy. If the affidavit is not submitted with the bid submission, the Purchasing Division shall promptly request by telephone and electronic mail that the low bidder and second low bidder provide the affidavit within one business day of the request. Failure to submit the affidavit within one business day of receiving the request shall result in disqualification of the bid. To comply with this law, Vendor should complete the enclosed drug-free workplace affidavit and submit the same with its bid. Failure to submit the signed and notarized drugfree workplace affidavit or a similar affidavit that fully complies with the requirements of the applicable code, within one business day of being requested to do so shall result in disqualification of Vendor's bid. Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is \$100,000 or less or temporary or emergency repairs.

2.1. DRUG-FREE WORKPLACE POLICY: Pursuant to W. Va. Code § 21-1D-4, Vendor and its subcontractors must implement and maintain a written drug-free workplace policy that complies with said article. The awarding public authority shall cancel this contract if: (1) Vendor fails to implement and maintain a written drug-free workplace policy described in the preceding paragraph, (2) Vendor fails to provide information regarding implementation of its drug-free workplace policy at the request of the public authority; or (3) Vendor provides to the public authority false information regarding the contractor's drug-free workplace policy.

Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is \$100,000 or less or temporary or emergency repairs.

3. DRUG FREE WORKPLACE REPORT: Pursuant to W. Va. Code § 21-1D-7b, no less than once per year, or upon completion of the project, every contractor shall provide a certified report to the public authority which let the contract. For contracts over \$25,000, the public authority shall be the West Virginia Purchasing Division. For contracts of \$25,000 or less, the public authority shall be the agency issuing the contract. The report shall include:

- (1) Information to show that the education and training service to the requirements of West Virginia Code § 21-1D-5 was provided;
- (2) The name of the laboratory certified by the United States Department of Health and Human Services or its successor that performs the drug tests;
- (3) The average number of employees in connection with the construction on the public improvement;
- (4) Drug test results for the following categories including the number of positive tests and the number of negative tests: (A) Pre-employment and new hires; (B) Reasonable suspicion; (C) Post-accident; and (D) Random.

Vendor should utilize the attached Certified Drug Free Workplace Report Coversheet when submitting the report required hereunder. Pursuant to W. Va. Code 21-1D-2(b) and (k), this provision does not apply to public improvement contracts the value of which is \$100,000 or less or temporary or emergency repairs.

4. AIA DOCUMENTS: All construction contracts that will be completed in conjunction with architectural services procured under Chapter 5G of the West Virginia Code will be governed by the attached AIA documents, as amended by the Supplementary Conditions for the State of West Virginia, in addition to the terms and conditions contained herein.

4A. PROHIBITION AGAINST GENERAL CONDITIONS: Notwithstanding anything contained in the AIA Documents or the Supplementary Conditions, the State of West Virginia will not pay for general conditions, or winter conditions, or any other condition representing a delay in the contracts. The Vendor is expected to mitigate delay costs to the greatest extent possible and any costs associated with Delays must be specifically and concretely identified. The state will not consider an average daily rate multiplied by the number of days extended to be an acceptable charge.

5. GREEN BUILDINGS MINIMUM ENERGY STANDARDS: In accordance with § 22-29-4, all new building construction projects of public agencies that have not entered the schematic design phase prior to July 1, 2012, or any building construction project receiving state grant funds and appropriations, including public schools, that have not entered the schematic design phase prior to July 1, 2012, shall be designed and constructed complying with the ICC International Energy Conservation Code, adopted by the State Fire Commission, and the ANSI/ASHRAE/IESNA Standard 90.1-2007: Provided, That if any construction project has a commitment of federal funds to pay for a portion of such project, this provision shall only apply to the extent such standards are consistent with the federal standards.

6. LOCAL LABOR MARKET HIRING REQUIREMENT: Pursuant to West Virginia Code §21-1C-1 et seq., Employers shall hire at least seventy-five percent of employees for public improvement construction projects from the local labor market, to be rounded off, with at least two employees from outside the local labor market permissible for each employer per project.

Any employer unable to employ the minimum number of employees from the local labor market shall inform the nearest office of Workforce West Virginia of the number of qualified employees needed and provide a job description of the positions to be filled.

If, within three business days following the placing of a job order, Workforce West Virginia is unable to refer any qualified job applicants to the employer or refers less qualified job applicants than the number requested, then Workforce West Virginia shall issue a waiver to the employer stating the unavailability of applicant and shall permit the employer to fill any positions covered by the waiver from outside the local labor market. The waiver shall be in writing and shall be issued within the prescribed three days. A waiver certificate shall be sent to both the employer for its permanent project records and to the public authority.

Any employer who violates this requirement is subject to a civil penalty of \$250 per each employee less than the required threshold of seventy-five percent per day of violation after receipt of a notice of violation.

Any employer that continues to violate any provision of this article more than fourteen calendar days after receipt of a notice of violation is subject to a civil penalty of \$500 per each employee less than the required threshold of seventy-five percent per day of violation.

The following terms used in this section have the meaning shown below.

(1) The term "construction project" means any construction, reconstruction, improvement, enlargement, painting, decorating or repair of any public improvement let to contract in an amount equal to or greater than \$500,000. The term "construction project" does not include temporary or emergency repairs;

(2) The term "employee" means any person hired or permitted to perform hourly work for wages by a person, firm or corporation in the construction industry; The term "employee" does not include:(i) Bona fide employees of a public authority or individuals engaged in making temporary or emergency repairs;(ii) Bona fide independent contractors; or(iii) Salaried supervisory personnel necessary to assure efficient execution of the employee's work;

(3) The term "employer" means any person, firm or corporation employing one or more employees on any public improvement and includes all contractors and subcontractors;

(4) The term "local labor market" means every county in West Virginia and any county outside of West Virginia if any portion of that county is within fifty miles of the border of West Virginia;

(5) The term "public improvement" includes the construction of all buildings, roads, highways, bridges, streets, alleys, sewers, ditches, sewage disposal plants, waterworks, airports and all other structures that may be let to contract by a public authority, excluding improvements funded, in whole or in part, by federal funds.

7. DAVIS-BACON AND RELATED ACT WAGE RATES:

- ☐ The work performed under this contract is federally funded in whole, or in part. Pursuant to _____, Vendors are required to pay applicable Davis-Bacon wage rates.
- ☒ The work performed under this contract is not subject to Davis-Bacon wage rates.

8. SUBCONTRACTOR LIST SUBMISSION: In accordance with W. Va. Code § 5-22-1, the apparent low bidder on a contract valued at more than \$250,000.00 for the construction, alteration, decoration, painting or improvement of a new or existing building or structure shall submit a list of all subcontractors who will perform more than \$25,000.00 of work on the project including labor and materials. (This section does not apply to any other construction projects, such as highway, mine reclamation, water or sewer projects.) The subcontractor list shall be provided to the Purchasing Division within one business day of the opening of bids for review. If the apparent low bidder fails to submit the subcontractor list, the Purchasing Division shall promptly request by telephone and electronic mail that the low bidder and second low bidder provide the subcontractor list within one business day of the request. Failure to submit the subcontractor list within one business day of receiving the request shall result in disqualification of the bid.

If no subcontractors who will perform more than \$25,000.00 of work are to be used to complete the project, the apparent low bidder must make this clear on the subcontractor list, in the bid itself, or in response to the Purchasing Division's request for the subcontractor list.

a. Required Information. The subcontractor list must contain the following information:

- i. Bidder's name
- ii. Name of each subcontractor performing more than \$25,000 of work on the project.
- iii. The license number of each subcontractor, as required by W. Va. Code § 21-11-1 et. seq.
- iv. If applicable, a notation that no subcontractor will be used to perform more than \$25,000.00 of work. (This item iv. is not required if the vendor makes this clear in the bid itself or in documentation following the request for the subcontractor list.)

b. Subcontractor List Submission Form: The subcontractor list may be submitted in any form, including the attached form, as long as the required information noted above is included. If any information is missing from the bidder's subcontractor list submission, it may be obtained from other documents such as bids, emails, letters, etc. that accompany the subcontractor list submission.

Subcontractor List Submission (Construction Contracts Only)

Bidder's Name: Persons Services Corp.

☐ Check this box if no subcontractors will perform more than \$25,000.00 of work to complete the project.

Subcontractor Name Potential	License Number if Required by W. Va. Code § 21-11-1 et. seq.
MAPCO - General Construction	
Taylor Electric Service	
Dodrill Comfort & Energy Solutions	
Modley's Plumbing & Heating	

Attach additional pages if necessary

Revised 01/09/2020

c. Substitution of Subcontractor. Written approval must be obtained from the State Spending Unit before any subcontractor substitution is permitted. Substitutions are not permitted unless:


- i. The subcontractor listed in the original bid has filed for bankruptcy;**
- ii. The subcontractor in the original bid has been debarred or suspended; or**
- iii. The contractor certifies in writing that the subcontractor listed in the original bid fails, is unable, or refuses to perform his subcontract.**

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Paul Stevens, Project Executive
(Name, Title)
Paul Stevens, Project Executive
(Printed Name and Title)
4474 Halls Mill Rd. Mobile, AL 36693
(Address)
251-660-0132 ext:147 // 251-660-2084
(Phone Number) / (Fax Number)
pstevens@personsservices.com
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Persons Services Corp.

(Company)

(Authorized Signature) (Representative Name, Title)
Paul Stevens, Project Executive
(Printed Name and Title of Authorized Representative)
6/10/2020
(Date)
251-660-0132 ext:147 // 251-660-2084
(Phone Number) (Fax Number)

**ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.:**

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- ☒ Addendum No. 1
- ☒ Addendum No. 2
- ☐ Addendum No. 3
- ☐ Addendum No. 4
- ☐ Addendum No. 5

- ☐ Addendum No. 6
- ☐ Addendum No. 7
- ☐ Addendum No. 8
- ☐ Addendum No. 9
- ☐ Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Persons Services Corp.

Company

Authorized Signature

Date

6/10/2020

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

**REQUEST FOR QUOTATION
Reconstruction**

GENERAL CONSTRUCTION SPECIFICATIONS (No AIA Documents)

- 1. PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Development Office to establish a construction contract as more fully described below. All work to be performed under the contract arises out of the state of emergency declared by the Governor on the 23rd of June, 2016, and identified as the Federal Declaration number FEMA-4273-DR.

Project Description: The Development Office is hereby requesting written bids from construction contractors with the qualifications and experience for the provision of residential reconstructions services to address the flood and storm related damages to qualified single-family homes owned by low to moderate income homeowners or rental properties which will serve low to moderate income tenants. The homes to be reconstructed are primarily located within the following counties: *Clay, Fayette, Greenbrier, Jackson, Kanawha, Lincoln, Monroe, Nicholas, Pocahontas, Roane, Summers, Webster*. This solicitation is intended to establish a pool of qualified responsible bidders and will be open-ended as to the quantity of homes to be demolished and reconstructed, and open-ended as to the quantity of related tasks listed on the pricing page. Vendor is required to provide unit pricing as outlined in the pricing page. This contract will cover three categories of homes as follows:

1. two (2) bedroom / two (2) bathroom stick built homes with one bedroom and one full bath on the first main level;
2. three (3) bedroom / two (2) bathroom stick built homes with one bedroom and one full bath on the first main level;
3. four (4) bedroom / two (2) bathroom stick built homes with one bedroom and one full bath on the first main level.

The construction contractor will be responsible for all aspects of ACM inspections and abatement, demolition, disposal, scheduling and replacement. The contractor will be required to conform to all applicable state and local codes and requirements and the WV Housing Restoration Policies and Procedures.

The Vendor shall receive a certified engineered blueprint as part of this Request for Quotation and will be responsible to furnish all materials, labor, and equipment necessary to complete all Construction Services. The Vendor shall furnish any incidental work, materials, labor, and equipment that are necessary to complete the Construction Services, even if such incidental work is not explicitly included in the Project Plans.

REQUEST FOR QUOTATION
Reconstruction

- 2. DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions and in the Project Plans as defined below.

2.1 "ACM" means asbestos contained material

2.2 "Construction Services" means residential reconstruction as more fully described in the Project Plans.

2.3 "MWBE" means Minority Women Business Enterprise

2.4 "Pricing Page" means the pages contained in wvOASIS, attached hereto as Exhibit A, or included in the Project Plans upon which Vendor should list its proposed price for the Construction Services.

2.5 "Project Plans" means detailed instructions on how the Construction Services are to be performed.

2.6 "Project" refers to the work associated with a designated number of residential reconstruction locations that have been identified and are ready to be assigned. The exact number of locations included in a Project will be determined by the State prior to attempting to assign to work to any one vendor.

2.7 "Residential Reconstruction Location" means a specific address at which demolition is to occur and/or a home is to be reconstructed.

2.8 "Solicitation" means the official notice of an opportunity to supply the State with Construction Services that is published by the Purchasing Division.

2.9 "Under Roof" means framed in under a shingles covering.

- 3. ORDER OF PRECEDENCE:** This General Construction Specifications document will have priority over, and supersede, anything contained in the Project Plans.

- 4. QUALIFICATIONS:** Vendor, or Vendor's staff if requirements are inherently limited to individuals rather than corporate entities, shall have the following minimum qualifications:

REQUEST FOR QUOTATION
Reconstruction

- 4.1. Experience:** Vendor, or Vendor's supervisory staff assigned to this project, must have successfully completed at least 5 projects, within 120 calendar days, that involved work similar to that described in these specifications or the Project Plans. Compliance with this experience requirement will be determined prior to contract award by the State through references provided by the Vendor during bid submission, through knowledge or documentation of the Vendor's past projects, through confirmation of experience requirements from the architect assisting the State in this project, or some other method that the State determines to be acceptable. Vendor must provide any documentation requested by the State to assist in confirmation of compliance with this provision. References, documentation, or other information to confirm compliance with this experience requirement may be requested after bid opening and prior to contract award.
- 4.2.** Five years' experience in the construction, repair, rehabilitation and maintenance of residential housing.
- 4.3.** Ability to commit to residential repair and construction projects and to carry such projects to completion within a 120 calendar day timeline from the date of a notice to proceed being issued. Vendor must provide documentation of five (5) examples of comparable project homes within 120 calendar days.
- 4.4.** Ability and experience with environmental mitigation related to the construction of new stick built homes.
- 4.5.** Experience in managing and completing projects funded by Community Development Block Grant (CDBG) or other federal funds.
- 5. CONTRACT AWARD:** The Contract is intended to provide Agency with a purchase price for the Construction Services as more fully described herein. Multiple contracts will be awarded from this solicitation to qualified responsible bidders thereby creating a pool of qualified responsible bidders. See Section 7.2.
- 6. SELECTION OF ALTERNATES:** Pursuant to W. Va. Code § 5-22-1(f), any solicitation of bids shall include no more than five alternates. Alternates, if accepted, shall be accepted in the order in which they are listed on the bid form. Any unaccepted alternate contained within a bid shall expire 90 days after the date of the opening of bids for review. Determination of the lowest qualified responsible bidder shall be based on the sum of the base bid and any alternates accepted.

**REQUEST FOR QUOTATION
Reconstruction**

- 7. PERFORMANCE:** Vendor shall perform the Construction Services in accordance with this document and the Project Plans and keep properties clean throughout the duration of the Construction Process. Vendor will be required to meet with Construction and Program Management once a week at the WV Development Office to discuss Construction details. The vendor is responsible for coordinating with Construction Management Team during all aspects of construction. Each contractor will be assigned a construction management specialist who is responsible for managing the construction projects and insuring the project in a timely manner.

7.1. Labor and Material Payment Bond: (Not Required)

7.1.1 For projects limited to the construction / replacement of one or more residential dwellings or appurtenances, the West Virginia Development Office, at its discretion, chooses not to require a vendor(s) to furnish payment or performance bond. For final payment to be released, the vendor(s) responsible for the contract shall provide to the West Virginia Development Office documentation certifying that all of the claims of subcontractors, laborers, materialmen, and all persons furnishing material have been paid.

7.1.2 All bidders are still required to provide a bid bond pursuant to West Virginia Code § 5-22-1(c) as more fully described in Section 7 of the General Terms and Conditions.

7.2. Project Awards, Assignments, and Timeline:

7.2.1 In accordance with WV Code § 5-22-1a, Project/s will be awarded to the lowest qualified responsible bidder first. If that Vendor is unable, unwilling, or fails to meet the prescribed timelines, Project/s will then be awarded to the second lowest responsible bidder, and so on, until the work is either accepted or there are no remaining qualified responsible bidders holding a contract that are willing to perform the Project. If no Vendors accept the work, the Agency may revise the Project and reoffer it to the lowest qualified responsible bidder, then the second lowest qualified responsible bidder, and so on.

The Development Office will assign the Project to the appropriate Vendor in writing. Within 10 business days, the parties will then establish a time to meet with State representatives at the residential reconstruction site for the Initial Site Inspection. The purpose of the meeting is to establish more accurate quantities for site preparation, well drilling, and other items that vary by site. Prices for these items will be set by the contract. Upon completion of the Initial Site Inspection, Vendor may accept or decline the Project. The Vendor will sign the Initial Site Inspection to accept the Project and complete the Contractor's Agreement with the Homeowner. Vendor's formal declination of a project must be received within seven calendar days,

REQUEST FOR QUOTATION Reconstruction

from the Initial Site Inspection, and must indicate they are unable or unwilling to complete the Project.

7.2.2 Once a Project has been assigned to a vendor and the onsite meeting has occurred, the State will issue a written Notice to Proceed in the form of a delivery order informing the vendor that it is now permitted to begin work. Vendor must not begin work on a residential reconstruction location until it has received written Notice to Proceed specifically covering that location. The Vendor will have 120 calendar days from the date the Notification to Proceed is issued to complete the work at the residential reconstruction locations that have been authorized. For each residential reconstruction location, the Vendor should follow the timeframes described below:

- | | |
|--|-------------------------|
| • All permits obtained, Asbestos Abated, and Home Demolished | 35 days from NTP |
| • Footer and Foundation Completed | 21 days from Demo |
| • Framed and Dried-In | 14 days from Foundation |
| • Windows and Siding Complete | 10 days from Dried-In |
| • Utilities, HVAC, and Mechanics Complete | 14 days from Siding |
| • Sheetrock and Painting Complete | 7 days from Mechanics |
| • Appliances, Trim, Finish Work Complete | 14 days from Sheetrock |
| • Final Inspection and Project Complete | 5 days from Finish Work |

7.2.3 Vendor may request a time extension to the Construction Management Team for weather or customer delays only. The extension request must be done, in writing, and a response will be provided to the Vendor within 24 hours. Extension requests must provide thorough information as to the cause of the delay, what the Vendor is doing to remediate the delay, and the specific number of days for that phase of construction to be extended.

7.2.4 Vendors who fail to meet any other timeframe listed above, and are not granted a time extension, will be deemed unable to perform for purposes of the next Project to be assigned and subsequent projects will be offered to the next lowest responsible bidder, then the second lowest qualified responsible bidder, and so on.

8. AUTHORIZATION TO BEGIN WORK: Vendor and Agency agree that Vendor will not begin work on any site identified in the contract until vendor receives an approved and executed delivery order from the State. The notice to proceed will be issued in the form of a delivery order containing the specific residential reconstruction locations for which work is

REQUEST FOR QUOTATION Reconstruction

authorized. Pursuant to the West Virginia Purchasing Division Procedures Handbook, delivery orders that exceed \$250,000 must be processed as a Central Delivery Order through the Purchasing Division prior to issuance.

- 9. SUBSTITUTIONS:** Any substitution requests must be submitted in accordance with the official question and answer period described in the INSTRUCTIONS TO VENDORS SUBMITTING BIDS, Paragraph 4. Vendor Question Deadline. Vendors submitting substitution requests should submit product brochures and product specifications during the official question and answer period.

- 10. PROJECT PLANS:** The checked box will apply to Project Plans for this solicitation.

Project Plans 2 Bedroom / 2 Bathroom, 3 Bedroom / 2 Bathroom, and 4 Bedroom / 2 Bathroom home configurations along with specifications and Green Building Requirements are attached as "Exhibit B." The WV Development Office requires construction to meet an industry-recognized standard that has achieved green building certification. WV Development Office has submitted the WV Rise Housing Restoration Green Building Modifications for the CDBG-DR Program. These modifications following energy efficiency ENERGY STAR® and the most current IECC.

Vendors must adhere to these plans, specifications, and requirements, as well as the RISE Housing Restoration Program Policy and Procedures throughout the duration of the contract. Failure to do so may result in partial or non-payment for the project along with loss of any future project assignments.

11. CONDITIONS OF THE WORK

11.1. Permits: The Vendor shall procure all necessary permits and licenses to comply with all applicable Federal, State, or Local laws, regulations and ordinances of any regulating body. All permits, sanitarian reports, and asbestos reports must be provided to the Construction Management Team prior to the request for Final Inspection. If these documents are not provided to the Construction Management Team, Vendor may lose any future project assignments. Vendor is required to post permits on-site in a clearly visible location.

11.2. Existing Conditions: Vendors who find discrepancies in existing conditions must notify the Construction Management Team in writing within 24 hours of discovery. Vendor must also immediately notify the Agency if suspected hazardous materials are encountered.

11.3. Project Closeout: Project Closeout shall include the following:

**REQUEST FOR QUOTATION
Reconstruction**

11.3.1. Final Cleanup: Vendor shall perform the final cleanup activities listed below, along with any other final cleanup activities normally associated with the work performed under this Contract, prior to final inspection:

11.3.1.1. All Construction and Demolition related materials are properly removed and any disturbed ground has been made level and new grass seed and straw is placed down.

11.3.1.2. All Utilities have been reconnected and are fully operational, includes existing gas utilities (if present).

11.3.1.3. Vendor has conducted an internal quality and scope of work inspection and closed out all permits. A formal written request for a Program Final Inspection will be provided to the Construction Management Team, along with the Vendor's internal quality inspection. This formal request must be submitted a minimum of 48 hours prior to the Program Final Inspection date.

11.3.1.4. Construction Management Team, Homeowner, and Vendor have completed a Program Final Inspection and the keys to the new residence are in the possession of the Homeowner. The Contractor must provide a one (1) year warranty to encompasses the entire scope of work for the project.

11.3.1.5. Final Inspection: Vendor shall participate in a Program Final Inspection with the Agency's project manager. The purpose of the Program Final Inspection is to ensure all Scope of Work items have been completed with quality workmanship, mitigation of any potential future water infiltration hazards, and provides a safe environment for the homeowner before the Agency's final acceptance of the work. Final acceptance does not waive or release Vendor from its obligation to ensure that work complies with the Contract requirements. Vendor shall submit any warranty documents to the Agency project manager at final inspection. Vendor is not authorized to submit a final invoice to the Agency until they receive a signed copy of the Program Final Inspection from the Construction Management Team.

11.4. Changes to Original Scope of Work:

11.4.1 All changes to the Original Scope of Work provided in the delivery order must be requested by the Vendor to the Construction Management Team in writing and must be approved prior to that specific scope of work being allowed to begin. The Construction Management Team will approve or reject all Change Order Requests within 24 hours of receipt. All other change

**REQUEST FOR QUOTATION
Reconstruction**

orders will be reviewed and approved by the Construction Management Team, the West Virginia Purchasing Division, and the Attorney General's Office.

11.4.2 If the requested Scope of Work Adjustment work is completed by the Vendor before the Scope of Work Adjustment Request approval is authorized, the Vendor may not be compensated for that work.

11.4.3 While a change order is under consideration, the original Scope of Work unaffected by the change order request will continue, as to not hinder the progress of the project.

12. MISCELLANEOUS:

12.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Paul Stevens

Telephone Number: 251 660-0132

Fax Number: 251 660-2084

Email Address: pstevens@personsservices.com

**REQUEST FOR QUOTATION
Reconstruction**

EXHIBIT A – Pricing Page

Reconstruction			
Unit Price Items			
Unit Price Items, "Measurement and Payment"			
	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
1	Fixed Rate 2 Bedroom / 2 Bathroom Single Family Electric Home	Each	\$ 124,992.00
2	Fixed Rate 2 Bedroom / 2 Bathroom Single Family Natural Gas Home	Each	\$ 127,260.00
3	Fixed Rate 3 Bedroom / 2 Bathroom Single Family Electric Home (Includes all options)	Each	\$ 153,900.00
4	Fixed Rate 3 Bedroom / 2 Bathroom Single Family Natural Gas Home (Includes all options)	Each	\$ 156,300.00
5	Fixed Rate 4 Bedroom / 2 Bathroom Single Family Electric Home	Each	\$ 167,762.00
6	Fixed Rate 4 Bedroom / 2 Bathroom Single Family Natural Gas Home	Each	\$ 169,050.00
7	Home Accessibility Interior Modifications	Each	\$ 12,500.00
8	Home Accessibility Exterior Modifications (Includes Ramps and Landings)	Linear Foot	\$ 195.00
9	HVAC Installation (Includes Elevated Stand)	Each	\$ 10,500.00
10	Fixed Rate Footer and Foundation - Ground Level to 40 inches (Includes sloped or uneven terrain)	Each	\$ 14,400.00
11	Additional Foundation above 40 inches from Ground Level (Per Course of Block)	Each	\$ 4,500.00
12	Fixed Rate Engineered Footer and Foundation - Ground Level to 40 inches (Includes sloped or uneven terrain) (Properties in Floodplain Only)	Each	\$ 18,900.00
13	Additional Engineered Foundation above 40 inches from Ground Level (Per Course of Block) (Properties in Floodplain Only)	Each	\$ 4,500.00
14	Demolition of Existing Structures	Square Foot	\$ 8.00
15	Removal of Municipal and Personal Waste or Woody and Vegetative Debris	Cubic Yards	\$ 25.00
16	Testing of Existing Septic Systems for Serviceability	Each	\$ 1,000.00
17	Draining, Removal, and Installation of New Septic Systems (As Required)	Each	\$ 8,750.00
18	Testing, Sealing, Filling In, and/or Capping of Underground Wells (As Required)	Each	\$ 1,250.00
19	Repair of Serviceable and Potable Existing Underground Water Wells (As Required)	Each	\$ 1,750.00
20	Drilling and Installation of New Underground Wells (As Required)	Linear Foot	\$ 277.78
21	Inspection, Sampling, Testing, and Documentation of Asbestos Containing Materials of all Structures (Includes previously demolished structures that have remained on site)	Each	\$ 650.00
22	Removal, Containment, and Transportation of Asbestos Containing Materials to an approved and properly licensed sanitary landfill	Square Foot	\$ 10.00
23	Inspection, Sampling, Testing, and Documentation of Hazardous Materials. (As Required)	Each	\$ 650.00
24	Removal, Containment, and Transportation of Hazardous Materials to an approved and properly licensed sanitary landfill	Tons	\$ 115.00
25	Removal of External Propane or Fuel Oil Tanks (As Required)	Each	\$ 1,350.00
26	Installation or Replacement of Utility Poles (As Required)	Each	\$ 1,250.00
27	Installation or Replacement of Electric Meters and/or Service Entrances (As Required)	Each	\$ 3,500.00
28	Rental of Heavy Construction Equipment (Hydraulic Excavator, D5 Equivalent or Larger Bulldozer, 2-1/2 Yard Loader or Larger)	Hours	\$ 225.00
29	Property Mitigation - Fill Dirt (As Required)	Cubic Yards	\$ 28.00
30	Property Mitigation - Stone for Ground Elevation (As Required)	Ton	\$ 85.00
31	Property Mitigation - Water Drainage (French Drain, Drainage Ditch, etc.) (As Required)	Linear Foot	\$ 25.00
32	Property Mitigation - Retaining Wall Below 6 Feet in Vertical Height (Includes Footer and Drainage)	Linear Foot	\$ 222.22
33	Ditch Culverts (As Required)	Linear Foot	\$ 52.00
34	Gravel for Road/Driveway Access (As Required)	Ton	\$ 45.00
35	Additional Water Line beyond 350 Linear Feet	Linear Foot	\$ 18.00
36	Additional Natural Gas Line Beyond 350 Linear Feet	Linear Foot	\$ 22.00
37	Additional Sewage Line Beyond 350 Linear Feet	Linear Foot	\$ 20.00
TOTAL BASE BID AMOUNT (1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23+24+25+26+27+28+29+30+31+32+33+34+35+36+37)			

**REQUEST FOR QUOTATION
Reconstruction**

EXHIBIT B – PROJECT PLANS

13. GENERAL REQUIREMENTS:

13.1 Mandatory Contract Item Requirements: Contract Item must meet or exceed the mandatory requirements listed below.

13.1.1 SCOPE OF WORK

Once a contractor commences work, the contractor is expected to complete all tasks. Items may include, but are not limited to the following items, which the construction contractor will be responsible for at least the following:

- Obtain all required permits
- Schedule the replacement activities with the applicant
- Disconnect all utilities
- Conduct ACM inspections and abatement
- Demolition of existing structure/structures
- Disposal of existing structure/structures
- Pad/Foundation preparation
- Property site mitigation and preparation
- Completion of the new residence (Includes Accessibility changes if required)
- Connection of all utilities, includes existing gas utilities (if present)
- Installation of all electrical, plumbing, septic systems, wells, and HVAC components and fixtures
- Purchase and installation of the following Energy Star Rated appliances:
(Refrigerator, Stove, Dishwasher, Windows, Hot Water Heater, Heat Pump, Lighting, Clothes Washer, Clothes Dryer)
- Scheduling and completion of all required inspections
- Obtain a Certificate of Occupancy (if provided by County or Municipality)

A detailed bid for a 2 Bed 2 Bath, 3 Bed 2 Bath, and 4 Bed 2 Bath stick built residence is required (includes Accessibility changes if required).

REQUEST FOR QUOTATION Reconstruction

13.1.2. Contractor will be responsible for scheduling and providing temporary storage to the residents when deemed necessary by the Development Office Construction Manager and identified within the Scope of Work. All applicants will have 30-days to move out of their damaged home, starting from their signature of the Homeowner's Agreement with the Contractor. After the 30-day period has expired, applicants may receive a short extension from the Program for extenuating circumstances. If the applicant has failed to move out of the residence, they will be placed on an Inactive Status. The Case Management will issue a notice to the applicant informing their change to Inactive Status. The notice will also clarify to the applicant that their home may not be completed due to the federal timeline the grant closes and no funds can be expended.

After completion of the new residence, the contractor must allow the resident fourteen (14) calendar days to vacate the temporary storage.

13.1.3 It is the Contractors responsibility to ensure every Line Item on the Pricing Page includes a bid. Failure to provide a bid, or to change the Pricing Page can result in the Vendor's Bid being rejected.

13.1.4 Upon completion of the work, the contractor must attend any necessary inspections. Final invoices for each site cannot be submitted until the final inspection has been passed. Contractors are required to warranty all work for a period of one (1) year and will respond to a warranty within 2 days of notification from the state and subsequently address all warranty issues within 7 days. The contractor can seek relief from warranty complaints in writing from the Program.

Respondent(s) are not required to comply with Davis Bacon wage rates for single-family housing.

13.1.5 ADDITIONAL ELEVATION REQUIREMENTS

Some properties eligible for Reconstruction will require additional elevation. Properties requiring additional elevation shall meet the criteria provided for in the Federal Register Notice 81 FR 5989 published on November 21, 2016; specifically, the items addressed under the section titled, "Elevation standards for new construction, repair of substantial damage, or substantial improvement". All elevations require an elevation certificate. The final elevation certificate must be provided to the Construction Management Team before the Vendor can invoice for any payment.

REQUEST FOR QUOTATION
Reconstruction

13.1.5.1. Due to the ground being sloped and not flat, some properties will require additional eight (8) inch courses of block to be emplaced. This specific type of elevation will have its own line item to bid on and will be for every additional eight (8) inch course of rise installed above 40 inches from ground level.

13.1.6. SCRAP / SALVAGE METAL

The Contractor will be authorized to recycle any scrap or salvaged metals from approved properties where demolition and/or personal property debris removal efforts are taking place. Any profits gained from the recycling of scrap or salvaged metals will remain with the Contractor.

It is the Contractors responsibility to seek out recycling facilities that will take in the scrap or salvaged metals from the demolition of homes or personal property debris removal.

The Contractor must abide by all State, County, and Municipality rules, policies, and laws regarding recycling.

13.1.7 PERFORMANCE MEASURES

Adherence to the timeliness goals (120 calendar days for Reconstruction Projects) will be monitored and enforced by the Development Office, or its designee. The ability to achieve these predefined goals will affect workload allocations as described in Section 7.2 above

Quality of the contractor's workmanship will be continuously assessed based on the judgment of the Development Office, or its designee.

13.1.8 HAZARDOUS MATERIALS:

All asbestos contained material (ACM) will be removed from the project area and all of the same shall be transported to and legally disposed of by the Contractor at an approved and properly licensed sanitary landfill licensed to handle ACM. Landfill or tipping fees shall be paid by the Contractor. Contractor is responsible for insuring that ACM does not fall from or blow off transporting vehicles in route to the sanitary landfill or transfer station.

The Contractor shall take all appropriate precautions to protect Community property (Streets, Utility Meters, Mains, Etc.) from damage by the Contractors equipment. The Contractor is responsible for filling out the WV DEP Division of

REQUEST FOR QUOTATION Reconstruction

Air Quality Asbestos Form for approval before any asbestos abatement begins, as well as providing a source to spray water on the homes identified as having Asbestos, in order to ensure the health and safety of the Contractors and the Community.

It shall be the Contractor's responsibility to provide on-site supervision of the asbestos removal, if required by law, by an Asbestos Abatement Supervisor with a valid and current license. The Contractor will abide by the asbestos abatement procedures outlined in the WV DHHR Asbestos Awareness and Removal Procedures.

It shall be the Contractor's responsibility to remove any and all asbestos containing material and dispose of it properly. The Contractor must have a proper license to remove asbestos and provide a copy of said license to the State with the bid package and must pay the appropriate state fees and notify the proper authorities under the proper time frame according to State and Federal law prior to starting abatement. Copies of all paperwork and custodial agreements concerning asbestos abatement shall be supplied to the Development Office upon request.

13.1.9 Pricing:

13.1.9.1 The contractor must provide a fixed price for items listed on Exhibit A "Pricing Page". The configuration should include a minimum of 900 sq.ft. of heated and cooled living space. All Reconstruction Projects must comply with U.S. Department of Housing and Urban Development (HUD) requirements.

- **Fixed price includes, but is not limited to, the following requirements:**
- **Certified and Engineered Blueprints 2 Bed 2 Bath, 3 Bed 2 Bath, and 4 Bed 2 Bath)**
- **Permitting**
- **Site preparation, including necessary fill dirt**
- **Utilities Disconnect and Reconnect (Plumbing, Sewer, and Electric, Utility pole, includes existing gas utilities if present, etc.)**
- **Temporary storage (Can be on or off site)**
- **Stick Built Unit (IRC Compliant) Crawlspace Foundation**
- **Pad / Foundation preparation**
- **Egress, per code requirements**

REQUEST FOR QUOTATION
Reconstruction

- **Energy Star Appliances (Refrigerator, Stove, Dishwasher, Windows, Hot Water Heater, Heat Pump, Lighting, Clothes Washer, Clothes Dryer)**
- **Contractors are required to warranty all work for a period of one (1) year.**
- **A certificate of occupancy (if issued by County or Municipality) is required to be submitted to the Development Office Construction Manager before final payment(s) will be made to the construction contractor.**

13.1.9.2 The Contractor may submit an initial invoice for 30% payment of the base home configuration cost (one of LINE ITEM "1-6" & "7") upon project being under roof. The Contractor may submit a second invoice for 70% of the base home configuration (one of LINE ITEM "1-6" & "7") upon completion which includes a signed Final Inspection and Green Building checklist from the Construction Management. The Contractor will submit a final invoice for the remaining commodity line items (LINE ITEMS "8" THROUGH "37") upon completion of the Contractor Lien Satisfaction Document (Exhibit C). The program invoice checklist (Exhibit D) will be submitted with all invoice requests from the Vendor, which includes the necessary documentation for reimbursements.

13.1.10 Liquidating Damages:

13.1.10.1 Contractor shall pay liquidated damages in the amount of \$500.00 per day if the project is not completed within 120 calendar days from the date the Notification to Proceed was issued, plus a one-time fixed cost of \$1,250.00 for Commerce Legal review for work not completed after contract completion date. This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy.

13.1.11 Project Locations:

Project locations and specific home configurations will be provided to the Vendor through the Delivery Order/Notice to Proceed and Homeowner Agreement.

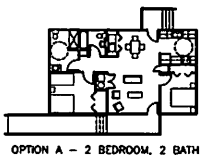
Flood Recovery
House Design
 for the
West Virginia Army National Guard
 Charleston, West Virginia
 July 26, 2018

Construction Documents

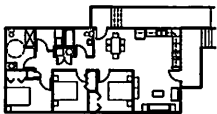
OWNER

West Virginia Army
 National Guard
 Charleston, WV 25302

KEY PLANS



OPTION A - 2 BEDROOM, 2 BATH



OPTION B - 3 BEDROOM, 2 BATH

DRAWING INDEX

SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME
G000	COVER SHEET				
ARCHITECTURAL					
A131	FLOOR PLAN OPTION A				
A132	FLOOR PLAN OPTION B				
A151	ROOF & FOUNDATION PLANS OPTION A				
A152	ROOF & FOUNDATION PLANS OPTION B				
A221	FINISH FLOOR PLAN OPTION A				
A222	FINISH FLOOR PLAN OPTION B				
A270	KITCHEN ELEVATIONS OPTIONS A & B				
A311	ELEVATIONS OPTION A				
A312	ELEVATIONS OPTION B				
A580	SECTIONS & DETAILS				
PLUMBING					
P131	PLUMBING SEWER PLAN A & PLAN B				
P142	PLUMBING DOMESTIC WATER PLAN A & PLAN B				
P511	PLUMBING DETAILS, NOTES AND SCHEDULES				
P512	PLUMBING DETAILS, NOTES AND SCHEDULES				
MECHANICAL					
M131	MECHANICAL HVAC PLAN				
M511	MECHANICAL DETAILS, NOTES AND SCHEDULES				
M512	MECHANICAL DETAILS, NOTES AND SCHEDULES				
ELECTRICAL					
E131	ELECTRICAL PLAN A & PLAN B				
E511	ELECTRICAL DETAILS, NOTES AND SCHEDULES				
E512	ELECTRICAL DETAILS, NOTES AND SCHEDULES				
E513	ELECTRICAL DETAILS, NOTES AND SCHEDULES				

BUILDING INFORMATION

USE AND OCCUPANCY CLASSIFICATION
 OCCUPANCY CLASSIFICATION - SINGLE FAMILY HOUSE
 (PER 2015 INTERNATIONAL RESIDENTIAL CODE)

CONSTRUCTION CLASSIFICATION

CONSTRUCTION TYPE : V
 NON-SPRINKLERED
 (PER 2015 INTERNATIONAL RESIDENTIAL CODE)

BUILDING AREA

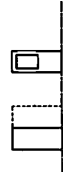
OPTION A	1,008 SF
OPTION B	1,200 SF

(PER 2015 INTERNATIONAL RESIDENTIAL CODE)

1. ALL REINFORCING DRAGGINGS ARE FROM FACE OF WALL TO FACE OF WALL UNLESS NOTED OTHERWISE.
2. ALL REINFORCING WALLS ARE 24" WOOD STUDS WITH 1" DIA. ON EACH SIDE.
3. PER AIA ALL REINFORCING SHALL NOT BE MORE THAN 1" IN ANY UNIFORM.



FT - FULLY TRIMMED CLASS



MOOD TYPE	TIME LEFT	MOOD SET
1	PRODUCES	$3^{\circ}-4^{\circ} = 5^{\circ}-6^{\circ}$
2	PRODUCES	$3^{\circ}-4^{\circ} = 6^{\circ}-7^{\circ}$
3	PRODUCES	$3^{\circ}-4^{\circ} = 5^{\circ}-6^{\circ}$

NOTE: ALL MOODS WILL COMPLY WITH 2009 EPA CLASS REQUIREMENTS



DRAWN	CHECKED	DATE	COMM. NO.
JSB	ARX	July 29, 1918	18065

A131

WEST VIRGINIA ARMY NATIONAL GUARD
FLOOD RECOVERY
HOUSE DESIGN
Charleston, WV

CONSTRUCTION DOCUMENTS

[illegible]

WEST VIRGINIA ARMY NATIONAL GUARD
FLOOD RECOVERY
HOUSE DESIGN
Charleston, WV

CONSTRUCTION DOCUMENTS

[illegible]

DOOR SCHEDULE - OPTION B

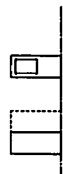
[illegible]

IT - FULLY TRAINED CLASS

WINDOW SCHEDULE

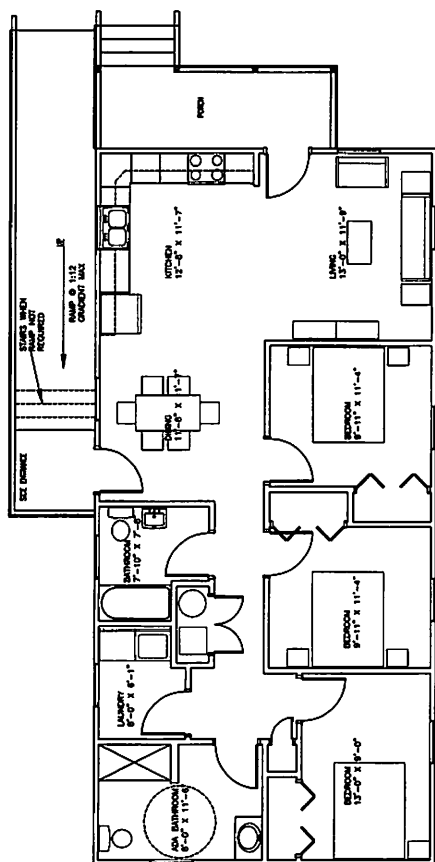
WINDY RECORD	DATE	TIME	WINDY
1	1980-03-05	10:00	10:00
2	1980-03-05	10:00	10:00
3	1980-03-05	10:00	10:00

**NOTE: ALL WINNERS WILL COMPLY WITH 2009
FDC GAMING REGULATIONS**

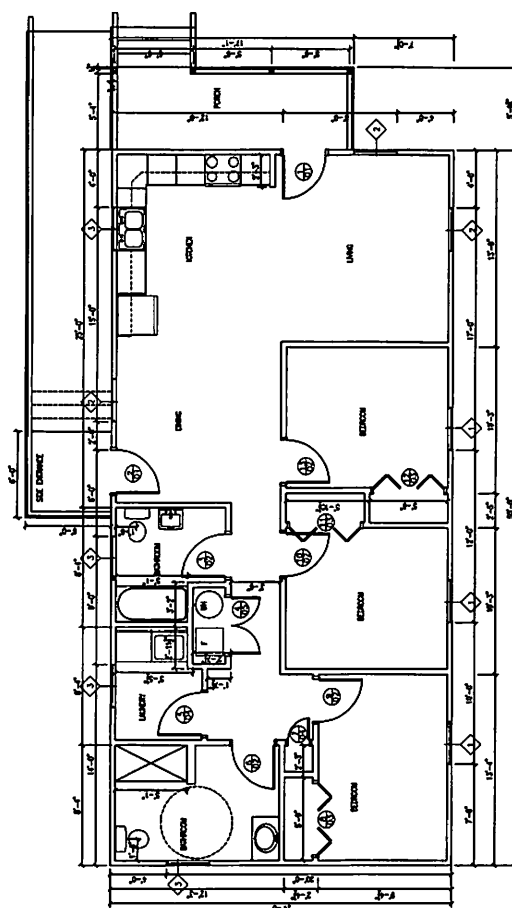


GENERAL NOTES

1. ALL INTERIOR CORNERS ARE FROM FACE OF WALL TO FACE OF WALL OR LESS
HOLLOW CORNER.
2. ALL INTERIOR WALLS ARE 2-4 INCH THICK WITH 1/2" GUTS ON EACH SIDE.
3. PER ADA ALL WALLS/CEILING SHALL NOT BE MORE THAN 1/2" IN THICK UNLESS



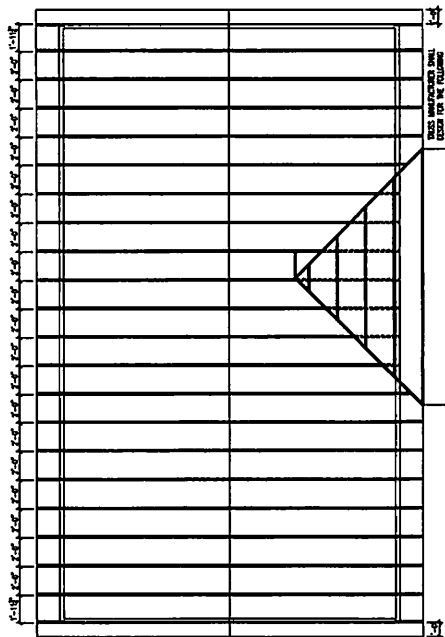
SCHEMATIC FLOOR PLAN - OPTION B



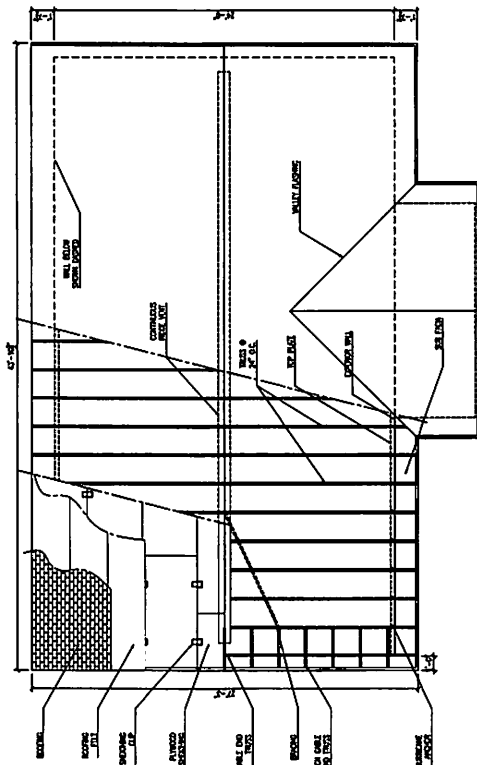
DIMENSIONED FLOOR PLAN - OPTION B

WEST VIRGINIA ARMY NATIONAL GUARD	FLOOD RECOVERY	HOUSE DESIGN	Charleston, WV	CONSTRUCTION DOCUMENTS
-----------------------------------	----------------	--------------	----------------	------------------------

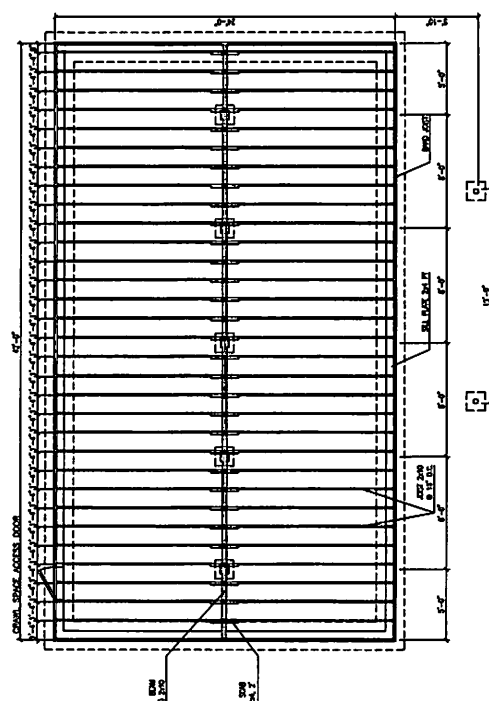
RAWN	CHECKED	DATE	COMM. NO.
JSB	ARK	July 28, 2018	1806S



ROOF FRAMING PLAN - OPTION A

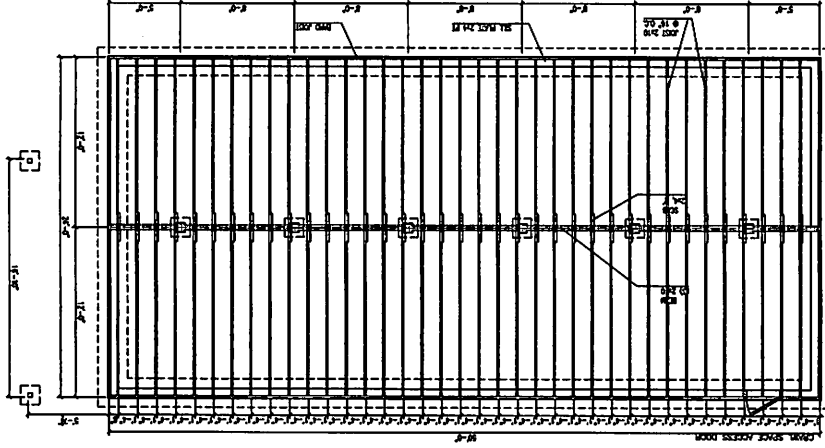


ROOF PLAN - OPTION A

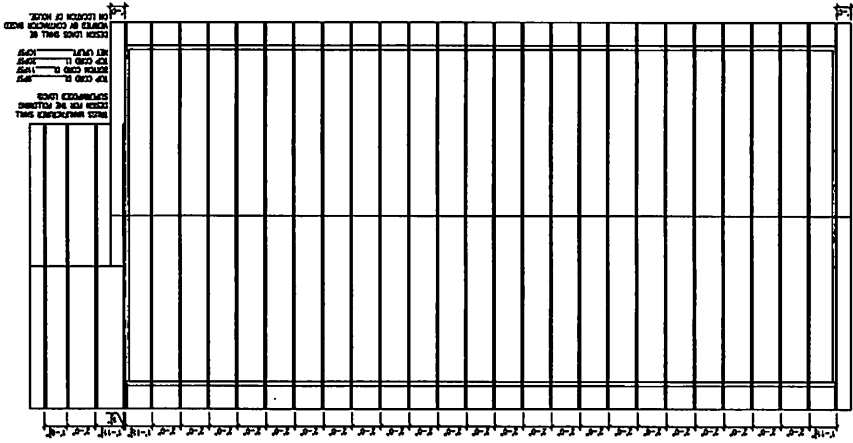


CRAWL SPACE FOUNDATION PLAN - OPTION A

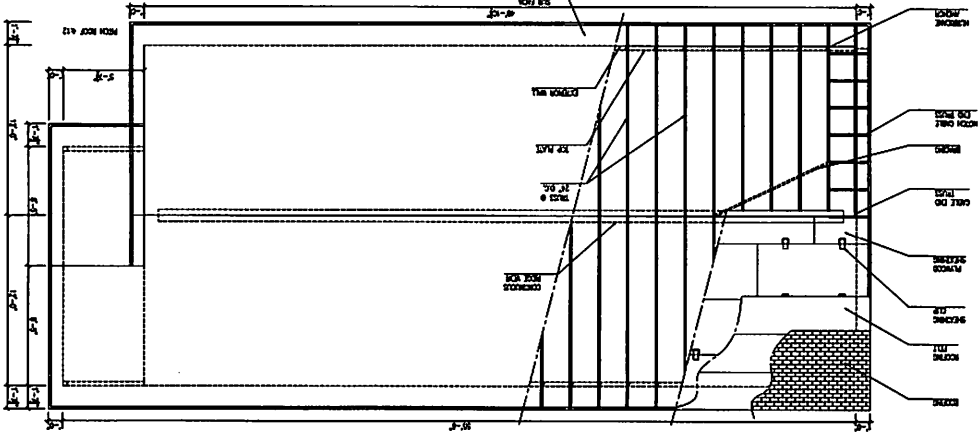
CRAWL SPACE FOUNDATION PLAN - OPTION B



ROOF FRAMING PLAN - OPTION B



~~1/6 - 1-2~~
~~ROOF PLAN - OPTION B~~



T VIRGINIA ARMY NATIONAL GUARD
FLOOD RECOVERY
 HOUSE DESIGN
 Charleston, WV

CONSTRUCTION DOCUMENTS

**ROOF &
FOUNDATION
PLANS
OPTION B**

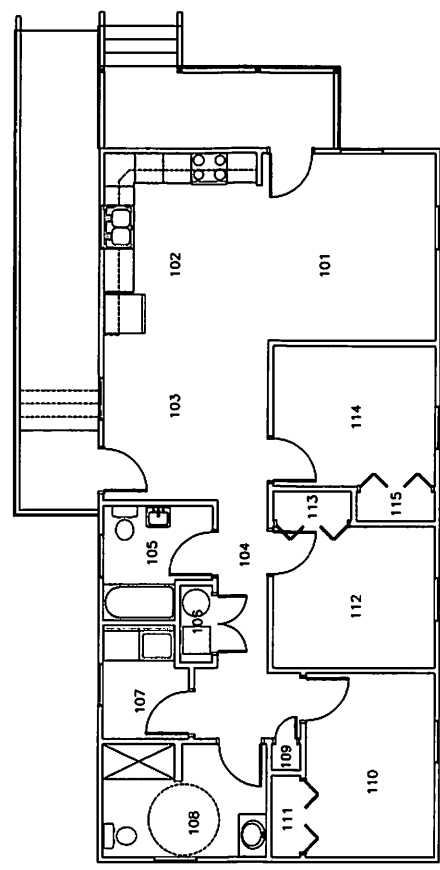
DRAWN	CHECKED	ARK	DATE	July 28, 2018	CONST. NO.	18065
JSB						

[illegible]

[illegible][illegible][illegible]

WEST VIRGINIA ARMY NATIONAL GUARD
FLOOD RECOVERY
HOUSE DESIGN
Charleston, WV

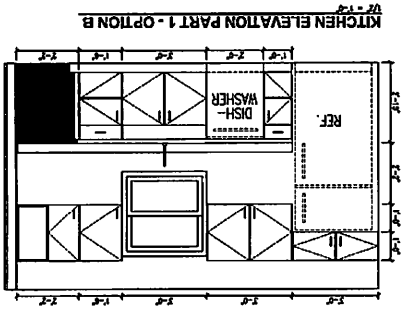
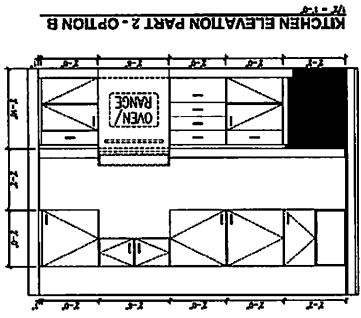
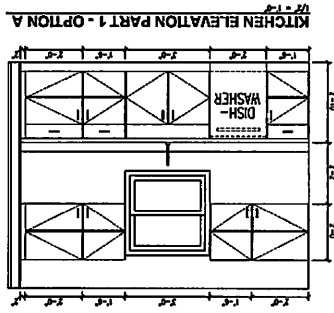
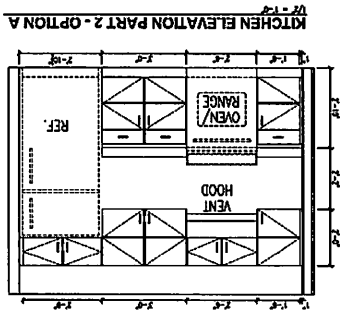
CONSTRUCTION DOCUMENTS

[illegible]

FINISH FLOOR PLAN - OPTION B

[illegible]

ROOM FINISH LEGEND				
LINE	ITEM	UNIT	QTY/SECTION AND FINISH / PNL	PNL NUMBER / COLOR
1	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
2	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
3	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
4	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
5	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
6	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
7	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
8	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
9	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
10	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
11	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
12	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
13	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
14	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
15	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
16	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
17	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
18	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
19	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
20	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
21	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
22	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
23	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
24	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
25	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
26	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
27	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
28	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
29	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
30	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
31	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
32	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
33	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
34	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
35	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
36	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
37	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
38	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
39	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
40	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
41	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
42	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
43	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
44	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
45	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
46	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
47	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
48	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
49	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
50	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
51	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
52	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
53	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
54	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
55	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
56	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
57	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
58	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
59	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
60	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
61	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
62	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
63	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
64	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
65	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
66	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
67	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
68	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
69	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
70	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
71	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
72	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
73	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
74	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
75	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
76	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
77	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
78	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
79	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
80	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
81	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
82	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
83	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
84	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
85	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
86	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
87	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
88	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
89	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
90	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
91	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
92	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
93	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
94	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
95	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
96	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
97	CEILING, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
98	WALL, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
99	FLOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100
100	DOOR, 1/2" x 4" x 8" PLANK, WHITE	100	100	100



NOTE: BASE CABINET(S) HEIGHT CAN BE ADJUSTED TO 36" IF HOUSE IS TO NOT BE ADA COMPLIANT

KITCHEN

KITCHEN ELEVATION PART 2 - OPTION B 1/2 - 1/2

KITCHEN

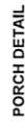
KITCHEN ELEVATION PART 1 - OPTION B

[illegible]

A311

ELEVATIONS OPTION B	DRAWN	CHECKED	ARK
	JSB	DATE	July 26, 2018
		COMM. NO.	15065
	A312		

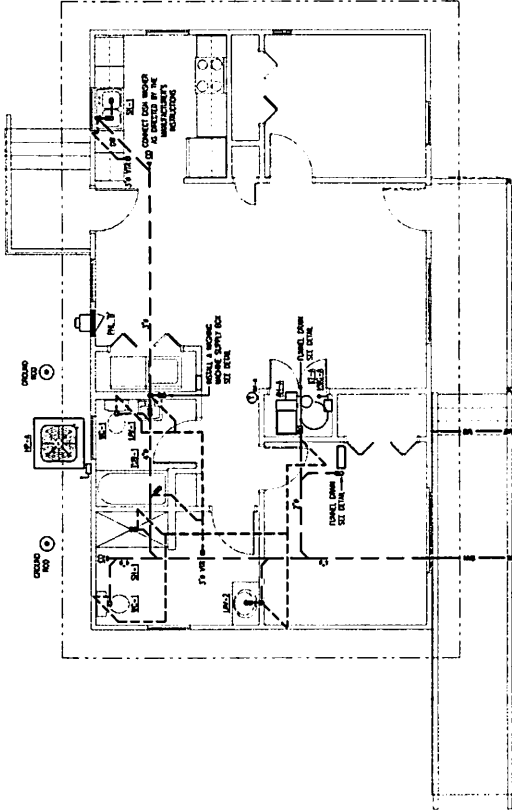
WEST VIRGINIA ARMY NATIONAL GUARD
FLOOD RECOVERY
HOUSE DESIGN
Charleston, WV
CONSTRUCTION DOCUMENTS

A560

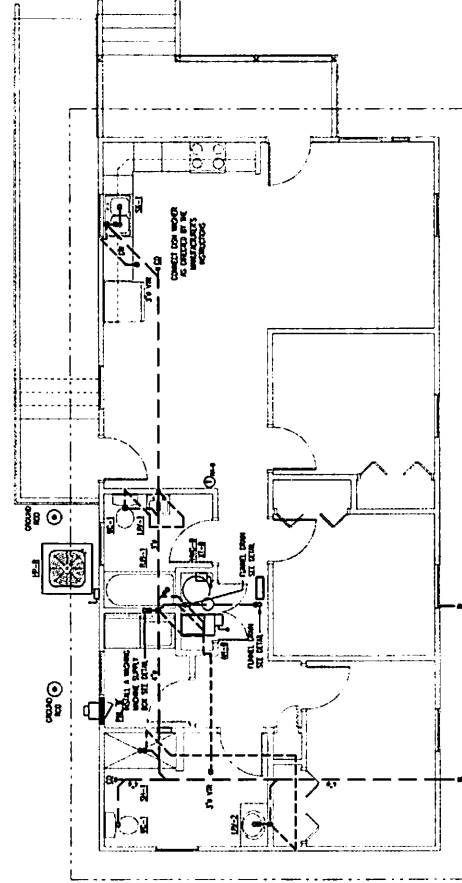
**PLUMBING
SEWER
PLAN A & PLAN B**

DRAWN	CHECKED
MWE	MWE
	DATE
	July 28, 2018
	COMM. NO.
	18265

P131

[illegible]

PLUMBING - SEWER PLAN (PLAN A)



PLUMBING - SEWER PLAN (PLAN B)
SCALE: 1/4" = 1'-0"

DRAWN MWE	CHECKED MWE	DATE July 26, 2018	COPIES NO. 18063

[illegible]

GENERAL DOMESTIC WATER NOTES:

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835

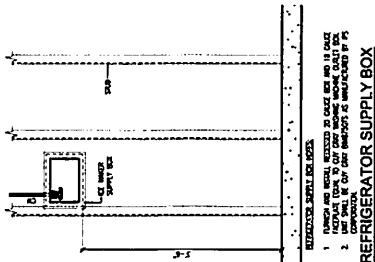
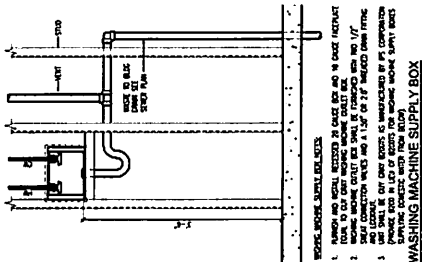
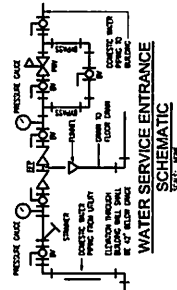
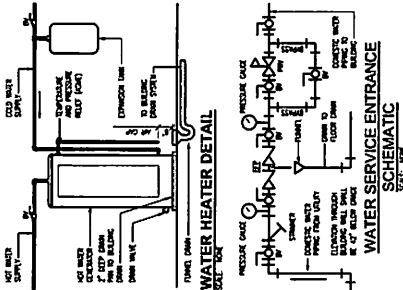
PLUMBING FIXTURE SCHEDULE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

WATER HEATER SCHEDULE

[illegible]

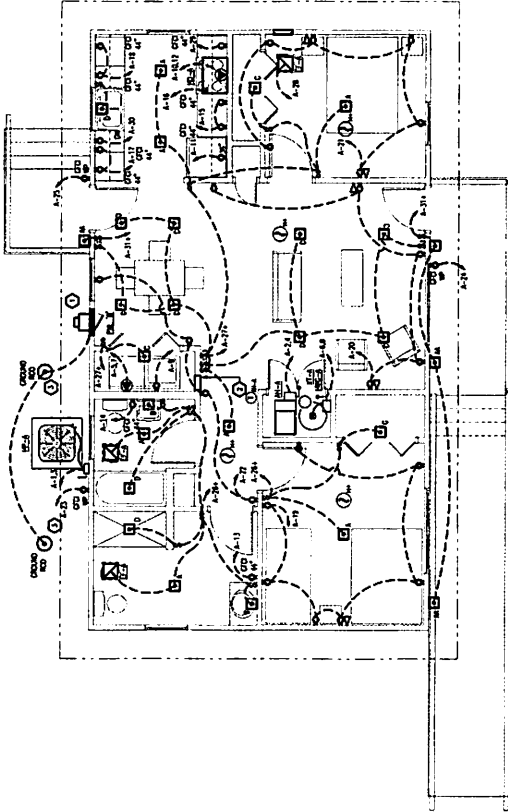
EXPANSION TANK SCHEDULE

[illegible]

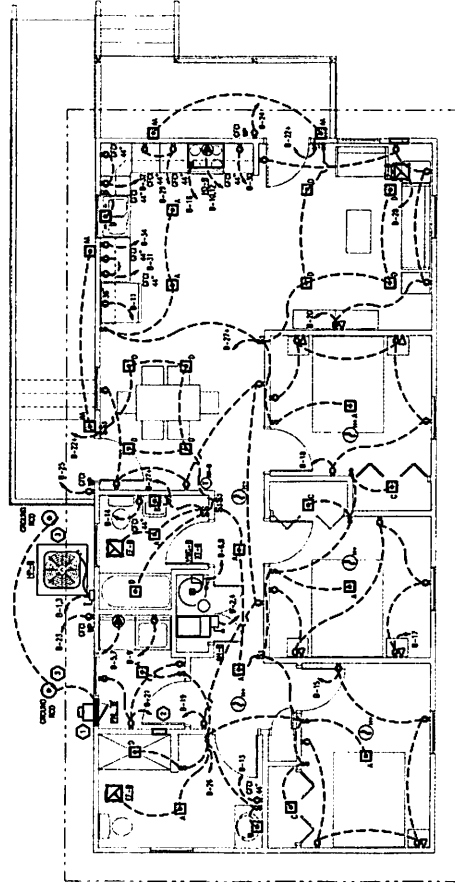
[illegible]

[illegible]

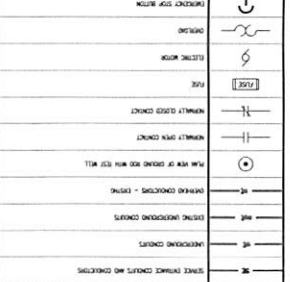
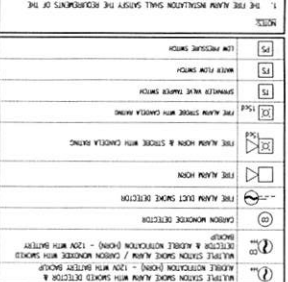
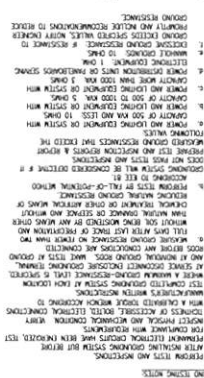
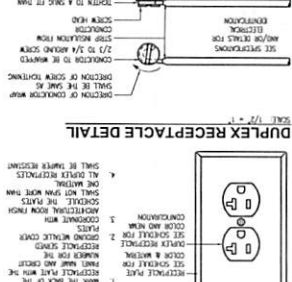
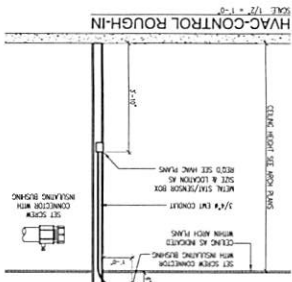
- PLAN NOTES:**
1. METER BASE & METER - SEE ELECTRICAL SCHEDULE
 2. CONDUIT RUN FOR PHONE, INTERCOM AND FIRE ALARM
 3. CONDUIT RUN FOR FIRE ALARM ONLY TO LOCATION
 4. CONDUIT RUN - SEE ELECTRICAL SCHEDULE



ELECTRICAL - PLAN A
SCALE 1/8" = 1'-0"



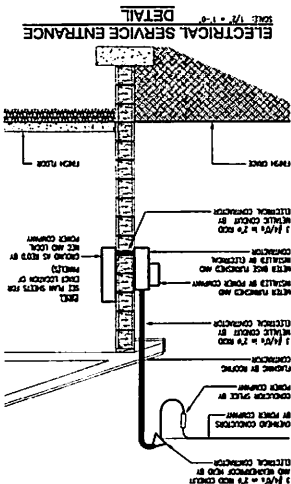
ELECTRICAL - PLAN B
DATE 1/6 - 1-0



ARMY NATIONAL GUARD
RECOVERY
CASE DESIGN
Weston, WV

Figure 1. The effect of the number of trials on the mean accuracy of the responses. The error bars represent the standard error of the mean.

LUMINAIRE SCHEDULE									
DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL	DATE	BY	REMARKS	DATE	BY
1. 100WATT FLUORESCENT LIGHT FIXTURE	1	EA	10.00	10.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
2. 200WATT FLUORESCENT LIGHT FIXTURE	2	EA	20.00	40.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
3. 400WATT FLUORESCENT LIGHT FIXTURE	3	EA	40.00	120.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
4. 600WATT FLUORESCENT LIGHT FIXTURE	4	EA	60.00	240.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
5. 800WATT FLUORESCENT LIGHT FIXTURE	5	EA	80.00	400.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
6. 1000WATT FLUORESCENT LIGHT FIXTURE	6	EA	100.00	600.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
7. 1500WATT FLUORESCENT LIGHT FIXTURE	7	EA	150.00	1050.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
8. 2000WATT FLUORESCENT LIGHT FIXTURE	8	EA	200.00	1600.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
9. 3000WATT FLUORESCENT LIGHT FIXTURE	9	EA	300.00	2700.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
10. 4000WATT FLUORESCENT LIGHT FIXTURE	10	EA	400.00	4000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
11. 5000WATT FLUORESCENT LIGHT FIXTURE	11	EA	500.00	5500.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
12. 6000WATT FLUORESCENT LIGHT FIXTURE	12	EA	600.00	7200.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
13. 7000WATT FLUORESCENT LIGHT FIXTURE	13	EA	700.00	9100.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
14. 8000WATT FLUORESCENT LIGHT FIXTURE	14	EA	800.00	11200.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
15. 9000WATT FLUORESCENT LIGHT FIXTURE	15	EA	900.00	13500.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
16. 10000WATT FLUORESCENT LIGHT FIXTURE	16	EA	1000.00	16000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
17. 12000WATT FLUORESCENT LIGHT FIXTURE	17	EA	1200.00	20400.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
18. 15000WATT FLUORESCENT LIGHT FIXTURE	18	EA	1500.00	27000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
19. 20000WATT FLUORESCENT LIGHT FIXTURE	19	EA	2000.00	38000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
20. 25000WATT FLUORESCENT LIGHT FIXTURE	20	EA	2500.00	50000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
21. 30000WATT FLUORESCENT LIGHT FIXTURE	21	EA	3000.00	63000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
22. 35000WATT FLUORESCENT LIGHT FIXTURE	22	EA	3500.00	77000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
23. 40000WATT FLUORESCENT LIGHT FIXTURE	23	EA	4000.00	92000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
24. 45000WATT FLUORESCENT LIGHT FIXTURE	24	EA	4500.00	108000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
25. 50000WATT FLUORESCENT LIGHT FIXTURE	25	EA	5000.00	125000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
26. 55000WATT FLUORESCENT LIGHT FIXTURE	26	EA	5500.00	143000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000
27. 60000WATT FLUORESCENT LIGHT FIXTURE	27	EA	6000.00	162000.00	10/10/2000	10/10/2000	10/10/2000	10/10/2000	10/10/2000

[illegible][illegible][illegible]

MENNONITE DISASTER SERVICE

3 BED - 2 BATH - HOUSE - OPTION #1 REVERSE

STEMWALL FOUNDATION

DRAWING LIST:

- A-0.0 COVER SHEET
- A-1.0 FOUNDATION PLAN
- A-1.1 FOOTINGS & FOUNDATION SECTIONS
- B-1.0 FLOOR FRAMING PLAN
- B-1.1 FLOOR PLAN
- B-1.2 ROOF TRUSS PLAN
- B-2.0 WALL SECTION
- B-2.1 EXTERIOR WALL STRAPPING DETAILS
- B-2.2 PORCH DECK FRAMING DETAILS
- B-2.3 PORCH ROOF FRAMING DETAILS
- B-2.4 NAILING DETAILS
- B-2.5 STAIR & RAILING DETAILS
- B-2.6 HVAC CLOSET DETAILS
- C-1.0 DOOR & WINDOW FLASHING DETAILS
- D-1.0 ELEVATIONS
- E-1.0 ELECTRICAL LAYOUT PLAN
- K-1.0 KITCHEN PLAN

GENERAL NOTES

- 1.- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF IRC AND ANY APPLICABLE LOCAL, COUNTY AND STATE ORDINANCES. STRUCTURAL DESIGN SHALL COMPLY WITH 140 MPH WIND, 30 PSF SNOW LOAD, AND EXPOSURE C REQUIREMENTS, UNLESS LOCAL CONDITIONS STIPULATE HIGHER REQUIREMENTS..
- 2.- COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR INSTALLATION ON ALL MATERIALS UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
- 3.- CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS IN THE FIELD.
- 4.- IF THE EXISTING FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE DETAILS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY AND PROVIDE INFORMATION OF EXISTING CONDITIONS. FINAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE INSTRUCTIONS OF THE ARCHITECT.
- 5.- ALL EXTERIOR NAILS, BOLTS, ANCHORS, HANGERS, AND NAILS PENETRATING PRESSURE TREATED LUMBER SHALL BE HOT DIPPED GALVANIZED.
- 6.- ALL WOOD IN CONTACT WITH CONCRETE, CONCRETE BLOCK, SHALL BE PRESSURE TREATED. ALL WOOD IN CONTACT WITH GROUND SHALL BE GROUND CONTACT PRESSURE TREATED.
- 7.- FINISHED GRADE SHALL SLOPE DOWN 8" AWAY FROM THE STRUCTURE IN THE FIRST 8'-0" UNLESS OTHERWISE NOTED.
- 8.- FRAMING LUMBER TO BE MIN. #2 HEM FIR, SOUTHERN PINE, OR SPRUCE-PINE-FIR, OR CONSTRUCTION GRADE DOUG FIR.
- 9.- FLOOR DECK TO BE APA RATED 3/4" TONGUE & GROOVE PLYWOOD OR OSB WITH A 32/16 SPAN RATING, BOTH GLUED AND NAILED TO APA STANDARDS ON 2X10 FLOOR JOIST AT 16" ON CENTER.
- 10.- ALL EXTERIOR WALLS TO BE 2x6 WOOD STUDS 16" ON CENTER WITH 1/2" DRYWALL INSIDE FINISH, AND R-19 FIBERGLASS BATT INSULATION. ALL INTERIOR WALLS TO BE 2x4 WOOD STUDS 16" ON CENTER WITH 1/2" DRYWALL BOTH SIDES UNLESS NOTED OTHERWISE.
- 11.- CONFIRM MANUFACTURE'S ROUGH OPENING FOR WINDOWS AND DOORS BEFORE FRAMING. (NOMINAL SIZES SHOWN ON PLAN)

12.- EXTERIOR WALL SHEATHING TO BE 7/16" OR 1/2" EXTERIOR GRADE OSB OR PLYWOOD.

13.- TYPICAL HEADERS TO BE DOUBLE 2x10.

14.- ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN DESIGN WITH ENERGY HEELS.

15.- ROOF SHEATHING TO BE APA RATED 5/8" PLYWOOD OR OSB WITH 32/16 SPAN RATING. H-CLIPS REQUIRED FOR TRUSSES 24" O.C.

16.- FELTS: 30LB (ROOF) ASPHALT SATURATED ORGANIC ROOFING FELT TYPE I, 38" ROLLS OR SYNTHETIC EQ. WALLS USE HOUSE WRAP, TYVEK OR EQ.

17.- SHINGLES: ASPHALT WITH AASTM D 3161, CLASS F OR ASTM D 7158 CLASS H RATING (CHECK WRAPPER FOR RATING), 20 YEAR MINIMUM WARRANTY. FASTENED WITH 6-1 1/2" NAILS PER SHINGLE.

18.- PROVIDE CONTINUOUS VENTED SOFFIT AND INSULATION BAFFLES

19.- INSULATION SHALL BE FIBERGLASS BATT INSULATION (R-19 IN EXTERIOR WALLS AND R-19 IN FLOORS, R30 BATTS OR BLOW-IN IN ATTICS). IN WARM HUMID CLIMATE ZONES USE INSULATION WITHOUT KRAFT PAPER. IF NOT AVAILABLE, USE INSULATION WITH PAPER, BUT INSTALL PAPER (VAPOR BARRIER) ON THE OUTSIDE AWAY FROM THE LIVING SPACE (PAPER TO OUTSIDE ON WALLS, PAPER UP IN ATTICS) (EXCEPTION: ALWAYS INSTALL PAPER UP TOWARD LIVING SPACE IN FLOORS) ALL OTHER ZONES, INSTALL PAPER TOWARDS LIVING SPACE.

20.- SIDING: USE VINYL WITH A MIN. 110 MPH RATING OR HARDIBOARD PANEL OR HARDIBOARD PLANK, INSTALL PER MANUFACTURERS RECOMMENDATIONS.

21.-STAIR TREADS TO BE (2) 5/4X6 DECK BOARDS.

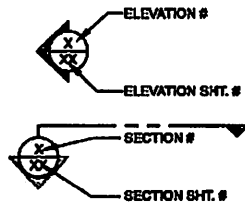
22.- PORCH, DECK, STAIR, AND RAMP GUARD RAILS SHALL BE 38" HIGH. HANDRAIL (WHERE REQUIRED) SHALL BE MIN. 34" HIGH.

23.- ELECTRICAL SERVICE TO BE 200 AMP WITH 20 AMP BREAKERS WITH 12 GA. WIRE.

24.- PROVIDE 4 SHELVES AT LINEN CLOSETS.

25.- PROVIDE SHELF AND POLE AT CLOSETS, IF CLOSET IS WIDER THAN 5'-0", PROVIDE CENTER BRACKET. SHELF HEIGHT TO BE 5'-6" FROM FLOOR.

LEGEND

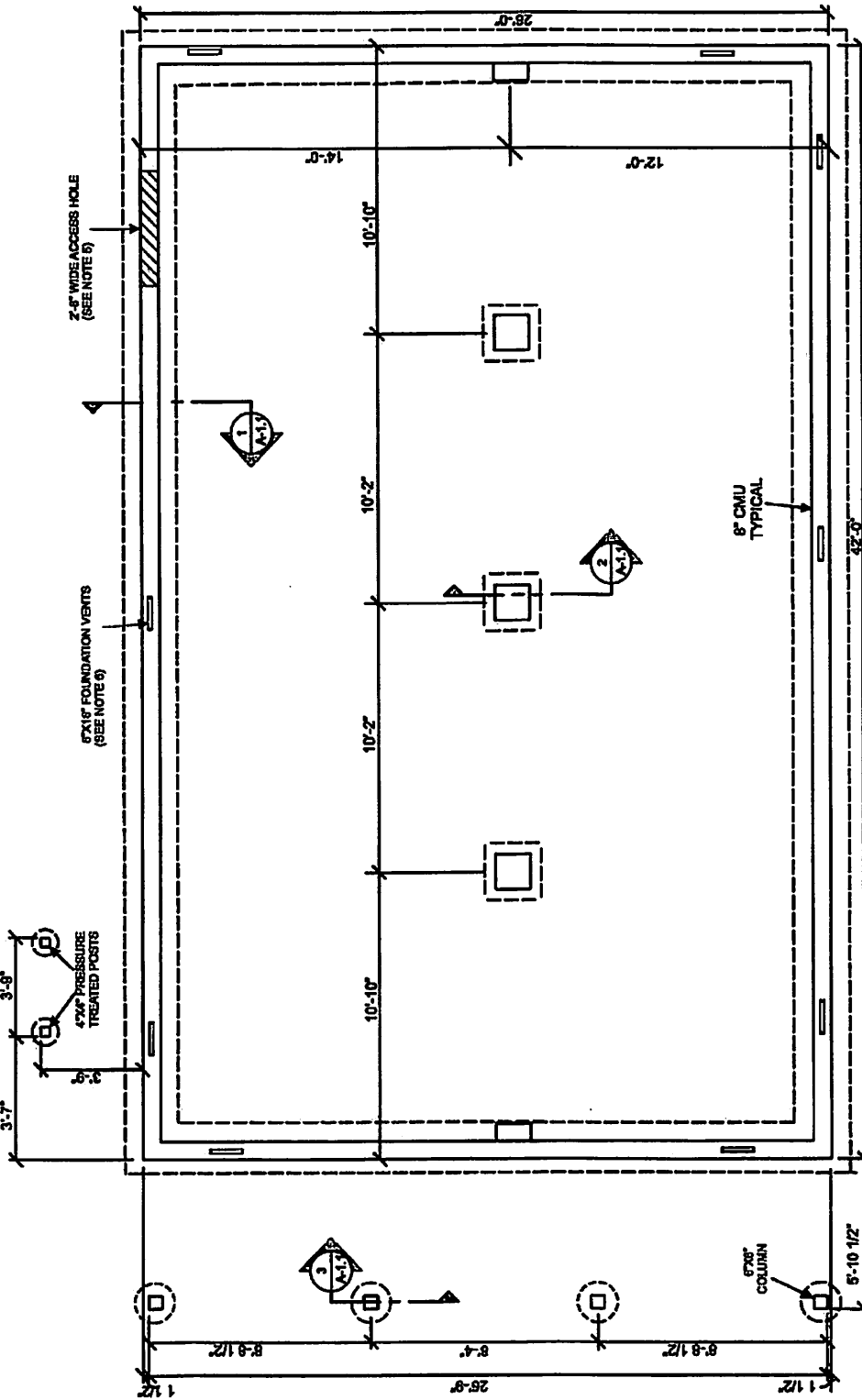


3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEMWALL FOUNDATION
26'X42' = 1082 SQ. FT.

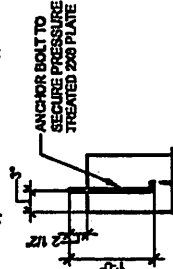


DRAWN BY: DMS
SHEET TITLE:
COVER SHEET

SHEET NO.
A-0.0
DATE: 08/02/18
REV:



- NOTES:**
1. INSTALL 1/2"x1/2" ANCHOR BOLTS AT 32" O.C. ON EACH OUTSIDE WALL. SEE TYPICAL HOUSE ANCHOR BOLT LOCATION DETAIL A-1.0 THIS SHEET.
 2. INSTALL 1/2"x1/2" ANCHOR BOLT AT 12" FROM CORNER OF EACH OUTSIDE WALL.
 3. FINISH FLOOR ELEVATION SHALL BE 1'-0" MIN. ABOVE GRADE. VERIFY AT EACH LOCATION.
 4. CONTRACTOR SHALL REFER TO LOCAL BUILDING CODE FOR ANCHOR BOLT REQUIREMENTS REGARDING QUANTITY, SPACING, PROJECTION, EMBEDMENT, AND HOOK LENGTH, AND BE GOVERNED ACCORDINGLY IF MORE STRINGENT REQUIREMENTS EXIST.
 5. INSTALL 2'-4" WIDE ACCESS HOLE. DETERMINE LOCATION OF ACCESS ON EACH SITE. FORM AND POUR A CONCRETE LINTEL ACROSS TOP OF HOLE WITH (2) #4 REBAR.
 6. INSTALL 8" FOUNDATION VENTS (2 IN LONG DIMENSION & 2 IN SHORT DIMENSION, 1 LESS ON ACCESS HOLE SIDS) IN SECOND TO TOP COURSE OF BLOCK EXCEPT IN CERTAIN FLOOD ZONES INSTALL VENTS WITHIN 12" OF FINISHED GRADE. ONE VENT TO BE WITHIN 8'-0" OF EACH BUILDING CORNER. FORM AND POUR A CONCRETE LINTEL ACROSS TOP OF VENTS WITH (2) #4 REBAR.



TYP. HOUSE ANCHOR BOLT LOCATION DETAIL

2
A-1.0

1
A-1.0

FOUNDATION PLAN

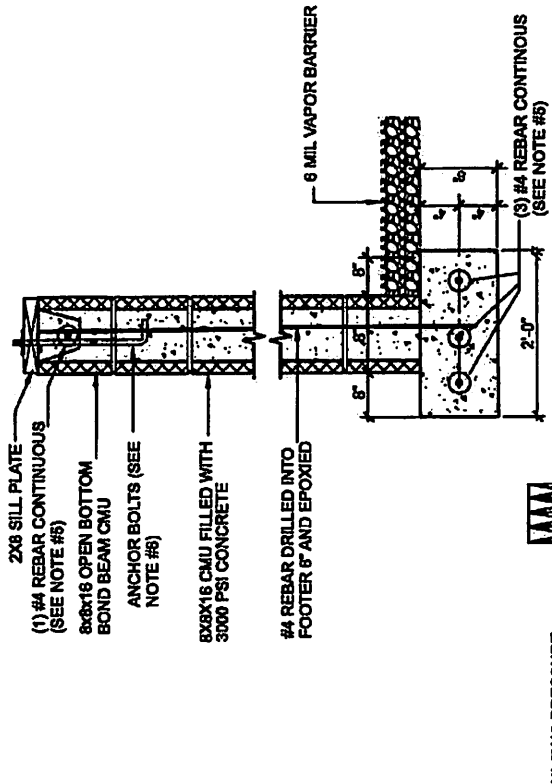
SHEET NO.
A-1.0

DATE: 09/02/18

DRAWN BY: JMS
SHEET TITLE:
FOUNDATION PLAN

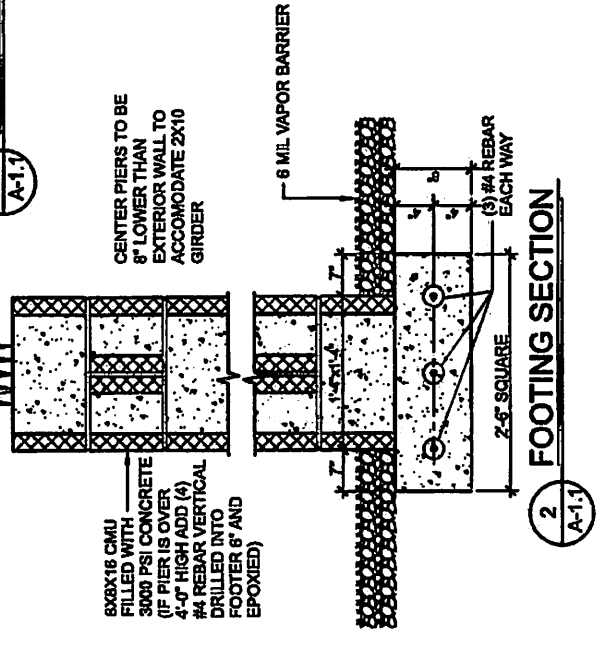


3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEM WALL FOUNDATION
28'X42' = 1082 SQ. FT.



FOOTING SECTION

1 A-1.1

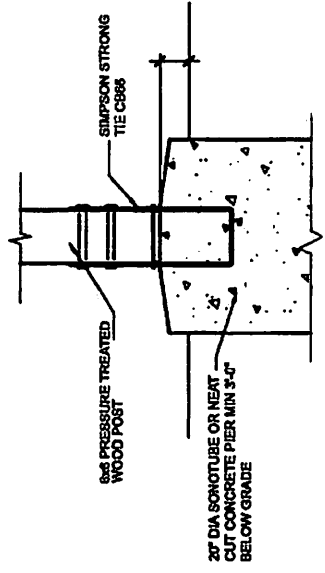


FOOTING SECTION

2 A-1.1

FOUNDATION NOTES:

1. CARRY ALL FOOTINGS TO FIRM UNDISTURBED BEARINGS. SEE FOUNDATIONS SECTIONS THIS SHEET FOR SIZE.
2. FOUNDATION SIZES AND REINFORCING STEEL SHOWN HAVE BEEN DESIGNED FOR 1,500 PSI SOIL BEARING WITHOUT ANY INFORMATION REGARDING THE SOIL LOCAL SOIL CONDITIONS AND/OR LOCAL PRACTICE MAY NECESSITATE A MORE STRINGENT FOOTING AND FOUNDATION DESIGN. CONSULT WITH LOCAL BUILDING INSPECTOR.
3. ALL CAST IN PLACE CONCRETE FOR THE BUILDING STRUCTURE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. IF OVER EXCAVATION OF FOOTINGS OCCUR, THE EXCAVATION SHALL BE FILLED WITH CONCRETE TO THE BOTTOM OF THE NEW FOOTING AT NO ADDITIONAL COST.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL REBAR ARE PROPERLY ALIGNED AND TIED IN PLACE BEFORE PLACING CONCRETE. ALL REBAR TO BE MINIMUM 2" FROM ANY SURFACE OF THE CONCRETE FOOTING. ALL HORIZONTAL REBAR TO BE CONTINUOUS WITH MINIMUM 3'-0" OVERLAPS.
6. 1/2"x12" ANCHOR BOLTS WITH 1/8"x3"x3" WASHERS TO BE PLACED WITHIN 12" OF EACH CORNER AND EVERY 32" ON CENTER. A #4 VERTICAL REBAR TO BE DRILLED 6" INTO FOOTER AND EPOXIED AT EACH ANCHOR BOLT LOCATION. ANCHOR BOLTS TO BE PLACED AS STATED UNLESS LOCAL CODES ARE MORE STRINGENT.
7. IF CONDITIONS REQUIRE IT INSTALL A FOUNDATION DRAIN AND DAMP PROOF EXTERIOR WALLS.



POST ANCHOR SECTION

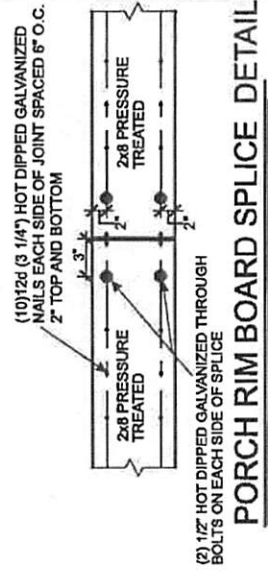
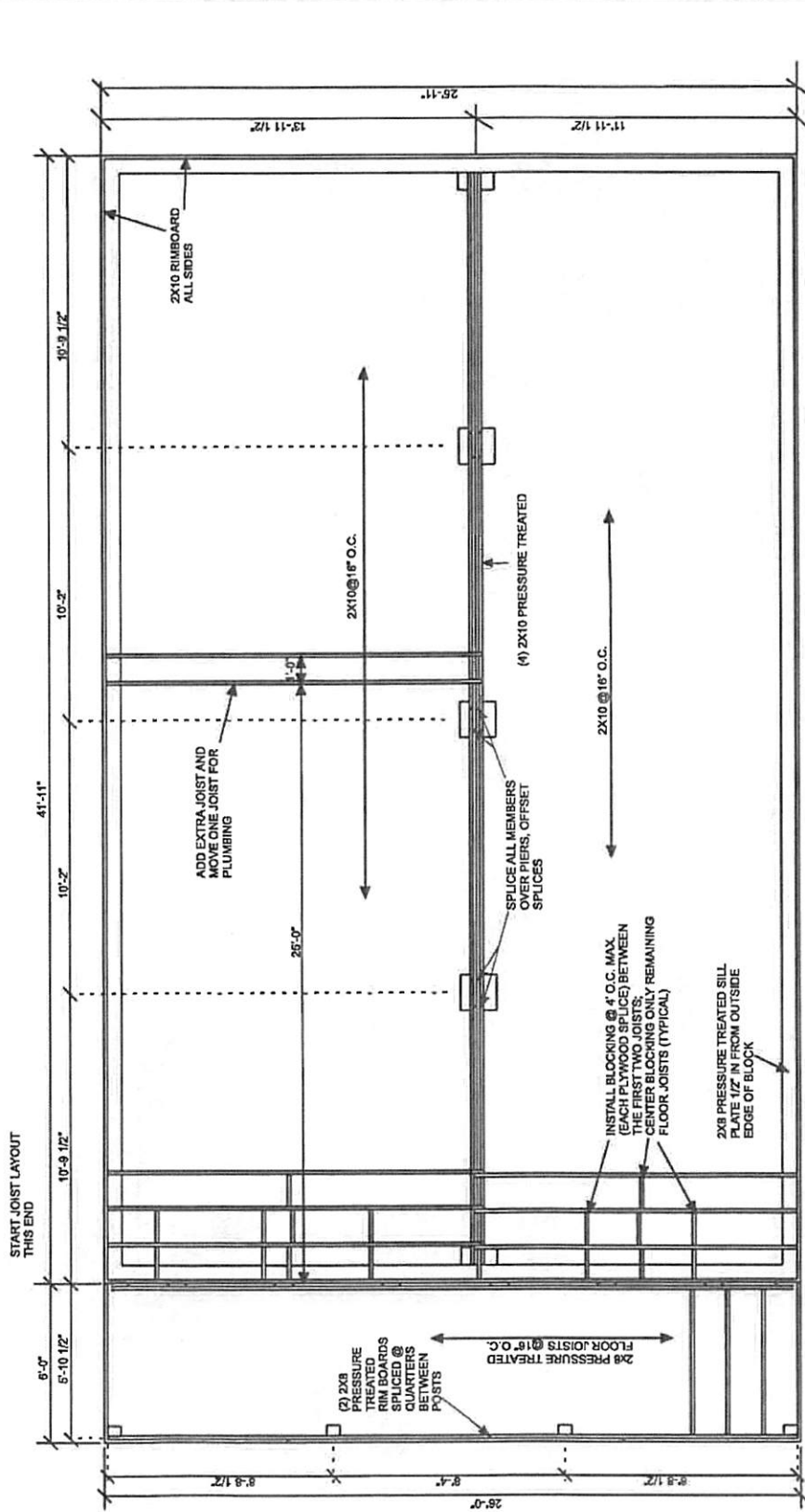
3 A-1.1

3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEMWALL FOUNDATION
26'X42" = 1092 SQ. FT.



DRAWN BY: RMS
SHEET TITLE:
FOUNDATIONS &
FOUNDATION SECTIONS

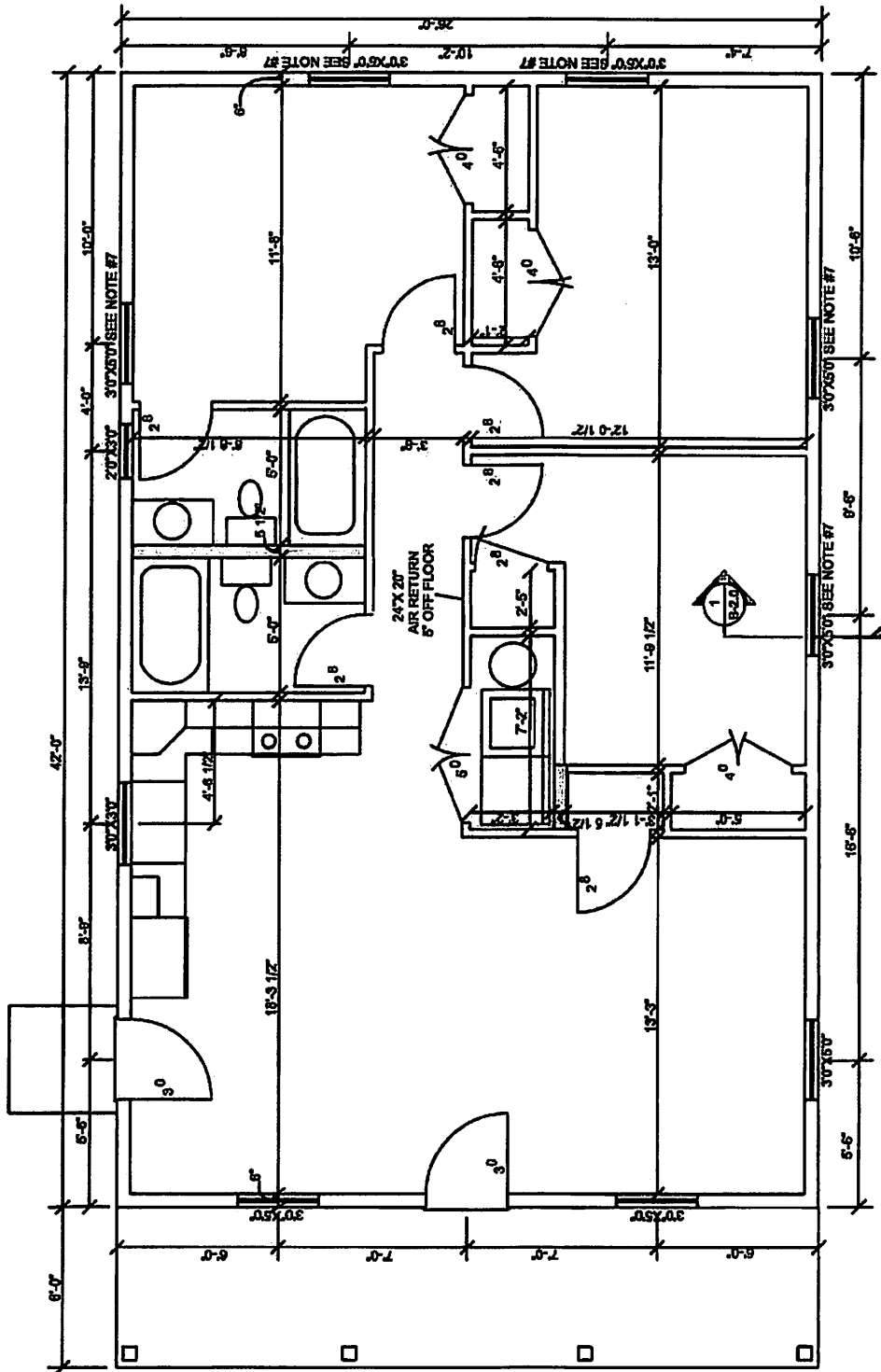
SHEET NO.
A-1.1
DATE: 09/20/18
REV.



NOTES:

1. REFER TO A-0.0 FOR GENERAL NOTES.
2. PORCH RIM BOARD SPLICES SHALL BE AT THE QUARTER POINTS BETWEEN PIERS.

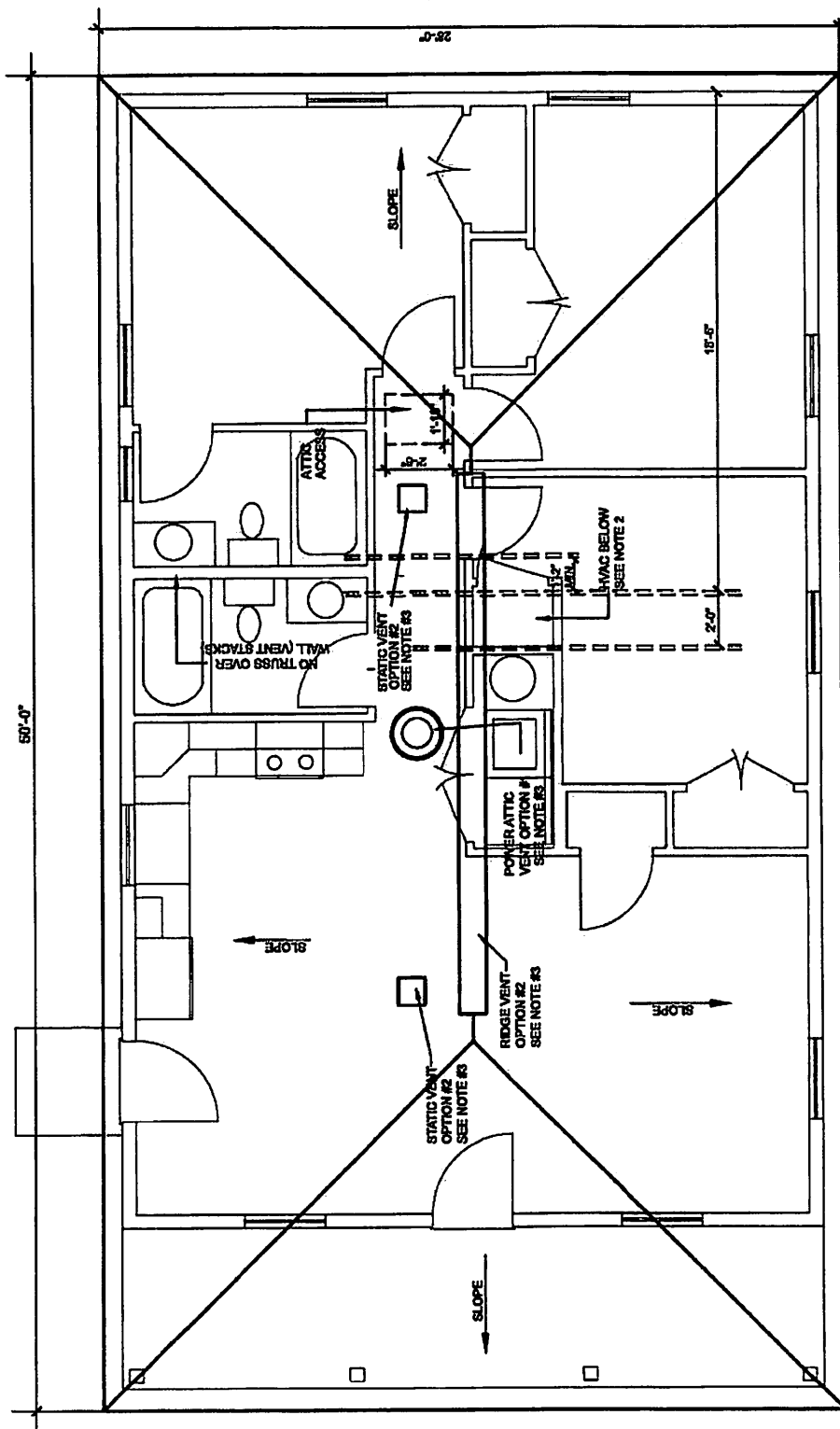
FLOOR FRAMING PLAN



FLOOR PLAN

NOTES:

- NOTES:**
1. REFER TO A-0.0 FOR GENERAL NOTES.
 2. EXTERIOR WALL DIMENSIONS ARE 6".
 3. INTERIOR WALL DIMENSIONS ARE 3 1/2" UNLESS NOTED OTHERWISE.
 4. INSTALL VERTICALLY ONE FULL 4'X8' SHEET OF WALL SHEETING AT EACH EXTERIOR WALL CORNER.
 5. EXTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 82" HIGH.
 6. INTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 65" HIGH.
 7. BEDROOM WINDOWS MUST MEET THE FOLLOWING EGRESS REQUIREMENTS: HAVE A MIN. 20" WIDE AND A MIN. 24" HIGH WITH A MIN. 8.0 FT. MIN. NET CLEAR OPENING. CHECK WITH MANUFACTURER FOR WINDOW ROUGH OPENING SIZES.
 8. VERIFY KITCHEN WINDOW MEASUREMENT FOR KITCHEN CABINET LAYOUT.
 9. DRYWALL AND TAPE INSIDE FURNACE CLOSET PRIOR TO HVAC INSTALLATION.



3-BED - 2-BATH - HOUSE
OPTION #1 REVERSE
STENWALL FOUNDATION
26'X42' = 1092 SQ. FT



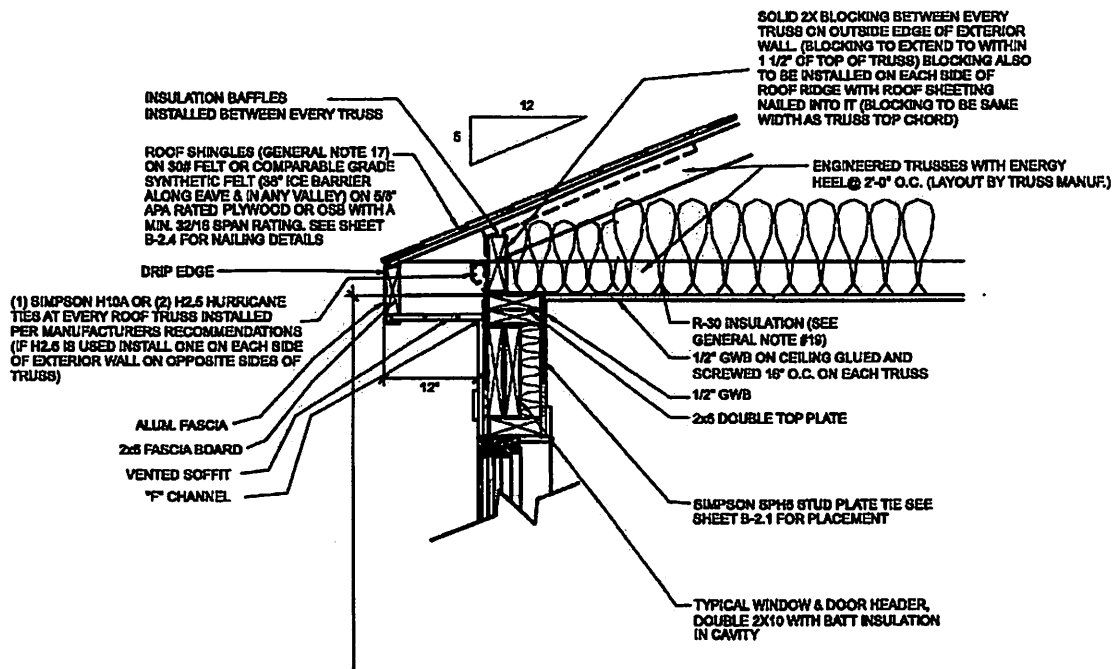
SHEET NO. B-1.2
DATE: 09/02/18
REV:

NOTES:

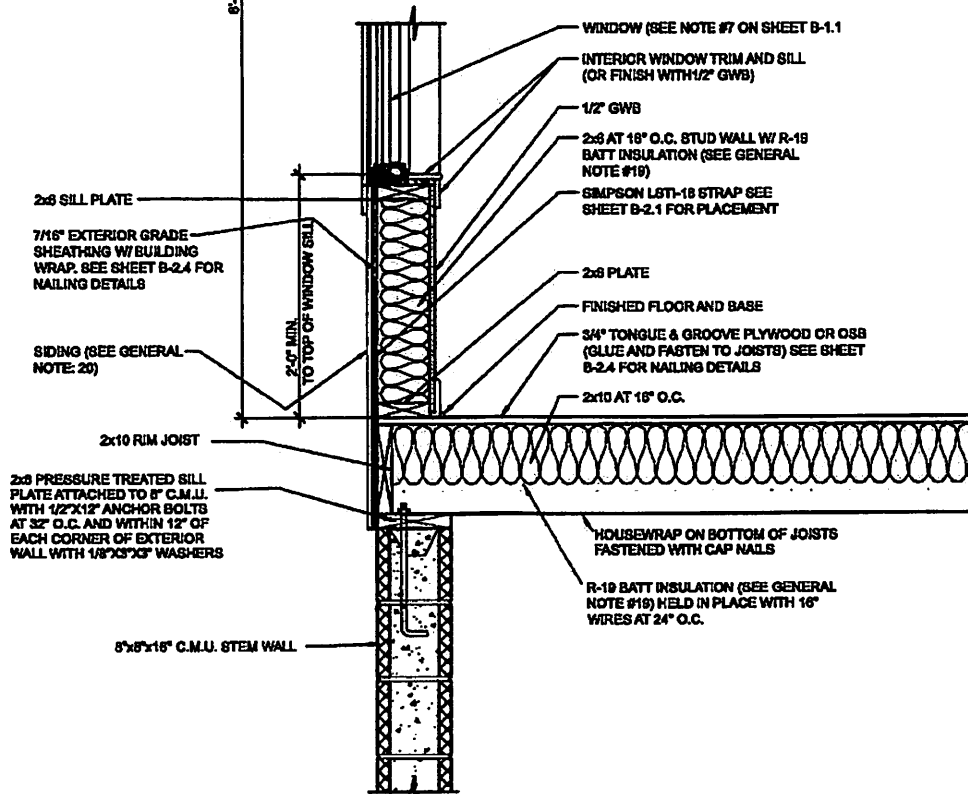
1. REFER TO A-0.0 FOR GENERAL NOTES.
2. TRUSS SUPPLIERS IS RESPONSIBLE FOR TRUSS LAYOUT. PROVIDE MIN. 22" CLEAR OPENING ABOVE HVAC CLOSET AND NO TRUSSES OVER ANY WALLS NOTED. ADD EXTRA TRUSS IF NECESSARY.
3. TWO OPTIONS FOR ATTIC VENTS: 1) POWER VENT OR 2) COMBINATION BAFFLED RIDGE VENT AND TWO BAFFLED STATIC VENTS, BOTH MIAMI DADE COUNTY APPROVED. WHEN USING RIDGE VENT ADDITIONAL BLOCKING MUST BE INSTALLED BETWEEN TRUSSES ON BOTH SIDES OF RIDGE.
4. ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN WITH 10 1/2" ENERGY HEEL OVERHANG FOR A 12" OVERHANG WITH 2X FACE PLATE.
5. ALL SLOPES TO BE 5:12 PITCH
6. TRUSS SUPPLIER TO PROVIDE BRACING DETAILS FOR 140 MPH EXPOSURE D WIND ZONE.

ROOF/TRUSS PLAN

1
B-12



NOTE:
1.REFER TO A-0.0 FOR GENERAL NOTES

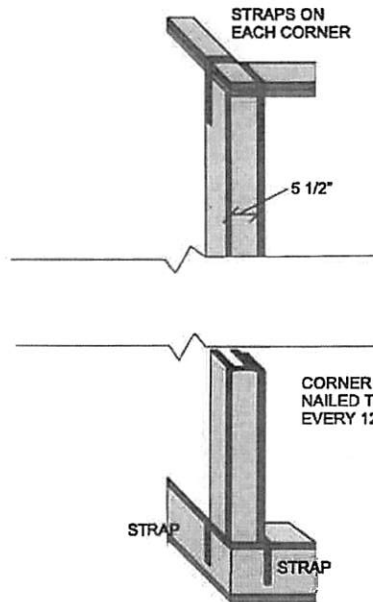


1
B-2.0

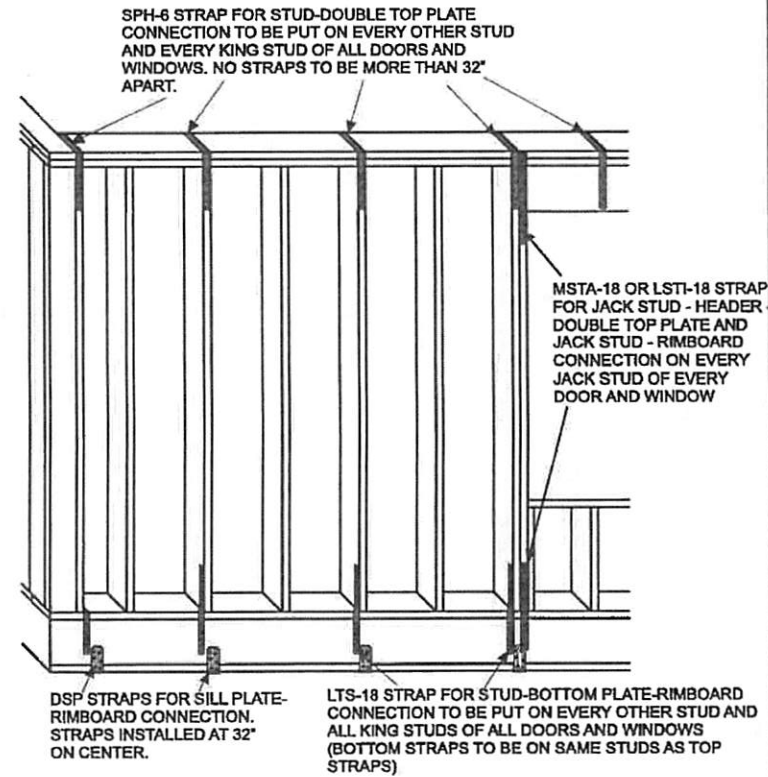
TYPICAL WALL SECTION

<p>SHEET NO.</p> <p>B-2.0</p> <p>DATE: 09/02/18 REV.:</p>	<p>DRAWN BY: DMS</p> <p>SHEET TITLE: WALL SECTION</p>		<p>3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMWALL FOUNDATION 26'x42' = 1092 SQ. FT.</p>	
--	---	---	--	--

EXTERIOR WALL CORNER FRAMING DETAIL



EXTERIOR WALL STRAPPING



NOTES

1. ALL NAIL HOLES IN ALL STRAPS HAVE TO BE FILLED WITH 10DX 1 1/2" GALVANIZED NAILS.
2. MAKE SURE TOP AND BOTTOM STRAPS ARE ON SAME STUDS.
3. MAKE SURE TOP STRAPS ARE PULLED DOWN AGAINST TOP PLATE WHEN FASTENING.

1
B-2.1

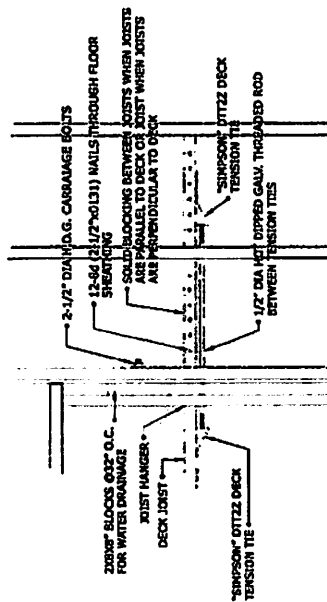
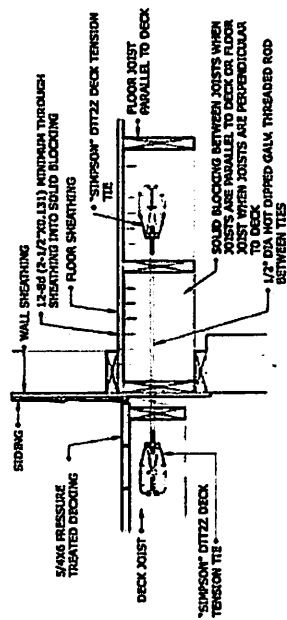
TYPICAL EXTERIOR WALL STRAPPING DETAILS

3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEM WALL FOUNDATION
26'X42' = 1092 SQ.FT.



DRAWN BY: IMS
SHEET TITLE:
EXTERIOR WALL
STRAPPING
DETAILS

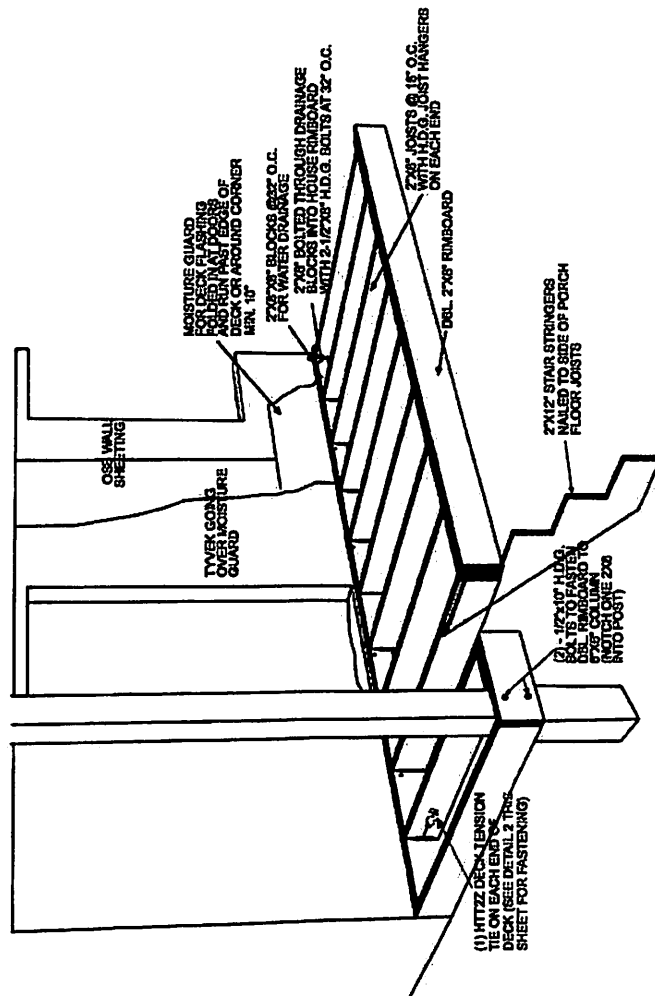
SHEET NO.
B-2.1
DATE: 09/02/18
REV:

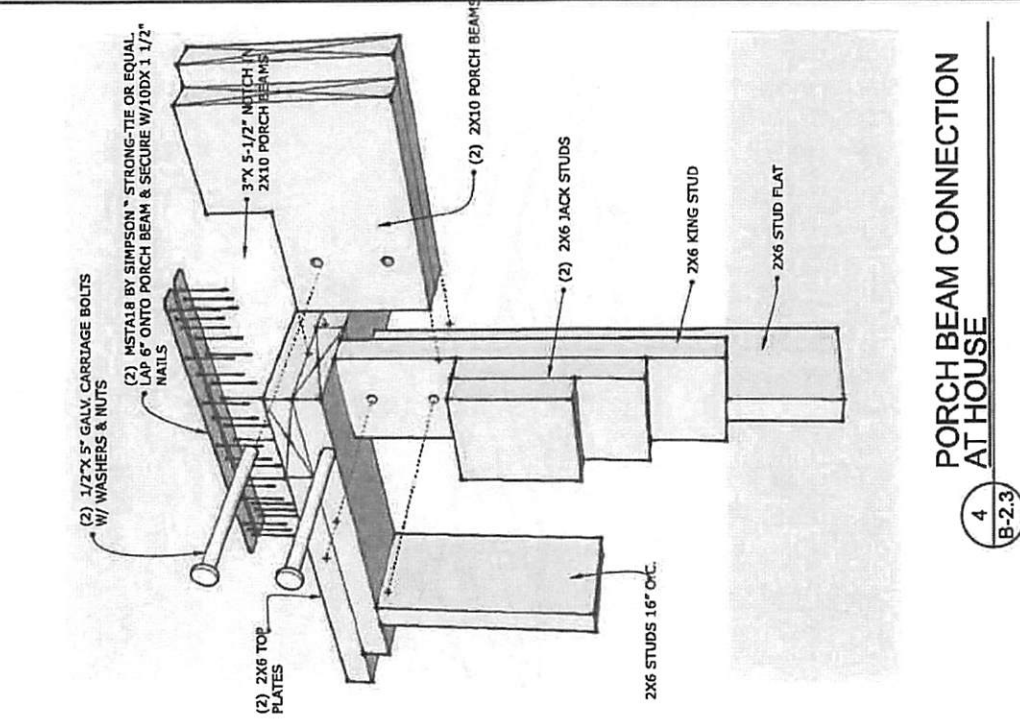


PORCH DECK TENSION TIE DETAILS

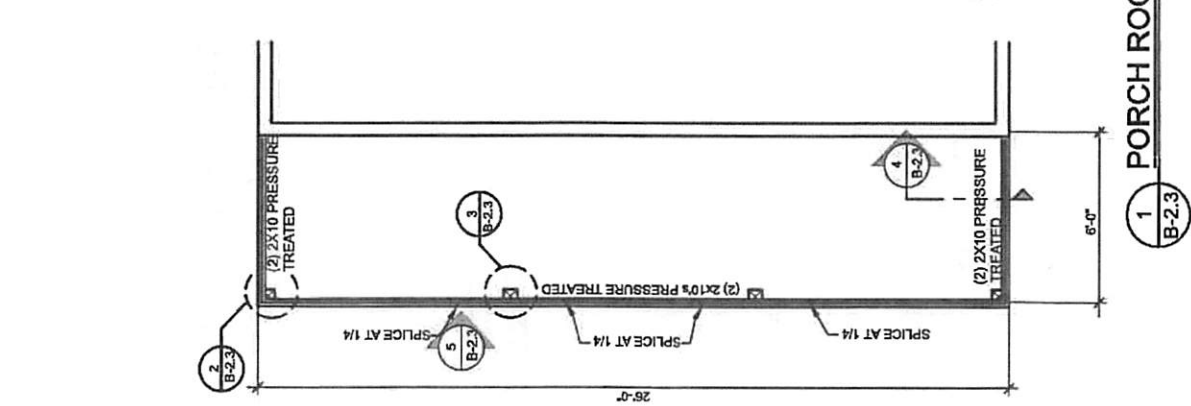
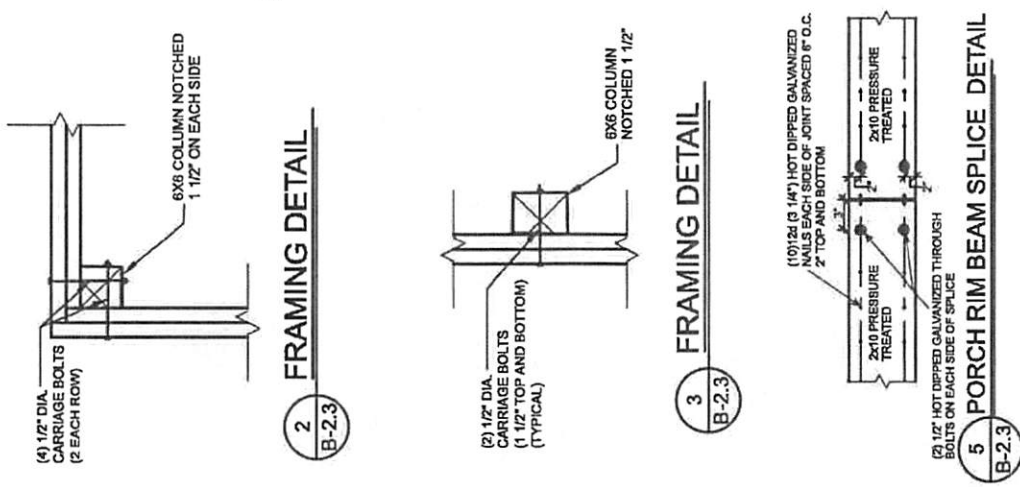
NOTE:

1. FINISHED DECK FLOOR HEIGHT TO BE 1/2" LOWER THAN INTERIOR SUBFLOOR.



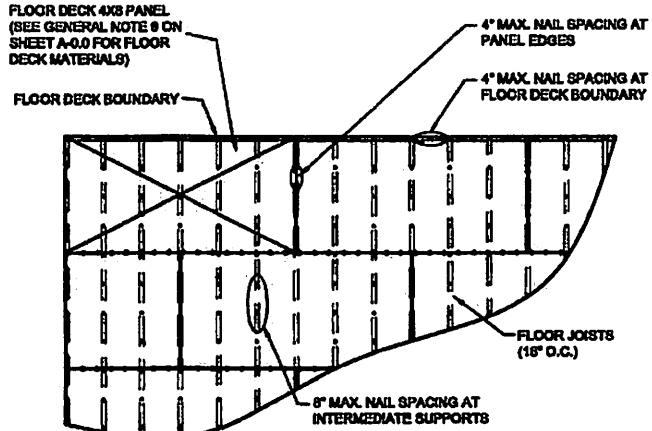


NOTES:
1.REFER TO A-0.0 FOR GENERAL NOTES



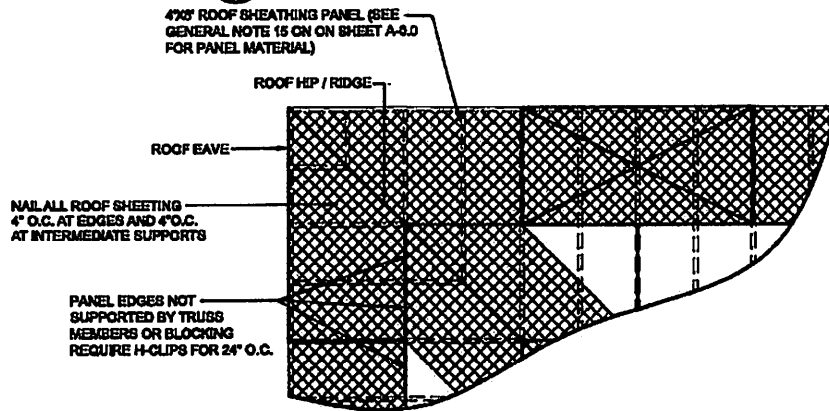
NOTES:

1. REFER TO SHEET A-0.0 FOR GENERAL NOTES.
2. ALL SHEETING FASTENERS TO BE SD 2 3/8" RINGSHANK NAILS.
3. GLUE FLOOR DECK PANELS TO FLOOR JOISTS.
4. GAP ALL SHEETING 1/8" BETWEEN SHEETS.



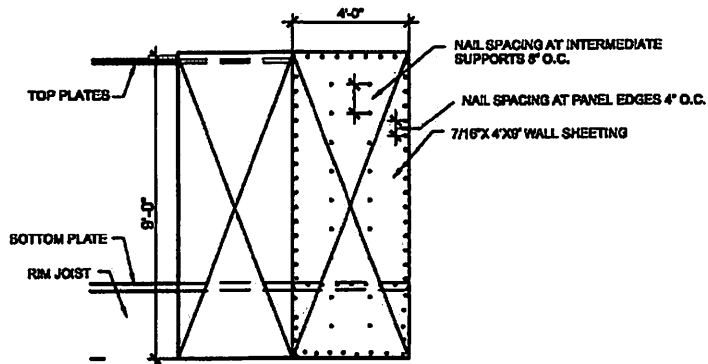
1
B-2.4

FLOOR DECK NAILING DETAIL



2
B-2.4

ROOF SHEATHING NAILING DETAIL



3
B-2.4

EXTERIOR WALL SHEATHING NAILING DETAIL

SHEET NO.

B-2.4

DATE: 09/02/18
REV.:

DRAWN BY: GMS

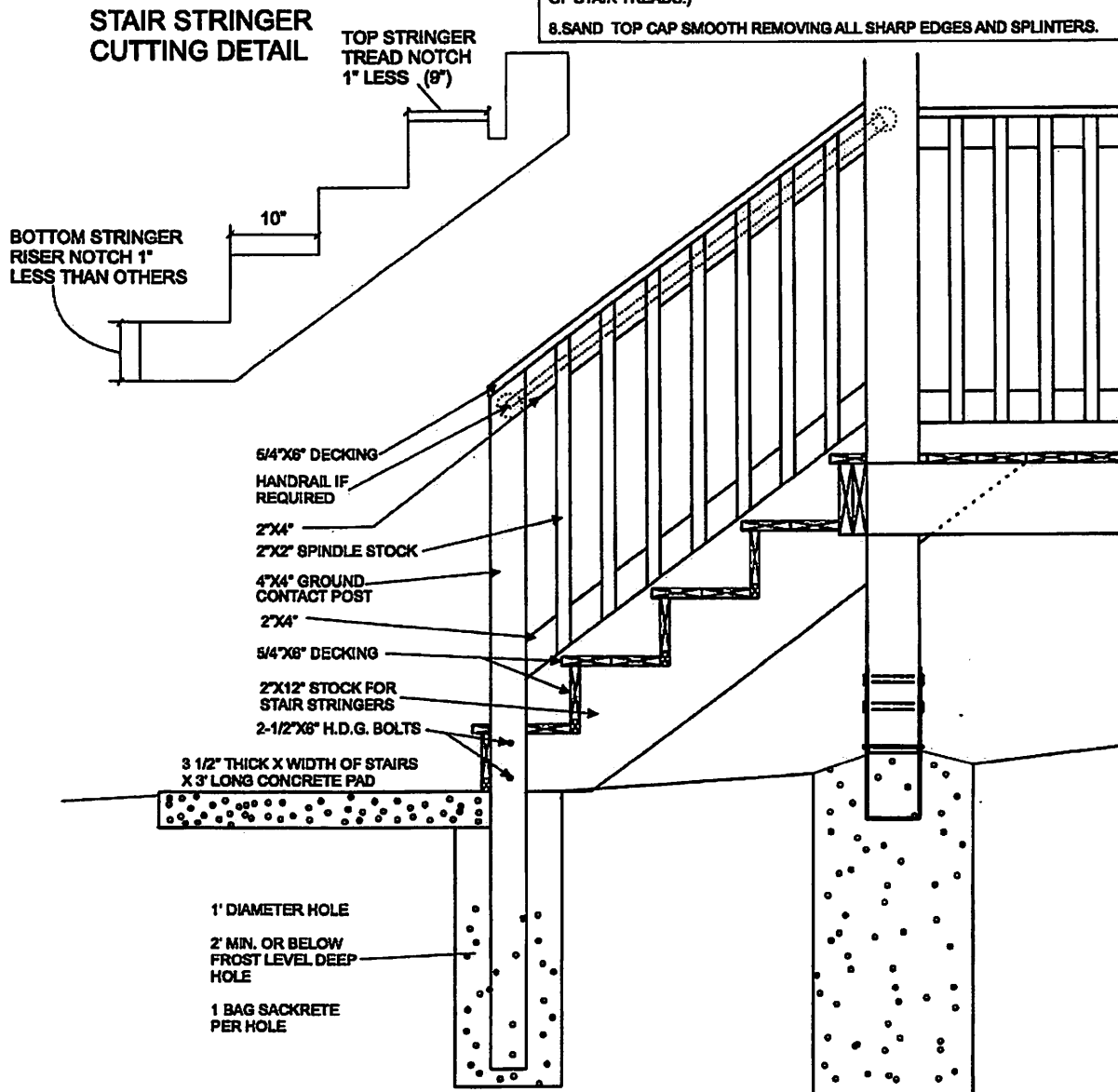
SHEET TITLE:
NAILING DETAILS



3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEMWALL FOUNDATION
26'x42' = 1092 SQ.FT.

NOTES:

1. MAXIMUM STAIR RISER HEIGHT IS 7 3/4". RISERS NOT TO VARY MORE THAN 1/4".
2. MINIMUM STAIR TREAD DEPTH IS 10". TYPICAL IS 2- 6" DECKBOARDS (11" WIDE). 1" NOSING OVERHANG.
3. GUARD RAIL HEIGHT IS 38". (MEASURED FROM THE NOSE OF STAIR TREADS).
4. MAXIMUM GAP BETWEEN SPINDLES IS 3 7/8". TYPICAL IS 3 1/2".
5. MINIMUM NET CLEAR WIDTH BETWEEN GUARD RAILS IS 36". TYPICALLY MAKE TREADS 48" WIDE.
6. USE 2 1/2" DECK SCREWS TO SCREW ALL RAILING AND DECKING COMPONENTS.
7. IF STAIRS ARE MORE THAN FOUR RISERS HIGH A 1 1/4" MIN. DIAMETER HANDRAIL MUST BE INSTALLED MIN. 34" HIGH (MEASURED FROM THE NOSE OF STAIR TREADS.)
8. SAND TOP CAP SMOOTH REMOVING ALL SHARP EDGES AND SPLINTERS.



1 TYPICAL STAIR & RAILING DETAILS

SHEET NO.

B-2.5

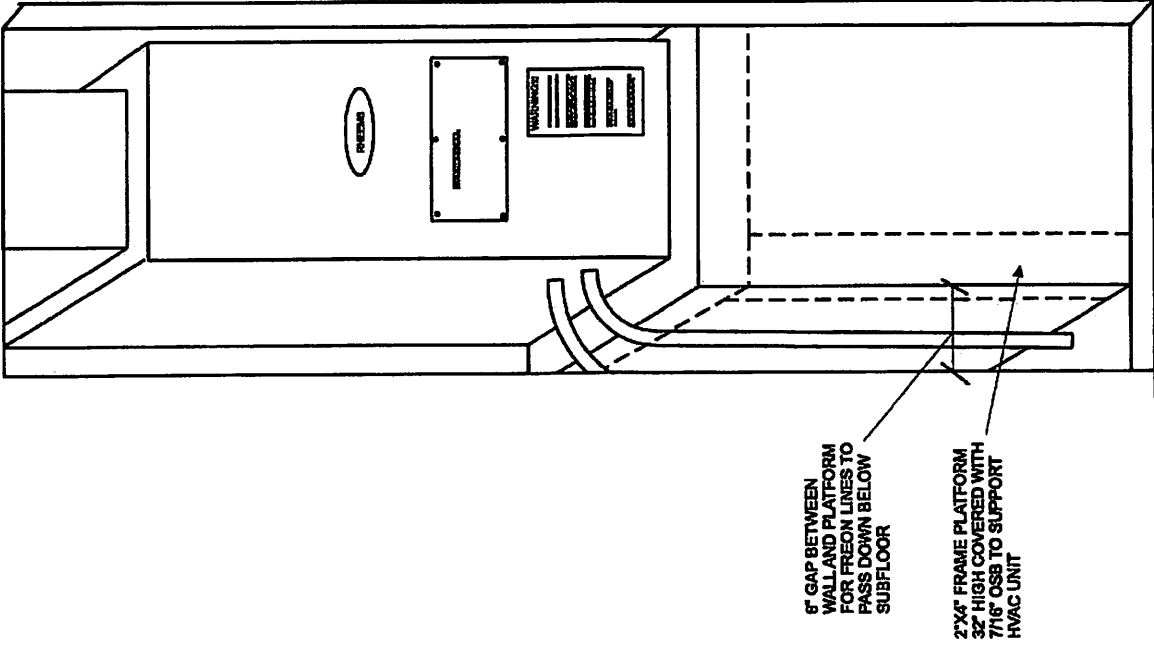
DATE: 09/02/16
REV:

DRAWN BY: JMS

SHEET TITLE:
STAIR & RAILING DETAIL

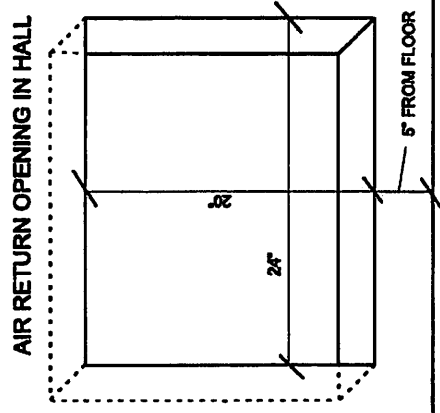


3 - BED - 2 - BATH - HOUSE
OPTION #1 REVERSE
STEMWALL FOUNDATION
26'x42' = 1092 SQ. FT.



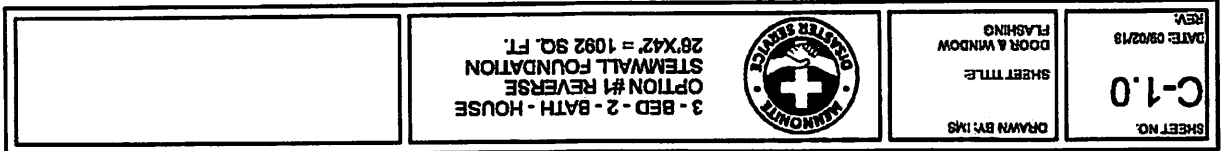
HVAC CLOSET DETAILS

1
B-2.6



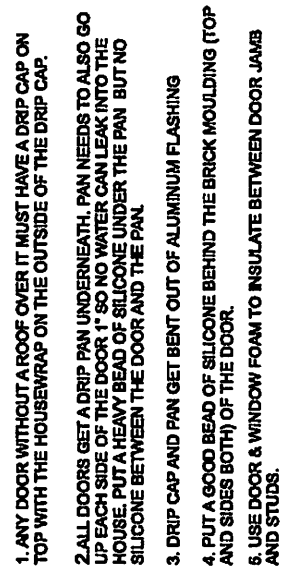
- NOTES:**
1. HVAC CLOSET CEILINGS AND WALLS MUST BE SHEETROCKED AND A TAPE COAT OF SPACKLE APPLIED BEFORE PLATFORM AND HVAC UNIT GET INSTALLED.
 2. 2X4 FRAME 32" HIGH COVERED WITH 7/16" OSB FOR PLATFORM. THIS MUST BE TIGHT SO RETURN AIR PULLS THROUGH FILTER IN HALL, (OR USE MANUFACTURER PROVIDED BASE INSTEAD OF PLATFORM).
 3. RETURN AIR FILTER OPENING IN HALL TO BE 24"x28" TO ACCOMMODATE STANDARD FILTERS. KEEP IT OFF FLOOR 5" TO ELIMINATE DUST COLLECTION IN FILTER.
 4. HVAC INSTALLER TO PROVIDE GRILL TO FIT OPENING. (NO TRIMOUT CARPENTRY NEEDED).
 5. IF UNIT IS GAS IT MUST BE A DIRECT VENT UNIT.

SHEET NO. B-2.6 REV: 03/02/16	DRAWN BY: JMS		3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMWALL FOUNDATION 26'X42' = 1082 SQ.FT.	HVAC CLOSET DETAILS
	SHEET TITLE:		DATE: 03/02/16	



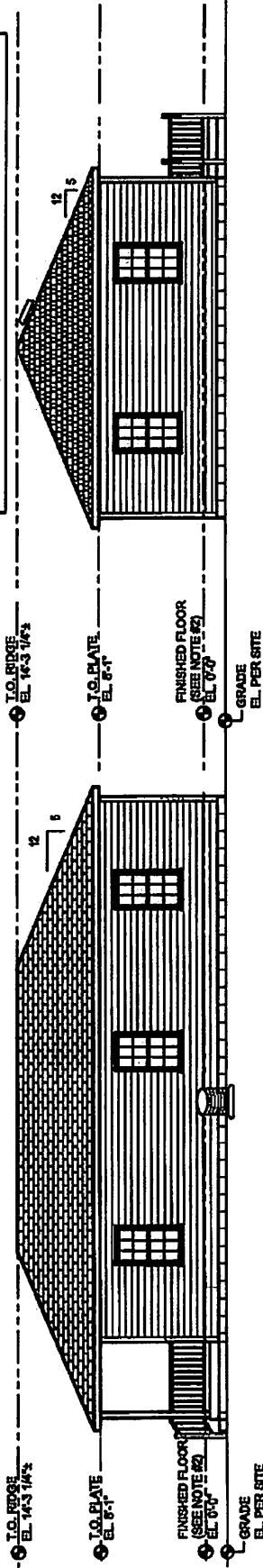
1. PUT A PIECE OF WINDOW TAPE ON SILL AND UP EACH SIDE 2" BEFORE INSTALLING WINDOW. (HAVE APPROXIMATELY 1 1/2" OF TAPE WITH THE REST STICKING OUT TO FOLD DOWN ON HOUSE WRAP BEFORE FOLDING IT DOWN SLIP AN 8"X12" PIECE OF ALUMINUM IN EACH CORNER UNDER THE TAPE. IT SHOULD BE CENTERED ON THE CORNER). THE FLASHING NEEDS TO BE CUT TO LENGTH TO DRAIN OUT ON SIDING FLANGE WHEN HANGING SIDING.
2. PUT A GOOD BEAD OF SILICONE ON TOP AND SIDE FLANGES OF WINDOW THEN INSTALL USING SIDING NAILS.
3. PUT WINDOW TAPE UP EACH SIDE OF WINDOW COVERING WINDOW FLANGE AND ONTO HOUSE WRAP.
4. PUT WINDOW TAPE ACROSS TOP FLANGE OF WINDOW AND UNDER HOUSE WRAP ON SHEETING THEN FOLD HOUSE WRAP DOWN ON TOP. (HOUSE WRAP MUST BE CUT AT TOP BEFORE INSTALLING WINDOW TO SLIP TAPE UNDERNEATH.
5. USE DOOR & WINDOW FOAM TO INSULATE BETWEEN WINDOW AND STUDS.

2
C-10



	3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMWALL FOUNDATION 28'X42' = 1092 SQ. FT.	SHEET NO. D-1.0	DATE: 09/02/18 REV:
	DRAWN BY: JMS SHEET TITLE: SIDE ELEVATIONS		

NOTES:
 1. REFER TO A-0.0 FOR GENERAL NOTES.
 2. FINISHED FLOOR ELEVATION SET BY ELEVATION CERTIFICATE +1'-1" (MDS RECOMMENDATION).

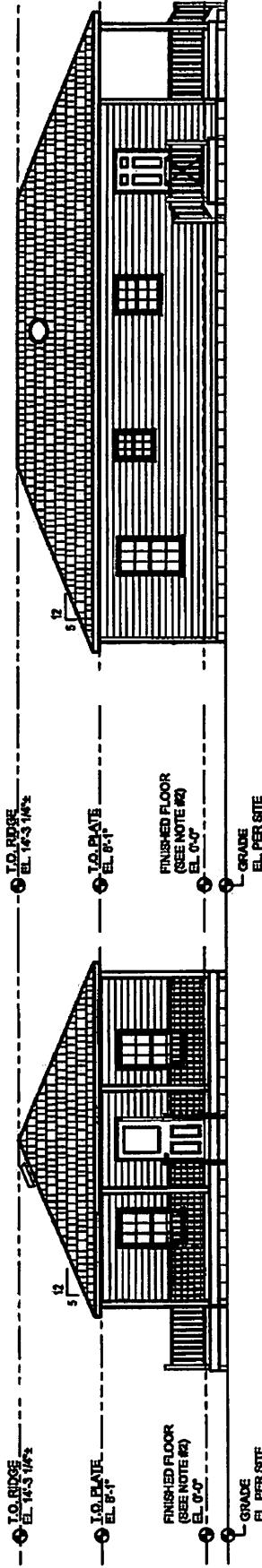


1 SIDE ELEVATION

1
D-1.0

2 REAR ELEVATION

2
D-1.0



3 FRONT ELEVATION

3
D-1.0

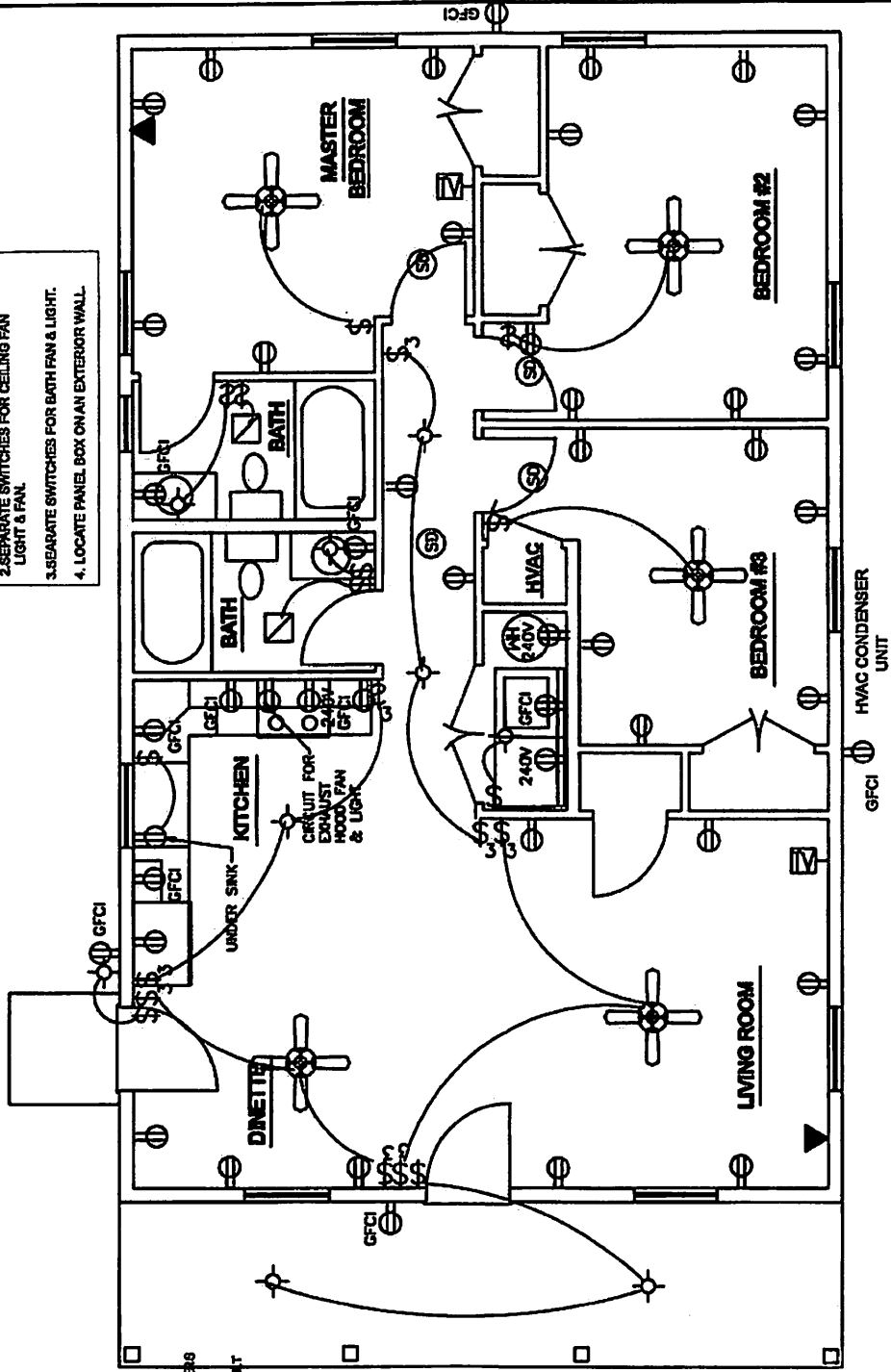
4 SIDE ELEVATION

4
D-1.0

ELECTRICAL LEGEND

- THREE WAY SWITCH
- DIMMER SWITCH
- SWITCH
- LIGHT FIXTURE - SPEC BY OTHERS
- DUPLX OUTLET - GROUND FAULT CIRCUIT INTERRUPT
- DUPLX OUTLET
- CEILING FAN & LIGHT
- PHONEDAXIAL CABLE
- SMOKE/RETRACTOR
- SMOKE DETECTOR
- BATH THERMOSTAT
- BATH VENT


NOTE:
 1. REFER TO A-0.0 FOR GENERAL NOTES
 2. SEPARATE SWITCHES FOR CEILING FAN LIGHT & FAN
 3. SEPARATE SWITCHES FOR BATH FAN & LIGHT.
 4. LOCATE PANEL BOX ON AN EXTERIOR WALL.

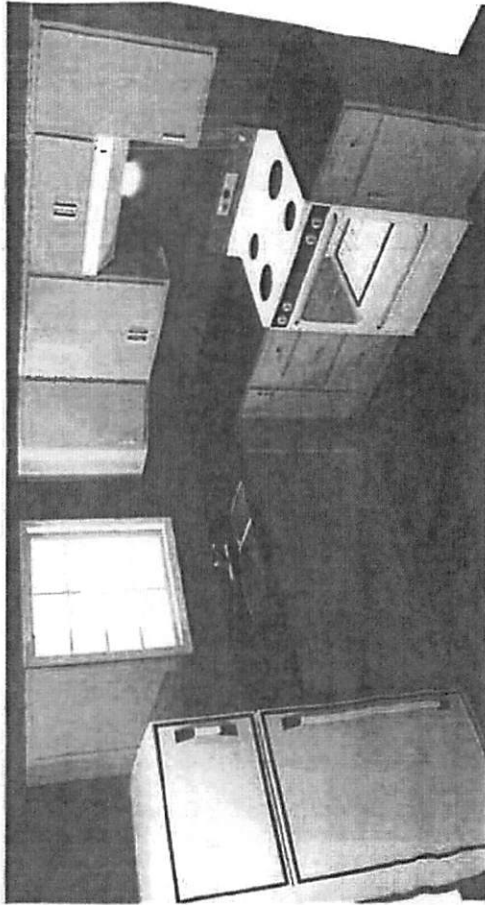


1 ELECTRIC LOCATION PLAN

1
E-1.0

<p>3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMMALL FOUNDATION 28'X42' = 1092 SQ. FT.</p>		<p>SHEET NO. E-1.0</p>
		<p>DATE: 09/02/18 REV: 09/02/18</p>
<p>3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMMALL FOUNDATION 28'X42' = 1092 SQ. FT.</p>	<p>DRAWN BY: JMS SHEET TITLE: ELECTRICAL LAYOUT PLAN</p>	<p>SHEET NO. E-1.0</p>

<div> <div>  </div> <div> 3 - BED - 2 - BATH - HOUSE OPTION #1 REVERSE STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT. </div> </div>	<div> <div> DRAWN BY: IMS SHEET TITLE: KITCHEN PLAN </div> </div>	<div> <div> SHEET NO. K-1.0 </div> <div> DATE: 09/02/18 REV: </div> </div>
	<div> <div> </div> </div>	



NOTES:

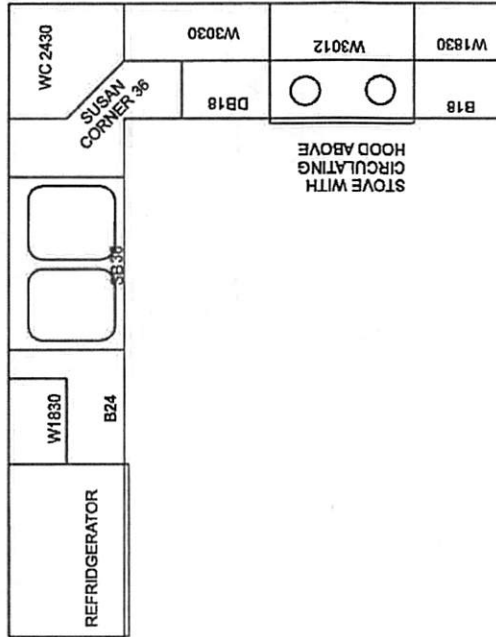
1. CABINET LIST
1- SINK BASE 36
1- SUSAN CORNER 36
1- BASE 24
1- DRAWER BASE 18
1- BASE 18

- 1- WALL CORNER 2430
1- WALL 3030
1- WALL 3012
2- WALL 1830

TOE KICK

2. COUNTERTOPS LIST

- 1- 8' RIGHT MITER PREFORMED LAMINATE TOP
1- 8' LEFT MITER PREFORMED LAMINATE TOP
2- END CAP KITS
1- MITER BOLT KIT



KITCHEN PLAN

1
K-1.0

MENNONITE DISASTER SERVICE

3 BED - 2 BATH - HOUSE - OPTION #1 STEMWALL FOUNDATION

DRAWING LIST:

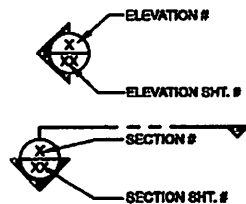
- A-0.0 COVER SHEET
- A-1.0 FOUNDATION PLAN
- A-1.1 FOOTINGS & FOUNDATION SECTIONS
- B-1.0 FLOOR FRAMING PLAN
- B-1.1 FLOOR PLAN
- B-1.2 ROOF TRUSS PLAN
- B-2.0 WALL SECTION
- B-2.1 EXTERIOR WALL STRAPPING DETAILS
- B-2.2 PORCH DECK FRAMING DETAILS
- B-2.3 PORCH ROOF FRAMING DETAILS
- B-2.4 NAILING DETAILS
- B-2.5 STAIR & RAILING DETAILS
- B-2.6 HVAC CLOSET DETAILS
- C-1.0 DOOR & WINDOW FLASHING DETAILS
- D-1.0 ELEVATIONS
- E-1.0 ELECTRICAL LAYOUT PLAN
- K-1.0 KITCHEN PLAN

GENERAL NOTES

- 1.- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF IRC AND ANY APPLICABLE LOCAL, COUNTY AND STATE ORDINANCES. STRUCTURAL DESIGN SHALL COMPLY WITH 140 MPH WIND, 30 PSF SNOW LOAD, AND EXPOSURE C REQUIREMENTS, UNLESS LOCAL CONDITIONS STIPULATE HIGHER REQUIREMENTS..
- 2.- COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR INSTALLATION ON ALL MATERIALS UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
- 3.- CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS IN THE FIELD.
- 4.- IF THE EXISTING FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE DETAILS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY AND PROVIDE INFORMATION OF EXISTING CONDITIONS. FINAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE INSTRUCTIONS OF THE ARCHITECT.
- 5.- ALL EXTERIOR NAILS, BOLTS, ANCHORS, HANGERS, AND NAILS PENETRATING PRESSURE TREATED LUMBER SHALL BE HOT DIPPED GALVANIZED.
- 6.- ALL WOOD IN CONTACT WITH CONCRETE, CONCRETE BLOCK, SHALL BE PRESSURE TREATED. ALL WOOD IN CONTACT WITH GROUND SHALL BE GROUND CONTACT PRESSURE TREATED.
- 7.- FINISHED GRADE SHALL SLOPE DOWN 8" AWAY FROM THE STRUCTURE IN THE FIRST 6'-0" UNLESS OTHERWISE NOTED.
- 8.- FRAMING LUMBER TO BE MIN. #2 HEM FIR, SOUTHERN PINE, OR SPRUCE-PINE-FIR, OR CONSTRUCTION GRADE DOUG FIR.
- 9.- FLOOR DECK TO BE APA RATED 3/4" TONGUE & GROOVE PLYWOOD OR OSB WITH A 32/16 SPAN RATING, BOTH GLUED AND NAILED TO APA STANDARDS ON 2X10 FLOOR JOIST AT 16" ON CENTER.
- 10.- ALL EXTERIOR WALLS TO BE 2x6 WOOD STUDS 16" ON CENTER WITH WITH 1/2" DRYWALL INSIDE FINISH, AND R-19 FIBERGLASS BATT INSULATION. ALL INTERIOR WALLS TO BE 2x4 WOOD STUDS 16" ON CENTER WITH 1/2" DRYWALL BOTH SIDES UNLESS NOTED OTHERWISE.
- 11.- CONFIRM MANUFACTURE'S ROUGH OPENING FOR WINDOWS AND DOORS BEFORE FRAMING. (NOMINAL SIZES SHOWN ON PLAN)

- 12.- EXTERIOR WALL SHEATHING TO BE 7/16" OR 1/2" EXTERIOR GRADE OSB OR PLYWOOD.
- 13.- TYPICAL HEADERS TO BE DOUBLE 2x10.
- 14.- ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN DESIGN WITH ENERGY HEELS.
- 15.- ROOF SHEATHING TO BE APA RATED 5/8" PLYWOOD OR OSB WITH 32/16 SPAN RATING. H-CLIPS REQUIRED FOR TRUSSES 24" O.C.
- 16.- FELTS: 30LB (ROOF) ASPHALT SATURATED ORGANIC ROOFING FELT TYPE I, 36" ROLLS OR SYNTHETIC EQ. WALLS USE HOUSE WRAP, TYVEK OR EQ.
- 17.- SHINGLES: ASPHALT WITH AASTM D 3161, CLASS F OR ASTM D 7158 CLASS H RATING (CHECK WRAPPER FOR RATING), 20 YEAR MINIMUM WARRANTY. FASTENED WITH 6-1 1/2" NAILS PER SHINGLE.
- 18.- PROVIDE CONTINUOUS VENTED SOFFIT AND INSULATION BAFFLES
- 19.- INSULATION SHALL BE FIBERGLASS BATT INSULATION (R-19 IN EXTERIOR WALLS AND R-19 IN FLOORS, R30 BATTS OR BLOW-IN IN ATTICS). IN WARM HUMID CLIMATE ZONES USE INSULATION WITHOUT KRAFT PAPER. IF NOT AVAILABLE, USE INSULATION WITH PAPER, BUT INSTALL PAPER (VAPOR BARRIER) ON THE OUTSIDE AWAY FROM THE LIVING SPACE (PAPER TO OUTSIDE ON WALLS, PAPER UP IN ATTICS) (EXCEPTION: ALWAYS INSTALL PAPER UP TOWARD LIVING SPACE IN FLOORS) ALL OTHER ZONES, INSTALL PAPER TOWARDS LIVING SPACE.
- 20.- SIDING: USE VINYL WITH A MIN. 110 MPH RATING OR HARDIBOARD PANEL OR HARDIBOARD PLANK, INSTALL PER MANUFACTURERS RECOMMENDATIONS.
- 21.- STAIR TREADS TO BE (2) 5/4X8 DECK BOARDS.
- 22.- PORCH, DECK, STAIR, AND RAMP GUARD RAILS SHALL BE 38" HIGH. HANDRAIL (WHERE REQUIRED) SHALL BE MIN. 34" HIGH.
- 23.- ELECTRICAL SERVICE TO BE 200 AMP WITH 20 AMP BREAKERS WITH 12 GA. WIRE.
- 24.- PROVIDE 4 SHELVES AT LINEN CLOSETS.
- 25.- PROVIDE SHELF AND POLE AT CLOSETS, IF CLOSET IS WIDER THAN 6'-0", PROVIDE CENTER BRACKET. SHELF HEIGHT TO BE 5'-6" FROM FLOOR.

LEGEND

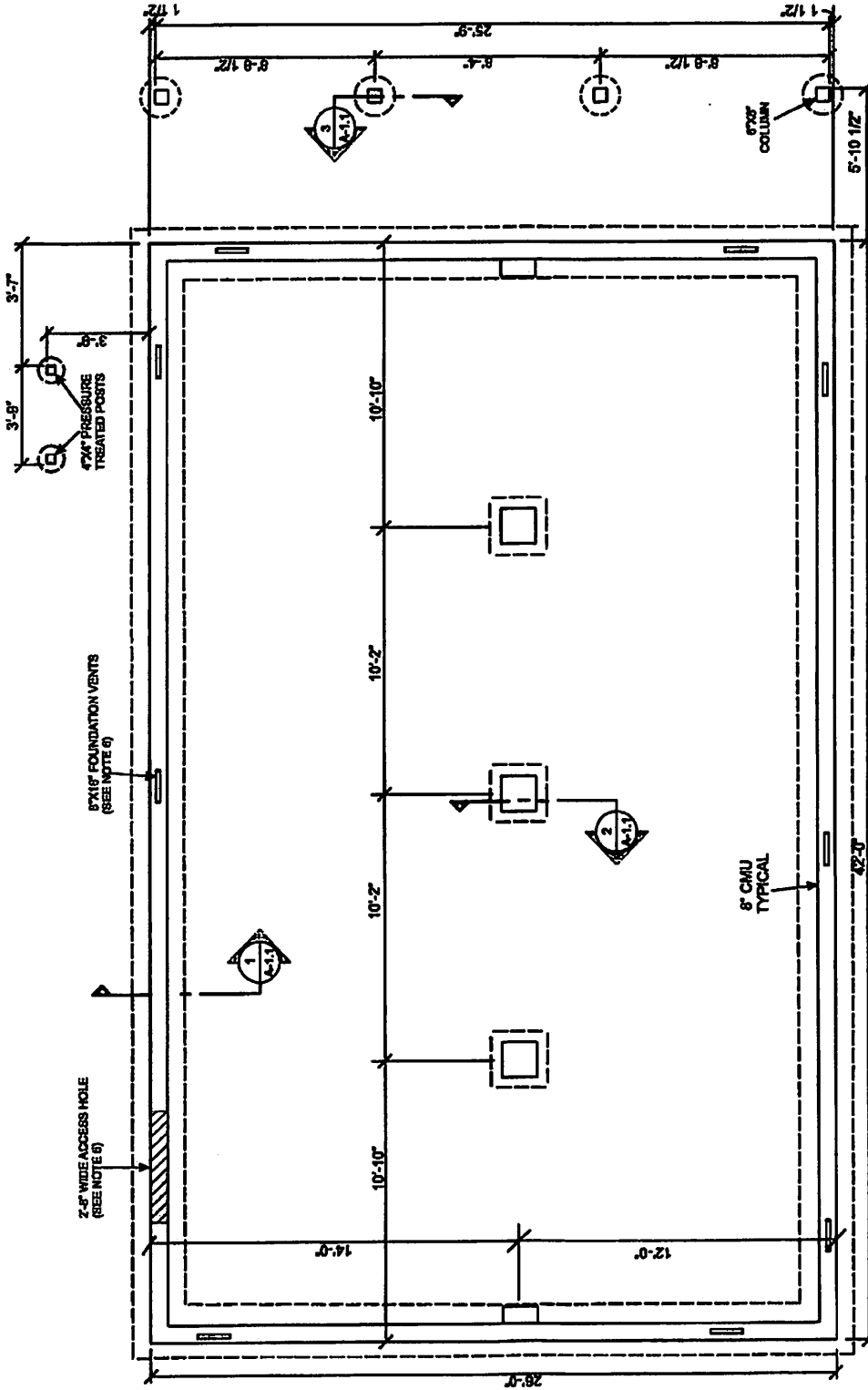


3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.

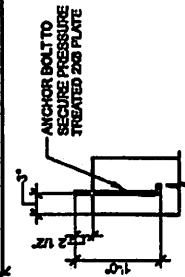


DRAWN BY: DMS
SHEET TITLE:
COVER SHEET

SHEET NO.
A-0.0
DATE: 08/02/18
REV:



- NOTES:**
1. INSTALL 1/2"x1/2" ANCHOR BOLTS AT 32" O.C. ON EACH OUTSIDE WALL. SEE TYPICAL HOUSE ANCHOR BOLT LOCATION DETAIL A-1.0 THIS SHEET.
 2. INSTALL 1/2"x1/2" ANCHOR BOLT AT 12" FROM CORNER OF EACH OUTSIDE WALL.
 3. FINISH FLOOR ELEVATION SHALL BE 1'-0" MIN. ABOVE GRADE. VERIFY AT EACH LOCATION.
 4. CONTRACTOR SHALL REFER TO LOCAL BUILDING CODE FOR ANCHOR BOLT REQUIREMENTS REGARDING QUANTITY, SPACING, PROJECTION, EMBEDMENT, AND HOOK LENGTH; AND BE GOVERNED ACCORDINGLY IF MORE STRINGENT REQUIREMENTS EXIST.
 5. INSTALL 2'-6" WIDE ACCESS HOLE. DETERMINE LOCATION OF ACCESS ON EACH SITE. FORM AND POUR A CONCRETE UNTEL ACROSS TOP OF HOLE WITH (2) #4 REBAR.
 6. INSTALL 8" FOUNDATION VENTS (5 IN LONG DIMENSION 4.2 IN SHORT DIMENSION, 1 LESS ON ACCESS HOLE SIDE) IN SECOND TO TOP COURSE OF BLOCK EXCEPT IN CERTAIN FLOOD ZONES. INSTALL VENTS WITHIN 12" OF FINISHED GRADE. ONE VENT TO BE WITHIN 5'-0" OF EACH BUILDING CORNER, FORM AND POUR A CONCRETE UNTEL ACROSS TOP OF VENTS WITH (2) #4 REBAR.

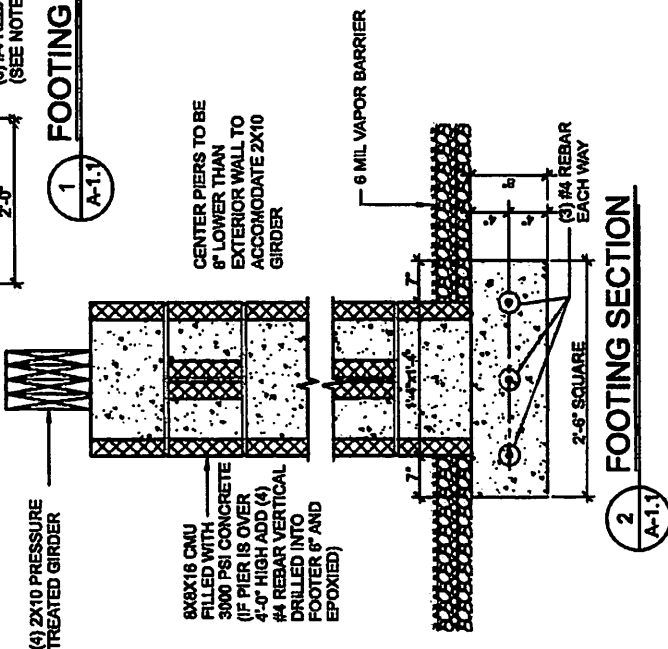
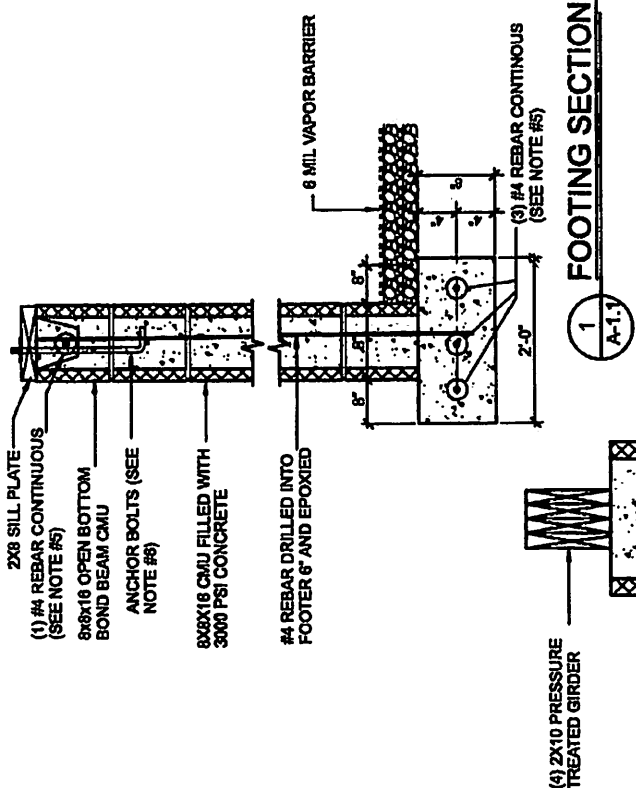
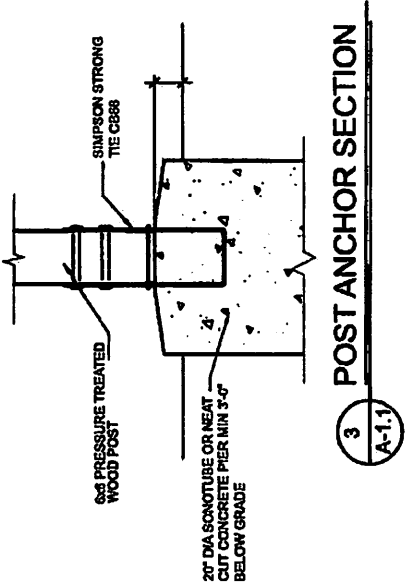


TYP. HOUSE ANCHOR BOLT LOCATION DETAIL

FOUNDATION PLAN

FOUNDATION NOTES:

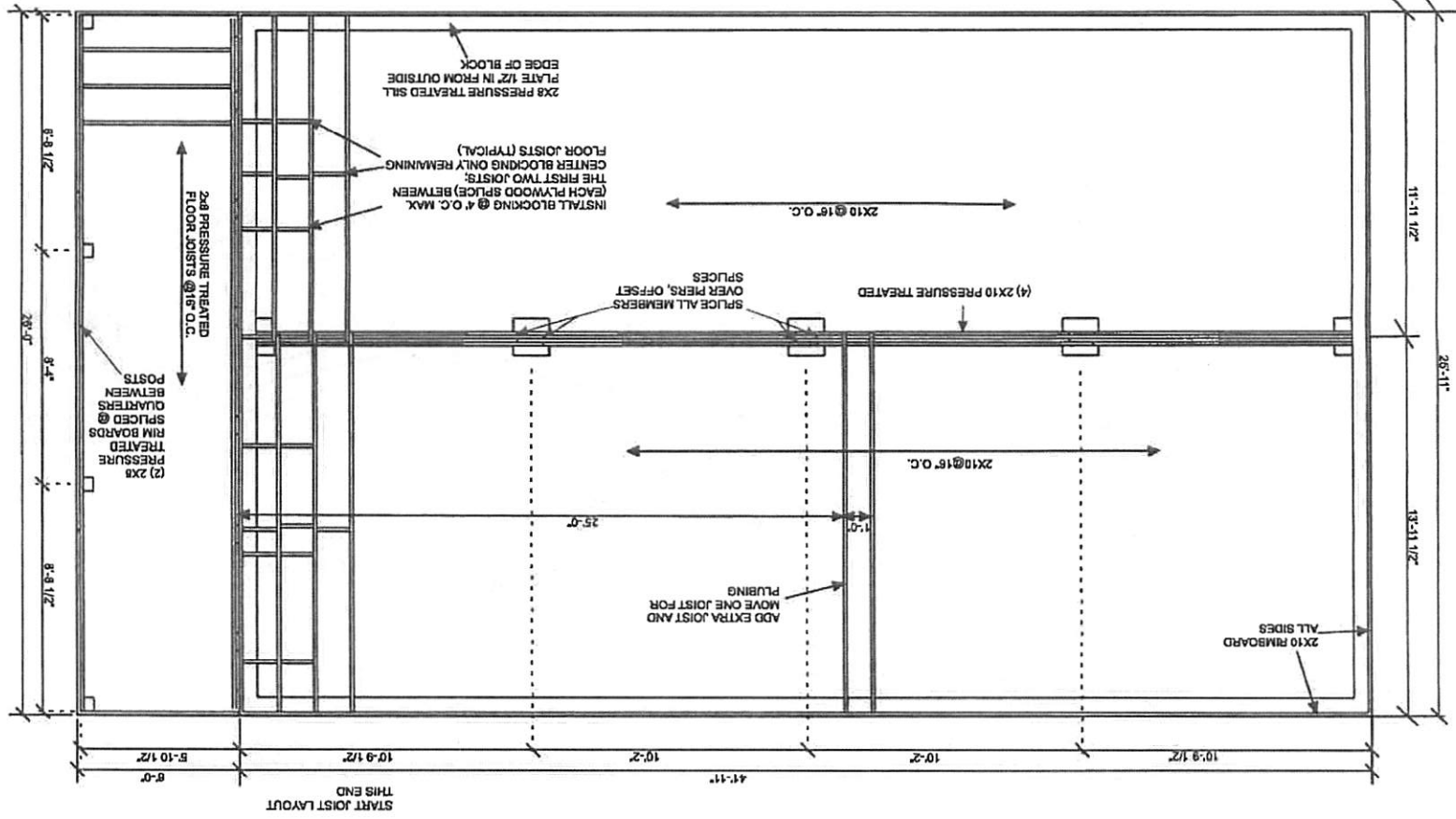
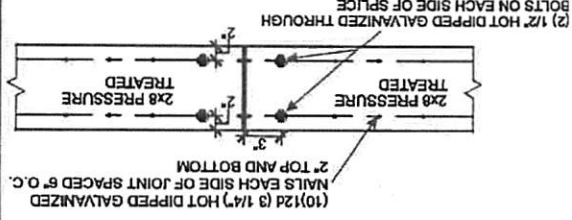
1. CARRY ALL FOOTINGS TO FIRM UNDISTURBED BEARINGS. SEE FOUNDATIONS SECTIONS THIS SHEET FOR SIZE.
2. FOUNDATION SIZES AND REINFORCING STEEL SHOWN HAVE BEEN DESIGNED FOR 1,500 PSI SOIL BEARING WITHOUT ANY INFORMATION REGARDING THE SOIL. LOCAL SOIL CONDITIONS AND/OR LOCAL PRACTICE MAY NECESSITATE A MORE STRINGENT FOOTING AND FOUNDATION DESIGN. CONSULT WITH LOCAL BUILDING INSPECTOR.
3. ALL CAST IN PLACE CONCRETE FOR THE BUILDING STRUCTURE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. IF OVER EXCAVATION OF FOOTINGS OCCUR, THE EXCAVATION SHALL BE FILLED WITH CONCRETE TO THE BOTTOM OF THE NEW FOOTING AT NO ADDITIONAL COST.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL REBAR ARE PROPERLY ALIGNED AND TIED IN PLACE BEFORE PLACING CONCRETE. ALL REBAR TO BE MINIMUM 2" FROM ANY SURFACE OF THE CONCRETE FOOTING. ALL HORIZONTAL REBAR TO BE CONTINUOUS WITH MINIMUM 3'-0" OVERLAPS.
6. 1/2"x12" ANCHOR BOLTS WITH 1/8"x3"x3" WASHERS TO BE PLACED WITHIN 1/2" OF EACH CORNER AND EVERY 32" ON CENTER. A #4 VERTICAL REBAR TO BE DRILLED 6" INTO FOOTER AND EPOXIED AT EACH ANCHOR BOLT LOCATION. ANCHOR BOLTS TO BE PLACED AS STATED UNLESS LOCAL CODES ARE MORE STRINGENT.
7. IF CONDITIONS REQUIRE IT, INSTALL A FOUNDATION DRAIN AND DAMP PROOF EXTERIOR WALLS.



FLOOR FRAMING PLAN

NOTES:
1. REFER TO A-2.0 FOR GENERAL NOTES.
2. PORCH RIM BOARD SPLICES SHALL BEAT THE QUARTER POINTS BETWEEN PIERS.

PORCH RIM BOARD SPLICE DETAIL



SHEET NO.

B-1.0

DATE: 09/02/18
REV.:

DRAWN BY: IMS

SHEET TITLE:
FLOOR FRAMING PLAN

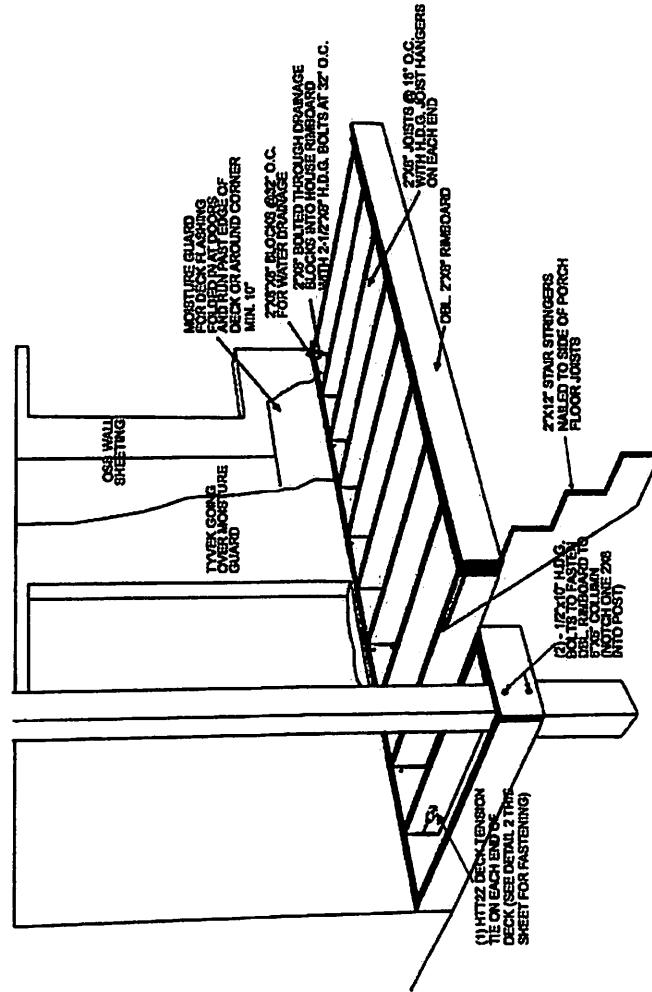


3-BED - 2-BATH-HOUSE
OPTION #1
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.



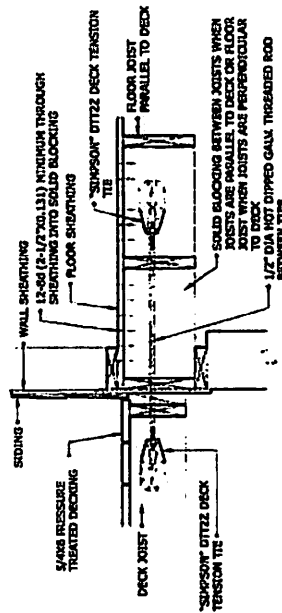
NOTE:

- 1. FINISHED DECK FLOOR HEIGHT TO BE 1/2" LOWER THAN INTERIOR SUBFLOOR.**

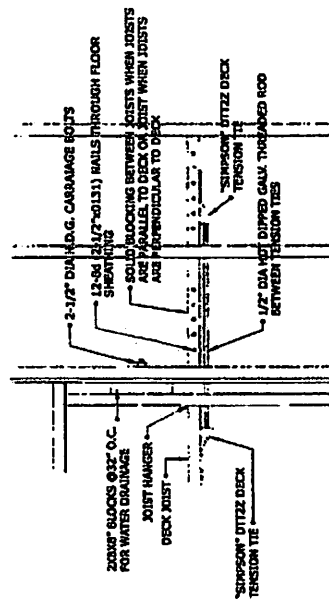


TYPICAL PORCH DECK DETAILS

1
B-2.2



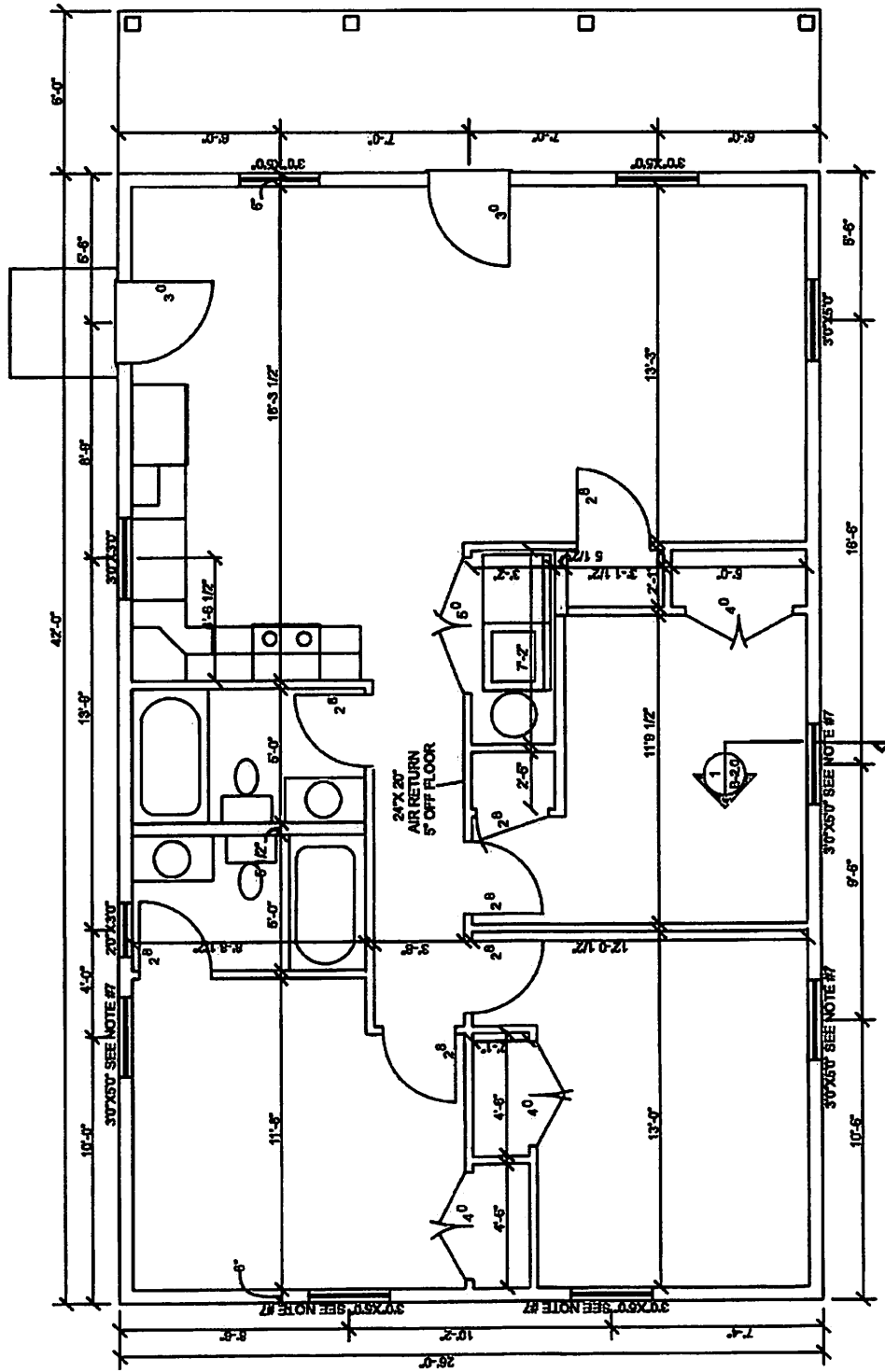
SECTION VIEW - DECK TENSION TIE



PLAN VIEW - DECK TENSION TIES

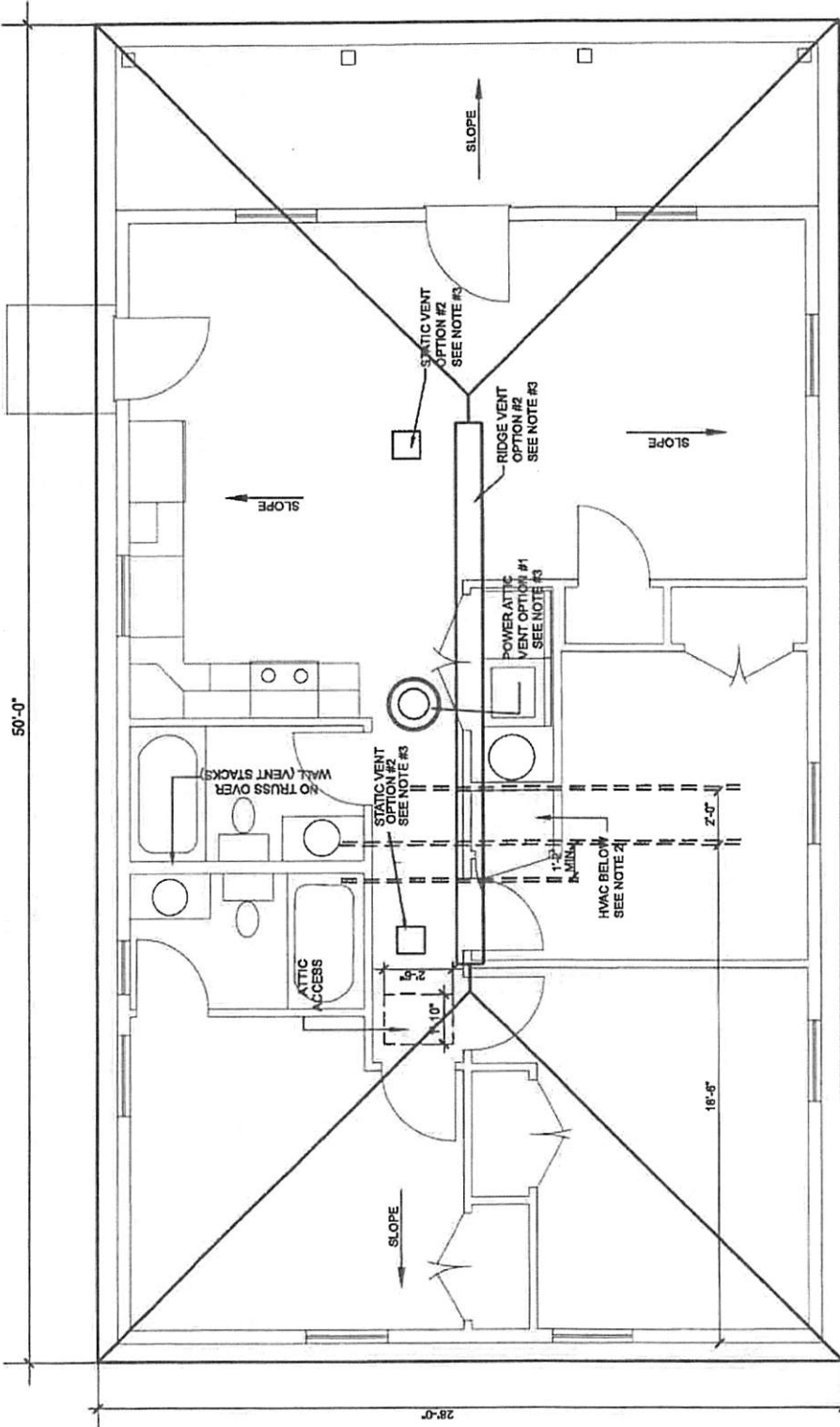
PORCH DECK TENSION TIE DETAILS

A circular logo with a thick black border. Inside the circle, there is a horizontal line. To the left of the line is the number '2', and to the right is the text 'B-2.2'.



FLOOR PLAN

- NOTES:**
1. REFER TO A-0.0 FOR GENERAL NOTES.
 2. EXTERIOR WALL DIMENSIONS ARE 6".
 3. INTERIOR WALL DIMENSIONS ARE 3 1/2" UNLESS NOTED OTHERWISE.
 4. INSTALL VERTICALLY ONE FULL 4'X8' SHEET OF WALL SHEETING AT EACH EXTERIOR WALL CORNER.
 5. EXTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 82" HIGH.
 6. INTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 85" HIGH.
 7. BEDROOM WINDOWS MUST MEET THE FOLLOWING EGRESS REQUIREMENTS: HAVE A MIN. 20" WIDE AND A MIN. 24" HIGH WITH A 5.7 SQ. FT. MIN. NET CLEAR OPENING. CHECK WITH MANUFACTURER FOR WINDOW ROUGH OPENING SIZES.
 8. VERIFY KITCHEN WINDOW MEASUREMENT FOR KITCHEN CABINET LAYOUT.
 9. DRYWALL AND TAPE INSIDE FURNACE CLOSET PRIOR TO HVAC INSTALLATION.



NOTES:

1. REFER TO A-0.0 FOR GENERAL NOTES.
2. TRUSS SUPPLIERS IS RESPONSIBLE FOR TRUSS LAYOUT. PROVIDE MIN. 22" CLEAR OPENING ABOVE HVAC CLOSET AND NO TRUSSES OVER ANY WALLS NOTED. ADD EXTRA TRUSS IF NECESSARY.
3. TWO OPTIONS FOR ATTIC VENTS: 1) POWER VENT OR 2) COMBINATION BAFFLED RIDGE VENT AND TWO BAFFLED STATIC VENTS. BOTH MIAMI DADE COUNTY APPROVED. WHEN USING RIDGE VENT ADDITIONAL BLOCKING MUST BE INSTALLED BETWEEN TRUSSES ON BOTH SIDES OF RIDGE.
4. ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN WITH 10 1/2" ENERGY HEEL OVERHANG FOR A 12" OVERHANG WITH 2X FACE PLATE.
5. ALL SLOPES TO BE 5:12 PITCH
6. TRUSS SUPPLIER TO PROVIDE BRACING DETAILS FOR 140 MPH EXPOSURE D WIND ZONE.

1 ROOF/TRUSS PLAN

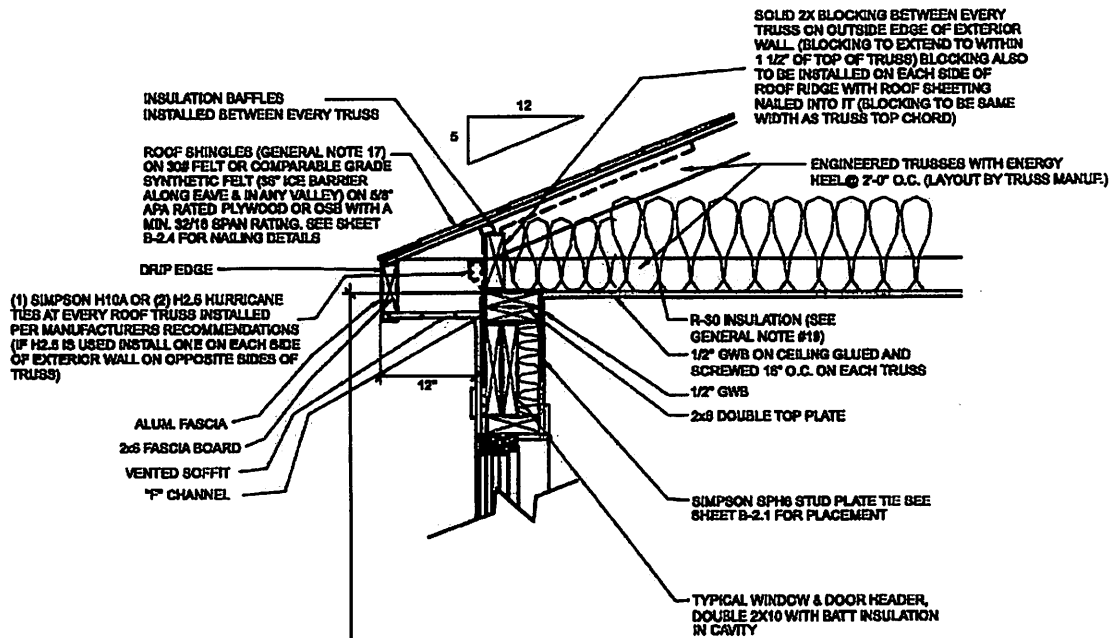
B-1.2

SHEET NO.
B-1.2
REV: 09/02/18
DATE: 09/02/18

DRAWN BY: IMS
SHEET TITLE:
ROOF TRUSS PLAN

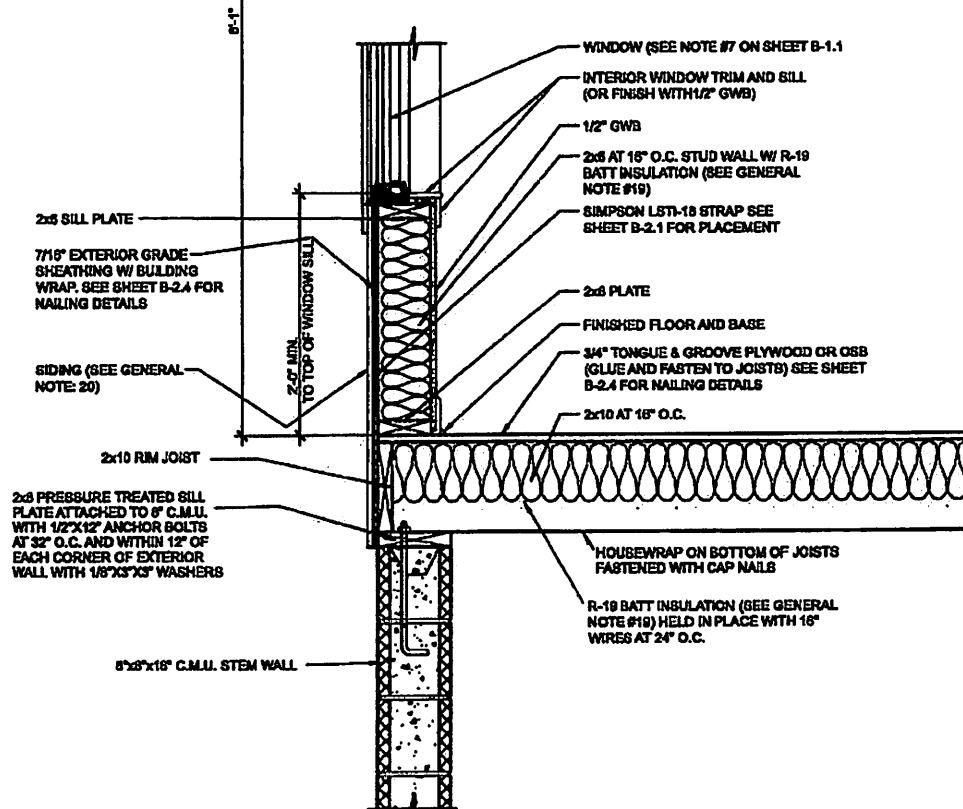


3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.



NOTE:

1. REFER TO A-0.0 FOR GENERAL NOTES



1
B-2.0
TYPICAL WALL SECTION

SHEET NO.

B-2.0

DATE: 09/02/18
REV:

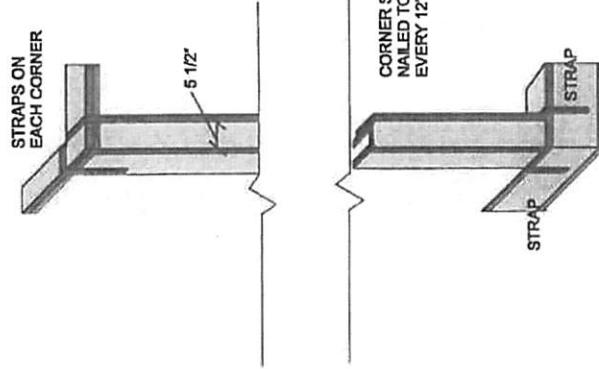
DRAWN BY: IMS

SHEET TITLE:
WALL SECTION



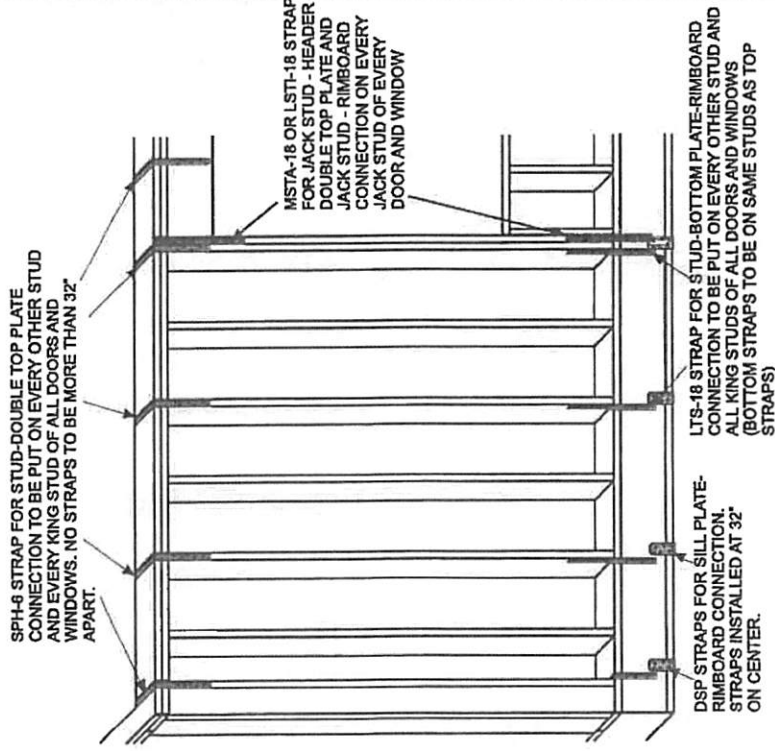
3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.

EXTERIOR WALL CORNER FRAMING DETAIL



1 B-2.1 TYPICAL EXTERIOR WALL STRAPPING DETAILS

EXTERIOR WALL STRAPPING

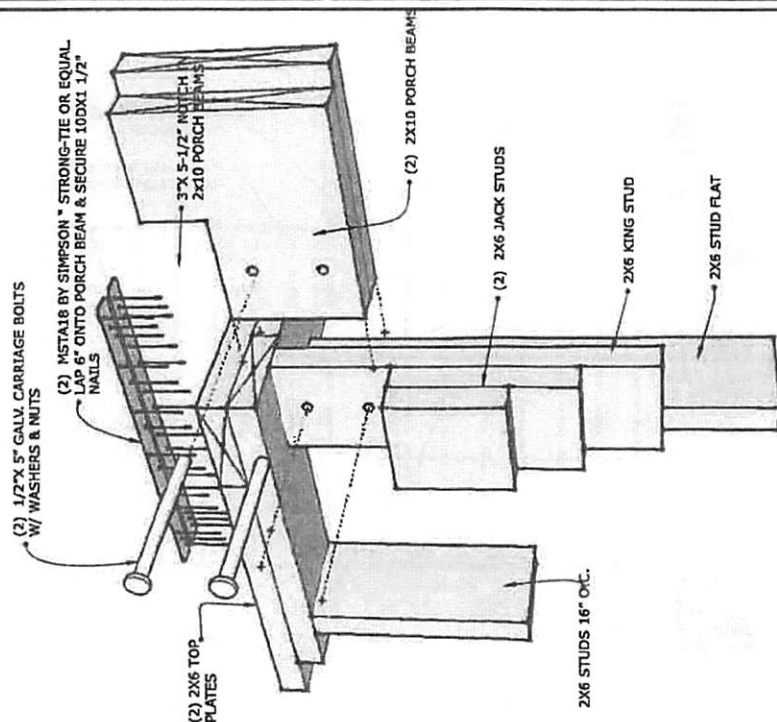


NOTES

1. ALL NAIL HOLES IN ALL STRAPS HAVE TO BE FILLED WITH 10DX 1 1/2" GALVANIZED NAILS.
2. MAKE SURE TOP AND BOTTOM STRAPS ARE ON SAME STUDS.
3. MAKE SURE TOP STRAPS ARE PULLED DOWN AGAINST TOP PLATE WHEN FASTENING.

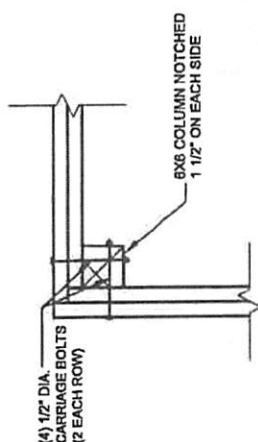
	<p>3 - BED - 2 - BATH - HOUSE OPTION #1 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT.</p>	<p>DRAWN BY: IMS SHEET TITLE: EXTERIOR WALL STRAPPING DETAILS</p>	<p>SHEET NO. B-2.1 DATE: 09/02/16 REV:</p>
--	--	---	--



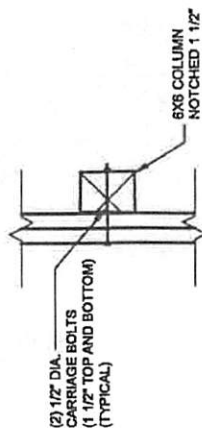


PORCH BEAM CONNECTION AT HOUSE

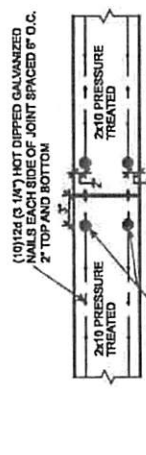
NOTES:
1.REFER TO A-0.0 FOR GENERAL NOTES



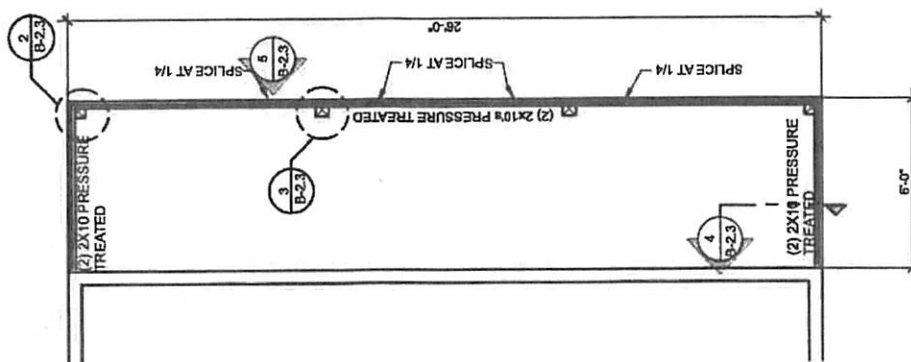
FRAMING DETAIL



FRAMING DETAIL



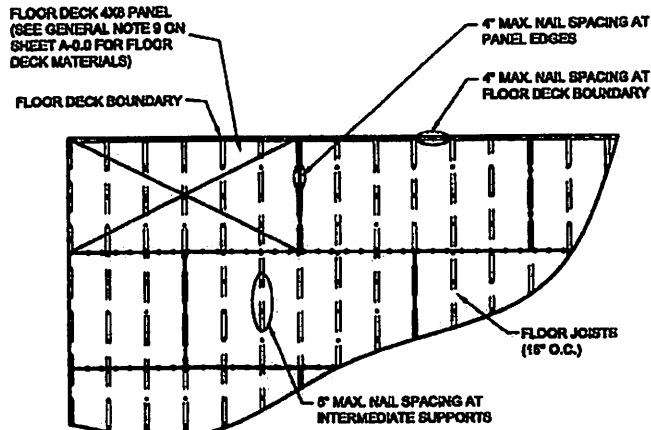
PORCH RIM BEAM SPLICE DETAIL



PORCH ROOF FRAMING

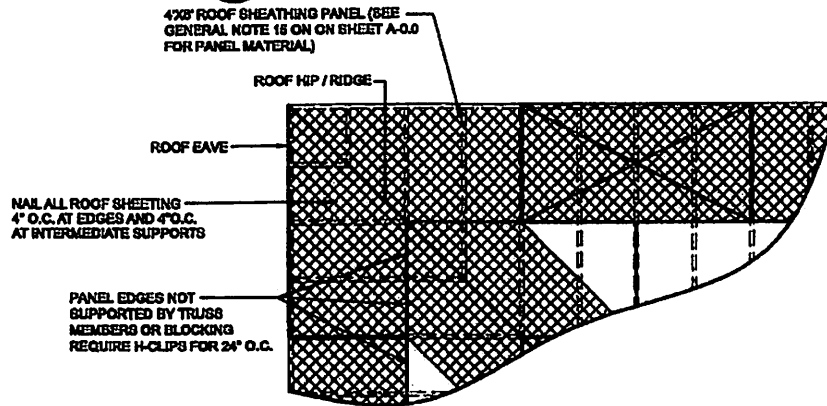
NOTES:

1. REFER TO SHEET A-0.0 FOR GENERAL NOTES.
2. ALL SHEETING FASTENERS TO BE 8D 2 3/8" RINGSHANK NAILS.
3. GLUE FLOOR DECK PANELS TO FLOOR JOISTS.
4. GAP ALL SHEETING 1/8" BETWEEN SHEETS.



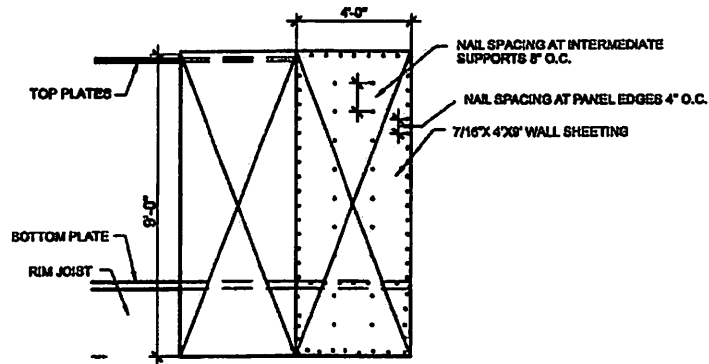
1 FLOOR DECK NAILING DETAIL

B-2.4



2 ROOF SHEATHING NAILING DETAIL

B-2.4



3 EXTERIOR WALL SHEATHING NAILING DETAIL

B-2.4

SHEET NO.

B-2.4

DATE: 09/02/18
REV.:

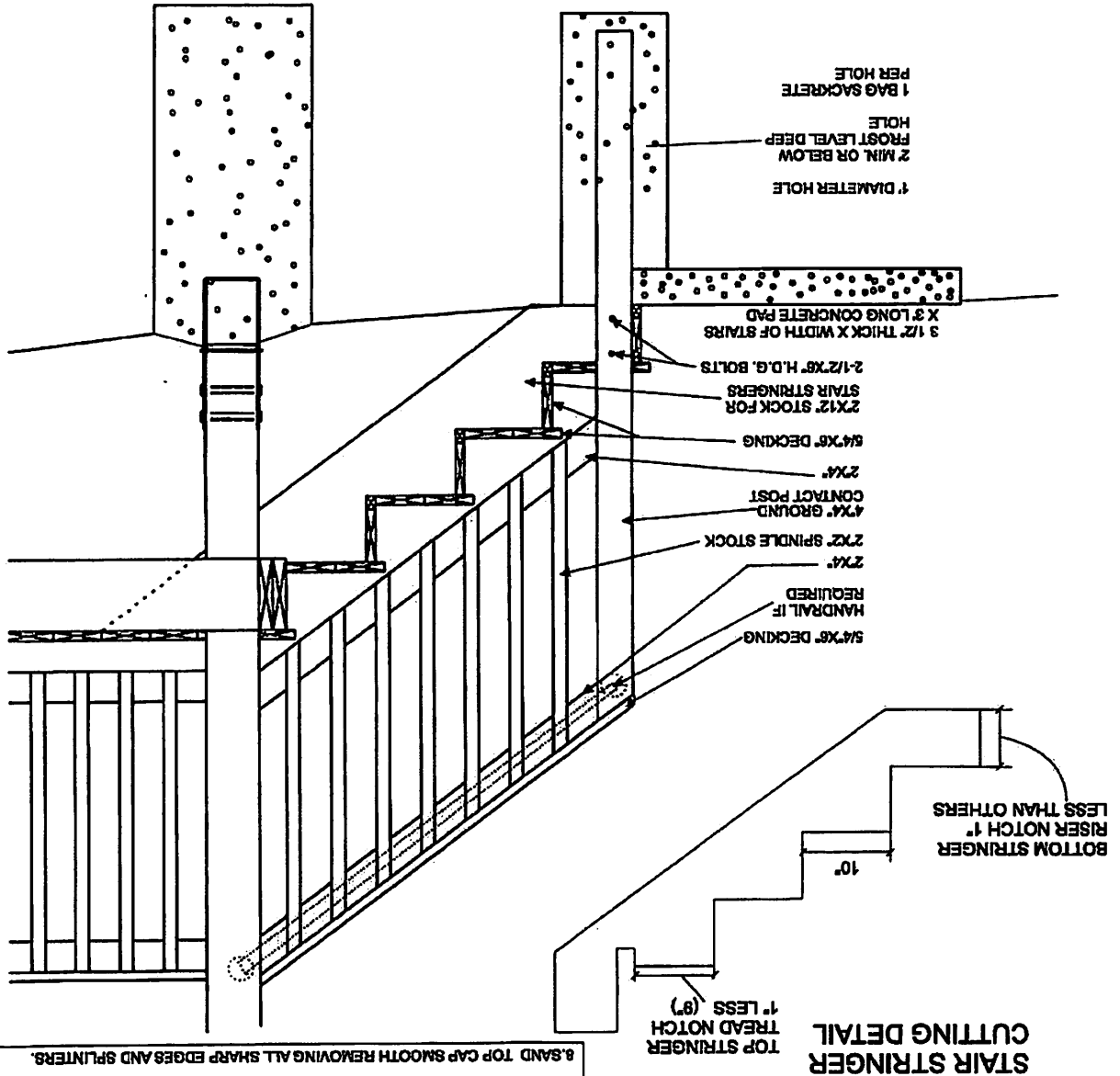
DRAWN BY: IMS

SHEET TITLE:
NAILING DETAILS

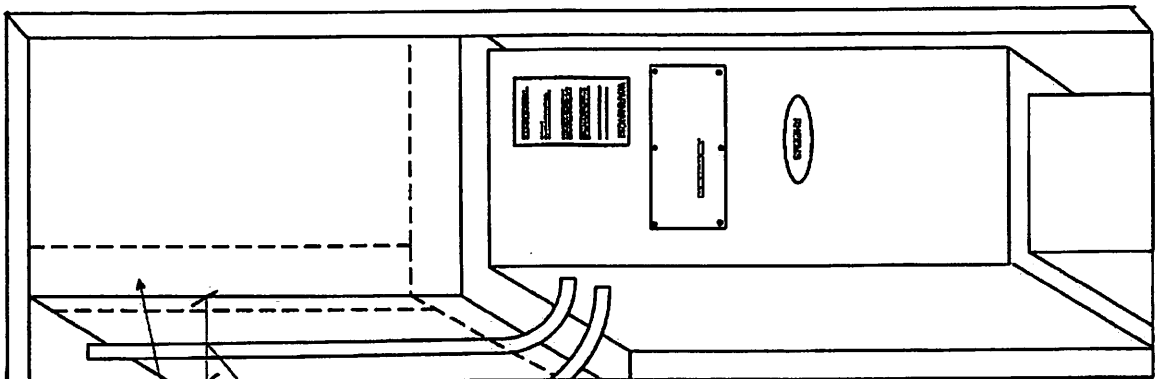


3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
28'X42' = 1092 SQ.FT.

1
TYPICAL STAIR & RAILING DETAILS



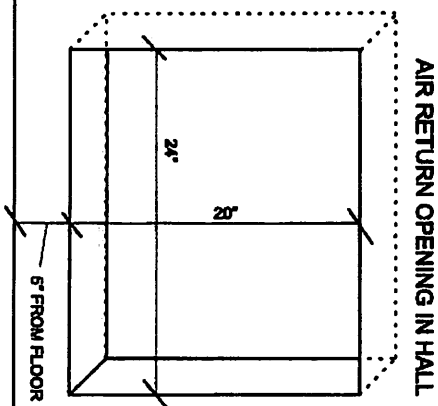
- NOTES:**
1. MAXIMUM STAIR RISER HEIGHT IS 7 3/4". RISERS NOT TO VARY MORE THAN 1/4".
 2. MINIMUM STAIR TREAD DEPTH IS 10". TYPICAL IS 2-6" DECKBOARDS (11" WIDE). 1" NOSING OVERHANG.
 3. GUARD RAIL HEIGHT IS 36". (MEASURED FROM THE NOSE OF STAIR TREADS).
 4. MAXIMUM GAP BETWEEN SPINDLES IS 3 7/8". TYPICAL IS 3 1/2".
 5. MINIMUM NET CLEAR WIDTH BETWEEN GUARD RAILS IS 36". TYPICALLY MAKE TREADS 48" WIDE.
 6. USE 2 1/2" DECK SCREWS TO SCREW ALL RAILING AND DECKING COMPONENTS.
 7. IF STAIRS ARE MORE THAN FOUR RISERS HIGH A 1 1/4" MIN. DIAMETER HANDRAIL MUST BE INSTALLED MIN. 34" HIGH (MEASURED FROM THE NOSE OF STAIR TREADS).
 8. SAND TOP CAP SMOOTH REMOVING ALL SHARP EDGES AND SPLINTERS.



6" GAP BETWEEN
WALL AND PLATFORM
FOR FREON LINES TO
PASS DOWN BELOW
SUBFLOOR

2"x4" FRAME PLATFORM
32" HIGH COVERED WITH
7/16" OSB TO SUPPORT
HVAC UNIT

HVAC CLOSET DETAILS



NOTES:

1. HVAC CLOSET CEILINGS AND WALLS MUST BE SHEETROCKED AND A TAPE COAT OF SPACKLE APPLIED BEFORE PLATFORM AND HVAC UNIT GET INSTALLED.
2. 2"x4" FRAME 32" HIGH COVERED WITH 7/16" OSB FOR PLATFORM. THIS MUST BE TIGHT SO RETURN AIR PULLS THROUGH FILTER IN HALL. (OR USE MANUFACTURER PROVIDED BASE INSTEAD OF PLATFORM).
3. RETURN AIR FILTER OPENING IN HALL TO BE 24"x24" TO ACCOMMODATE STANDARD FILTERS. KEEP IT OFF FLOOR 5" TO ELIMINATE DUST COLLECTION IN FILTER.
4. HVAC INSTALLER TO PROVIDE GRILL TO FIT OPENING. (NO TRIMOUT CARPENTRY NEEDED).
5. IF UNIT IS GAS IT MUST BE A DIRECT VENT UNIT.

SHEET NO.

B-2.6

DATE: 09/02/18
REV.

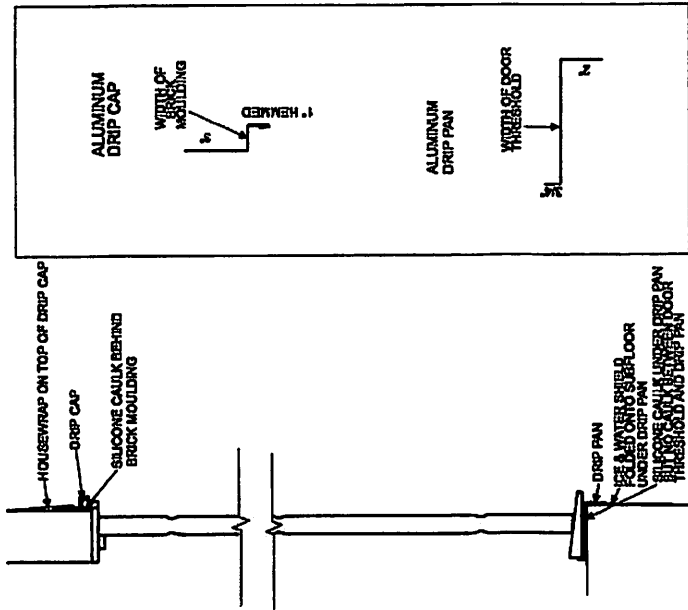
DRAWN BY: SMS

SHEET TITLE:

HVAC CLOSET DETAILS



3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.

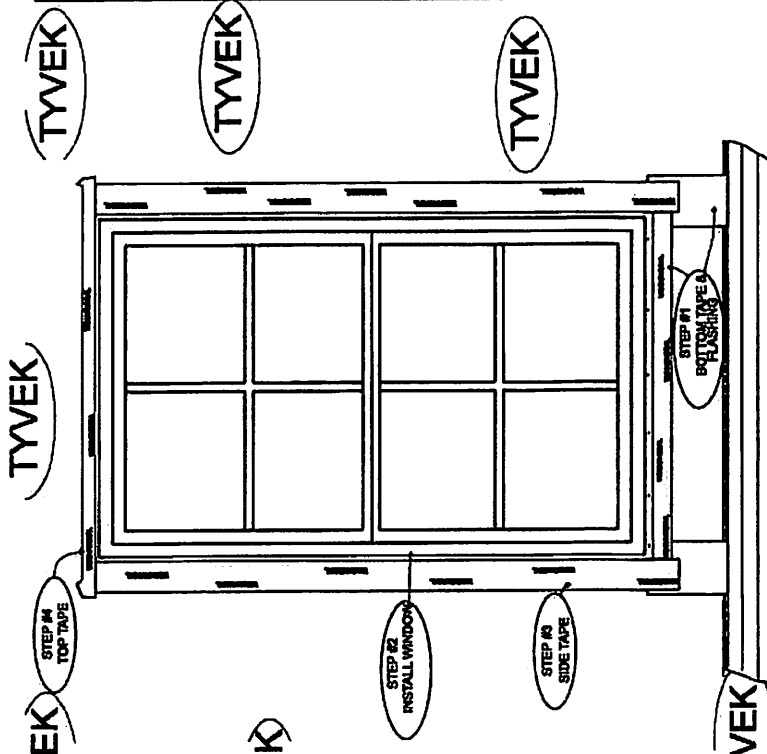


NOTES:

1. ANY DOOR WITHOUT A ROOF OVER IT MUST HAVE A DRIP CAP ON TOP WITH THE HOUSEWRAP ON THE OUTSIDE OF THE DRIP CAP.
2. ALL DOORS GET A DRIP PAN UNDERNEATH. PAN NEEDS TO ALSO GO UP EACH SIDE OF THE DOOR 1" SO NO WATER CAN LEAK INTO THE HOUSE. PUT A HEAVY BEAD OF SILICONE UNDER THE PAN BUT NO SILICONE BETWEEN THE DOOR AND THE PAN.
3. DRIP CAP AND PAN GET BENT OUT OF ALUMINUM FLASHING
4. PUT A GOOD BEAD OF SILICONE BEHIND THE BRICK MOULDING (TOP AND SIDES BOTH) OF THE DOOR.
5. USE DOOR & WINDOW FOAM TO INSULATE BETWEEN DOOR JAMB AND STUDS.

DOOR FLASHING DETAIL

1
C-1.0



NOTES:

1. PUT A PIECE OF WINDOW TAPE ON SILL AND UP EACH SIDE 2" BEFORE INSTALLING WINDOW. (HAVE APPROXIMATELY 1 1/2" OF TAPE WITH THE REST STICKING OUT TO FOLD DOWN ON HOUSE WRAP. BEFORE FOLDING IT DOWN SLIP AN 8"x12" PIECE OF ALUMINUM IN EACH CORNER UNDER THE TAPE. IT SHOULD BE CENTERED ON THE CORNER.) THE FLASHING NEEDS TO BE CUT TO LENGTH TO DRAIN OUT ON SIDING FLANGE WHEN HANGING SIDING.
2. PUT A GOOD BEAD OF SILICONE ON TOP AND SIDE FLANGES OF WINDOW THEN INSTALL USING SIDING NAILS.
3. PUT WINDOW TAPE UP EACH SIDE OF WINDOW COVERING WINDOW FLANGE AND ONTO HOUSE WRAP.
4. PUT WINDOW TAPE ACROSS TOP FLANGE OF WINDOW AND UNDER HOUSE WRAP ONTO SHEETING THEN FOLD HOUSE WRAP DOWN ON TOP. (HOUSE WRAP MUST BE CUT AT TOP BEFORE INSTALLING WINDOW TO SLIP TAPE UNDERNEATH.)
5. USE DOOR & WINDOW FOAM TO INSULATE BETWEEN WINDOW AND STUDS.

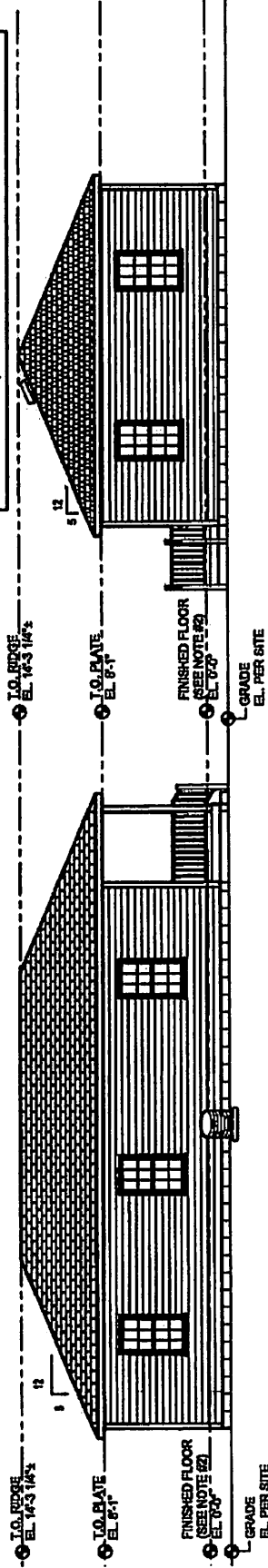
WINDOW FLASHING DETAIL

2
C-1.0

SHEET NO. C-1.0 DATE: 09/02/18 REV:	DRAWN BY: LMS SHEET TITLE: DOOR & WINDOW FLASHING		3 - BED - 2 - BATH - HOUSE OPTION #1 STEMMWALL FOUNDATION 26'X42' = 1092 SQ. FT.	[Empty box for notes or specifications]
	[Empty box for notes or specifications]			

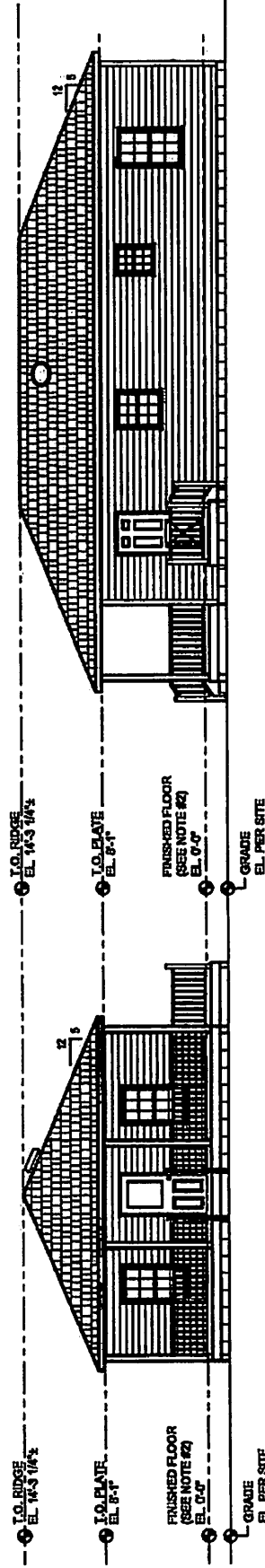
<p>3 - BED - 2 - BATH - HOUSE OPTION #1 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT.</p>		<p>DRAWN BY: NMS</p>	<p>SHEET TITLE: SIDE ELEVATIONS</p>	<p>DATE: 09/02/18</p>
		<p>SHEET NO. D-1.0</p>	<p>REV:</p>	

NOTES:
1. REFER TO A-0.0 FOR GENERAL NOTES.
2. FINISHED FLOOR ELEVATION SET BY ELEVATION CERTIFICATE #1-0' (MDS RECOMMENDATION).



1 SIDE ELEVATION

2 REAR ELEVATION

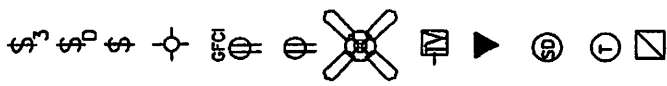


3 FRONT ELEVATION

4 SIDE ELEVATION

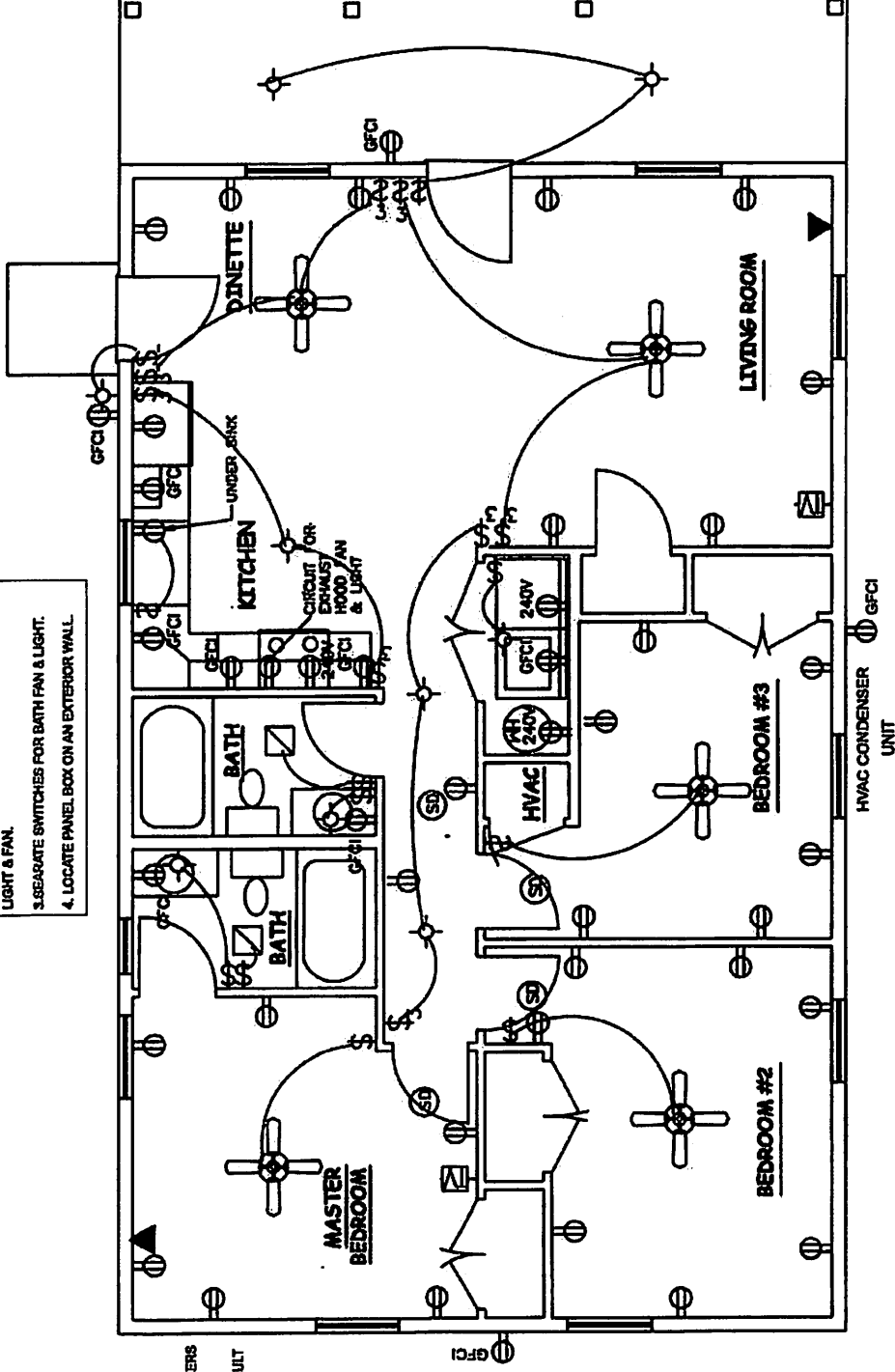
ELECTRICAL LEGEND

- THREE WAY SWITCH
- DIMMER SWITCH
- SWITCH
- LIGHT FIXTURE - SPEC BY OTHERS
- DUPLEX OUTLET - GROUND FAULT
CIRCUIT INTERRUPT
- DUPLEX OUTLET
- CEILING FAN & LIGHT
- COAXIAL CABLE
- PHONE
- SMOKE DETECTOR
- THERMOSTAT
- BATH VENT



NOTE:

1. REFER TO A-JJ FOR GENERAL NOTES
2. 2 SEPARATE SWITCHES FOR CEILING FAN LIGHT & FAN.
3. SEPARATE SWITCHES FOR BATH FAN & LIGHT.
4. LOCATE PANEL BOX ON AN EXTERIOR WALL.



1 E-1.0

3 - BED - 2 - BATH - HOUSE
OPTION #1
STEMWALL FOUNDATION
 28'X42' = 1092 SQ. FT.

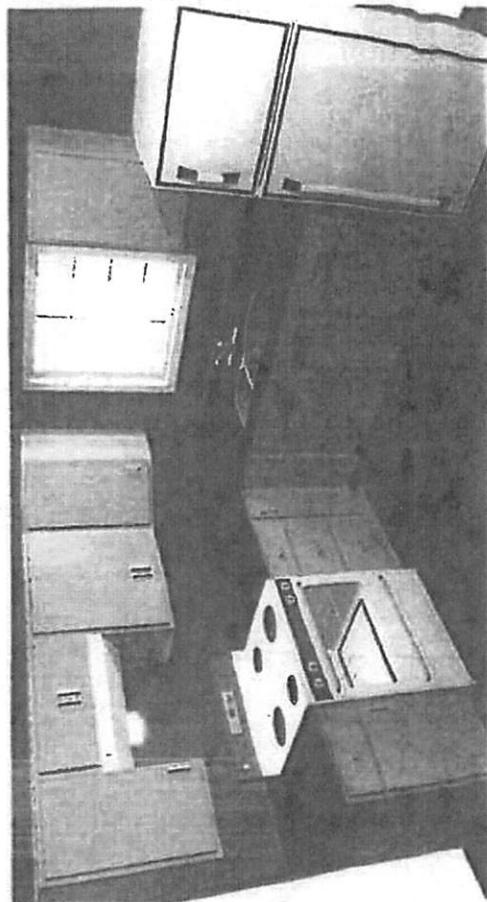
SHEET TITLE:
 ELECTRICAL LAYOUT

DRAWN BY: IMS

SHEET NO.
 E-1.0

DATE: 09/02/18

REV:



NOTES:

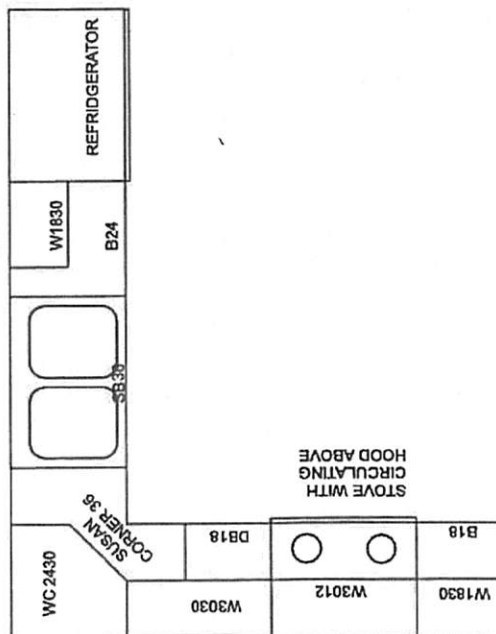
1. CABINET LIST
1- SINK BASE 36
1-SUSAN CORNER 36
1-BASE 24
1-DRAWER BASE 18
1-BASE 18

- 1-WALL CORNER 2430
1-WALL 3030
1-WALL 3012
2-WALL 1630

TOE KICK

2. COUNTERTOPS LIST

- 1-8' RIGHT MITER PREFORMED LAMINATE TOP
1-8' LEFT MITER PREFORMED LAMINATE TOP
2- ENDCAP KITS
1-MITER BOLT KIT



KITCHEN PLAN

1
K-1.0

MENNONITE DISASTER SERVICE

3 BED - 2 BATH - HOUSE - OPTION #2

STEMWALL FOUNDATION

DRAWING LIST:

- A-0.0 COVER SHEET
- A-1.0 FOUNDATION PLAN
- A-1.1 FOOTINGS & FOUNDATION SECTIONS
- B-1.0 FLOOR FRAMING PLAN
- B-1.1 FLOOR PLAN
- B-1.2 ROOF TRUSS PLAN
- B-2.0 WALL SECTION
- B-2.1 EXTERIOR WALL STRAPPING DETAILS
- B-2.2 PORCH DECK FRAMING DETAILS
- B-2.3 PORCH ROOF FRAMING DETAILS
- B-2.4 NAILING DETAILS
- B-2.5 STAIR & RAILING DETAILS
- B-2.6 HVAC CLOSET DETAILS
- C-1.0 DOOR & WINDOW FLASHING DETAILS
- D-1.0 ELEVATIONS
- E-1.0 ELECTRICAL LAYOUT PLAN
- K-1.0 KITCHEN PLAN

GENERAL NOTES

- 1.- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF IRC AND ANY APPLICABLE LOCAL, COUNTY AND STATE ORDINANCES. STRUCTURAL DESIGN SHALL COMPLY WITH 140 MPH WIND, 30 PSF SNOW LOAD, AND EXPOSURE C REQUIREMENTS, UNLESS LOCAL CONDITIONS STIPULATE HIGHER REQUIREMENTS..
- 2.- COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR INSTALLATION ON ALL MATERIALS UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
- 3.- CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS IN THE FIELD.
- 4.- IF THE EXISTING FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE DETAILS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY AND PROVIDE INFORMATION OF EXISTING CONDITIONS. FINAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE INSTRUCTIONS OF THE ARCHITECT.
- 5.- ALL EXTERIOR NAILS, BOLTS, ANCHORS, HANGERS, AND NAILS PENETRATING PRESSURE TREATED LUMBER SHALL BE HOT DIPPED GALVANIZED.
- 6.- ALL WOOD IN CONTACT WITH CONCRETE, CONCRETE BLOCK, SHALL BE PRESSURE TREATED. ALL WOOD IN CONTACT WITH GROUND SHALL BE GROUND CONTACT PRESSURE TREATED.
- 7.- FINISHED GRADE SHALL SLOPE DOWN 8" AWAY FROM THE STRUCTURE IN THE FIRST 8'-0" UNLESS OTHERWISE NOTED.
- 8.- FRAMING LUMBER TO BE MIN. #2 HEM FIR, SOUTHERN PINE, OR SPRUCE-PINE-FIR, OR CONSTRUCTION GRADE DOUG FIR.
- 9.- FLOOR DECK TO BE APA RATED 3/4" TONGUE & GROOVE PLYWOOD OR OSB WITH A 32/16 SPAN RATING, BOTH GLUED AND NAILED TO APA STANDARDS ON 2X10 FLOOR JOIST AT 16" ON CENTER.
- 10.- ALL EXTERIOR WALLS TO BE 2x6 WOOD STUDS 16" ON CENTER WITH WITH 1/2" DRYWALL INSIDE FINISH, AND R-19 FIBERGLASS BATT INSULATION. ALL INTERIOR WALLS TO BE 2x4 WOOD STUDS 16" ON CENTER WITH 1/2" DRYWALL BOTH SIDES UNLESS NOTED OTHERWISE.
- 11.- CONFIRM MANUFACTURE'S ROUGH OPENING FOR WINDOWS AND DOORS BEFORE FRAMING. (NOMINAL SIZES SHOWN ON PLAN)

12.- EXTERIOR WALL SHEATHING TO BE 7/16" OR 1/2" EXTERIOR GRADE OSB OR PLYWOOD.

13.- TYPICAL HEADERS TO BE DOUBLE 2x10.

14.- ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN DESIGN WITH ENERGY HEELS.

15.- ROOF SHEATHING TO BE APA RATED 5/8" PLYWOOD OR OSB WITH 32/16 SPAN RATING. H-CLIPS REQUIRED FOR TRUSSES 24" O.C.

16.- FELTS: 30LB (ROOF) ASPHALT SATURATED ORGANIC ROOFING FELT TYPE I, 36" ROLLS OR SYNTHETIC EQ. WALLS USE HOUSE WRAP, TYVEK OR EQ.

17.- SHINGLES: ASPHALT WITH A ASTM D 3161, CLASS F OR ASTM D 7168 CLASS H RATING (CHECK WRAPPER FOR RATING), 20 YEAR MINIMUM WARRANTY. FASTENED WITH 6-1 1/2" NAILS PER SHINGLE.

18.- PROVIDE CONTINUOUS VENTED SOFFIT AND INSULATION BAFFLES

19.- INSULATION SHALL BE FIBERGLASS BATT INSULATION (R-19 IN EXTERIOR WALLS AND R-19 IN FLOORS, R30 BATTS OR BLOW-IN IN ATTICS). IN WARM HUMID CLIMATE ZONES USE INSULATION WITHOUT KRAFT PAPER. IF NOT AVAILABLE, USE INSULATION WITH PAPER, BUT INSTALL PAPER (VAPOR BARRIER) ON THE OUTSIDE AWAY FROM THE LIVING SPACE (PAPER TO OUTSIDE ON WALLS, PAPER UP IN ATTICS) (EXCEPTION: ALWAYS INSTALL PAPER UP TOWARD LIVING SPACE IN FLOORS) ALL OTHER ZONES, INSTALL PAPER TOWARDS LIVING SPACE.

20.- SIDING: USE VINYL WITH A MIN. 110 MPH RATING OR HARDIBOARD PANEL OR HARDIBOARD PLANK, INSTALL PER MANUFACTURERS RECOMMENDATIONS.

21.-STAIR TREADS TO BE (2) 5/4X6 DECK BOARDS.

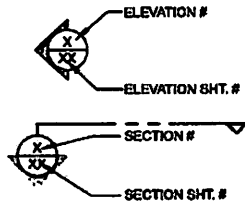
22.- PORCH, DECK, STAIR, AND RAMP GUARD RAILS SHALL BE 38" HIGH. HANDRAIL (WHERE REQUIRED) SHALL BE MIN. 34" HIGH.

23.- ELECTRICAL SERVICE TO BE 200 AMP WITH 20 AMP BREAKERS WITH 12 GA. WIRE.

24.- PROVIDE 4 SHELVES AT LINEN CLOSETS.

25.- PROVIDE SHELF AND POLE AT CLOSETS, IF CLOSET IS WIDER THAN 5'-0", PROVIDE CENTER BRACKET. SHELF HEIGHTH TO BE 5'-6" FROM FLOOR.

LEGEND

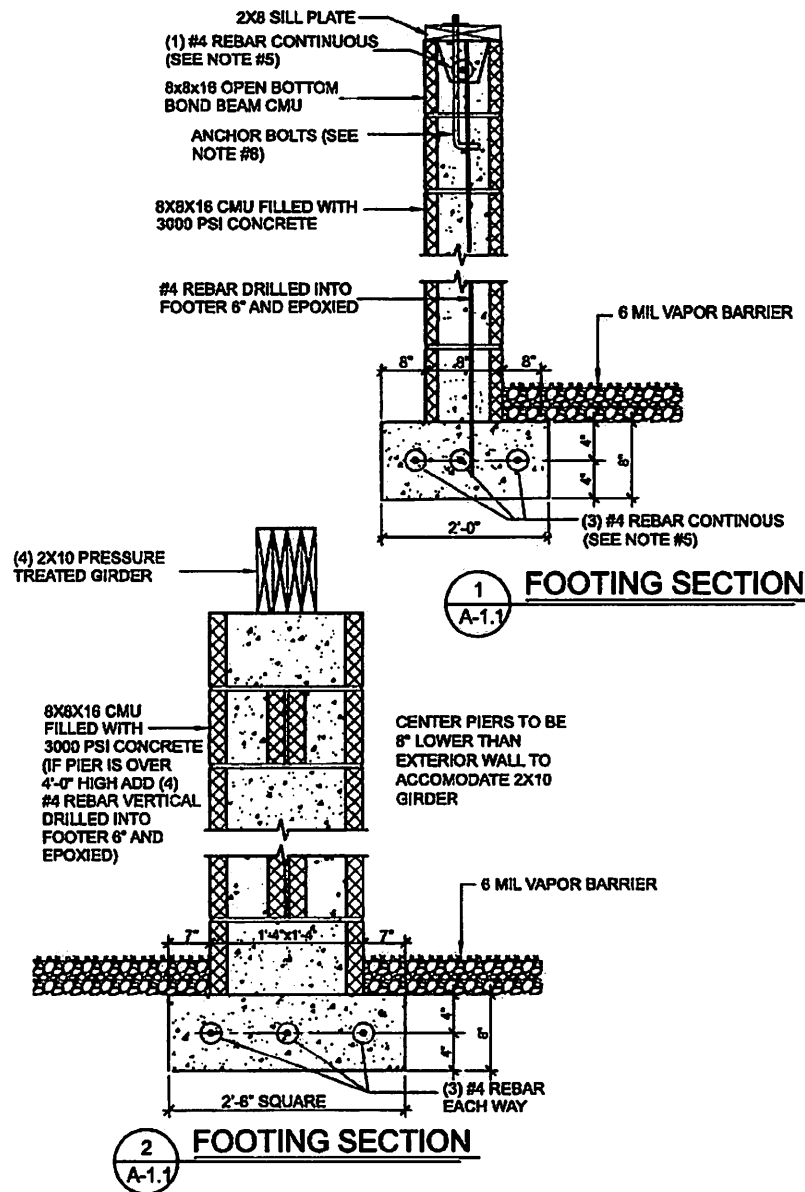


3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.



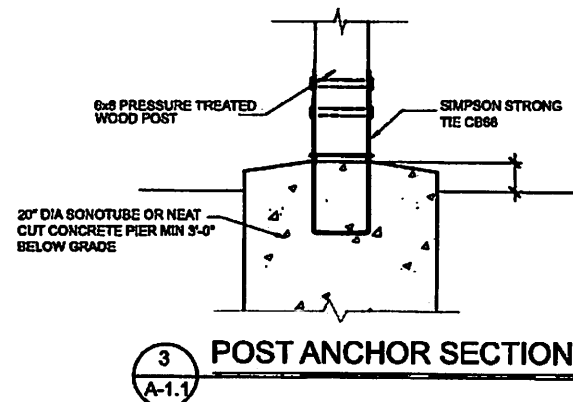
DRAWN BY: IMS
SHEET TITLE:
COVER SHEET

SHEET NO.
A-0.0
DATE: 09/02/18
REV.:



FOUNDATION NOTES:

1. CARRY ALL FOOTINGS TO FIRM UNDISTURBED BEARINGS. SEE FOUNDATIONS SECTIONS THIS SHEET FOR SIZE.
2. FOUNDATION SIZES AND REINFORCING STEEL SHOWN HAVE BEEN DESIGNED FOR 1,500 PSI SOIL BEARING WITHOUT ANY INFORMATION REGARDING THE SOIL. LOCAL SOIL CONDITIONS AND/OR LOCAL PRACTICE MAY NECESSITATE A MORE STRINGENT FOOTING AND FOUNDATION DESIGN. CONSULT WITH LOCAL BUILDING INSPECTOR.
3. ALL CAST IN PLACE CONCRETE FOR THE BUILDING STRUCTURE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. IF OVER EXCAVATION OF FOOTINGS OCCUR, THE EXCAVATION SHALL BE FILLED WITH CONCRETE TO THE BOTTOM OF THE NEW FOOTING AT NO ADDITIONAL COST.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL REBAR ARE PROPERLY ALIGNED AND TIED IN PLACE BEFORE PLACING CONCRETE. ALL REBAR TO BE MINIMUM 2" FROM ANY SURFACE OF THE CONCRETE FOOTING. ALL HORIZONTAL REBAR TO BE CONTINUOUS WITH MINIMUM 3'-0" OVERLAPS.
6. 1/2"X12" ANCHOR BOLTS WITH 1/8"X3"X3" WASHERS TO BE PLACED WITHIN 12" OF EACH CORNER AND EVERY 32" ON CENTER. A #4 VERTICAL REBAR TO BE DRILLED 6" INTO FOOTER AND EPOXIED AT EACH ANCHOR BOLT LOCATION. ANCHOR BOLTS TO BE PLACED AS STATED UNLESS LOCAL CODES ARE MORE STRINGENT.
7. IF CONDITIONS REQUIRE IT INSTALL A FOUNDATION DRAIN AND DAMP PROOF EXTERIOR WALLS.



3 - BED - 2 - BATH - HOUSE
 OPTION #2
 STEMWALL FOUNDATION
 26'X42' = 1092 SQ. FT.




DRAWN BY: IMS
 SHEET TITLE:
 FOOTINGS &
 FOUNDATION SECTIONS

SHEET NO.
A-1.1
 DATE: 09/02/19
 REV:

1 FLOOR FRAMING PLAN
B-1.0

3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
 26'X42' = 1092 SQ. FT.

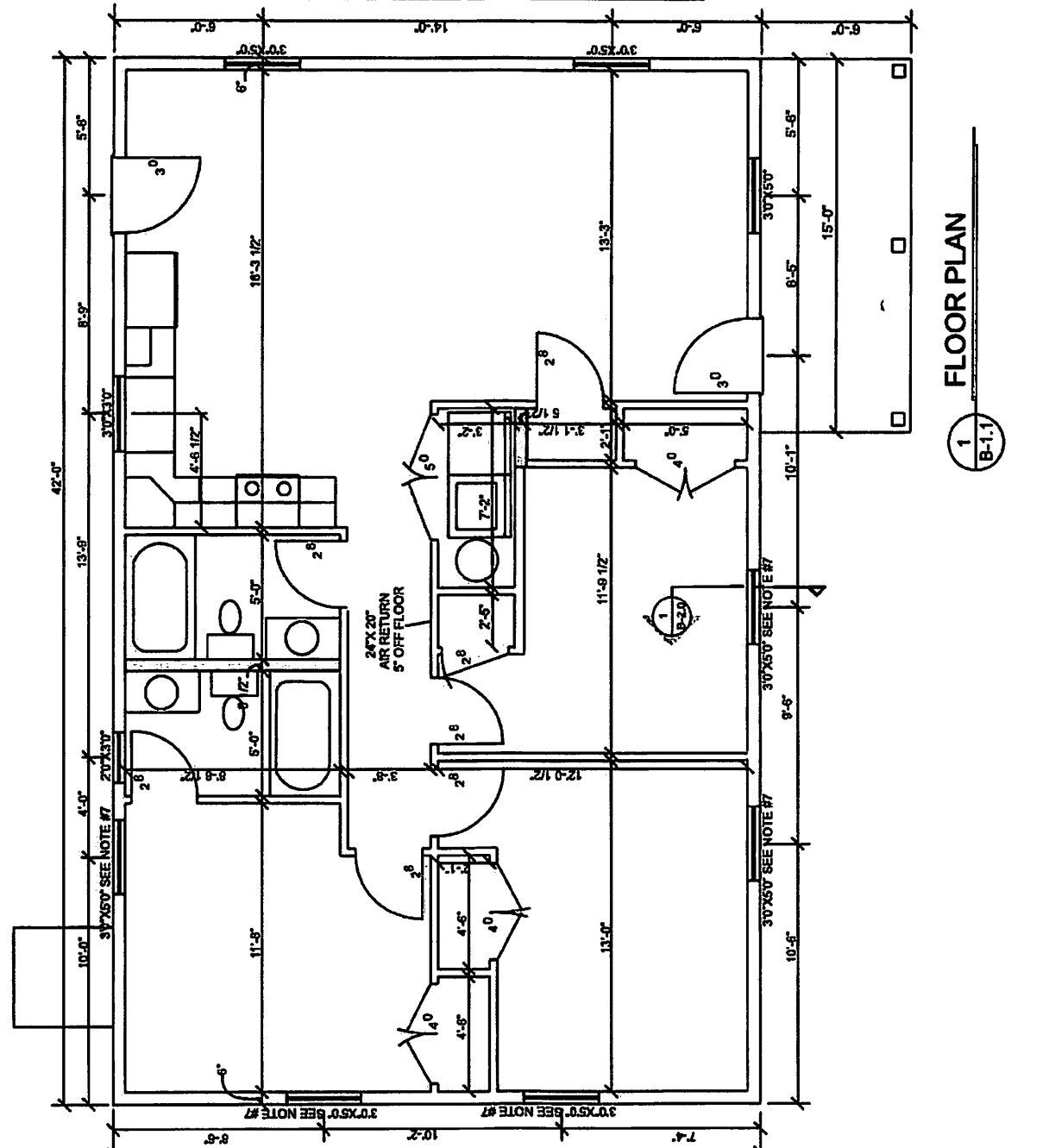


SHEET NO. B-1.1
DATE: 09/02/16
REV: 09/02/16

DRAWN BY: IMS
FLOOR PLAN
SHEET TITLE:

NOTES:

1. REFER TO A-0.0 FOR GENERAL NOTES.
2. EXTERIOR WALL DIMENSIONS ARE 6".
3. INTERIOR WALL DIMENSIONS ARE 3 1/2" UNLESS NOTED OTHERWISE.
4. INSTALL VERTICALLY ONE FULL 4'X8' SHEET OF WALL SHEETING AT EACH EXTERIOR WALL CORNER.
5. EXTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 82" HIGH.
6. INTERIOR DOOR ROUGH OPENING SIZE IS PLUS 2" IN WIDTH X 83" HIGH.
7. BEDROOM WINDOWS MUST MEET THE FOLLOWING EGRESS REQUIREMENTS: HAVE A MIN. 20" WIDE AND A MIN. 24" HIGH WITH A 5.7 SQ. FT. MIN. NET CLEAR OPENING. CHECK WITH WINDOW MANUFACTURER FOR WINDOW ROUGH OPENING SIZES.
8. VERIFY KITCHEN WINDOW MEASUREMENT FOR KITCHEN LAYOUT.
9. DRYWALL AND TAPE INSIDE FURNACE CLOSET PRIOR TO HVAC

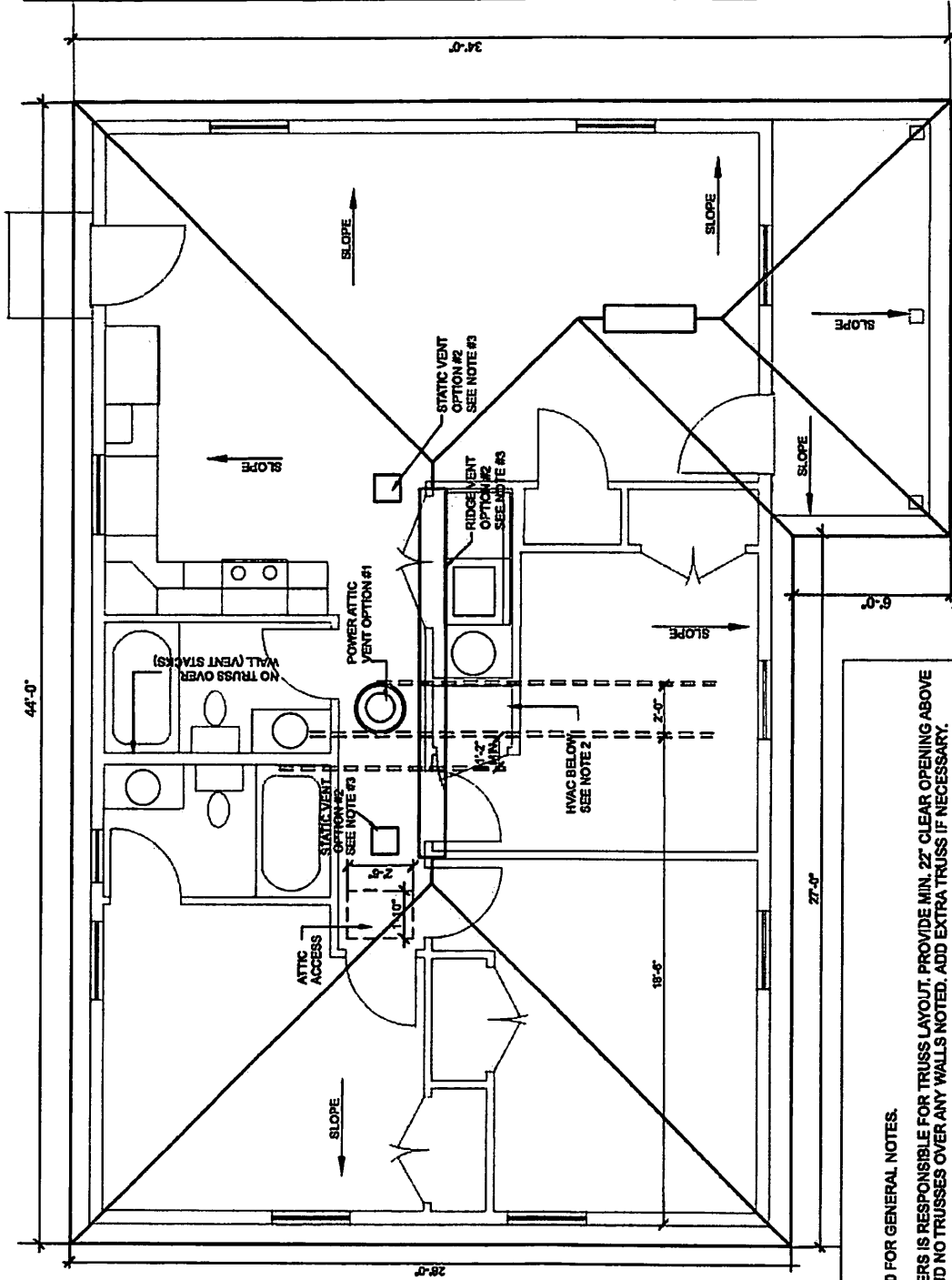


The floor plan shows a rectangular house with overall dimensions of 26'-0" by 42'-0". It includes a living area, kitchen, two bedrooms, two bathrooms, and a central hallway. A furnace closet is located near the kitchen. Various door and window openings are dimensioned throughout the plan.

1
B-1.1

FLOOR PLAN

	3 - BED - 2 - BATH - HOUSE OPTION #2 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT	DRAWN BY: MS SHEET TITLE: ROOF TRUSS PLAN	SHEET NO. B-1.2 DATE: 09/02/16 REV:

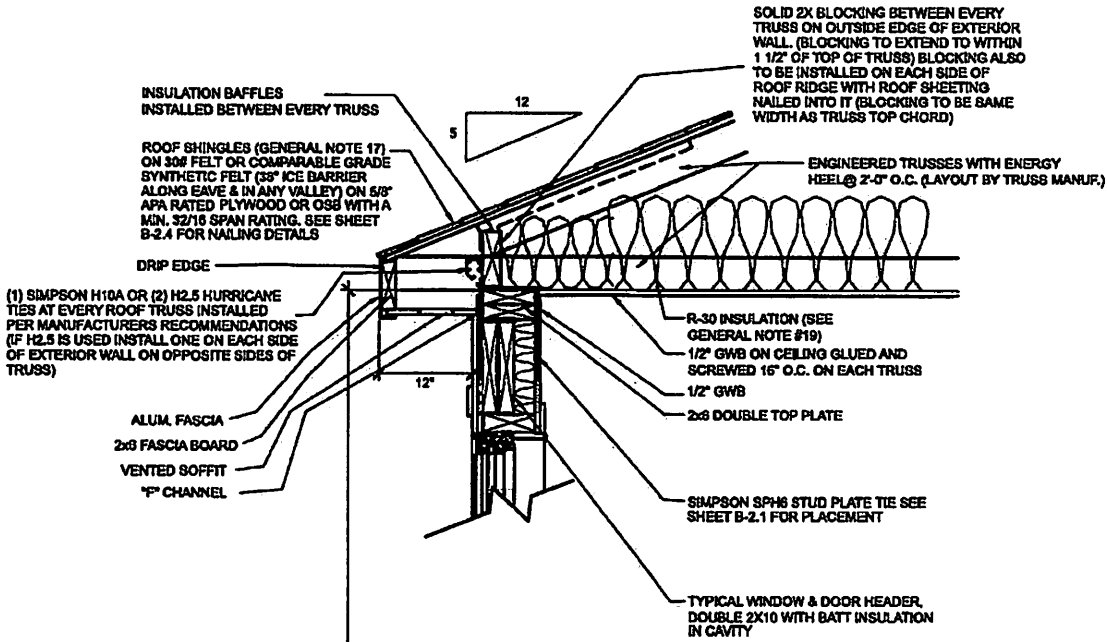


1 ROOF/TRUSS PLAN

1
B-1.2

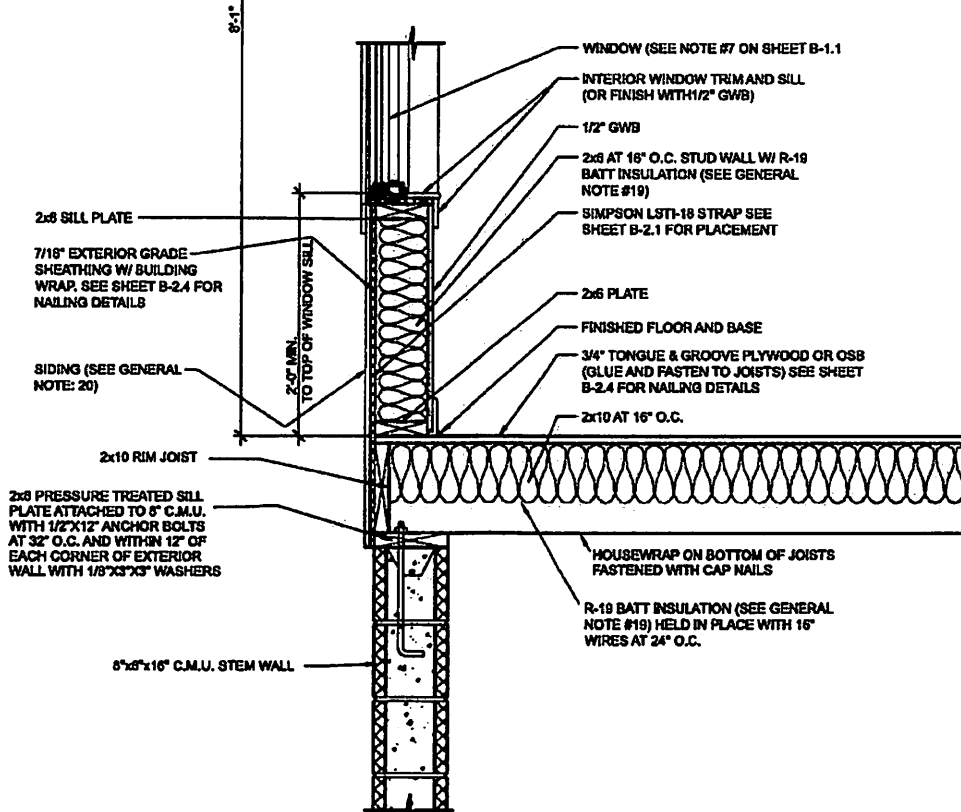
NOTES:

1. REFER TO A-0.0 FOR GENERAL NOTES.
2. TRUSS SUPPLIERS IS RESPONSIBLE FOR TRUSS LAYOUT, PROVIDE MIN. 22" CLEAR OPENING ABOVE HVAC CLOSET AND NO TRUSSES OVER ANY WALLS NOTED. ADD EXTRA TRUSS IF NECESSARY.
3. TWO OPTIONS FOR ATTIC VENTS: 1) POWER VENT OR 2) COMBINATION BAFELED RIDGE VENT AND TWO BAFELED STATIC VENTS, BOTH MIAMI DADE COUNTY APPROVED. WHEN USING RIDGE VENT ADDITIONAL BLOCKING MUST BE INSTALLED BETWEEN TRUSSES ON BOTH SIDES OF RIDGE.
4. ROOF TRUSSES SHALL BE PRE-ENGINEERED CLEAR SPAN WITH 10 1/2" ENERGY HEEL OVERHANG FOR A 12" OVERHANG WITH 2X FACE PLATE.
5. ALL SLOPES TO BE 5:12 PITCH
6. TRUSS SUPPLIER TO PROVIDE BRACING DETAILS FOR 140 MPH EXPOSURE D WIND ZONE.



NOTE:

1.REFER TO A-0.0 FOR GENERAL NOTES



1
B-2.0

TYPICAL WALL SECTION

SHEET NO.

B-2.0

DATE: 09/02/18
REV.:

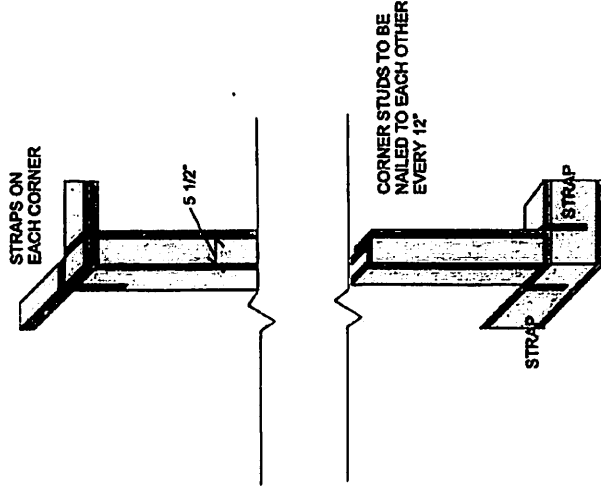
DRAWN BY: IMS

SHEET TITLE:
WALL SECTION



3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.

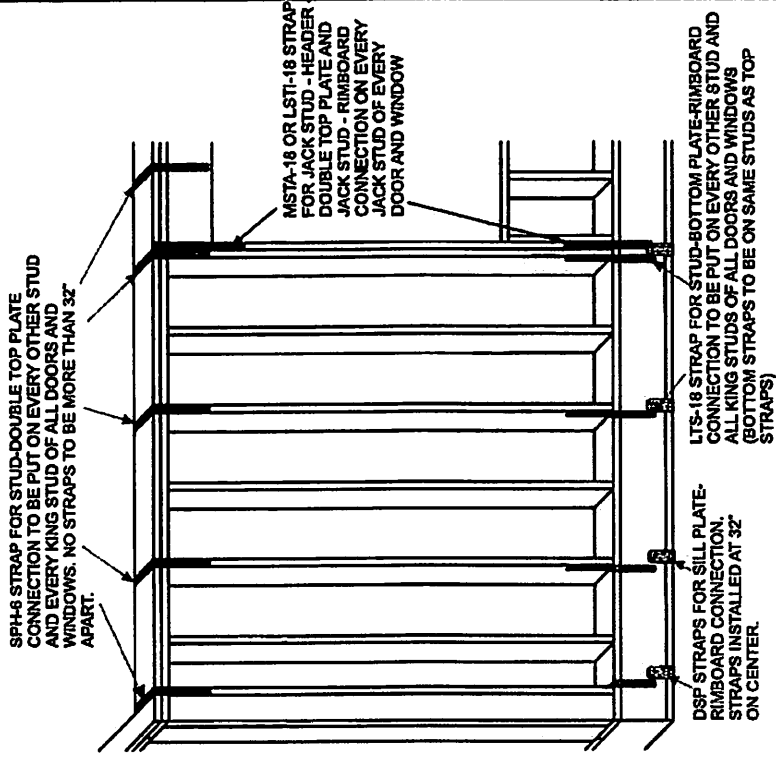
EXTERIOR WALL CORNER FRAMING DETAIL



TYPICAL EXTERIOR WALL STRAPPING DETAILS

1
B-2.1

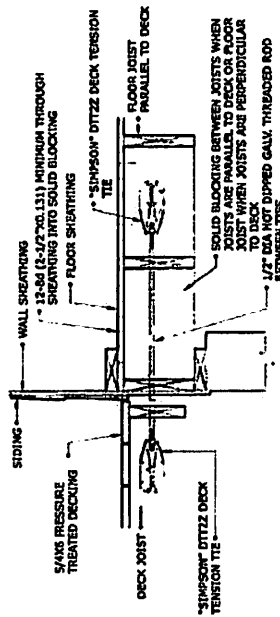
EXTERIOR WALL STRAPPING



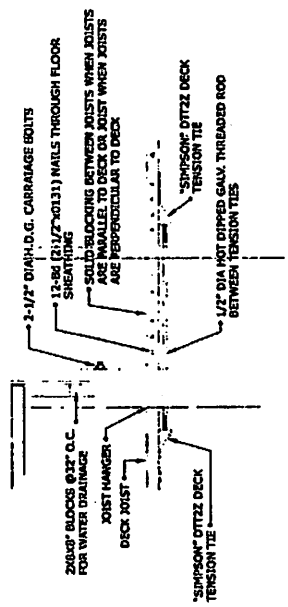
NOTES

1. ALL NAIL HOLES IN ALL STRAPS HAVE TO BE FILLED WITH 100X 1 1/2" GALVANIZED NAILS.
2. MAKE SURE TOP AND BOTTOM STRAPS ARE ON SAME STUDS.
3. MAKE SURE TOP STRAPS ARE PULLED DOWN AGAINST TOP PLATE WHEN FASTENING.

<p>3 - BED - 2 - BATH - HOUSE OPTION #2 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT.</p>		<p>DRAWN BY: BMS SHEET TITLE: EXTERIOR WALL STRAPPING DETAILS</p>	<p>SHEET NO. B-2.1</p>
		<p>DATE: 09/02/18 REV:</p>	



SECTION VIEW - DECK TENSION TIE



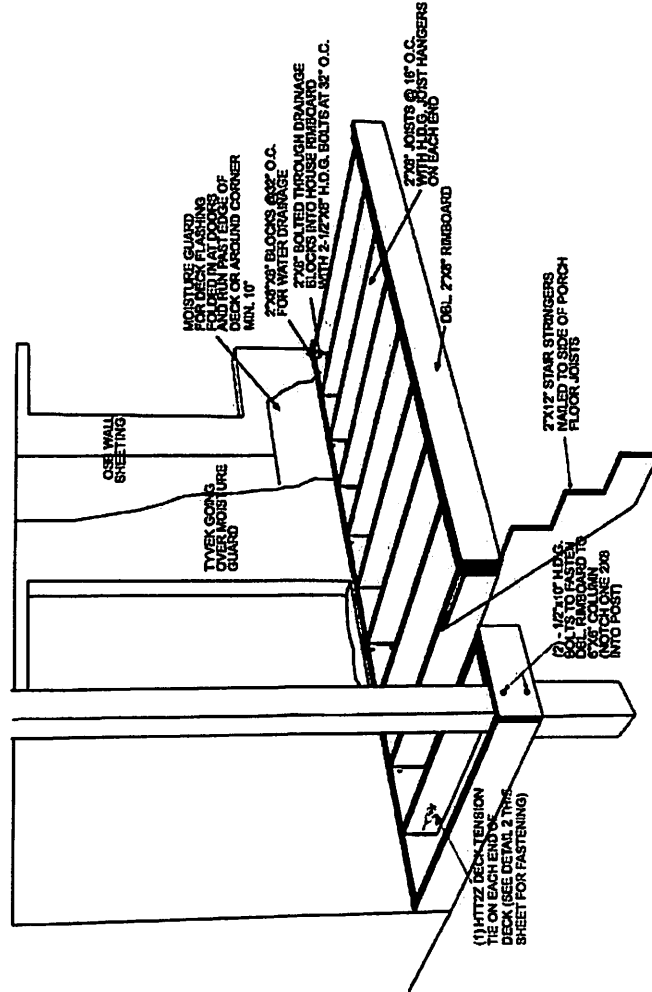
PLAN VIEW - DECK TENSION TIES

2 PORCH DECK TENSION TIE DETAILS

B-2.2

NOTE:

1. FINISHED DECK FLOOR HEIGHT TO BE 1/2" LOWER THAN INTERIOR SUBFLOOR.



1 TYPICAL PORCH DECK DETAILS

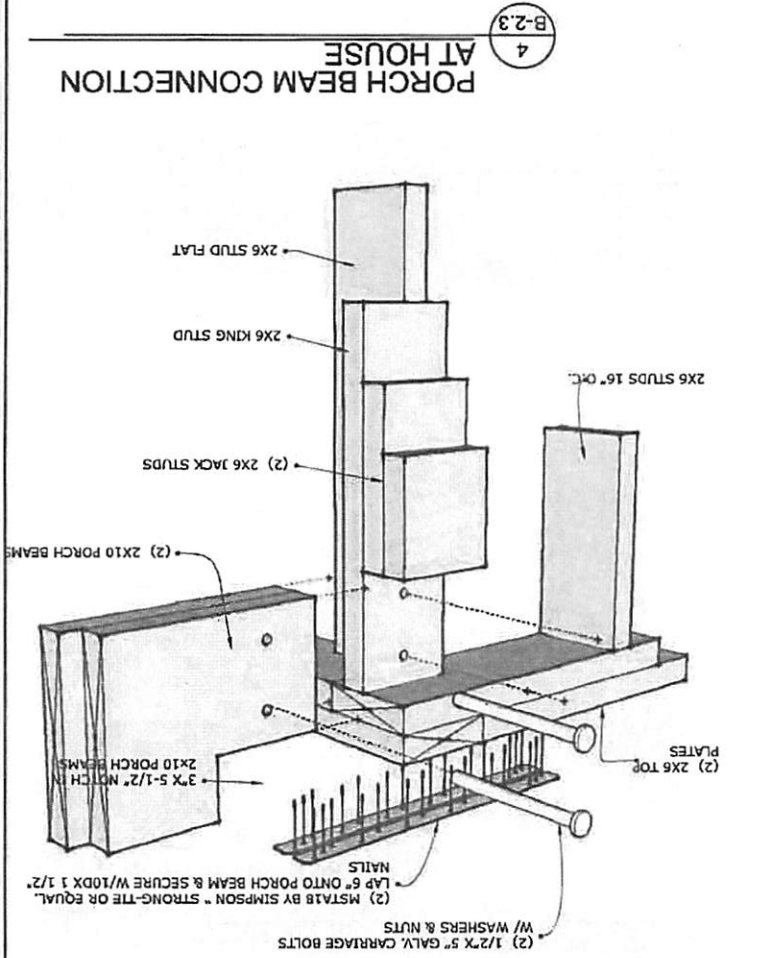
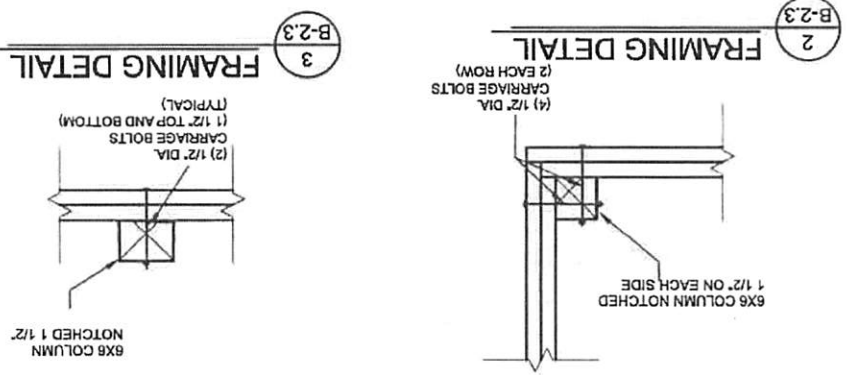
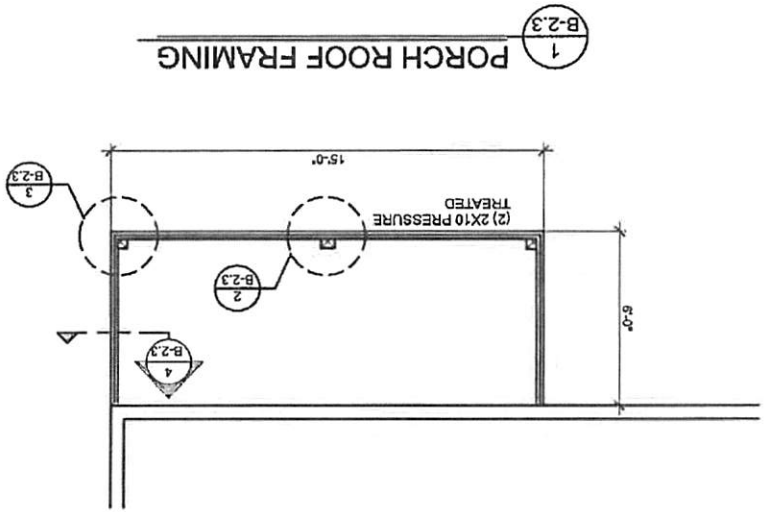
B-2.2

3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
28'X42' = 1092 SQ. FT.



DRAWN BY: JMS & RRU
SHEET TITLE:
PORCH DECK
FRAMING DETAILS

SHEET NO.
B-2.2
DATE: 09/02/18
REV:



NOTES:
1. REFER TO A-0.0 FOR GENERAL NOTES

SHEET NO.
B-2.3

DATE: 09/02/18
REV:

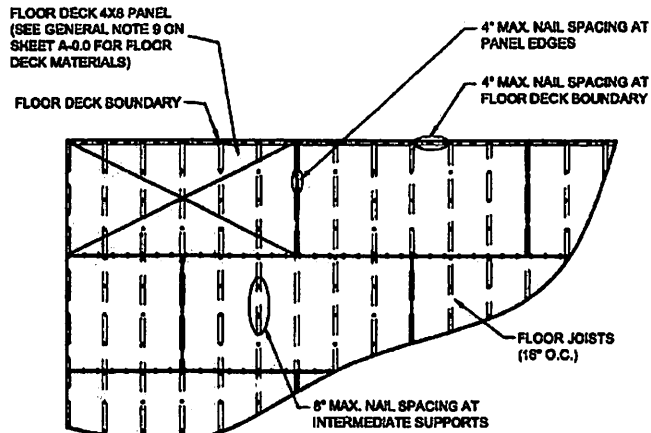
DRAWN BY: IMS & RU

SHEET TITLE:
PORCH ROOF
FRAMING DETAILS

3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.

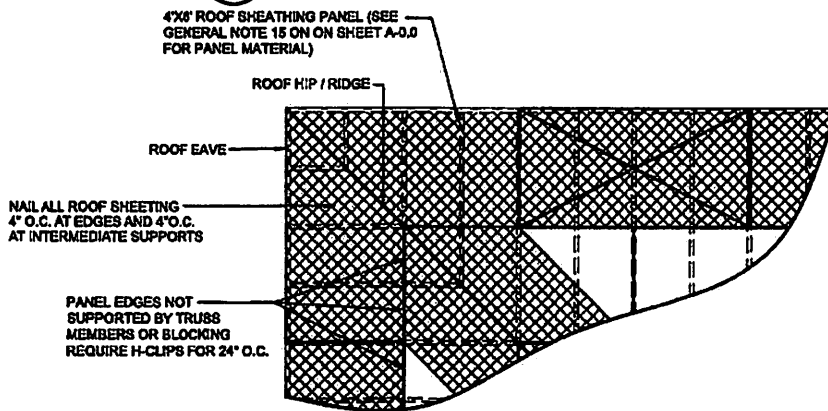
NOTES:

1. REFER TO SHEET A-0.0 FOR GENERAL NOTES.
2. ALL SHEETING FASTNERS TO BE 8D 2 3/8" RINGSHANK NAILS.
3. GLUE FLOOR DECK PANELS TO FLOOR JOISTS.
4. GAP ALL SHEETING 1/8" BETWEEN SHEETS.



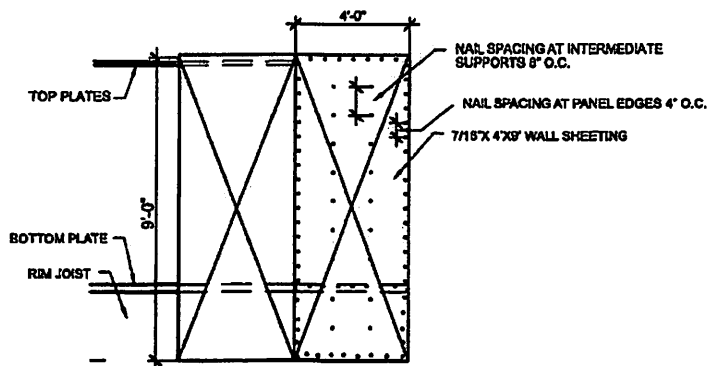
1 FLOOR DECK NAILING DETAIL

1
B-2.4



2 ROOF SHEATHING NAILING DETAIL

2
B-2.4



3 EXTERIOR WALL SHEATHING NAILING DETAIL

3
B-2.4

SHEET NO.

B-2.4

DATE: 09/02/18
REV.:

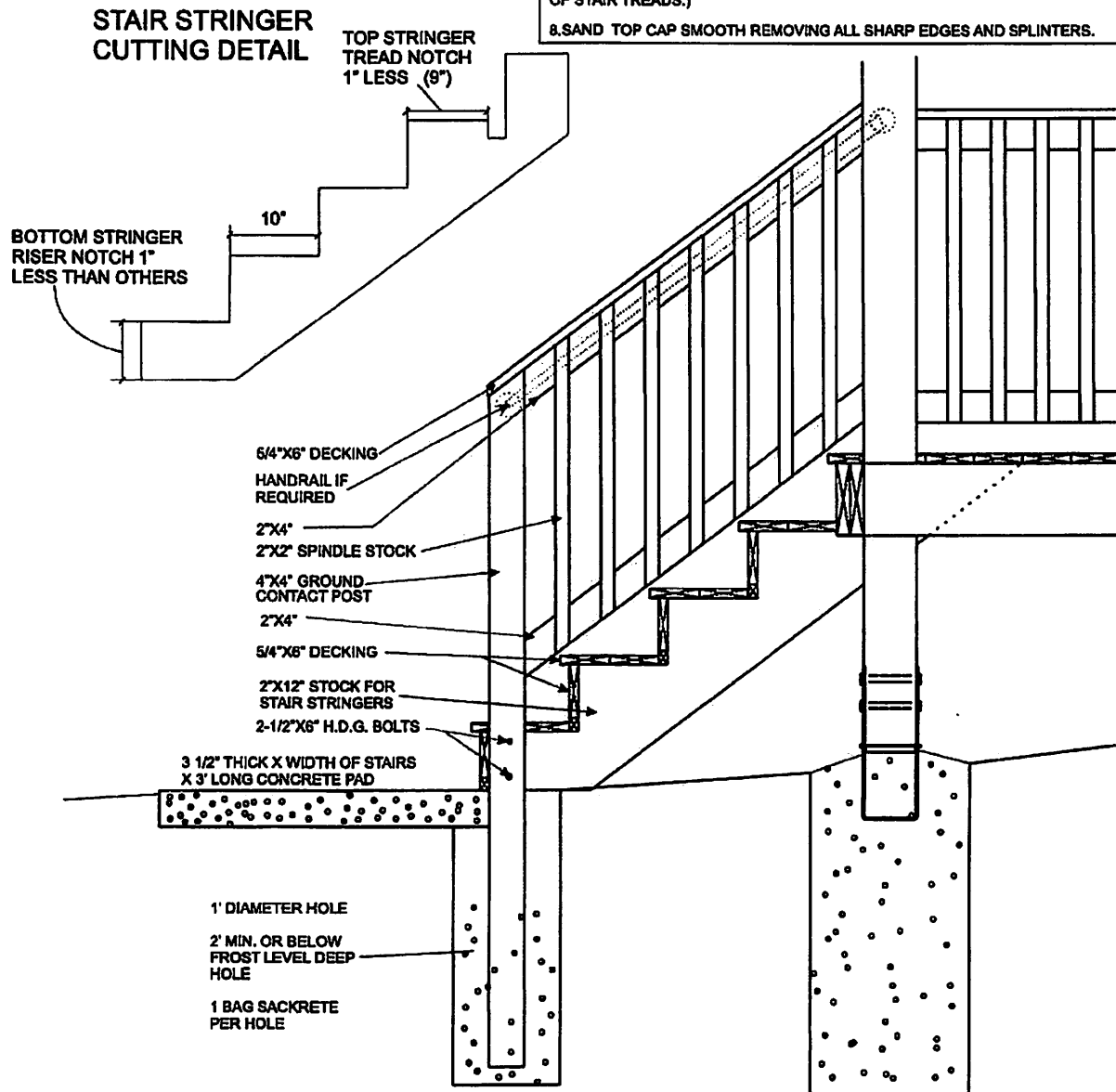
DRAWN BY: JMS
SHEET TITLE:
NAILING DETAILS



3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ.FT.

NOTES:

1. MAXIMUM STAIR RISER HEIGHT IS $7 \frac{3}{4}$ ". RISERS NOT TO VARY MORE THAN $\frac{1}{4}$ ".
2. MINIMUM STAIR TREAD DEPTH IS 10". TYPICAL IS 2'-6" DECKBOARDS (11" WIDE). 1" NOSING OVERHANG.
3. GUARD RAIL HEIGHT IS 38". (MEASURED FROM THE NOSE OF STAIR TREADS).
4. MAXIMUM GAP BETWEEN SPINDLES IS $3 \frac{7}{8}$ ". TYPICAL IS $3 \frac{1}{2}$ ".
5. MINIMUM NET CLEAR WIDTH BETWEEN GUARD RAILS IS 36". TYPICALLY MAKE TREADS 48" WIDE.
6. USE $2 \frac{1}{2}$ " DECK SCREWS TO SCREW ALL RAILING AND DECKING COMPONENTS.
7. IF STAIRS ARE MORE THAN FOUR RISERS HIGH A $1 \frac{1}{4}$ " MIN. DIAMETER HANDRAIL MUST BE INSTALLED MIN. 34" HIGH (MEASURED FROM THE NOSE OF STAIR TREADS.)
8. SAND TOP CAP SMOOTH REMOVING ALL SHARP EDGES AND SPLINTERS.



1
B-2.5

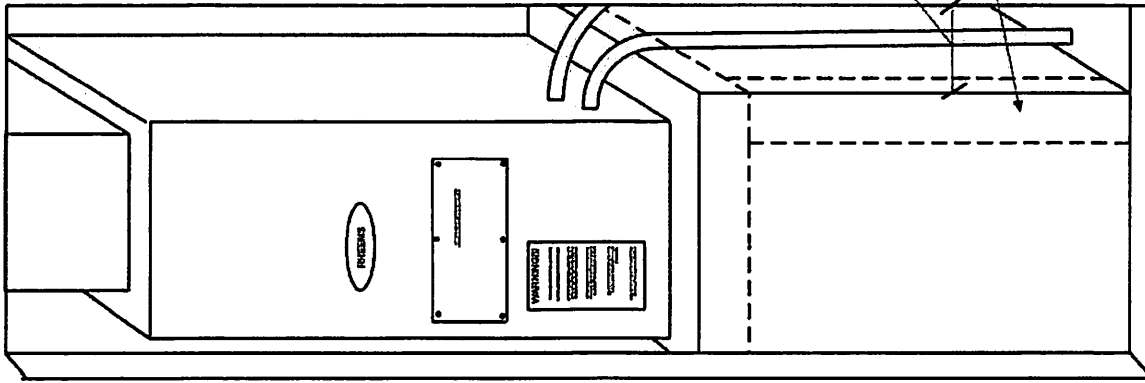
TYPICAL STAIR & RAILING DETAILS

SHEET NO.

B-2.5DATE: 09/02/18
REV.:

DRAWN BY:IMS

SHEET TITLE:
STAIR & RAILING DETAIL3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.



AIR RETURN OPENING IN HALL

6" GAP BETWEEN
WALL AND PLATFORM
FOR FREON LINES TO
PASS DOWN BELOW
SUBFLOOR

2'X4" FRAME PLATFORM
32" HIGH COVERED WITH
7/16" OSB TO SUPPORT
HVAC UNIT

5" FROM FLOOR

HVAC CLOSET DETAILS

1
B-2.6

NOTES:

1. HVAC CLOSET CEILINGS AND WALLS MUST BE SHEETROCKED AND A TAPE COAT OF SPACKLE APPLIED BEFORE PLATFORM AND HVAC UNIT GET INSTALLED.
2. 2X4 FRAME 32" HIGH COVERED WITH 7/16" OSB FOR PLATFORM. THIS MUST BE TIGHT SO RETURN AIR PULLS THROUGH FILTER IN HALL, (OR USE MANUFACTURER PROVIDED BASE INSTEAD OF PLATFORM).
3. RETURN AIR FILTER OPENING IN HALL TO BE 24"X20" TO ACCOMMODATE STANDARD FILTERS. KEEP IT OFF FLOOR 6" TO ELIMINATE DUST COLLECTION IN FILTER.
4. HVAC INSTALLER TO PROVIDE GRILL TO FIT OPENING. (NO TRIMOUT CARPENTRY NEEDED).
5. IF UNIT IS GAS IT MUST BE A DIRECT VENT UNIT.

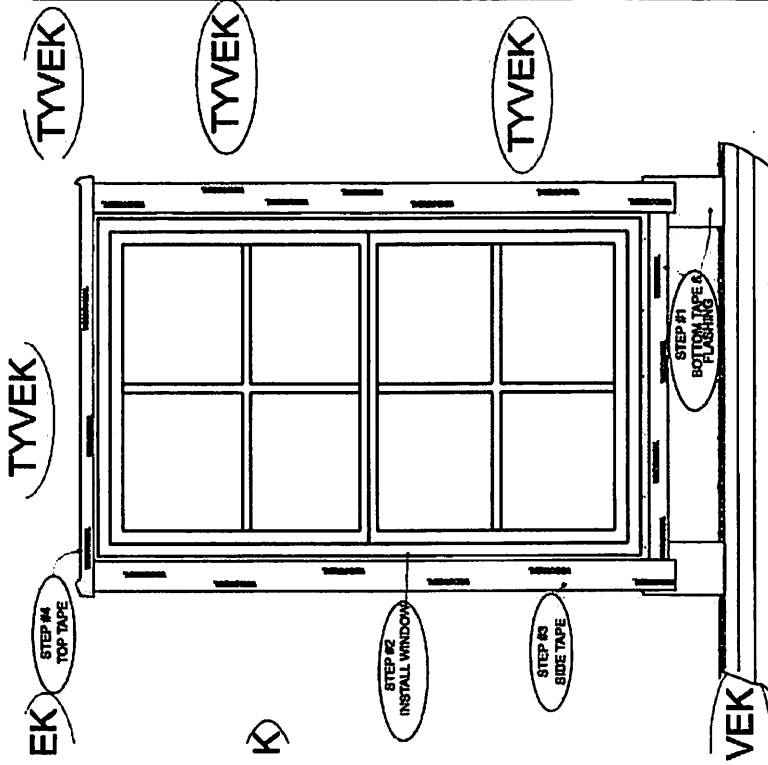
3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
28'X42' = 1092 SQ. FT.



DRAWN BY: BMS
SHEET TITLE:
HVAC CLOSET DETAILS

SHEET NO.
B-2.6
DATE: 09/02/16
REV:

SHEET NO. C-1.0	DATE: 09/02/18 REV.
	DRAWN BY: M.S. SHEET TITLE: DOOR & WINDOW FLASHING
3 - BED - 2 - BATH - HOUSE OPTION #2 STEMWALL FOUNDATION 26'X42" = 1092 SQ. FT.	

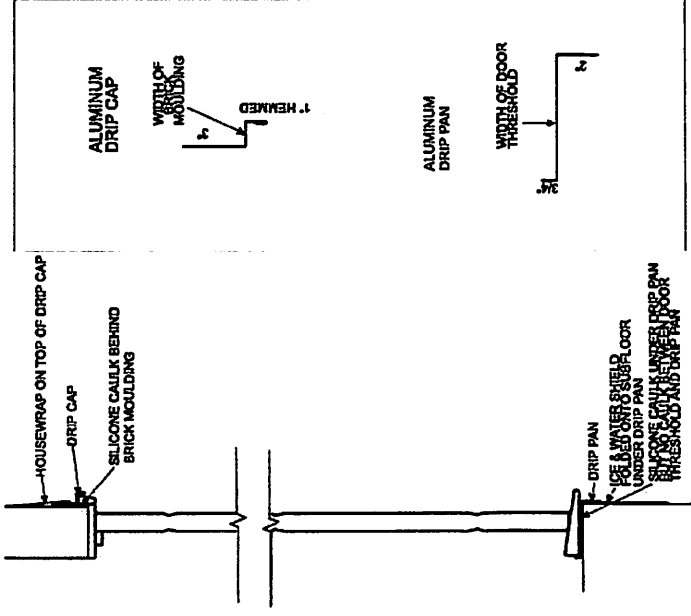


NOTES:

1. PUT A PIECE OF WINDOW TAPE ON SILL AND UP EACH SIDE 2' BEFORE INSTALLING WINDOW. (HAVE APPROXIMATELY 1 1/2" OF TAPE WITH THE REST STICKING OUT TO FOLD DOWN ON HOUSE WRAP. BEFORE FOLDING IT DOWN SLIP AN 8"X12" PIECE OF ALUMINUM IN EACH CORNER UNDER THE TAPE. IT SHOULD BE CENTERED ON THE CORNER.) THE FLASHING NEEDS TO BE CUT TO LENGTH TO DRAIN OUT ON SIDING FLANGE WHEN HANGING SIDING.
2. PUT A GOOD BEAD OF SILICONE ON TOP AND SIDE FLANGES OF WINDOW THEN INSTALL USING SIDING NAILS.
3. PUT WINDOW TAPE UP EACH SIDE OF WINDOW COVERING WINDOW FLANGE AND ONTO HOUSE WRAP.
4. PUT WINDOW TAPE ACROSS TOP FLANGE OF WINDOW AND UNDER HOUSE WRAP ONTO SHEETING THEN FOLD HOUSE WRAP DOWN ON TOP. (HOUSE WRAP MUST BE CUT AT TOP BEFORE INSTALLING WINDOW TO SLIP TAPE UNDERNEATH.)
5. USE DOOR & WINDOW FOAM TO INSULATE BETWEEN WINDOW AND STUDS.

WINDOW FLASHING DETAIL

1
C-1.0



NOTES:

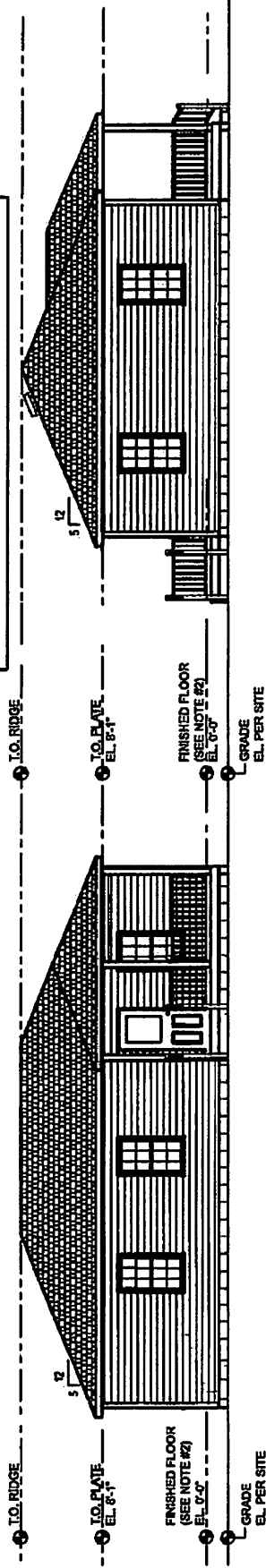
1. ANY DOOR WITHOUT A ROOF OVER IT MUST HAVE A DRIP CAP ON TOP WITH THE HOUSEWRAP ON THE OUTSIDE OF THE DRIP CAP.
2. ALL DOORS GET A DRIP PAN UNDERNEATH. PAN NEEDS TO ALSO GO UP EACH SIDE OF THE DOOR 1' SO NO WATER CAN LEAK INTO THE HOUSE. PUT A HEAVY BEAD OF SILICONE UNDER THE PAN BUT NO SILICONE BETWEEN THE DOOR AND THE PAN.
3. DRIP CAP AND PAN GET BENT OUT OF ALUMINUM FLASHING
4. PUT A GOOD BEAD OF SILICONE BEHIND THE BRICK MOULDING (TOP AND SIDES BOTH) OF THE DOOR.
5. USE DOOR & WINDOW FOAM TO INSULATE BETWEEN DOOR JAMB AND STUDS.

DOOR FLASHING DETAIL

1
C-1.0

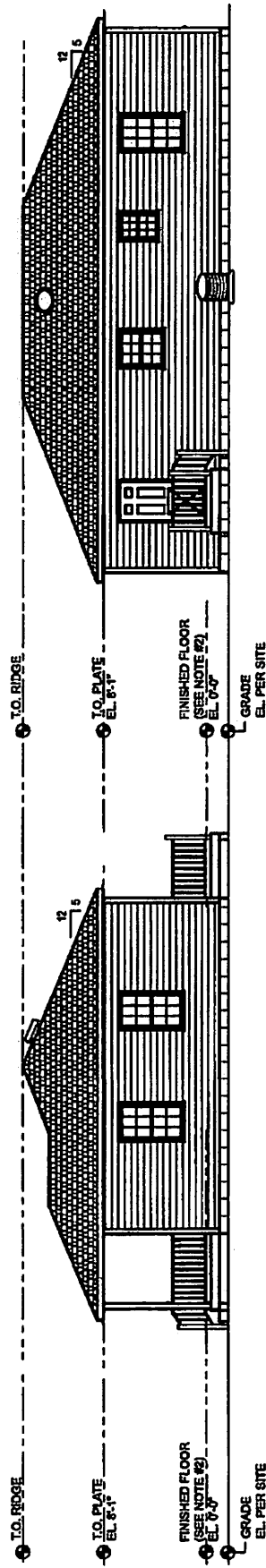
<p>3 - BED - 2 - BATH - HOUSE OPTION #2 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT.</p>		<p>DRAWN BY: JMS</p>	<p>SHEET NO. D-1.0</p>
		<p>SHEET TITLE: SIDE ELEVATIONS</p>	<p>DATE: 08/02/18 REV:</p>

NOTES:
1. REFER TO A-0.0 FOR GENERAL NOTES.
2. FINISHED FLOOR ELEVATION SET BY ELEVATION CERTIFICATE + 1'-0" (MDS RECOMMENDATION).



1 FRONT ELEVATION
D-1.0

2 SIDE ELEVATION
D-1.0



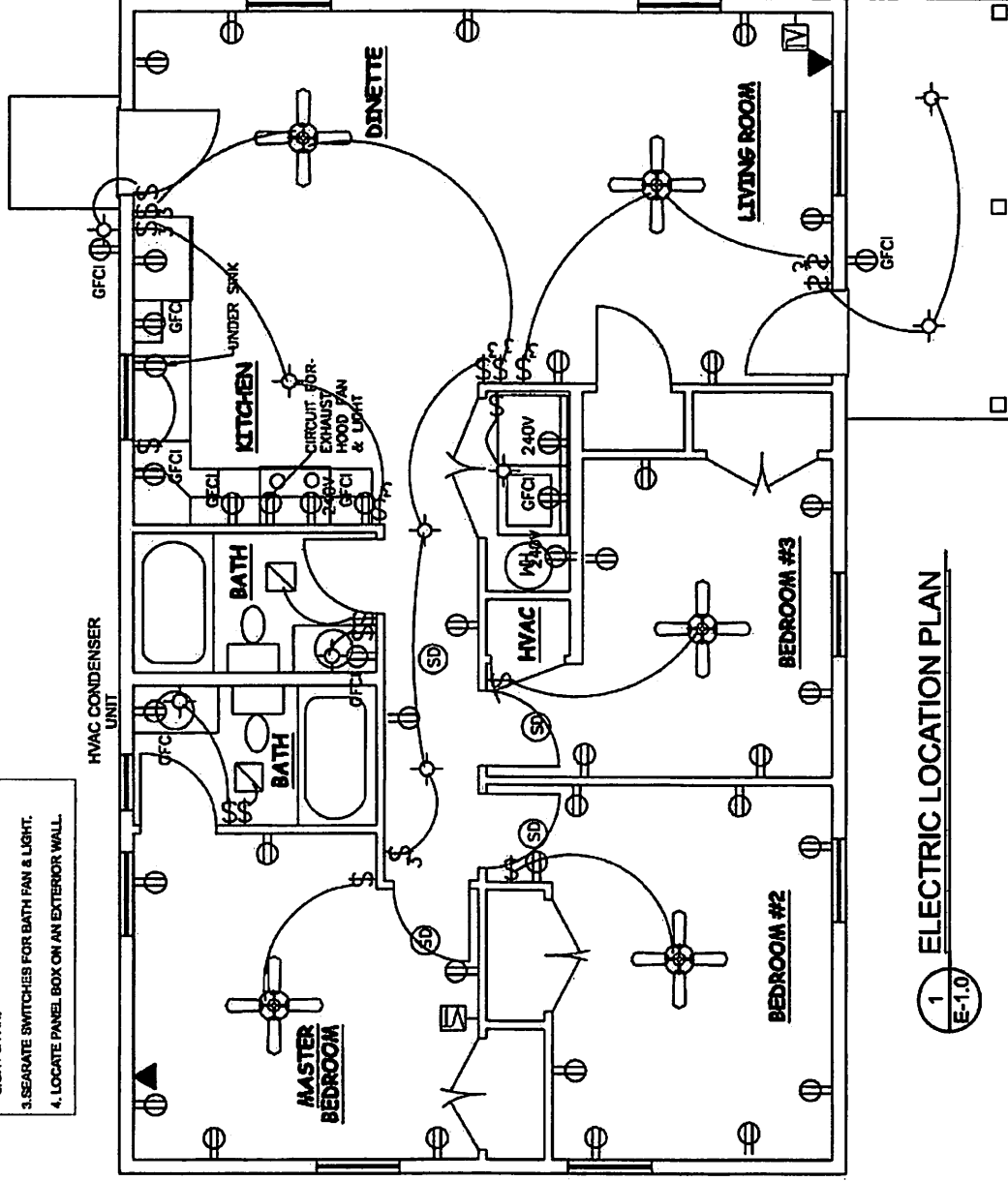
3 SIDE ELEVATION
D-1.0

4 REAR ELEVATION
D-1.0

ELECTRICAL LEGEND

\$3	THREE WAY SWITCH
\$D	DIMMER SWITCH
\$	SWITCH
⊕	LIGHT FIXTURE - SPEC BY OTHERS
GFCI	DUPLEX OUTLET - GROUND FAULT CIRCUIT INTERRUPT
⊕	DUPLEX OUTLET
⊕	CEILING FAN & LIGHT
TV	COAXIAL CABLE
▶	PHONE
SD	SMOKE DETECTOR
T	THERMOSTAT
□	BATH VENT

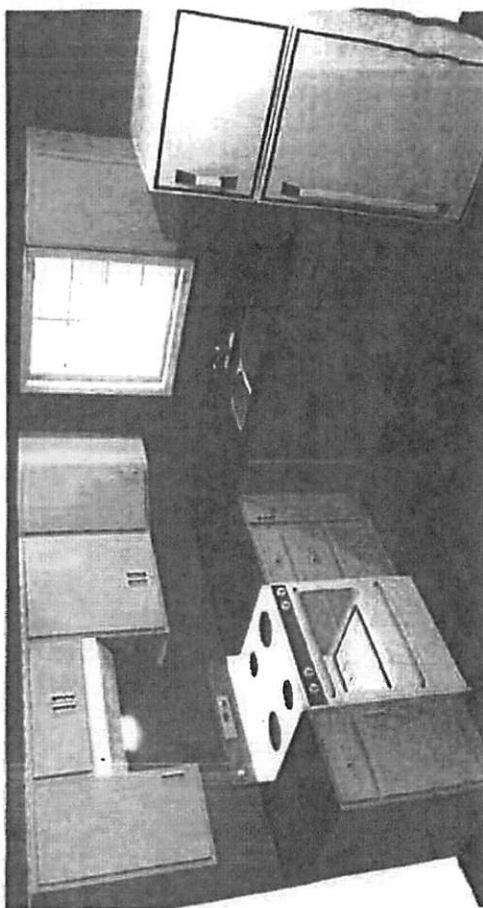
- NOTES:**
1. REFER TO A-0.0 FOR GENERAL NOTES
 2. SEPARATE SWITCHES FOR CEILING FAN LIGHT & FAN.
 3. SEPARATE SWITCHES FOR BATH FAN & LIGHT.
 4. LOCATE PANEL BOX ON AN EXTERIOR WALL.



SHEET NO. E-1.0	DATE: 08/02/18 REV:	3 - BED - 2 - BATH - HOUSE OPTION #2 STEMWALL FOUNDATION 26'X42' = 1092 SQ. FT.	
	DRAWN BY: LMS SHEET TITLE: ELECTRICAL LAYOUT		



3 - BED - 2 - BATH - HOUSE
OPTION #2
STEMWALL FOUNDATION
26'X42' = 1092 SQ. FT.



NOTES:

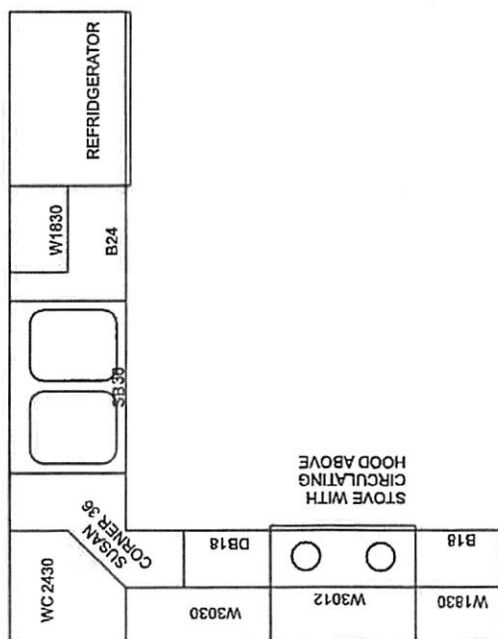
1. CABINET LIST
1-SINK BASE 36
1-SUSAN CORNER 36
1-BASE 24
1-DRAWER BASE 18
1-BASE 18

- 1-WALL CORNER 2430
1-WALL 3030
1-WALL 3012
2-WALL 1830

TOE KICK

- ## 2. COUNTERTOPS LIST

- 1-8' RIGHT MITER PREFORMED LAMINATE TOP
1-8' LEFT MITER PREFORMED LAMINATE TOP
2- ENDCAP KITS
1-MITER BOLT KIT



KITCHEN PLAN



46 28 1288

WINDOW SCHEDULE

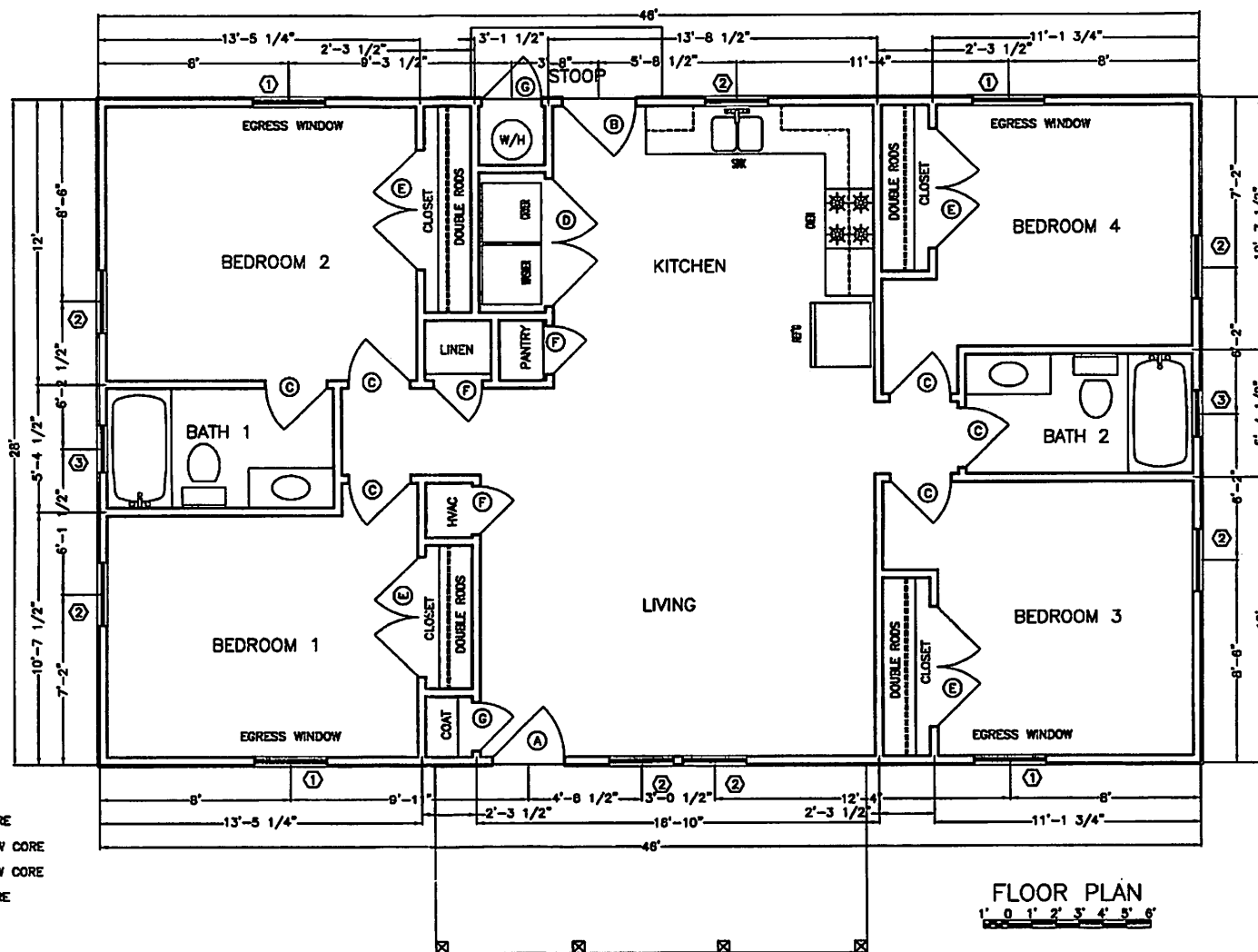
- ① 3'-0" x 4'-4" VYNAL SINGLE HUNG,
DOUBLE PANE INSULATED 1/2" AIRSPACE
- ② 2'-8" x 3'-0" VYNAL SINGLE HUNG,
DOUBLE PANE INSULATED 1/2" AIRSPACE
- ③ 2'-0" x 2'-0" VYNAL SLIDING,
DOUBLE PANE INSULATED 1/2" AIRSPACE

SQUARE FOOTAGE

AREA	SQUARE FOOTAGE
LIVING	1288
PORCH	144
STOOP	24

DOOR SCHEDULE

- (A) 3'-0" x 6'-8", STEEL DOOR UNIT, 6 PANEL
- (B) 3'-0" x 6'-8", STEEL DOOR UNIT
- (C) 2'-6" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- (D) 2 - 2'-8" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- (E) 2 - 2'-6" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- (F) 2'-0" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- (G) 2'-6" x 6'-8", STEEL DOOR UNIT

FLOOR PLAN
1' 0' 1' 2' 3' 4' 5' 6'

PLANNED BY
DIXIELAND DESIGNS
P. O. BOX 2757
COLUMBUS, MS 39704-2757
662-328-4745

ALL STATE AND LOCAL CODES SHALL TAKE PREFERENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

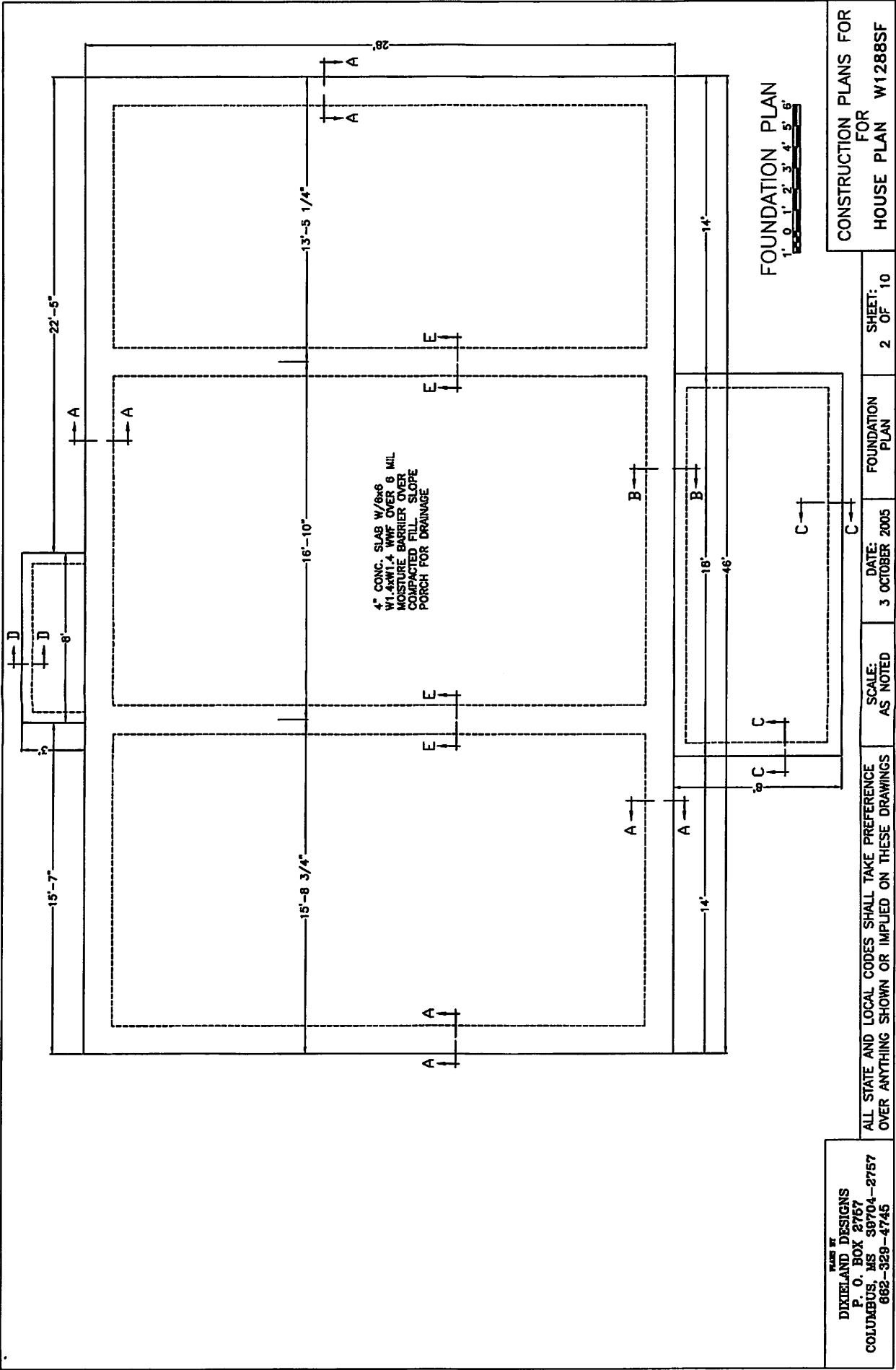
SCALE:
AS NOTED

DATE:
3 OCTOBER 2005

FLOOR
PLAN

SHEET:
1 OF 10

CONSTRUCTION PLANS FOR
FOR
HOUSE PLAN W1288SF



PLANS BY
DIXIELAND DESIGNS
P. O. BOX 2757
COLUMBUS, MS 39704-2757
662-329-4745

ALL STATE AND LOCAL CODES SHALL TAKE PREFFERENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

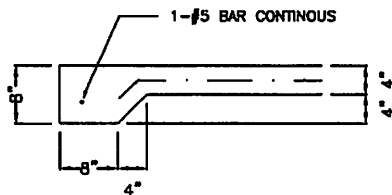
DATE:
3 OCTOBER 2005

SCALE:
AS NOTED

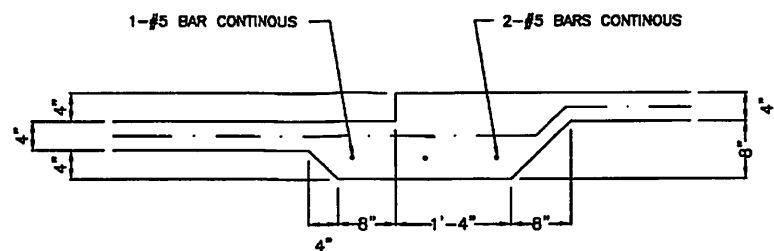
FOUNDATION
PLAN

SHEET:
2 OF 10

CONSTRUCTION PLANS FOR
FOR
HOUSE PLAN W1288SF



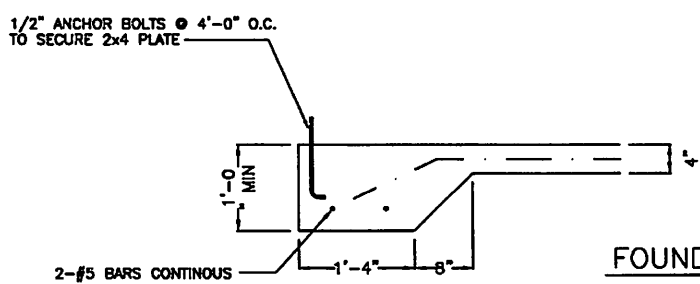
SECTION C-C



SECTION B-B

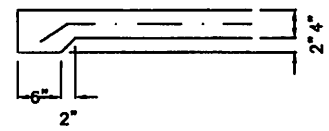
FOUNDATION NOTES:

1. FLOOR SLABS ON GRADE SHALL BE 4" THICK, REINFORCED WITH 6x6 W2.9xW2.9 AND SHALL BE PLACED ON .006 VISQUEEN ON COMPACTED EARTH OR SELECT FILL. WIRE MESH REINFORCEMENT SHALL BE LOCATED 1-1/2" BELOW TOP OF SLAB.
2. FOUNDATION SIZES AND REINFORCING STEEL SHOWN HAVE BEEN DESIGNED FOR 2,000 PSI SOIL BEARING WITHOUT ANY INFORMATION REGARDING THE SOIL.
3. ALL CAST-IN-PLACE CONCRETE FOR THE BUILDING STRUCTURE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI @ 28 DAYS.
4. IF OVER EXCAVATION OF FOOTINGS OCCUR, THE EXCAVATION SHALL BE FILLED WITH CONCRETE TO THE BOTTOM OF THE NEW FOOTING AT NO ADDITIONAL COST.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL REBARS ARE PROPERLY ALIGNED AND TIED IN PLACE BEFORE PLACING CONCRETE. ALL VERTICAL REBAR AND ANCHOR BOLTS SHALL BE ACCURATELY LOCATED AND SECURED IN PLACE SO THAT IT REMAINS IN THIS POSITION DURING CONCRETE PLACING OPERATIONS.



SECTION A-A

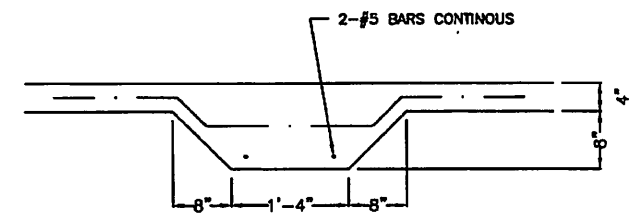
FOUNDATION SECTIONS



SECTION D-D

GENERAL NOTES:

1. CARRY ALL FOOTINGS TO FIRM UNDISTURBED BEARING. SEE FOUNDATION SECTIONS FOR SIZE.
2. FRAMING DESIGN BASED ON THE FOLLOWING LOADING CONDITIONS:
 ROOF DEAD LOADS - 15 P.S.F.
 ROOF LIVE LOAD - 30 P.S.F.
 MAXIMUM WIND SPEED - 110 M.P.H.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS.
4. CONTRACTOR SHALL COMPLY WITH THE CONTENTS OF THE SPECIFICATIONS FOR THIS HOUSE.
5. LOCAL SOIL CONDITIONS AND/OR LOCAL PRACTICE MAY NECESSITATE A MORE STRINGENT FOOTING AND FOUNDATION DESIGN. CONSULT WITH LOCAL CONTRACTOR OR BUILDING INSPECTOR. SOIL DESIGN BEARING PRESSURE IS ASSUMED 2,000 P.S.F.



SECTION E-E

PLANNED BY
 DIXIELAND DESIGNS
 P. O. BOX 2757
 COLUMBUS, MS 38704-2757
 662-329-4745

ALL STATE AND LOCAL CODES SHALL TAKE PRECEDENCE OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

SCALE:
 AS NOTED

DATE:
 3 OCTOBER 2005

FOUNDATION
 DETAILS

SHEET:
 3 OF 10

CONSTRUCTION PLANS FOR
 FOR
 HOUSE PLAN W1288SF

DIXIE LAND DESIGNS
P. O. BOX 2757
COLUMBUS, MS 38704-2757
662-328-4745

ALL STATE AND LOCAL CODES SHALL TAKE PRECEDENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

SCALE:
AS NOTED

DATE:
3 OCTOBER 2005

FLOOR
PLAN

SHEET:
1 OF 10

CONSTRUCTION PLANS FOR
HOUSE PLAN W1384SF

DOOR SCHEDULE

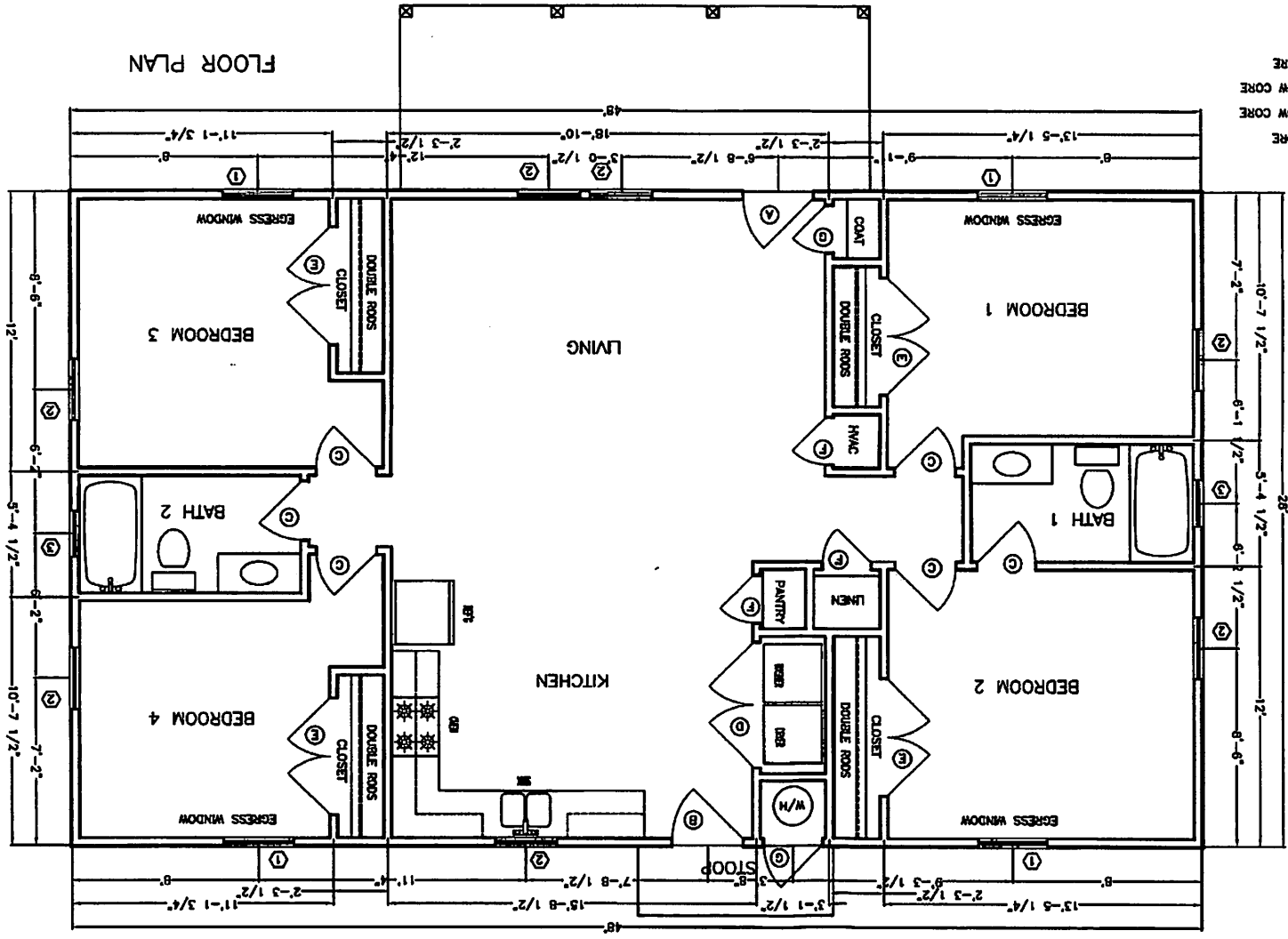
- ④ 3'-0" x 6'-8", STEEL DOOR UNIT, 6 PANEL
- ③ 3'-0" x 6'-8", STEEL DOOR UNIT
- ② 2'-6" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- ① 2'-2'-6" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- ② 2'-2'-6" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- ③ 2'-0" x 6'-8" x 1 3/8" FLUSH WOOD, HOLLOW CORE
- ④ 2'-6" x 6'-8", STEEL DOOR UNIT

AREA	SQUARE FOOTAGE
LIVING	1384
PORCH	144
STOOP	24

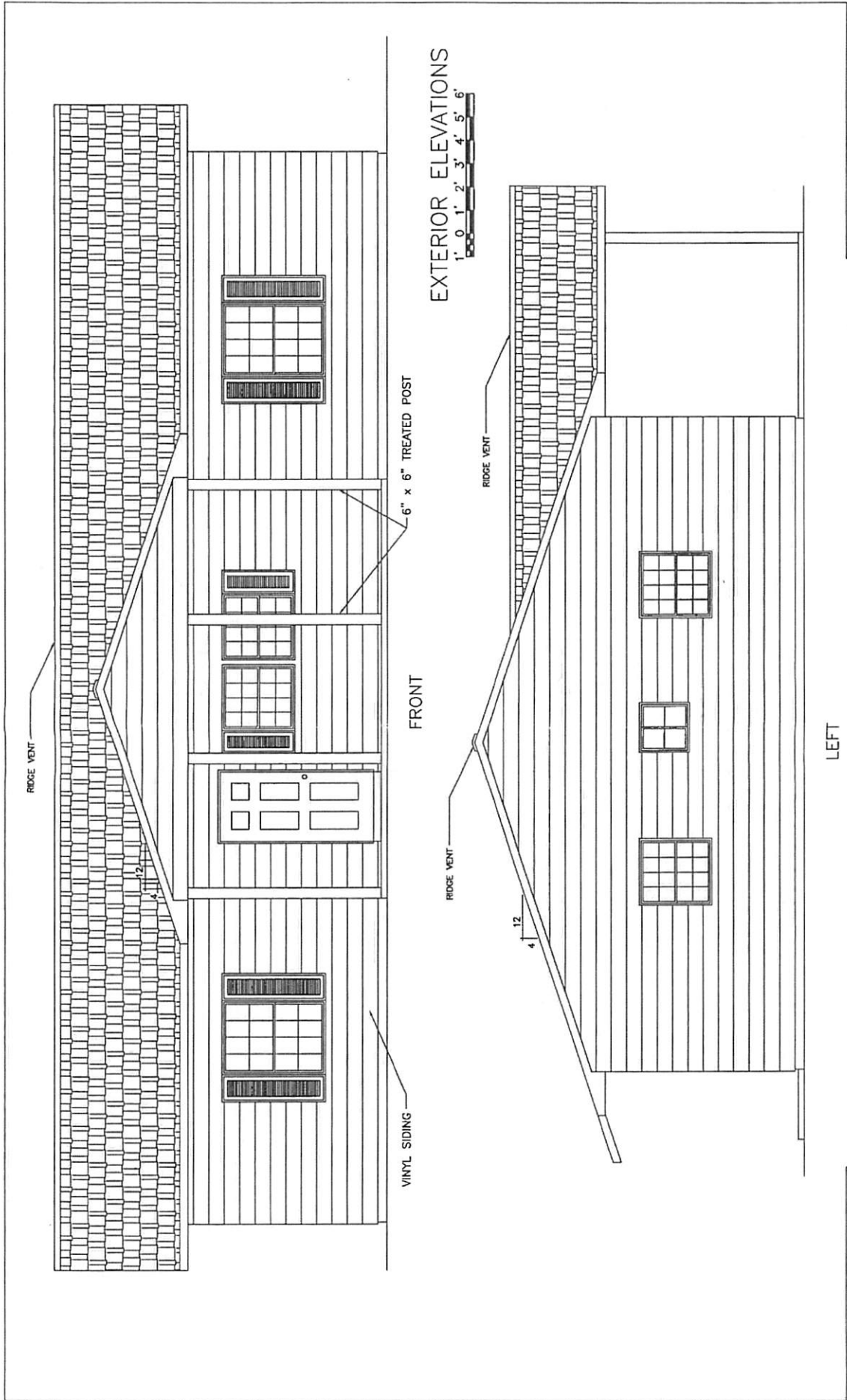
SQUARE FOOTAGE

WINDOW SCHEDULE

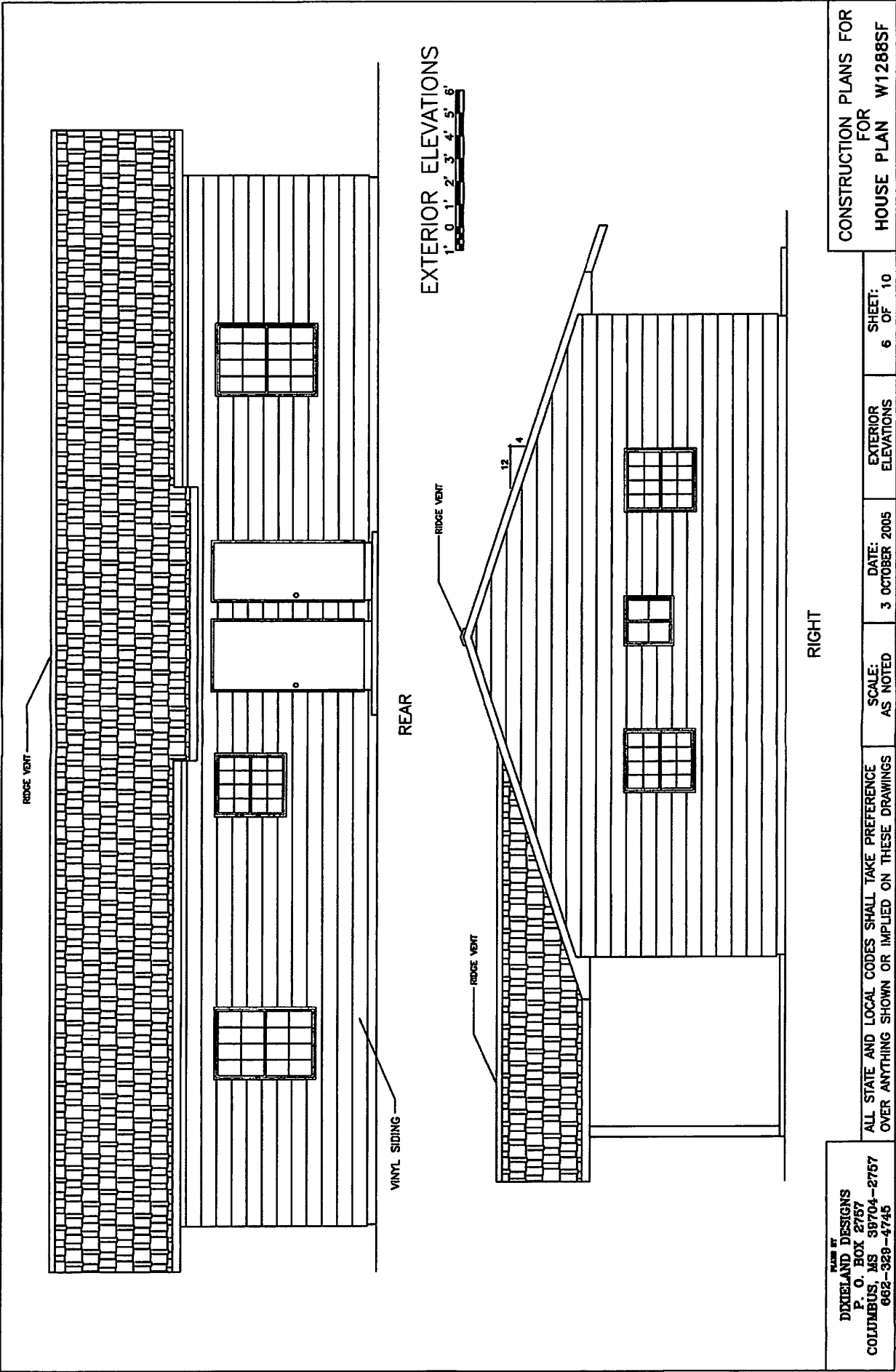
- ① 3'-0" x 4'-4" VINYL SINGLE HUNG, DOUBLE PANE INSULATED 1/2" AIRSPACE
- ② 2'-6" x 3'-0" VINYL SINGLE HUNG, DOUBLE PANE INSULATED 1/2" AIRSPACE
- ③ 2'-0" x 2'-0" VINYL SLIDING, DOUBLE PANE INSULATED 1/2" AIRSPACE

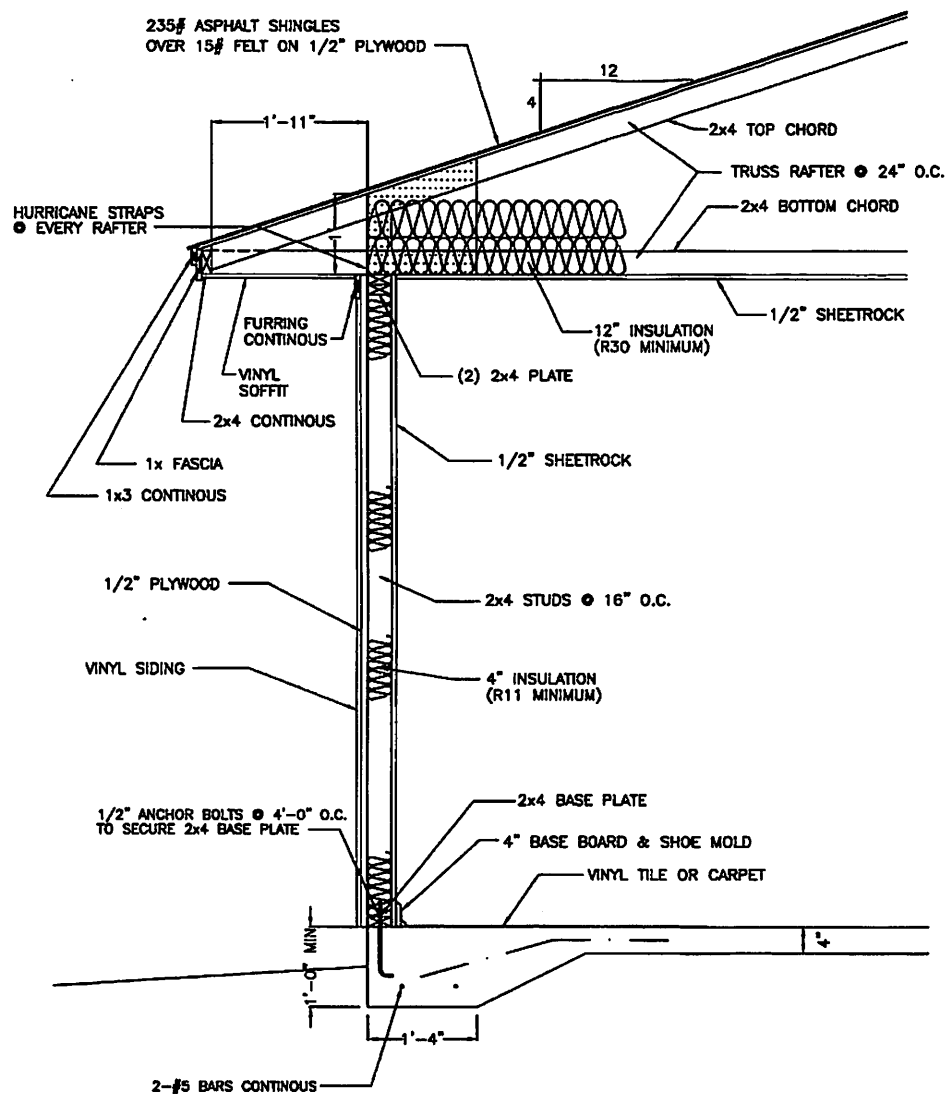


FLOOR PLAN



PLANNED BY DIXIELAND DESIGNS P. O. BOX 2757 COLUMBUS, MS 38704-2757 662-329-4745		ALL STATE AND LOCAL CODES SHALL TAKE PREFFERENCE OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS			SCALE: AS NOTED	DATE: 3 OCTOBER 2005	EXTERIOR ELEVATIONS	SHEET: 5 OF 10	CONSTRUCTION PLANS FOR FOR HOUSE PLAN W1288SF
--	--	--	--	--	--------------------	-------------------------	------------------------	-------------------	---





NOTES:

1. INSTALL HURRICANE ANCHORS @ 4' O.C. IN SLAB
2. INSTALL U-STRAP TO BASE PLATE AT 4' O.C.
3. INSTALL U-STRAP EACH SIDE OF EACH OPENING
4. INSTALL U-STRAP AT EACH CORNER
5. INSTALL HURRICANE TIES AT EACH TRUSS

TYPICAL WALL SECTION



PLANS BY
DIXIELAND DESIGNS
P. O. BOX 2757
COLUMBUS, MS 39704-2757
662-329-4745

ALL STATE AND LOCAL CODES SHALL TAKE PREFERENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

SCALE:
AS NOTED

DATE:
3 OCTOBER 2005

WALL SECTION
AND DETAILS

SHEET:
7 OF 10

CONSTRUCTION PLANS FOR
FOR
HOUSE PLAN W1288SF

DIXIELAND DESIGNS
P. O. BOX 2767
COLUMBUS, MS 39704-2767
662-328-4745

ALL STATE AND LOCAL CODES SHALL TAKE PREFFERENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

SCALE:
AS NOTED

DATE:
3 OCTOBER 2005

CANINET DETAILS
& ROOM FINISH

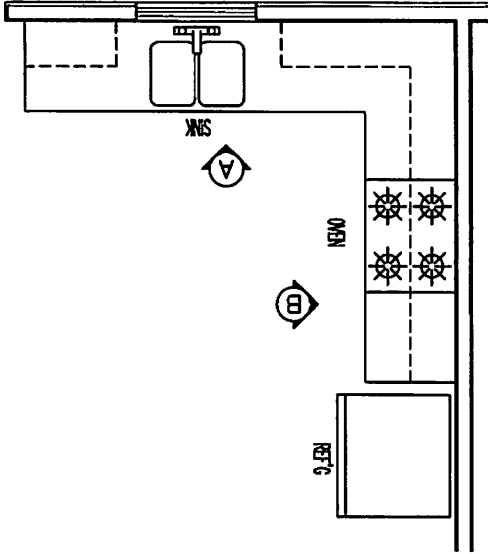
SHEET:
8 OF 10

CONSTRUCTION PLANS FOR
HOUSE PLAN W1288SF

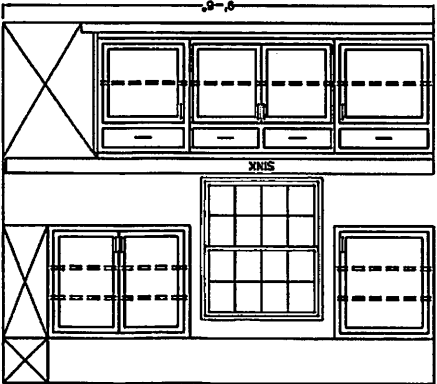
ROOM	FLOOR	BASE	WAINSCOT	WALLS	CEILING	REMARKS
STOOP	CONCRETE					
PORCH	CONCRETE			VNIL SIDING	1/2" B/C PLWD	
LIVING	VINYL	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
KITCHEN	VINYL	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
BEDROOM 1	CARPET	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
BEDROOM 2	CARPET	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
BEDROOM 3	CARPET	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
BEDROOM 4	CARPET	1x4 WOOD		1/2" GYPSUM	1/2" GYPSUM	
BATH 1	VINYL			1/2" GYPSUM*	1/2" GYPSUM*	*WATER RESISTANT
BATH 2	VINYL			1/2" GYPSUM*	1/2" GYPSUM*	*WATER RESISTANT
CLOSETS	VINYL	1x4 WOOD			1/2" GYPSUM	

ROOM FINISH SCHEDULE

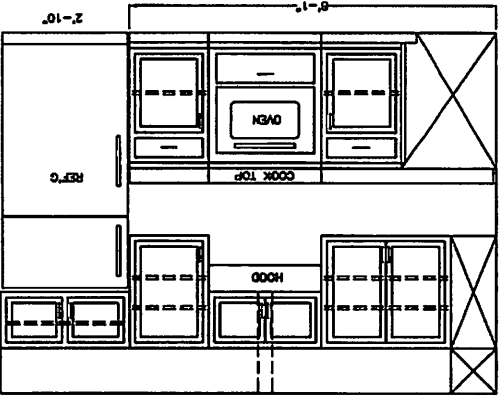
KITCHEN PLAN



ELEVATION A



ELEVATION B



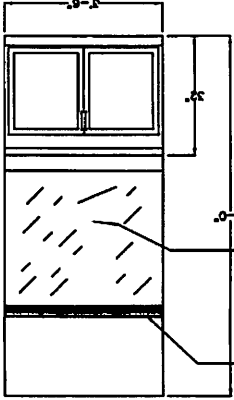
CABINET ELEVATIONS

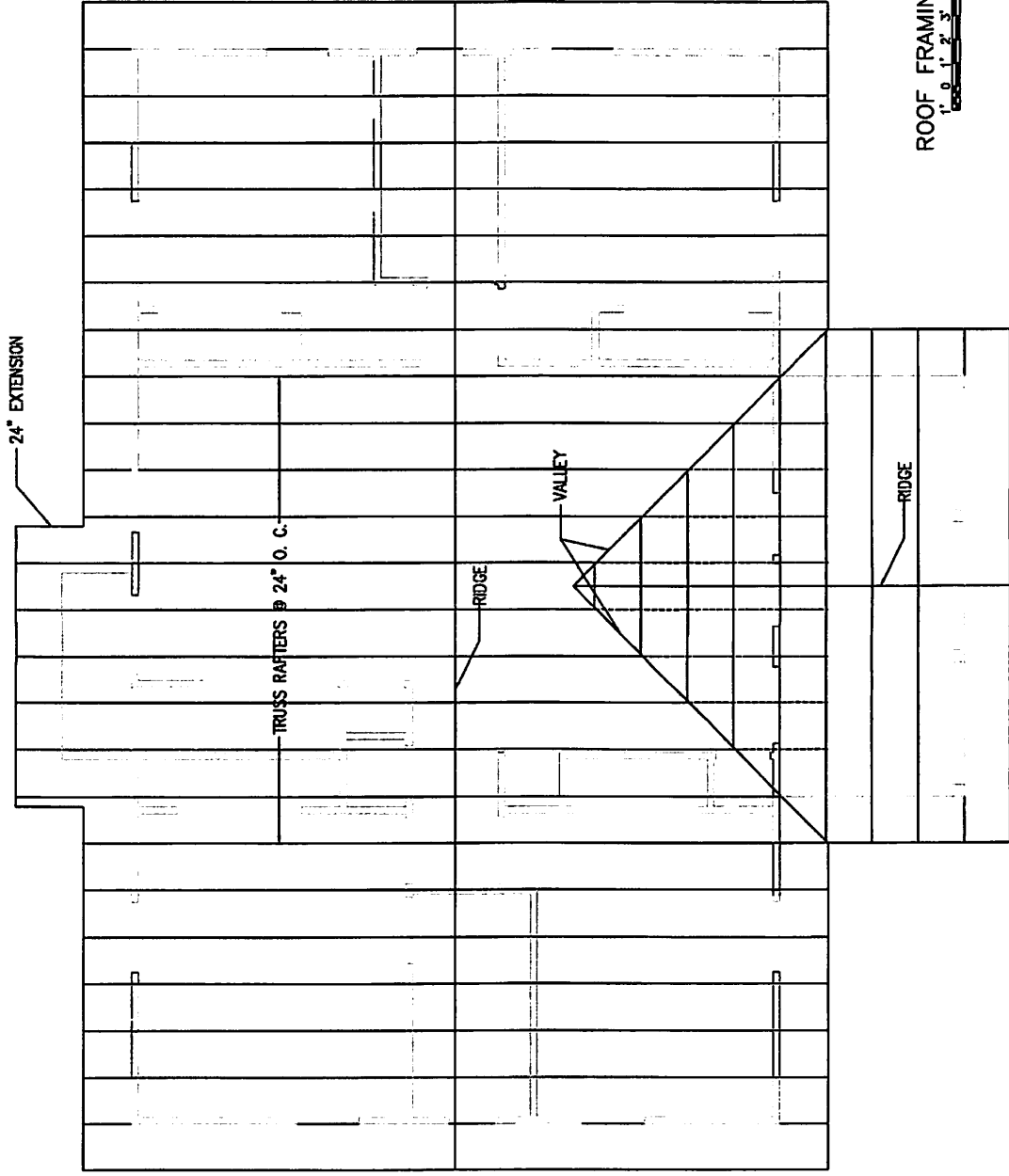


FLUORESCENT LIGHTS

MIRROR

TYPICAL VANITY





ROOF FRAMING PLAN

1" = 0' 1" 2" 3" 4" 5" 6"

DRAWN BY DIXIELAND DESIGNS P. O. BOX 2767 COLUMBUS, MS 39704-2767 662-329-4745	ALL STATE AND LOCAL CODES SHALL TAKE PREFERENCE OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS				CONSTRUCTION PLANS FOR FOR HOUSE PLAN W1288SF	
	SCALE:	DATE:	ROOF FRAMING	SHEET:		
	AS NOTED	3 OCTOBER 2005	PLAN	9 OF 10		

DIXIELAND DESIGNS
P. O. BOX 2767
COLUMBUS, MS 39704-2767
662-928-4746

ALL STATE AND LOCAL CODES SHALL TAKE PREFFERENCE
OVER ANYTHING SHOWN OR IMPLIED ON THESE DRAWINGS

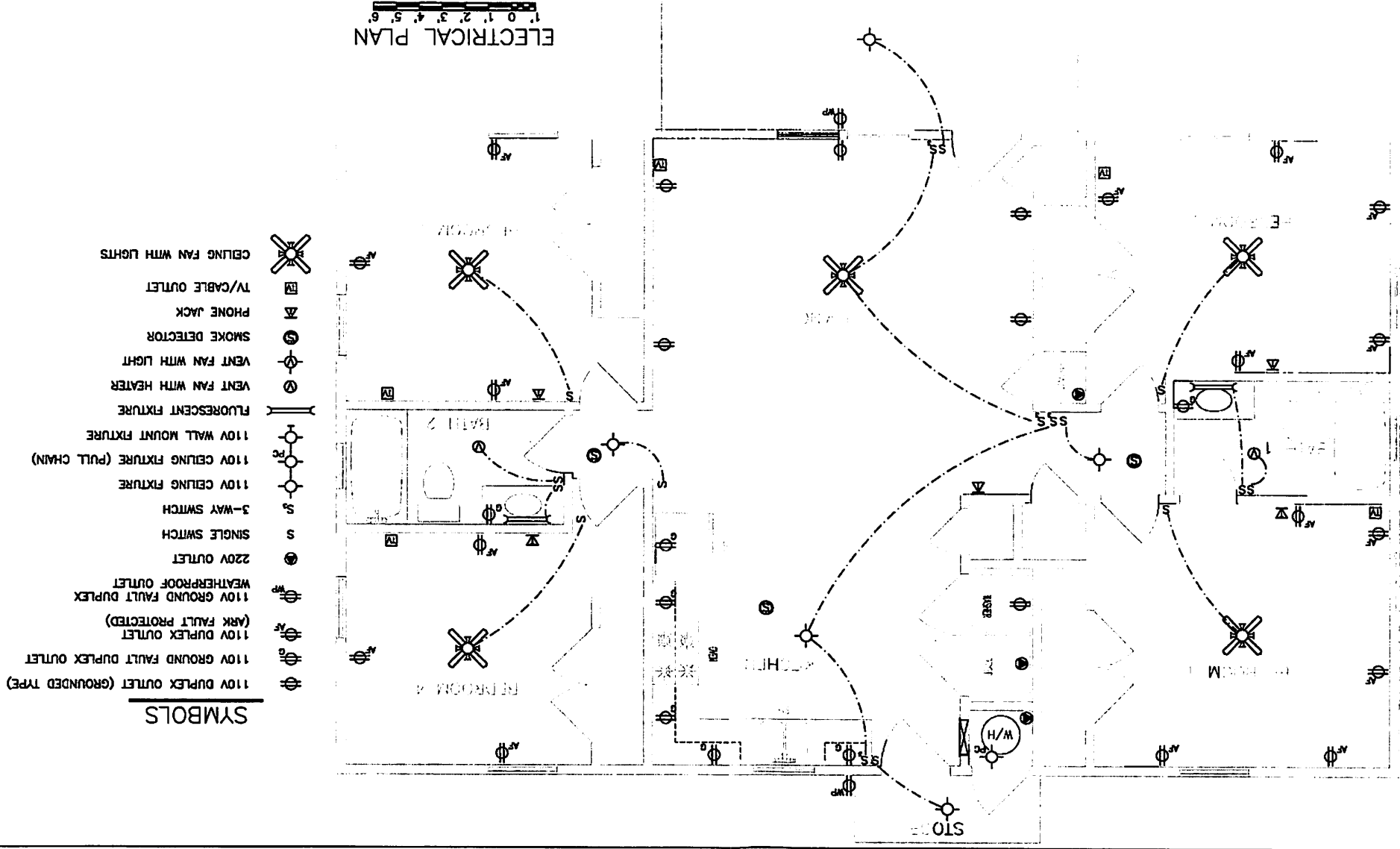
SCALE:
AS NOTED

DATE:
3 OCTOBER 2005

ELECTRICAL
PLAN

SHEET:
10 OF 10

CONSTRUCTION PLANS FOR
HOUSE PLAN W1288SF



- SYMBOLS**
- 110V DUPLEX OUTLET (GROUNDED TYPE)
 - 110V DUPLEX OUTLET (GROUND TYPE)
 - 110V DUPLEX OUTLET (ARK FAULT PROTECTED)
 - 110V GROUND FAULT DUPLEX
 - WEATHERPROOF OUTLET
 - 220V OUTLET
 - SINGLE SWITCH
 - 3-WAY SWITCH
 - 110V CEILING FIXTURE
 - 110V CEILING FIXTURE (PULL CHAIN)
 - 110V WALL MOUNT FIXTURE
 - FLUORESCENT FIXTURE
 - VENT FAN WITH HEATER
 - VENT FAN WITH LIGHT
 - SMOKE DETECTOR
 - PHONE JACK
 - TV/CABLE OUTLET
 - CEILING FAN WITH LIGHTS

PROJECT MANUAL

**Flood Recovery
House Design
For the
West Virginia Army National
Guard
Charleston, West Virginia**

July 26, 2018

Job No. 18065

**Construction
Documents**

THIS PAGE IS BLANK

Table of Contents

Division 03 – Concrete

033000	Cast-In-Place Concrete	16	07/26/18
--------	------------------------------	----	----------

Division 04 – Masonry

042200	Concrete Unit Masonry	9	07/26/18
--------	-----------------------------	---	----------

Division 05 – Metals (Not Used)

Division 06 – Wood, Plastics, and Composites

061000	Rough Carpentry	8	07/26/18
061600	Sheathing	7	07/26/18
061753	Shop-Fabricated Wood Trusses	7	07/26/18
062023	Interior Finish Carpentry	2	07/26/18
064114	Architectural Wood Cabinets	7	07/26/18

Division 07 – Thermal and Moisture Protection

072100	Thermal Insulation	5	07/26/18
072500	Weather Barriers	3	07/26/18
072601	Crawl Space Drainage System	3	07/26/18
073113	Asphalt Shingles	8	07/26/18
074646	Fiber Cement Siding	5	07/26/18
076200	Sheet Metal Flashing and Trim	11	07/26/18
077200	Roof Accessories	5	07/26/18
077253	Snow Guards	2	07/26/18
079200	Joint Sealants	11	07/26/18

Division 08 – Openings

081416	Flush Wood Doors	6	07/26/18
081613	Fiberglass Entry Doors	5	07/26/18
085413	Fiberglass Windows	7	07/26/18
087100	Door Hardware	5	07/26/18

Division 09 – Finishes

092900	Gypsum Board	6	07/26/18
096519	Resilient Floor Tile	3	07/26/18
097523	Solid Surfacing Window Stools	3	07/26/18
099123	Interior Painting	8	07/26/18

<u>Document</u>	<u>Description</u>	<u>Pages</u>	<u>Date</u>
Division 10 – Specialties			
102800	Toilet, Bath, and Laundry Accessories	2	07/26/18
Division 11 – Equipment			
113100	Residential Appliances.....	8	07/26/18
Division 12 – Furnishings			
123661.16	Solid Surfacing Countertops	5	[07/26/18]
Division 13 – 33 (Not Used)			

End Table of Contents

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following:
 - 1. Footings.
 - 2. Foundation walls.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site .
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
 - C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
 - D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
 - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
 - E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure. Location of construction joints is subject to approval of the Architect.
 - F. Samples: For vapor retarder .
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer and testing agency.
 - B. Manufacturer Certification: Copy of current certification of concrete supplier by the West Virginia Department of Transportation.
 - C. Welding certificates.
 - D. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Waterstops.
 - 6. Curing compounds.
 - 7. Bonding agents.
 - 8. Adhesives.
 - 9. Vapor retarders.
 - 10. Semirigid joint filler.
 - 11. Joint-filler strips.
 - 12. Repair materials.
 - E. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

- F. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
 - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 318-11, "Building Code Requirements for Structural Concrete," or AASHTO specifications.
- B. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- D. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as a Portland Cement Concrete Technician by the West Virginia Department of Transportation or as an ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code – Reinforcing Steel."

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
- C. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Site Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 1. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets. Coiled welded-wire reinforcement will be rejected.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 1. Portland Cement: ASTM C 150/C 150M, Type I, gray.
 2. Fly Ash: ASTM C 618, Class F or C.
 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.

- C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Coarse Aggregate: Conforming to size No. 57 as per West Virginia Division of Highways Standard Specifications For Roads And Bridges Table 703.4.
2. Coarse Aggregate for concrete pours 2 inches thick and less shall be size No. 8 washed river gravel as per West Virginia Division of Highways Standard Specifications For Roads And Bridges Table 703.4. Limestone and furnace slag are prohibited.
3. Fine Aggregate: Sand graded as follows:

Sieve Size	Percent Passing by Weight
3/8 inch (9.5 mm)	100
No. 4 (4.75 mm)	95-100
No. 16 (1.18 mm)	45-80
No. 50 (300 µm)	10-30
No. 100 (150 µm)	2-10

- a. Free of materials with deleterious reactivity to alkali in cement.

2.6 ADMIXTURES

- A. Manufacturers: Subject to compliance with requirements, provide admixture products by one of the following:
1. Euclid Chemical Co.
 2. W. R. Grace & Co., Construction Products Div.
 3. BASF, Inc.
 4. Sika Corporation.
- B. Air-Entraining Admixture: ASTM C 260/C 260M.
- C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 4. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 5. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- D. Water: ASTM C 94/C 94M and potable.
- E. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

2.7 CURING MATERIALS

- A. Evaporation Retarder (for hot, dry, or windy conditions; not a substitute for curing): Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Corporation-Construction Systems; Confilm.
 - b. Euclid Chemical Company (The); an RPM company; Eucobar.
 - c. L&M Construction Chemicals, Inc; E-CON.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Water: Potable.

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.9 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Slag Cement: 50 percent.
 4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 5. Silica Fume: 10 percent.
 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Bond Beams, Block Fill: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.55.
 3. Slump Limit: 4 inches or, 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
- B. Footings, Grade Beams: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
- C. Exterior concrete: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 2. Class C, 1/2 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 1. Install keyways, reglets, recesses, and the like, for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- G. Chamfer exterior corners and edges of permanently exposed concrete.

- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of formed concrete and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 48 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.3 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
 - 1. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 2. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- E. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 1. Apply to concrete surfaces not exposed to public view .
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 1. Apply to concrete surfaces exposed to public view, or to be covered with a coating or covering material applied directly to concrete .
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.
- D. Cementitious Patching Material – Apply to formed concrete surfaces where indicated on Drawings, and as per material patching manufacturer's recommendations.
 1. Finish: Manufacturer's Smooth Grade.

3.7 MISCELLANEOUS CONCRETE ITEM INSTALLATION

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

3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing

operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. **Formed Surfaces:** Cure formed concrete surfaces, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. **Unformed Surfaces:** Begin curing immediately after finishing concrete. Cure unformed surfaces, and other surfaces.
- E. **Cure concrete according to ACI 308.1, by one or a combination of the following methods:**
 - 1. **Moisture Curing:** Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. **Moisture-Retaining-Cover Curing:** Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

3.9 JOINT FILLING

- A. **Prepare, clean, and install joint filler according to manufacturer's written instructions.**
 - 1. **Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.**
- B. **Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.**
- C. **Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.**

3.10 CONCRETE SURFACE REPAIRS

- A. **Defective Concrete:** Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. **Patching Mortar:** Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. **Repairing Formed Surfaces:** Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. **Repairing Unformed Surfaces:** Test unformed surfaces, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 - 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 - 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.

- a. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change. Samples shall be obtained after final adjustments to mix are made including any addition of water at Project site.
 - 3. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

- b. When cold-weather placement procedures are implemented: Cast and field cure one sets of four standard cylinder specimens for each composite sample.
- 6. Compressive-Strength Tests: ASTM C 39/C 39M;
 - a. Test one laboratory-cured specimen at 7 days and one set of two specimens at 28 days and hold one specimen in reserve for additional tests if required.
 - b. Test one field-cured specimen at 7 days and one set of two specimens at 28 days and hold one specimen in reserve for additional tests if required.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
- 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- 9. All test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- 11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
- 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.12 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Steel reinforcing bars.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product. For masonry units, include data on material properties .
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
 - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.6 FIELD CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa) .
 - 2. Density Classification: Normal weight.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Cemex S.A.B. de C.V.
- b. Essroc.
- c. Holcim (US) Inc.

E. Mortar Cement: ASTM C 1329.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Continental Building Products, LLC.

F. Aggregate for Mortar: ASTM C 144.

1. White-Mortar Aggregates: Natural white sand or crushed white stone.
2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Aggregate for Grout: ASTM C 404.

H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

I. Water: Potable.

2.4 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Exterior Walls: Hot-dip galvanized carbon or Stainless steel.
2. Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.
3. Wire Size for Cross Rods: 0.187-inch (4.76-mm) diameter.
4. Spacing of Cross Rods: Not more than 16 inches (407 mm) o.c.

2.5 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated.
1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M .

2.6 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
1. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
 2. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
 3. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
- B. Flexible Flashing: Use one of the following unless otherwise indicated:
1. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spun-bonded polyolefin to produce an overall thickness of not less than 0.040 inch (1.02 mm).
 2. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
- C. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.
- D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use portland cement-lime or masonry cement mortar unless otherwise indicated.
 - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Portland Cement: ASTM C 150/C 150M, Type I, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Masonry Cement: ASTM C 91/C 91M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cemex S.A.B. de C.V.
 - b. Essroc.
 - c. Holcim (US) Inc.
- F. Mortar Cement: ASTM C 1329.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Continental Building Products, LLC.
- G. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- H. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For masonry below grade or in contact with earth, use Type S.
 - 2. For reinforced masonry, use Type S.
 - 3. For mortar parge coats, use Type S or Type N.
 - 4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type S.

I. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.2 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in one-half running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
 - 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

3.6 FLASHING

- A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape.
 - 2. At lintels, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
 - 3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
 - 4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

3.7 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

3.8 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 - 2. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.9 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

THIS PAGE IS BLANK

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Wood blocking and nailers.
3. Plywood wall and backing panels.

B. Related Requirements:

1. Section 061753 "Shop-Fabricated Wood Trusses" for wood trusses made from dimension lumber.
2. Section 061600 "Sheathing".
3. Section 313116 "Termite Control" for site application of borate treatment to wood framing.

1.3 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. RIS: Redwood Inspection Service.
 4. SPIB: The Southern Pine Inspection Bureau.
 5. WCLIB: West Coast Lumber Inspection Bureau.
 6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, blocking, and similar concealed members in contact with masonry or concrete.
 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawl spaces or unexcavated areas.
 5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

- A. Load-Bearing and Non-Load-Bearing framing including wood joists, rafters, soffit framing, and wall studs: Construction or No. 2 grade, and any of the following species:
1. Hem-fir (north); NLGA.
 2. Mixed southern pine; SPIB.
 3. Spruce-pine-fir; NLGA.
 4. Hem-fir; WCLIB or WWP A.
 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWP A.
 6. Northern species; NLGA.

7. Eastern softwoods; NeLMA.
 8. Western woods; WCLIB or WWPA.
- B. All framing is to possess minimum yield strength and other structural properties as indicated on Drawings.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Cants.
 5. Furring.
 6. Grounds.
 7. Utility shelving.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
1. Hem-fir (north); NLGA.
 2. Mixed southern pine; SPIB.
 3. Spruce-pine-fir; NLGA.
 4. Hem-fir; WCLIB or WWPA.
 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
 6. Western woods; WCLIB or WWPA.
 7. Northern species; NLGA.
 8. Eastern softwoods; NeLMA.
- C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:
1. Mixed southern pine, No. 2 grade; SPIB.
 2. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
 3. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
 4. Eastern softwoods, No. 2 Common grade; NeLMA.
 5. Northern species, No. 2 Common grade; NLGA.
 6. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Plywood: DOC PS 1 Exposure 1, C-D Plugged.
- C. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- D. Factory mark panels to indicate compliance with applicable standard.
- E. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- F. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- G. Application: Treat all plywood unless otherwise indicated.
- H. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.
 - 1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For rough carpentry exposed to weather, in ground contact, for pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.

- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.7 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cleveland Steel Specialty Co.
 - 2. Simpson Strong-Tie Co., Inc.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
 - 1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.
- E. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches (57 mm) wide by 0.062 inch (1.6 mm) thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.
- F. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.

1. Bolt Diameter: 3/4 inch (19 mm).
 2. Width: 2-1/2 inches (64 mm) .
 3. Body Thickness: 0.138 inch (3.5 mm).
 4. Base Reinforcement Thickness: 0.239 inch (6.1 mm).
- G. Wall Bracing: T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches (29 mm) wide by 9/16 inch (14 mm) deep by 0.034 inch (0.85 mm) thick with hemmed edges.
- H. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch (24 by 24 by 1 mm) thick with hemmed edges.

2.8 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
- E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
 - I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
 - J. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
 - K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. NES NER-272 for power-driven fasteners.
 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- 3.2 PROTECTION
- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
 - B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Subflooring.
4. Underlayment.
5. Sheathing joint and penetration treatment.

- B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.
2. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review air-barrier and water-resistant glass-mat gypsum sheathing requirements and installation, special details, transitions, mockups, air-leakage testing, protection, and work scheduling that covers air-barrier and water-resistant glass-mat gypsum sheathing.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 1. For air-barrier and water-resistant glass-mat gypsum sheathing, include manufacturer's technical data and tested physical and performance properties of products.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer including list of ABAA-certified installers and supervisors employed by Installer, who work on Project and testing and inspecting agency.

- B. Product Certificates: From air-barrier and water-resistant glass-mat gypsum sheathing manufacturer, certifying compatibility of sheathing accessory materials with Project materials that connect to or that come in contact with the sheathing.
- C. Product Test Reports: For each air-barrier and water-resistant glass-mat gypsum sheathing assembly, indicating compliance with specified requirements, for tests performed by a qualified testing agency.
- D. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preserved-treated plywood.
 - 2. Fire-retardant-treated plywood.
 - 3. Foam-plastic sheathing.
 - 4. Air-barrier and water-resistant glass-mat gypsum sheathing.
- E. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of air-barrier and water-resistant glass-mat gypsum sheathing.
 - 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
- B. Mockups: Build mockups to set quality standards for materials and execution.
 - 1. Build integrated mockups of exterior wall assembly, 150 sq. ft. (14 sq. m), incorporating backup wall construction, window, storefront, door frame and sill, ties and other penetrations, and flashing to demonstrate crack and joint treatment and sealing of gaps, terminations, and penetrations of air-barrier sheathing assembly.
 - a. Coordinate construction of mockups to permit inspection and testing of sheathing before external insulation and cladding are installed.
 - b. Include junction with roofing building corner condition, and foundation wall intersection.
 - c. If Architect determines mockups do not comply with requirements, reconstruct mockups until mockups are approved.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Testing Agency Qualifications:
 - 1. For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

2. For testing and inspecting agency providing tests and inspections related to air-barrier and water-resistant glass-mat gypsum sheathing: an independent agency, qualified according to ASTM E329 for testing indicated, and certified by Air Barrier Association of America, Inc.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on field mockups.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.4 WALL SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exterior, Structural I sheathing.
1. Span Rating: Not less than 32/16.
 2. Nominal Thickness: Not less than ¾ inch.
- B. Cementitious Backer Units: ASTM C1325, Type A.
1. Provide products by one of the following:
 - a. USG Corporation.
 - b. Custom Building Products.
 - c. FinPan, Inc.
 2. Thickness: 5/8 inch (15.9 mm).
- C. POLYISOCYANURATE FOAM-PLASTIC BOARD
1. Polyisocyanurate Board, Foil Faced: ASTM C 1289, foil faced, Type I, Class 1 or 2.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Dow Chemical Company.
 - b. Rmax, Inc.
 - c. Hunter Panels
 3. Properties as follows:
 - a. Stabilized 'R' Value (LTTR) per inch ASTM C518: 6.5
 - b. Compressive Strength - ASTM D1621: 25 psi min.
 - c. Flexural Strength – ASTM C203: 55 psi min.
 - d. Dimensional Stability – ASTM D2126: 0.1 % linear change, max.
 - e. Water Absorption – ASTM C209: 0.1 % by volume, max.
 - f. Water Vapor Permeance – ASTM E96: <0.05 perms, max.
 - g. Maximum Use Temperature: 250° F
 - h. Surface Burning Characteristics ASTM E84:
 - 1) Flame Spread: 25
 - 2) Smoke Development <450
 4. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.5 ROOF SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exterior, Structural I sheathing.
1. Span Rating: Not less than 32/16.
 2. Nominal Thickness: Not less than ¾ inch.

2.6 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Subflooring: Either DOC PS 1 or DOC PS 2, Exposure 1, Structural I single-floor panels or sheathing.
 - 1. Span Rating: Not less than 32/16.
 - 2. Nominal Thickness: Not less than $\frac{3}{4}$ inch.
- B. Underlayment: Provide underlayment in nominal thicknesses indicated or, if not indicated, not less than 1/4 inch (6.4 mm) over smooth subfloors and not less than 3/8 inch (9.5 mm) over board or uneven subfloors.
 - 1. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exposure 1 Underlayment $\frac{1}{4}$ inch with fully sanded face.
 - 2. Plywood Underlayment for Ceramic Tile: DOC PS 1, Interior, Underlayment, not less than 1/4-inch (15.9-mm) nominal thickness.
 - 3. Plywood Underlayment for Carpet: DOC PS 1, Interior, Underlayment.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

2.8 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. ICC-ES evaluation report for fastener.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Subflooring:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch (3 mm) apart at edges and ends.
 - 2. Wall and Roof Sheathing:
 - a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
 - b. Space panels 1/8 inch (3 mm) apart at edges and ends.
 - 3. Underlayment:
 - a. Nail or staple to subflooring.
 - b. Space panels 1/32 inch (0.8 mm) apart at edges and ends.
 - c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

3.3 CEMENTITIOUS BACKER UNIT INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 FOAM-PLASTIC SHEATHING INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.
- C. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing and Inspecting Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

THIS PAGE IS BLANK

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Wood roof trusses.
2. Wood truss bracing.
3. Metal truss accessories.

- B. Related Requirements:

1. Section 061600 "Sheathing" for roof sheathing and subflooring.

1.3 DEFINITIONS

- A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
6. Show splice details and bearing details.

- B. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For metal connector-plate manufacturer, professional engineer, and fabricator.
- B. Material Certificates: For dimension lumber specified to comply with minimum specific gravity. Indicate species and grade selected for each use and specific gravity.
- C. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.
- D. Evaluation Reports: For the following, from ICC-ES:
 - 1. Metal-plate connectors.
 - 2. Metal truss accessories.

1.6 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of the Truss Plate Institute (TPI) and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
 - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction .
- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations in TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
 - 1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
 - 2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
 - 3. Provide for air circulation around stacks and under coverings.
- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses.
- B. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
 - 1. Design Loads: As indicated.
 - 2. Maximum Deflection Under Design Loads:
 - a. Roof Trusses: Vertical deflection of $1/240$ of span.
- C. Comply with applicable requirements and recommendations of the following publications:
 - 1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
 - 2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
 - 3. TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
- D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

2.2 DIMENSION LUMBER

- A. Certified Wood: For metal-plate-connected wood trusses and permanent bracing, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. Provide dressed lumber, S4S.
 - 4. Provide dry lumber with 15 percent maximum moisture content at time of dressing.
- C. Truss chord size as per truss manufacturing engineering analysis and requirements.
- D. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 "Rough Carpentry."

2.3 METAL CONNECTOR PLATES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Alpine Engineered Products, Inc.; a division of ITW Building Components Group, Inc.
 2. Eagle Metal Products.
 3. Jager Building Systems, Inc.
 4. Robbins Engineering, Inc.
 5. Truswal Systems Corporation.
- B. Source Limitations: Obtain metal connector plates from single manufacturer.
- C. General: Fabricate connector plates to comply with TPI 1.
- D. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 (Z180) coating designation; and not less than 0.036 inch (0.9 mm) thick.
1. Use for interior locations unless otherwise indicated.
- E. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
1. Use for wood-preservative-treated lumber and where indicated.
- F. Stainless-Steel Sheet: ASTM A 666, Type 316, and not less than 0.035 inch (0.88 mm) thick.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
 2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cleveland Steel Specialty Co.
 2. KC Metals Products, Inc.
 3. Simpson Strong-Tie Co., Inc.

- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
 - 1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.
- E. Stainless-Steel Sheet: ASTM A 666, Type 316.
 - 1. Use for exterior locations and where indicated.
- F. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below, 1-1/2 inches (38 mm) wide by 0.050 inch (1.3 mm) thick. Tie fastens to one side of truss, top plates, and side of stud below.
- G. Roof Truss Clips: Angle clips for bracing bottom chord of roof trusses at non-load-bearing walls, 1-1/4 inches (32 mm) wide by 0.050 inch (1.3 mm) thick. Clip is fastened to truss through slotted holes to allow for truss deflection.
- H. Roof Truss Bracing/Spacers: U-shaped channels, 1-1/2 inches (38 mm) wide by 1 inch (25 mm) deep by 0.040 inch (1.0 mm) thick, made to fit between two adjacent trusses and accurately space them apart, and with tabs having metal teeth for fastening to trusses.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.

2.7 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

2.8 SOURCE QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections.
 1. Provide special inspector with access to fabricator's documentation of detailed fabrication and quality-control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.
 2. Provide special inspector with access to places where wood trusses are being fabricated to perform inspections.
- B. Correct deficiencies in Work that special inspections indicate does not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.
- G. Anchor trusses securely at bearing points; use metal truss tie-downs as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
 1. Anchor trusses to girder trusses as indicated.
- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
 1. Install bracing to comply with Section 061000 "Rough Carpentry."

2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

J. Install wood trusses within installation tolerances in TPI 1.

K. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

L. Replace wood trusses that are damaged or do not meet requirements.

1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

3.2 REPAIRS AND PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

C. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

D. Protective Coating: Clean and prepare exposed surfaces of metal connector plates. Brush apply primer, when part of coating system, and one coat of protective coating.

1. Apply materials to provide minimum dry film thickness recommended by coating system manufacturer.

END OF SECTION

THIS PAGE IS BLANK

SECTION 062023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior base molding.

1.3 ACTION SUBMITTALS

- A. Samples: For base molding.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Hardboard: ANSI A135.4.

2.2 INTERIOR TRIM

- A. Moldings for Opaque Finish (Painted Finish): Made to patterns included in MMPA's "WM/Series Wood Moulding Patterns."
 - 1. Hardwood Moldings: MMPA HWM 4, P-grade.
 - a. Species: Red Oak - Plain Sawn.
 - b. Maximum Moisture Content: 9 percent.
- B. Molding Patterns:
 - 1. Base Pattern: WM 753, 9/16-by-3-1/4-inch beaded-edge base.

2.3 SHELVING AND CLOTHES RODS

- A. Closet and Utility Shelving: Rubbermaid FreeSlide 12 inch wide White Wire Shelf.

1. Width as required.
- B. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.2 INSTALLATION, GENERAL

- A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.

3.3 RUNNING BASE TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.4 SHELVING AND CLOTHES ROD INSTALLATION

- A. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners not more than 16 inches (400 mm) o.c.
- B. Install shelf brackets according to manufacturer's written instructions, spaced not more than 32 inches (800 mm) o.c. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

END OF SECTION

SECTION 064114 – ARCHITECTURAL WOOD CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Architectural wood cabinets.
 - 2. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets unless concealed within other construction before cabinet installation.
 - 3. Shop finishing of architectural wood cabinets.

- B. Related Requirements:

- 1. Section 123661.16 “Solid Surfacing Countertops”.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including panel products cabinet hardware and accessories and finishing materials and processes.

- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

- 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural wood cabinets.
 - 4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
 - 5. Apply AWI Quality Certification Program label to Shop Drawings.

- C. Samples for Initial Selection:

- 1. Shop-applied transparent finishes.

D. Samples for Verification:

1. Lumber for transparent finish, not less than 5 inches (125 mm) wide by 12 inches (300 mm) long, and cut, finished on one side and one edge.
2. Corner pieces as follows:
 - a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
 - b. Miter joints for standing trim.
3. Exposed cabinet hardware and accessories, one unit for each type and finish.

1.5 REFERENCES

- A. Window and Door Manufacturer's Association (WDMA).
- B. Architectural Woodwork Standards (AWS).
- C. Architectural Woodwork Institute (AWI).

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- C. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Certified participant in AWI's Quality Certification Program.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Build mockups of typical architectural wood cabinets as shown on Drawings.
 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 70 percent during the remainder of the construction period.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.10 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood-veneer-faced architectural cabinets can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET FABRICATORS

- A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of architectural wood cabinets with sequence-matched wood surfaces wood paneling wood doors with faces that are sequence matched with woodwork and transparent-finished wood doors that are required to be of same species as woodwork.

2.2 ARCHITECTURAL WOOD CABINETS, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural wood cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

- A. Grade: Premium.

- B. Type of Construction: Face frame.
- C. Cabinet and Door and Drawer Front Interface Style: Reveal overlay.
- D. Reveal Dimension: 1/2 inch (13 mm).
- E. Wood for Exposed Surfaces:
 - 1. Species: Maple – WDMA Grade AA.
 - 2. Cut: Plain sliced/plain sawn.
 - 3. Grain Direction: Vertically for doors and fixed panels, horizontally for drawer fronts.
 - 4. Matching of Door and Panel Leaves: Book match.
- F. Semi exposed Surfaces: Provide surface materials indicated below:
 - 1. Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces Drawer.
 - 2. Sub fronts, Backs, and Sides: Solid-hardwood lumber, same species indicated for exposed surfaces.
 - 3. Drawer Bottoms: Solid hardwood lumber, same species indicated for exposed surfaces. .
- G. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- H. Drawer Construction: Fabricate with exposed fronts fastened to sub front with mounting screws from interior of body.
 - 1. Join sub fronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content: 4 to 9 percent.

2.5 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
- B. Butt Hinges: 2-3/4-inch (70-mm), five-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:
 - 1. Semi concealed Hinges for Overlay Doors: BHMA A156.9, B01521.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.

- D. Catches: Roller catches, BHMA A156.9, B03071.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04102; with shelf brackets, B04112.
- F. Drawer Slides: BHMA A156.9.
 - 1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.
 - 2. For drawers not more than 3 inches (75 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1.
 - 3. For drawers more than 3 inches (75 mm) high but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1HD-100.
 - 4. For drawers more than 6 inches (150 mm) high or more than 24 inches (600 mm) wide, provide Grade 1HD-200.
 - 5. For computer keyboard shelves, provide Grade 1HD-100.
 - 6. For trash bins not more than 20 inches (500 mm) high and 16 inches (400 mm) wide, provide Grade 1HD-100.
- G. Door Locks: BHMA A156.11, E07121.
- H. Drawer Locks: BHMA A156.11, E07041.
- I. Door and Drawer Silencers: BHMA A156.16, L03011.
- J. Float Glass for Cabinet Doors: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
 - 1. Thickness: 5.0 mm.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.6 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.7 FABRICATION

- A. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of Cabinets: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
- D. Install glass to comply with applicable requirements in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.8 SHOP FINISHING

- A. General: Finish architectural wood cabinets at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. General: Shop finish transparent-finished architectural wood cabinets at fabrication shop as specified in this Section. Refer to Section 099123 "Interior Painting" for field finishing opaque-finished architectural woodwork.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural wood cabinets, as applicable to each unit of work.
 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- D. Transparent Finish:
 1. Finish: System - 11, catalyzed polyurethane over Shaker Maple Spice Stain.
 2. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
 - 1. For shop finished items use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
- G. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

THIS PAGE IS BLANK

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Extruded polystyrene foam-plastic board for beneath floor applications.
 - 2. Glass-fiber blanket for insulation between framing members.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Low-emitting product certification.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

- A. Extruded Polystyrene Board, Type IV: ASTM C 578, Type IV, 25-psi (173-kPa) minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
 - 1. Manufacturers – Subject to specified requirements, provide products by one of the following:
 - a. Dow Chemical
 - b. Owens Corning
 - c. Diversifoam Products
 - d. Kingspan Corporation
 - 2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET

- A. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
 - 1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
 - 2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.
 - 3. Low Emitting: Complies with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Glass-Fiber Blanket, Reinforced-Foil Faced: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Knauf Insulation.
 - d. Owens Corning.

2.3 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Gemco.
 2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation.
- B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 1 inch (25 mm) between face of insulation and substrate to which anchor is attached.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Gemco.

2.4 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
 2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- C. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.

- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.
 - 2. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
 - 3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
 - 4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
- C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

THIS PAGE IS BLANK

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Building wrap.

- B. Related Requirements:

- 1. Section 061600 "Sheathing" for sheathing joint and penetration treatment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For water-resistive barrier, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

- A. Building Wrap: ASTM E 1677, Non-Woven Polyolefin Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

- 1. Basis Of Design: Subject to compliance with requirements, provide Dupont 'TYVEK' Commercial Wrap or comparable products by one of the following:

- a. Dow Chemical Company (The).
 - b. Raven Industries, Inc.

- B. Coordinate permeance value retained or inserted in "Water-Vapor Permeance" Subparagraph below with products retained. Consult manufacturers' literature.
- C. Performance Characteristics:
 - 1. Air Penetration: 0.001 cfm/ft² at 75 Pa when tested in accordance with ASTM E2178. Type 1 when tested in accordance with ASTM E 1677. ≤0.04 cfm/ft @ 75 Pa when tested in accordance with ASTM E2357.
 - 2. Water Vapor Transmission: 30 perms, when tested in accordance with ASTM E 96, Method B.
 - 3. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127.
 - 4. Basis Weight: 2.4 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 - 5. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460.
 - 6. Tensile Strength: 33/41 lbs/in., when tested in accordance with ASTM D 822 , Method A.
 - 7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84. Flame Spread: 15, Smoke Developed: 25.
- D. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.
 - 1. Basis of Design: 3 inch DuPont TYVEK Tape.

2.2 MISCELLANEOUS MATERIALS

- A. Butyl Rubber, Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spun-bonded polyolefin to produce an overall thickness of not less than 0.040 inch (1.0 mm).
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - b. Protecto Wrap Company.
 - c. Raven Industries, Inc.
- B. Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.
- C. Nails and Staples: ASTM F 1667.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

- A. Cover exposed exterior surface of sheathing with water-resistive barrier securely fastened to framing immediately after sheathing is installed.

3.2 INSTALLATION OF VAPOR RETARDERS IN CRAWL SPACES

- A. Install vapor retarders over prepared grade. Lap joints a minimum of 12 inches (305 mm) and seal with manufacturer's recommended tape. Install second layer over pathways to equipment.
- B. Extend vapor retarder over footings and seal to foundation wall or grade beam with manufacturer's recommended tape.
 - 1. Extend vapor retarder vertically minimum 24 inches (610 mm) above top of footing.
- C. Seal around penetrations such as utilities and columns in order to create a monolithic, airtight membrane at grade surface, perimeter, and all vertical penetrations.

3.3 FIELD QUALITY CONTROL

- A. Flush collection piping assembly with water hose to verify discharge to sump well.
- B. Test sump pump operation. Verify adequate discharge to outside.
- C. Check inspection port covers.

3.4 PROTECTION

- A. Protect vapor retarders from damage until concealed by permanent construction.

END OF SECTION

THIS PAGE IS BLANK

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.
 - 3. Ridge vents.
 - 4. Metal flashing and trim.

1.3 RELATED SECTIONS

- A. Section 061600 – Sheathing.
- B. Section 076200 – Sheet Metal Flashing and Trim.

1.4 DEFINITION

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
 - 1. Asphalt Shingles: Full size.
 - 2. Ridge and Hip Cap Shingles: Full size.
 - 3. Ridge Vent: 12-inch- (300-mm-) long Sample.
 - 4. Exposed Valley Lining: 12 inches (300 mm) square.
- C. Samples for Initial Selection: For each type of asphalt shingle indicated.

1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For the following products, of sizes indicated:
1. Asphalt Shingles: Full size.
 2. Ridge and Hip Cap Shingles: Full size.
 3. Ridge Vent: 12-inch- (300-mm-) long Sample.
 4. Exposed Valley Lining: 12 inches (300 mm) square.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by manufacturer and witnessed by a qualified testing agency.
- C. Evaluation Reports: For high-temperature, self-adhering sheet underlayment, from ICC-ES or other testing and inspecting agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes.
- D. Sample Warranty: For manufacturer's warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Asphalt Shingles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is a Preferred Contractor as defined and certified by manufacturer. Qualifications and credentials are to conform to manufacturer's warranty requirements.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.

- C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.13 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
- B. Basis Of Design Manufacturer's System "Golden Pledge Limited Warranty."
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - 2. Material Warranty Period: 30 years from date of Substantial Completion, nonprorated.
 - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 130 mph (58 m/s) for lifetime from date of Substantial Completion.
 - 4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.
 - 5. Workmanship Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 ASPHALT SHINGLES

- A. Basis Of Design: Subject to compliance with requirements, provide 'Timberline Ultra HD Lifetime High Definition Shingles as manufactured by GAF Corporation.
 - 1. Granule surfaced, self sealing asphalt shingle with a strong fiberglass reinforced core and stain protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules. Architectural laminate styling provides a wood shake appearance with a 5 5/8" exposure. UL 790 Class A rated with UL 997 Wind Resistance Label.
 - 2. ASTM D 7158 Standard Test Method for Wind Resistance of Sealed Asphalt Shingles Class H – 150 mph.

3. ASTM D 3161, Standard Test Method for Wind Resistance of Sealed Asphalt Shingles on Steep Sloped Roofing Class A – 60 mph;
 4. ASTM D 3018, Standard Specification For Class A Asphalt Shingles Surfaced with Mineral Granules (Self-Sealing) Type 1;
 5. ASTM D 3462; Standard Specification For Asphalt Shingles made from Glass Felt and Surfaced with Mineral Granules.
 6. CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval. Color: Onyx Black.
 7. Hip and Ridge Shingles:
 - a. Roof Shingle Manufacturer's self sealing hip and ridge cap shingle matching the color of selected roof shingle. Each bundle covers approx. 33.3 lineal feet (10.15m) with 5 5/8 inch (147mm) exposure.
 8. Starter strips and all other roof shingle accessories as manufactured or required by roof shingle manufacturer for warranty enforcement.
- B. Comparable Roof Shingle Products as manufactured by the following:
1. 'TruDefinition Duration' Asphalt Shingles manufactured by Owens Corning.
 2. Comparable products of CertainTeed Corporation.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, 30 lb. asphalt-saturated organic felts, nonperforated.
1. Type: Type II.
- B. Ridges, Valleys, Crickets, Eaves, and Roof Penetrations: Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils (0.76 mm) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
 3. Products: Subject to compliance with requirements, provide Firestone 'Clad-Gard' SA Metal Underlayment (Basis Of Design) or comparable products of one of the following manufacturers:
 - a. W.R.Grace & Company - Grace Ice and Water Shield HT;
 - b. Henry Company;
 - c. Kirsch Building Products, LLC;
 - d. Metal-Fab Manufacturing, LLC;
 - e. Owens Corning;

2.4 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.

1. Basis Of Design: Subject to compliance with requirements, provide GAF Rigid Plastic Ridge Vent, 10 inches wide or comparable products by one of the following:
 - a. Air Vent, Inc.; a Gibraltar Industries Company.
 - b. Ridge Vent by Owens Corning.
2. Minimum Net Free Area: 18 square inches per linear foot.
3. Features:
 - a. Nonwoven geotextile filter strips.
 - b. External deflector baffles.

2.5 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.
 1. Shank: Barbed.
 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.
- D. Synthetic-Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.

2.6 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
 1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches (125 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
 2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 5 inches (125 mm) over the underlying asphalt shingle and up the vertical surface.
 3. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch- (25-mm-) high, inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm) .
 4. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.5-mm) drip at lower edge.

- C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches (100 mm) from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt-underlayment nails.
 - 1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction that sheds water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.
 - 2. Install fasteners at no more than 36 inches (914 mm) o.c.
- C. Metal-Flushed, Open-Valley Underlayment: Install two layers of minimum 36-inch- (914-mm-) wide underlayment centered in valley. Stagger end laps between layers at least 72 inches (1830 mm). Lap ends of each layer at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck.
 - 1. Lap roof-deck underlayment over first layer of valley underlayment at least 6 inches (150 mm).

3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
 1. Secure hemmed flange edges into metal cleats spaced 12 inches (300 mm) apart and fastened to roof deck.
 2. Adhere 9-inch- (225-mm-) wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- E. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- F. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- G. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
 1. Execute 'Special Installation' as required by shingle manufacturer for wind speed warranty.
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip at least 7 inches (175 mm) wide with self-sealing strip face up at roof edge.
 1. Extend asphalt shingles 3/4 inch (19 mm) over fasciae at eaves and rakes.
 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- E. Fasten asphalt-shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.

1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 3. When ambient temperature during installation is below 50 deg F (10 deg C) , seal asphalt shingles with asphalt roofing cement spots.
- F. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.
1. Set valley edge of asphalt shingles in a 3-inch- (75-mm-) wide bed of asphalt roofing cement.
 2. Do not nail asphalt shingles to metal open-valley flashings.
- G. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION

SECTION 074646 - FIBER-CEMENT SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes fiber-cement siding and soffit.
- B. Related Requirements:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood furring, grounds, nailers, and blocking.
 - 2. Section 061600 "Sheathing" for fiberglass mat-faced gypsum board sheathing.
 - 3. Section 072726 "Fluid-applied Membrane Air Barriers" for weather-resistive barriers.

1.3 COORDINATION

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples for Initial Selection: For fiber-cement siding and soffit including related accessories.
- C. Samples for Verification: For each type, color, texture, and pattern required.
 - 1. 12-inch- (300-mm-) long-by-actual-width Sample of siding.
 - 2. 12-inch- (300-mm-) long-by-actual-width Sample of soffit.
 - 3. 12-inch- (300-mm-) long-by-actual-width Samples of trim and accessories.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of fiber-cement siding and soffit.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.
- C. Research/Evaluation Reports: For each type of fiber-cement siding required, from ICC-ES.
- D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish full lengths of fiber-cement siding and soffit including related accessories, in a quantity equal to 2 percent of amount installed.

1.9 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall area as shown on Drawings.
 - 2. Build mockups for fiber-cement siding and soffit including accessories.
 - a. Size: 48 inches (1200 mm) long by 60 inches (1800 mm) high.
 - b. Include outside corner on one end of mockup.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with labels intact until time of use.
- B. Store materials on elevated platforms, under cover, and in a dry location.

1.11 WARRANTY

- A. Product Warranty: Limited product warranty against manufacturing defects.
 - 1. Lap siding for 50 years.
 - 2. Trim for 10 years.
- B. Finish Warranty: Limited product warranty against manufacturing finish defects.
 - 1. 15 years from the date of purchase.
- C. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.

2.2 FIBER-CEMENT SIDING

- A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
- B. Basis Of Design Lap Siding and Trim: HardiePlank Lap Siding and Trim as manufactured by James Hardie Building Products, Inc.
 - 1. Type: Smooth Lap size: 8 inch x 12 ft.
 - 2. Trim: Trim, Soffit, and Molding as manufactured by siding manufacturer.
 - 3. Color: As selected by Architect.
- C. Additional Acceptable Manufacturers:
 - 1. Plycem USA, Inc.
 - 2. GAF Materials Corporation.
 - 3. Products to match quality of Basis Of Design products.
- D. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.
- E. Nominal Thickness: Not less than 5/16 inch (8 mm).
 - 1. Texture: Smooth.

- F. **Factory Priming and Finishing:** Manufacturer's standard acrylic primer covered with two coats of manufacturer's warranted coating. Color as selected by Architect.

2.3 ACCESSORIES

- A. **Siding Accessories, General:** Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - 1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.
- B. **Decorative Accessories:** Provide the following fiber-cement decorative accessories as indicated:
 - 1. Corner posts.
 - 2. Door and window casings.
 - 3. Fasciae.
 - 4. Moldings and trim.
- C. **Flashing:** Provide aluminum flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
 - 1. **Finish for Aluminum Flashing:** High-performance organic finish.
- D. **Fasteners:**
 - 1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch (6 mm), or three screw-threads, into substrate.
 - 2. For fastening fiber cement, use hot-dip galvanized or stainless-steel fasteners.
- E. **Insect Screening for Soffit Vents:** Aluminum, 18-by-16 (1.4-by-1.6-mm) mesh.
- F. **Continuous Soffit Vents:** Aluminum, hat-channel shape, with perforations; 2 inches (51 mm) wide and not less than 96 inches (2438 mm) long.
 - 1. **Net-Free Area:** 4 sq. in./linear ft. (280 sq. cm/m).
 - 2. **Finish:** Mill finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Examine substrates** for compliance with requirements for installation tolerances and other conditions affecting performance of fiber-cement siding and soffit and related accessories.
- B. **Proceed with installation** only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 - 1. Do not install damaged components.
 - 2. Install fasteners no more than 24 inches (600 mm) o.c.
- B. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.

3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

RECEIVED THE AMERICAN INSTITUTE OF MATHEMATICS

NOV 9 1952

AMERICAN INSTITUTE OF MATHEMATICS

THE AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY

NOV 9 1952

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

THIS PAGE IS BLANK

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY

AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY
AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY
AMERICAN INSTITUTE OF MATHEMATICS
601 NORTH DARTMOUTH STREET
PRINCETON, NEW JERSEY

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

AMERICAN INSTITUTE OF MATHEMATICS

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed steep-slope roof sheet metal fabrications.
3. Concrete Splash Pans.

- B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, and blocking.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak-proof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 6. Include details of termination points and assemblies.
 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 8. Include details of roof-penetration flashing.
 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter-flashings as applicable.
 10. Include details of special conditions.
 11. Include details of connections to adjoining work.
 12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches (1:5) .
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- D. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
 4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested .
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are SPRI ES-1 tested , shop shall be listed as able to fabricate required details as tested and approved.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. FM Approvals Listing: Manufacture and install copings and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90 . Identify materials with name of fabricator and design approved by FM Approvals.
- D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated on Drawings.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint

sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces .

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 1. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.3 UNDERLAYMENT MATERIALS

- A. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F (111 deg C); and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Atlas Roofing Corporation.
 - b. Intertape Polymer Group.
 - c. Kirsch Building Products, LLC.
 - d. SDP Advanced Polymer Products Inc.
- B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. ((0.16 kg/sq. m)) minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

- a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- F. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- G. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- H. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
1. Gutter Profile: Style K according to cited sheet metal standard.
 2. Expansion Joints: Lap type.
 3. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.
 4. Gutters with Girth 16 to 20 Inches (410 to 510 mm): Fabricate from the following materials:
 - a. Aluminum: 0.040 inch (1.02 mm) thick.
- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.
1. Fabricated Hanger Style: Fig 35A according to SMACNA's "Architectural Sheet Metal Manual."
 2. Fabricate from the following materials:
 - a. Aluminum: 0.024 inch (0.61 mm) thick.
- C. Concrete Splash blocks: Fabricate to dimensions and shape required and from the following materials:
1. Precast concrete splash blocks as manufactured by one of the following:
 - a. Modern Precast, Inc. 370 West 1550 South, Salt Lake City, UT 84115
(801) 466-1374, Toll Free (866) 466-1374, Fax (801) 466-4825
<mailto:info@modernprecast.com>

- b. Nitterhouse Masonry Products, 859 Cleveland Avenue, Chambersburg, PA 17201 (717) 267-4500, Fax (717) 267-4527, email: masonry@nitterhouse.com
 - c. Other manufacturer as approved by Architect.
2. Cement - Portland Cement Type I/II gray and/or white conforming to ASTM C-150.
 3. Course Aggregate - Carefully graded and washed gravel or stone conforming to ASTM C-33. Usual mix gravel does not exceed 3/8 inch. Gradation may vary to achieve desired finish and texture.
 4. Fine Aggregate - Graded and washed natural concrete sand conforming to ASTM C-33.
 5. Color - Bayferrox inorganic, synthetic iron oxide pigments, lime proof, and non-fading, conforming to ASTM C-979. Amount of pigment shall not exceed 10% by weight of the cement used.
 6. Admixtures - ASTM C-494.
 7. Water - Potable water free from impurities.
 8. Air Entrainment - Wet cast mixture maintains 5-7% air entrainment. Admixture conforms to ASTM C-260.
 9. Reinforcing Steel - Conforms to ASTM 615 and deformations conform to ASTM M-305. Use M13 #4, Grade 60 rebar, and 1/4 inch HR round steel.
 10. Concrete Strength - Comprehensive strength of 4,000 to 6,000 psi at age 28 days of curing as determined by tests of 6 inch cylinders.
 11. Splash blocks are to have full length relieved drainage ribs or recessed drainage grooves on bottom surface 1/2 inch high in the long direction in order to facilitate drainage.

2.7 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
 1. Aluminum: 0.032 inch (0.81 mm) thick.
- B. Valley Flashing: Fabricate from the following materials:
 1. Stainless Steel: 0.019 inch (0.48 mm) thick.
- C. Drip Edges: Fabricate from the following materials:
 1. Aluminum: 0.032 inch (0.81 mm) thick.
- D. Eave, Rake Flashing: Fabricate from the following materials:
 1. Aluminum: 0.032 inch (0.81 mm) thick.
- E. Counterflashing: Fabricate from the following materials:
 1. Aluminum: 0.032 inch (0.81 mm) thick.
- F. Roof-Penetration Flashing: Fabricate from the following materials:
 1. Zinc-Tin Alloy-Coated Copper: 16 oz./sq. ft. (0.55 mm thick) .

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.
- D. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- E. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- F. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
 - 1. Fasten gutter spacers to front and back of gutter.
 - 2. Anchor and loosely lock back edge of gutter to continuous cleat .
 - 3. Anchor gutter with straps spaced not more than 24 inches (600 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
 - 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
 - 2. Provide elbows at base of downspout to direct water away from building.
 - 3. Connect downspouts to underground drainage system.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs . Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- D. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.
- E. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

- F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of anchor and washer at 36-inch (910-mm) centers unless otherwise indicated.
- G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.
- B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

THIS PAGE IS BLANK

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Preformed flashing sleeves.

- B. Related Sections:

- 1. Section 073113 "Asphalt Shingles" for installation of sheet metal flashing and trim integral with roofing.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
 - 3. Section 077253 "Snow Guards" for snow guards.

1.3 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For roof accessories.

- 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Wind-Restraint Performance: As indicated on Drawings.

2.2 PREFORMED FLASHING SLEEVES

- A. Exhaust Vent Flashing: Double-walled metal flashing sleeve or boot, insulation filled, with integral deck flange, 12 inches (300 mm) high, with removable metal hood and slotted or perforated metal collar.
 - 1. Metal: Aluminum sheet, 0.063 inch (1.60 mm) thick.
 - 2. Diameter: As indicated on Drawings.
- B. Vent Stack Flashing: Metal flashing sleeve, uninsulated, with integral deck flange.
 - 1. Metal: Aluminum sheet, 0.063 inch (1.60 mm) thick.
 - 2. Height: 13 inches (330 mm).
 - 3. Diameter: As indicated on Drawings.

2.3 METAL MATERIALS

- A. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZM150) coated.
 - 1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
 - 2. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
 - b. Color as selected by Architect.
 - 3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- B. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.
- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

D. Underlayment:

1. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
2. Slip Sheet: Building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum, rosin sized.
3. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
4. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

F. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.

4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions; flash sleeve flange to surrounding roof membrane according to roof membrane manufacturer's instructions.
- D. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

THIS PAGE IS BLANK

SECTION 077253 - SNOW GUARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pad-type, flat-mounted snow guards.

1.3 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for snow guards.
- B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.
 - 1. Include calculation of number and location of snow guards based on snow load, roof slope, roof type, components, spacings, and finish.
- C. Samples: Full-size unit.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of snow guard, for tests performed by manufacturer and witnessed by a qualified testing agency.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally induced movement without failure, rattling, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Structural Performance:

1. Snow Loads: As indicated on Drawings.

2.2 PAD-TYPE SNOW GUARDS

A. Flat-Mounted Metal Snow Guard Pads:

1. Provide Snow Guards as manufactured by Alpine Snowguards/Vermont Slate and Copper or comparable products of one of the following manufacturers:
 - a. Berger Building Products.
 - b. IceBlox, Inc.
 - c. Sieger Snow Guards, Inc.
2. Material: Manufacturer's standard noncorrosive metal.
3. Finish and Color: Powder coat; color as selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.
 1. Verify compatibility with and suitability of substrates including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare substrates for bonding snow guards.
- B. Prime substrates according to snow guard manufacturer's written instructions.

3.3 INSTALLATION

- A. Install snow guards according to manufacturer's written instructions. Space rows as recommended by manufacturer.
- B. Attachment for Asphalt Shingle Roofing:
 1. Flat-Mounted, Snow Guard Pads: Mechanically anchored through predrilled holes concealed by the shingles.

END OF SECTION

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

- C. **Preconstruction Laboratory Test Schedule:** Include the following information for each joint sealant and substrate material to be tested:
 - 1. Joint-sealant location and designation.
 - 2. Manufacturer and product name.
 - 3. Type of substrate material.
 - 4. Proposed test.
 - 5. Number of samples required.
- D. **Preconstruction Laboratory Test Reports:** From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- E. **Preconstruction Field-Adhesion-Test Reports:** Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- F. **Field-Adhesion-Test Reports:** For each sealant application tested.
- G. **Sample Warranties:** For special warranties.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** An authorized representative who is trained and approved by manufacturer.
- B. **Product Testing:** Test joint sealants using a qualified testing agency.
 - 1. **Testing Agency Qualifications:** Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. **Mockups:** Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

- A. **Preconstruction Laboratory Testing:** Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. **Adhesion Testing:** Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. **Compatibility Testing:** Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 - 3. **Stain Testing:** Use ASTM C 1248 to determine stain potential of sealant when in contact with masonry substrates.

4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. **Special Installer's Warranty:** Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. **Warranty Period:** Two years from date of Substantial Completion.
- B. **Special Manufacturer's Warranty:** Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. **Warranty Period:** Five years from date of Substantial Completion.
- C. **Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:**
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. **Compatibility:** Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. **Colors of Exposed Joint Sealants:** As selected by Architect from manufacturer's full range.

2.2 JOINT SEALANTS

- A. **Joint Sealant JS-1 - Urethane, M, NS, 50, NT:** Multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 50, Use NT.
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; Dynatrol II.
 - b. Tremco Dymeric 240 FC.
 - c. Polymeric Systems, Inc. PSI-270
 - 2. **Applications:** Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 3. **Joint Locations:**

- a. Construction joints in cast-in-place concrete.
- b. Joints between plant-precast architectural concrete units.
- c. Joints in dimension stone cladding.
- d. Joints in glass unit masonry assemblies.
- e. Joints in exterior insulation and finish systems.
- f. Joints between metal panels.
- g. Joints between different materials listed above.
- h. Perimeter joints between materials listed above and frames of doors, windows, and louvers.

B. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces JS-2.

- 1. **Joint Locations:**
 - a. Control and expansion joints in brick pavers.
 - b. Isolation and contraction joints in cast-in-place concrete slabs.
 - c. Joints between plant-precast architectural concrete paving units.
 - d. Joints in stone paving units, including steps.
 - e. Tile control and expansion joints.
 - f. Joints between different materials listed above.
 - g. Other joints as indicated on Drawings.
 - 2. Silicone, Nonstaining, S, NS, 100/50, T, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 3. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning 790 Silicone Sealant.
 - b. Comparable products of the following manufacturers:
 - 1) Tremco
 - 2) Pecora Corporation
 - 3) Sherwin Williams
 - 4) Bostik, Inc.
 - 4. **Joint-Sealant Color:** As selected by Architect from manufacturer's full range of colors .
- C. Joint Sealant JS-3 - Urethane, M, P, 25, T, NT:** Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade P, Class 25, Uses T and NT.

- 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc.; Chem-Calk 555-SL.
 - b. LymTal International, Inc.; Iso-Flex 880 GB.
 - c. Pecora Corporation; Dynatrol II SG
 - d. Sherwin-Williams Company (The); Loxon-2SL.
 - e. Tremco Incorporated; THC 900/901.

2. Applications: Interior joints in horizontal traffic surfaces.
 3. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in stone flooring.
 - c. Control and expansion joints in brick flooring.
 - d. Control and expansion joints in tile flooring.
- D. Joint Sealant JS-4 - Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals, LLC, Building Systems; Sonolastic SL 1.
 - b. Pecora Corporation; Dynatrol 1-XL
 - c. Polymeric Systems, Inc.; Flexiprene 952.
 - d. Schnee-Morehead, Inc.; an ITW company; Permthane SM7101.
 - e. Sherwin-Williams Company (The); Loxon-1 SL.
 - f. Tremco Incorporated; Dymonic 100.
 2. Applications: Interior joints in vertical surfaces and horizontal nontraffic surfaces
 3. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of unit masonry and concrete, walls and partitions.
 - d. Joints on underside of plant-precast structural concrete beams and planks.
- E. Joint Sealant JS-5 - Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. GE Construction Sealants; SCS2700 SilPruf LM .
 - b. Sika Corporation U.S.; Sikasil WS-290 FPS.
 - c. Tremco; Spectrem 1.
 2. Applications: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 3. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precast architectural concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Joints in dimension stone cladding.
 - e. Joints in glass unit masonry assemblies.

- f. Joints in exterior insulation and finish systems.
 - g. Joints between metal panels.
 - h. Joints between different materials listed above.
 - i. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
 - j. Control and expansion joints in ceilings and other overhead surfaces.
- F. Joint Sealant JS-6 - Silicone, Acid Curing, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc.; Chem-Calk 1200.
 - b. Dow Corning Corporation; 999A.
 - c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 100 GC.
 - d. Pecora Corporation; 860.
 - e. Polymeric Systems, Inc.; PSI-601.
 - f. Sika Corporation U.S.; Sikasil-GP.
 - 2. Applications: Interior joints in vertical and horizontal surfaces between glass and metal or ceramic surfaces.
- G. Joint Sealant JS-7 - Silicone, Mildew-Resistant, Acid Curing, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT.
- 1. Products:
 - a. Dow Corning 786
 - b. Tremco Incorporated; Tremsil 200
 - c. Sika Corporation U.S.; Sikasil-GP.
 - 2. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 3. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
- H. Joint Sealant JS-8 - Urethane, Immersible, S, P, 50, T, NT, I: Immersible, single-component, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 50, Uses T, NT, and I.
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Tremco Incorporated; Dymonic 100
 - 2. Applications: Exterior joints in horizontal traffic surfaces subject to water immersion.

3. Joint Locations:

- a. Joints in paving and pedestrian plazas.
- b. Joints in swimming pool decks.

I. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. GE Construction Sealants; Momentive Performance Materials Inc.
- b. Hilti, Inc.
- c. Pecora Corporation.
- d. Tremco Incorporated.

2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.

2.3 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Construction Chemicals - Construction Systems.
- b. Construction Foam Products; a division of Nomaco, Inc.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - 4. Provide recessed joint configuration of recess depth according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 3 tests for the first 100 feet of joint length for each kind of sealant and joint substrate.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

THIS PAGE IS BLANK

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Solid-core flush wood doors for opaque finish.
 - 2. [Hollow Core] [Transparent Finish].

- B. Related Requirements:

- 1. Section 099123 "Interior Painting" for field finishing doors.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including the following:

- 1. Door edge construction
 - 2. Door face type and characteristics.
 - 3. Door frame construction.

- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

- 1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.
 - 2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
 - 3. Details of frame for each frame type, including dimensions and profile.
 - 4. Dimensions and locations of blocking for hardware attachment.
 - 5. Dimensions and locations of mortises and holes for hardware.
 - 6. Clearances and undercuts.
 - 7. Doors to be factory primed and application requirements.

- C. Samples for Verification:

1. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.
 - D. Field quality-control reports.
 - E. Sample Warranty: For special warranty.
- 1.5 CLOSEOUT SUBMITTALS
- A. Special warranties.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Comply with requirements of referenced standard and manufacturer's written instructions.
 - B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.
 - C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
- 1.7 FIELD CONDITIONS
- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.
 - B. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during remainder of construction period.
- 1.8 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace doors and frames that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors and frames.
 3. Warranty Period for Hollow-Core Interior Doors: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS AND FRAMES, GENERAL

- A. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

2.3 SEVEN-PLY FLUSH WOOD DOORS AND FRAMES FOR OPAQUE FINISH

- A. Interior Doors:

1. Provide door and frame products by one of the following manufacturers”
 - a. Eggers Industries.
 - b. Lambton Doors.
 - c. Oshkosh Door Company.
 - d. Graham Doors.
2. Performance Grade: ANSI/WDMA I.S. 1A Standard Duty.
3. Performance Grade:
4. Faces: Any closed-grain hardwood of mill option.
 - a. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
5. Exposed Vertical and Top Edges: Any closed-grain hardwood.
 - a. Mineral Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
 - 1) Screw-Holding Capability: 550 lbf (2440 N) in accordance with WDMA T.M. 10.
6. Core for Non-Fire-Rated Doors: ANSI A208.1, Grade LD-1 particleboard.
 - a. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
7. Construction: Seven plies, hot-pressed, bonded.

2.4 WOOD DOOR FRAMES

- A. Interior Frames:

1. Wood Species: Any closed-grain hardwood.
2. Cut: Plain sliced/plain sawn.
3. Wood Moisture Content: 8 to 13 percent.
4. Profile: T-stop.
5. Construction: Solid lumber.

2.5 LIGHT FRAMES AND LOUVERS

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
 1. Wood Species: Any closed-grain hardwood.
 2. Profile: Recessed tapered beads.
- B. Wood Louvers: Door manufacturer's standard solid-wood louvers unless otherwise indicated.
 1. Wood Species: Any closed-grain hardwood.
 2. Profile: Flat.

2.6 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated.
 1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied.
 1. Locate hardware to comply with DHI-WDHS-3.
 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
- C. Openings: Factory cut and trim openings through doors.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."
 3. Louvers: Factory install louvers in prepared openings.

2.7 FACTORY PRIMING

- A. Doors for Opaque Finish: Factory prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 099123 "Interior Painting."

2.8 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
 - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 2. Finish faces, all four edges, edges of cutouts, and mortises.
- B. Opaque Finish:
 - 1. Coatings as per section 099123 "Interior Painting".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Install doors and frames to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Install frames level, plumb, true, and straight.
 - 1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3.2 mm in 2400 mm).
 - 2. Anchor frames to anchors or blocking built in or directly attached to substrates.
 - a. Secure with countersunk, concealed fasteners and blind nailing.
 - b. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1) For factory-finished items, use filler matching finish of items being installed.
- D. Job-Fitted Doors:
 - 1. Align and fit doors in frames with uniform clearances and bevels as indicated below.
 - 2. Machine doors for hardware.
 - 3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

4. Clearances:

- a. Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors.
- b. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
- c. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
- d. Comply with NFPA 80 for fire-rated doors.

5. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Inspections:
 - 1. Provide inspection of installed Work certifying that wood doors and frames, including installation, comply with requirements of AWI/AWMCA/WI's "Architectural Woodwork Standards" for the specified grade.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 081613 - FIBERGLASS ENTRY DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Fiberglass Entry Doors

1.3 RELATED SECTIONS

- A. Section 061000 "Rough Carpentry".
- B. Section 062013 "Exterior Finish Carpentry".
- C. Section 079200 "Joint Sealants".
- D. Section 087100 "Door Hardware"
- E. Section 099113 "Exterior Painting".

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - 2. ASTM E 283 – Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
 - 3. ASTM E 330 – Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - 4. ASTM E 331 – Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 5. ASTM E 413 – Classification for Rating Sound Insulation (STC).
 - 6. ASTM E 547 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
 - 7. ASTM E 1300 – Standard Practice for Determining Load Resistance of Glass in Buildings.
 - 8. ASTM E 1332 – Standard Classification for Determination of Outdoor-Indoor Transmission Class.
 - 9. ASTM E 1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
 - 10. ASTM E 1996 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

11. ASTM E 2235 – Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods.

B. Environmental Protection Agency and Department of Energy:

1. Energy Star Program Requirements Product Specification for Residential Windows, Doors, and Skylights.

C. Code of Federal Regulations:

1. CFR 1201 Part 2 – Safety Standard for Architectural Glazing Materials.

D. National Fenestration Rating Council

1. NFRC 100 – Procedure for Determining Fenestration Product U-Factors.
2. NFRC 200 – Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance (VT) at Normal Incidence.
3. NFRC 400 – Procedure for Determining Fenestration Product Air Leakage.

1.5 PERFORMANCE REQUIREMENTS

- A. Door Unit Air Leakage, NFRC 400, 1.57 psf (25 mph): 0.50 cfm per square foot of frame or less.
- B. Door Unit Water Penetration: No water penetration through door unit when tested in accordance with ASTM E 331 or ASTM E 547 with water applied at rate of 5 gallons per hour per square foot at 0 psf.

1.6 SUBMITTALS

- A. Refer to Division 013300 Submittal Procedures.
- B. Product Data: Submit door manufacturer current product literature, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections, anchorage methods and locations, accessories, hardware locations, and installation details.
- D. Samples: Submit full-size or partial full-size verification sample of door illustrating glazing system, quality of construction, texture, and color of finish.

1.7 QUALITY ASSURANCE

- A. Mockup:
 1. Provide sample unit of representative product size and using manufacturer approved installation methods to determine acceptability of door installation methods. Comply with Division 01 43 39 Quality Assurance
 2. Approved mockup shall represent minimum quality required for the Work.
 3. Approved mockup may remain in place within the Work if approved by Architect.
- B. Quality Assurance Submittals:

1. Provide documentation for specified performance as required.
 2. Manufacturers' installation instructions.
- C. Manufacturer Qualifications: Manufacturer shall have successful experience in producing the type of product required for project applications equivalent to the requirements for this project.
- D. Installer Qualifications:
1. Optional: Installer holds current credential as a NAMI Certified Installer of Therma-Tru Side Hinged Door Installations and as a Therma-Tru® Certified Installer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Division 016000 "Product Requirements".
- B. Delivery: Deliver materials to site undamaged with labels clearly identifying manufacturer, product name, and installation instructions
- C. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.
- D. Handling: protect materials and finish during handling and installation to prevent damage.

1.9 WARRANTY

- A. Refer to Section 017700 "Closeout Procedures".
- B. Therma-Tru® standard limited warranty for fiberglass Therma-Tru® Door Product and genuine Therma-Tru® components, including rot-resistant frames, mullions, and brickmould sourced from Therma-Tru (excluding primed pine door frames and oak door frames, and non-rot resistant mullions and brickmould) used in commercial and multi- residential projects will be free from material and workmanship defects for a period of three years subject to certain limitations and restrictions. For complete details and current warranty information go to www.thermatru.com.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of design: Therma-Tru Corp.
1. 1750 Indian Wood Circle Maumee, OH 43537
 2. (419) 891-7400
 3. (800) 843-7628
 4. www.thermatru.com Contact: rlark@thermatru.com
- B. Products of other manufacturers as approved by Architect. Reference Section 012500 "Substitutions".

2.2 FIBERGLASS ENTRY DOORS

- A. Fiberglass Entry Doors: All fiberglass doors manufactured by Therma-Tru®. Specification is for complete entry systems with components manufactured by Therma-Tru® and assembled by independent fabricators.
 - 1. Select Classic -Craft®.
 - 2. Construction:
 - a. Classic-Craft®
 - 1) 3/32" minimum thickness proprietary fiberglass reinforced thermoset composite, "AccuGrain" textured to duplicate hand-crafted hardwood master or smooth surface. Door edges are machinable kiln-dried hardwood, flush and square with door faces, lock edge reinforced with full-length integrated 3-1/2-inch wide engineered lumber core. Door bottom edge is moisture- and decay-resistant composite. Core is foamed-in-place polyurethane, with a minimum density of 1.9 pcf.
- B. Door Style
 - 1. Classic-Craft®
 - a. American Collection: Enter Style Number CCA260XC-SDL.
- C. Frames: Provided and assembled by third party fabricators to exacting specifications from Therma-Tru to help maximize system performance. Therma-Tru® strongly recommends the use of rot-resistant frames, mullions, and brickmould sourced from Therma-Tru, however, the use of a non Therma-Tru® frame system (or a Therma-Tru Primed Pine Frame or Therma-Tru Oak Frame) will not automatically void the entire limited warranty. Refer to 1.8.B for clarification.
 - 1. Milled from 5/4 kiln-dried material with profiled 1/2" stop and 6 degree sill gain prep.
 - 2. Jamb Width Standard 4 9/16"
 - 3. Rot Resistant – frames, mullions, and brickmould sourced through Therma-Tru.
- D. Sills
 - 1. Inswing: Hardwood Adjustable
 - 2. Finish: Mill

2.3 GLAZING

- A. Therma-Tru factory glazed with double-pane or construction.

2.4 INSTALLATION ACCESSORIES

- A. Sill pan
- B. Corner seal pad
- C. Rain deflector

D. Rain Guard

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive doors. Notify Architect in writing any unacceptable conditions that would adversely affect installation or subsequent performance of the product. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install fiberglass doors in full compliance with Therma-Tru® written instructions and approved shop drawings.
- B. Install 20 minute doors with permanent fire door certification label in compliance with the requirements of the labeling agency and NFPA.
- C. Maintain alignment and compatibility with adjacent work.

3.3 FINISHING

- A. Finish in compliance with Therma-Tru® written recommendations. Guidance for proper finishing is available at www.thermatru.com – “Recommendations for Proper Finishing and Painting or Staining.”

3.4 Protection

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products prior to Substantial Completion in accordance with Therma-Tru written recommendations. Guidance for proper finishing is available at www.thermatru.com – “Recommendations for Proper Finishing and Painting or Staining.”

END OF SECTION

THIS PAGE IS BLANK

SECTION 085413 – FIBERGLASS WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes fiberglass-framed double-hung windows.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review, discuss, and coordinate the interrelationship of fiberglass windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
 - 3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 - 4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 RELATED SECTIONS

- A. Section 079200 "Joint Sealants": Sealants and caulking.

1.5 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
 - 2. AAMA 623 - Voluntary Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C 1036 - Flat Glass.
 - 2. ASTM C 1048 - Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
 - 3. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
 - 4. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
 - 5. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.

6. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

C. Screen Manufacturers Association (SMA):

1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.

D. Window and Door Manufacturers Association (WDMA):

1. ANSI/AAMA/NWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.

1.6 PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: WDMA certified with label attached to each window.

- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Hallmark Certification: H-R-35
2. Minimum Performance Grade: 35.

- C. Window Air Leakage, ASTM E 283: Window air leakage when tested at 1.57 psf (25 mph) shall be 0.25 cfm/ft² of frame or less.

- D. Window Water Penetration, ASTM E 547: No water penetration through window when tested under static pressure of 4.5 psf (42 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

- E. Basic Wind Speed : 90 mph (3 second gust)

- F. Wind Exposure Category: B

- G. Wind Importance Factor:: 1.15

- H. Main Wind Force Resisting System

1. Horizontal: 12psf
2. Vertical
 - a. Internal: 1 psf
 - b. External: 12 psf

- I. Components and Cladding

1. Horizontal: 12psf
2. Vertical
 - a. Internal: 5 psf
 - b. External: 16 psf

1.7 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.
- D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.

1.8 QUALITY ASSURANCE

- A. Mockup:
 - 1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
 - 2. Approved mockup shall represent minimum quality required for the Work.
 - 3. Approved mockup shall [not] remain in place within the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
- B. Storage:
 - 1. Store materials in accordance with manufacturer's instructions.
 - 2. Store materials off ground and under cover.
 - 3. Protect materials from weather, direct sunlight, and construction activities.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 FIBERGLASS DOUBLE-HUNG WINDOWS

A. Double-Hung Windows: Pella Impervia.

- 1. Factory-assembled window with sash installed in frame.
- 2. Frame and Sash Material: Duracast. 5-layer, pultruded-fiberglass material, reinforced with interlocking mat.

B. Frame:

- 1. Type: New construction frame.
- 2. Interior and Exterior Frame: Pultruded, fiberglass composite with foam inserts.
- 3. Overall Frame Depth: 3 inches for Block frame and New Construction frame;
- 4. Nominal Wall Thickness of Fiberglass Members: 0.050 inch to 0.070 inch.
- 5. Frame Corners:
 - a. Mitered at head and jamb on 10 degree sill.
 - b. Joined and bonded with nylon corner lock, with thermoset polyurethane adhesive and mechanically fastened.
- 6. Jambs: Factory-drilled, counter-bored, installation screw holes.

C. Sash:

- 1. Interior and Exterior Sash: Pultruded, fiberglass composite [with foam inserts]
- 2. Lower Sash: Lower sash vent, tilts for cleaning exterior glass.
- 3. Upper Sash: Upper sash vent, tilts for cleaning exterior glass.
- 4. Sash Corners:
 - a. Mitered.
 - b. Bonded and sealed with injected thermoset polyurethane adhesive.

D. Glazing:

- 1. Float Glass: ASTM C 1036, Quality 1.
 - a. Tempered Glass: ASTM C 1048.
- 2. Type: Tape-glazed, 1 1/16-inch thick, insulating glass, clear tempered.

E. Weather Stripping:

- 1. Vent Upper Sash: Fin-type pile on jambs, top rail and stile.
- 2. Vent Lower Sash: Vinyl-wrapped foam at sill on frame and bottom rail.

2.3 OPTIONS

A. Grilles:

1. Insulating Glass: Contain 3/4-inch, contoured, aluminum grilles between the glass.
2. Finish: Factory-finished. Match window frame.

B. Insect Screens:

1. Compliance: ASTM D 3656 and SMA 1201.
2. Screen Cloth: Half- or full-size with [black, vinyl-coated, 18/16 mesh] [Vinyl-coated 18/18 mesh], fiberglass screen cloth set in aluminum frame fitted to outside of window.
3. Complete with necessary hardware.
4. Screen Frame Finish: Baked enamel.
 - a. Color: Match window exterior.

2.4 HARDWARE

A. Balances: Galvanized steel block-and-tackle balances.

B. Lock:

1. Type: Self-aligning, cam-action lock.
2. Windows 37 Inches Wide or Greater: 2 locks.
3. Finish: Match window finish.

C. Tilt Latches:

1. Glass reinforced Nylon 6
2. Integrated into sash corner
3. Finish is matte gray

D. Lower Sash Lift: Integrated into Duracast checkrail.

E. Upper Sash Lift: Color-in ABS Resin.

2.5 TOLERANCES

A. Windows shall accommodate the following opening tolerances:

1. Vertical Dimensions Between High and Low Points: Plus 1/4-inch, minus 0 inch.
2. Width Dimensions: Plus 1/4-inch, minus 0 inch.
3. Building Columns or Masonry Openings: Plus or minus 1/4-inch from plumb.

2.6 FINISH

A. Exterior and Interior Duracast Finish: Factory-applied powder-coat paint, comply with AAMA 623.

1. Color: White.

2.7 INSTALLATION ACCESSORIES

- A. A. Flashing/Sealant Tape: Pella SmartFlash.
 - 1. Aluminum-foil-backed butyl window and door flashing tape.
 - 2. Maximum Total Thickness: 0.013 inch.
 - 3. UV resistant.
 - 4. Verify sealant compatibility with sealant manufacturer.
- B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.
- C. Exterior Perimeter Sealant: "Pella Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.
- D. Installation Accessories: Vinyl installation fin with head drip flashing, Installation clips, and Installation screws for frame screw applications.

2.8 SOURCE QUALITY CONTROL

- A. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive windows. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Install windows to be weather-tight and freely operating.
- C. Maintain alignment with adjacent work.
- D. Secure assembly to framed openings, plumb and square, without distortion.
- E. Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
- F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.
- G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

- H. Leave windows closed and locked.

3.3 FIELD QUALITY CONTROL

- A. Field Testing: Field water testing shall be conducted in accordance with ASTM E1105 Test Procedure B. The test pressure shall be based on the maximum positive components and cladding design pressure. Utilizing the AAMA 502 field test reduction, the water test pressure is 10% of the maximum positive design pressure.

3.4 CLEANING

- A. Clean window frames and glass in accordance with Division 1 requirements.
- B. Do not use harsh cleaning materials or methods that would damage finish or glass.
- C. Remove labels and visible markings.

3.5 PROTECTION

- A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

THIS PAGE IS BLANK

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Mechanical door hardware for the following:
 - a. Swinging doors.
 - b. Folding doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product in each finish specified.
- C. Door hardware schedule.
- D. Keying schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedule.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: One years from date of Substantial Completion.

PART 2 - PRODUCTS

- A. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOJ's "2010 ADA Standards for Accessible Design", the ABA standards of the Federal agency having jurisdiction, and the ICC A117.1.

2.2 SCHEDULED DOOR HARDWARE

- A. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule.

- 1. Door hardware is scheduled in Part 3.

2.3 HINGES

- A. Hinges: As scheduled or comparable products of Stanley, McKinney, or Soss.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required and as follows:
 - 1. Bored Locks: Minimum 1/2-inch (13-mm) latch bolt throw.
- C. Lock Backset: 2-3/4 inches (70 mm) unless otherwise indicated.
- D. Strikes: Provide manufacturer's standard strike for each lock bolt or latch bolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.
- A. Bored Locks: BHMA A156.2; Grade 2; As scheduled in Door Hardware Schedule or comparable products of Stanley, Schlage, or Falcon.

2.5 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide four keys for each keyed lock.
- B. Keys: Manufacturer's standard Nickel Silver, Brass or Bronze.

2.6 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
Manufacturer as scheduled or comparable products of Reese, Zero, or Pemco.

2.7 FOLDING DOOR HARDWARE

- A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.
 - 1. Hardware as scheduled or comparable products of other manufacturers as approved by Architect.

2.8 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Sets: Install at 2-3/4" backset for exterior doors, 2-3/8" backset for interior doors.

- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."
 - F. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 1. Do not notch perimeter gasketing to install other surface-applied hardware.
 - G. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- 3.2 ADJUSTING
- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- 3.3 DOOR HARDWARE SCHEDULE
- A. Set No. 1 – Entrance Door
 - 1. 3 Hinge Full mortise, five knuckle, bearing-type, standard-duty, steel, 3 ½" x 3 ½", finish Satin Nickel Gatehouse
 - 2. 1 Entrance Lock Tubular Interconnect Keyed Lock, BHMA Grade 2, Falcon H2 Series Finish Satin Nickel
 - 3. 1 Threshold Aluminum and Wood 1.125 x door width threshold, M-D Building Products.
 - 4. 1 Set Weatherstripping along door perimeter by Reese, Zero, or Pemco
 - B. Set No. 2 – Bedroom and Bathroom Doors
 - 1. 3 Hinge Full mortise, five knuckle, bearing-type, standard-duty, steel, 3 ½" x 3 ½", finish Satin Nickel Gatehouse
 - 2. 1 Bedroom Privacy Lock Cylindrical Gatehouse Baron Mushroom Turn Lock Privacy Finish Satin Nickel
 - 3. 1 Door Stop Door Hinge-Mounted Baldwin Universal Hinge Pin Stop
 - C. Set No. 3 – Bi-Fold Closet Doors
 - 1. 1 Set Bi-fold Door Hardware - Overhead Door Roller Track Set including 3 hinges per door by National Hardware
 - D. Set No. 4 – Closet Doors
 - 1. 3 Hinge Full mortise, five knuckle, bearing-type, standard-duty, steel, 3 ½" x 3 ½", finish Satin Nickel Gatehouse
 - 2. 1 Passage Lock Cylindrical Gatehouse Baron Mushroom Passage Latch Finish Satin Nickel
 - 3. 1 Door Stop Door Hinge-Mounted Baldwin Universal Hinge Pin Stop

E. Set No. 5 – Double Closet Doors

1. 6 Hinge Full mortise, five knuckle, bearing-type, standard-duty, steel, 3 ½" x 3 ½", finish Satin Nickel Gatehouse.
2. 1 Passage Lock Cylindrical Gatehouse Baron Mushroom Passage Latch Finish Satin Nickel
3. 2 Flushbolts – Gatehouse 6-inch Brass Flush Bolt top and bottom of inactive door leaf.

END OF SECTION

THIS PAGE IS BLANK

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.

B. Related Sections include the following:

1. Section 099123 "Interior Painting" for prime and finish coatings applied to gypsum board surfaces.

C. Marking and Identification of protective construction: Apply painted warnings or signage decals on all fire-resistive and barrier construction in concealed spaces as per paragraph 703.7 of the current edition of the International Building Code.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

A. Submit Material Safety Data Sheet (MSDS) for all gypsum board products.

B. Only gypsum board products manufactured within the borders of the United States of America will be accepted. Imported products will be rejected.

1.4 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. G-P Gypsum.
 - b. National Gypsum Company.
 - c. USG Corporation.
 - d. Continental Building Products.
 - e. Certainteed.
- B. Type X: Thickness: 1/2 inch, Long Edges: Tapered.
- C. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.
 1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.
- D. Moisture - and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 1. Core: 1/2 inch (15.9 mm), Type X.
 2. Long Edges: Tapered.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 2. Shapes:

- a. Corner bead.
- b. LC-Bead: J-shaped; exposed long flange receives joint compound.
- c. L-Bead: L-shaped; exposed long flange receives joint compound.
- d. Expansion (control) joint.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape for Interior Gypsum Wallboard: As manufactured by gypsum board manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

2.6 COATINGS

- A. Primer and finish coats: Refer Section 099123 "Interior Painting".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- I. Isolate perimeter of gypsum board at floors with 1/2 inch bead of sealant over backer rod applied immediately following gypsum board installation.
- J. Cover all cut edges of gypsum board panels with waterproof coating before installation.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: As indicated on Drawings Vertical surfaces, unless otherwise indicated.
 - 2. Ceiling Type: Ceiling surfaces.
- B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
 1. Isolate gypsum board construction with control joints at the following locations:
 - a. Intersection of gypsum board and dissimilar materials, along all edges.
 - b. Where wings of "L", "U", and "T" shaped ceiling areas are joined.
 - c. Wall Partitions: 30 feet maximum spacing each direction.
 - d. Interior ceilings with perimeter relief: 50 feet maximum spacing each direction. Interior ceilings without perimeter relief: 30 feet maximum spacing each direction.
 - e. Exterior ceilings: 30 feet maximum spacing in each direction.
 - f. Control joints aligned with openings must continue from bottom to top of gypsum board if opening heights are less than height of gypsum board surface.
- C. Interior Trim: Install in the following locations:
 1. Corner bead: Use at outside corners, unless otherwise indicated.
 2. LC-Bead: Use at exposed panel edges.
 3. L-Bead: Use where indicated.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

- C. Apply joint tape over gypsum board joints, except those with trim not intended for tape.
- D. Finish Levels: Finish gypsum panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile and where indicated on Drawings.
 - 3. Level 4: At panel surfaces that will be exposed to view.
 - a. Primer and its application to surfaces are specified in Division 9 Painting Sections.

3.6 FIELD QUALITY CONTROL

- A. The moisture content of the taped and sanded gypsum board walls be measured and documented at two locations on each wall: the bottom edge and halfway between floor and ceiling. The interior finish may not be applied until the moisture content of the wallboard is below 0.4% on a gypsum moisture meter or below 12% on a wood meter.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 096519 - RESILIENT FLOOR TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Vinyl Plank Flooring.
2. Product, Color, and Pattern selections as indicated on Drawings.
3. Resilient flooring accessories.

B. Related Sections:

1. Section 062023 "Interior Finish Carpentry" for floor base molding.

1.2 SUBMITTALS

A. Samples for Verification: Full-size units of each color and pattern of floor tile required.

B. Bond and Moisture Test Reports: Verify compliance with ASTM F 710 and manufacturer's recommendations.

C. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1.

1. Review methods and procedures related to floor tile installation including:
2. Review delivery, storage, and handling procedures.
3. Review concrete slab conditions including results of bond and moisture testing.
4. Review ambient conditions and ventilation procedures.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.5 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 90 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 90 deg F.
- C. Close spaces to traffic during floor tile installation, and for 48 hours after floor tile installation.
- D. Install floor tile after other finishing operations, including painting, have been completed.

1.6 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

- A. Reference Drawings for product selections to be provided.

2.2 VINYL PLANK FLOORING

- A. Basis of Design: Pergo TimberCraft + WetProtect Waterproof Wheaton Oak Embossed Wood Plank Laminate Flooring.
 - 1. Overall Thickness: 12 mm
 - 2. Construction: Laminated Wood.
 - 3. Tile Size: 7.48 inches x 4.52 ft.
 - 4. Installation : Floating

2.3 INSTALLATION MATERIALS

- A. Underlayment: Pergo Gold Premium 3mm Flooring Underlayment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure performance of resilient products.

- B. Wood Subfloor Substrates: Verify level and suitability of surface to receive required underlayment as per floor tile manufacturer's instructions.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles in pattern indicated on Drawings or, if not indicated, square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay vinyl planks in pattern as indicated.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile products from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION

THIS PAGE IS BLANK

SECTION 097523 - SOLID SURFACING WINDOW STOOLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid surface window stools.

1.3 ACTION SUBMITTALS

- A. Product Data: For window stool materials.
- B. Shop Drawings: Show materials, finishes, edge profiles and methods of joining.
- C. Show locations and details of joints.
 - 1. Show direction of directional pattern, if any.
- D. Samples for Initial Selection: For each type of material exposed to view.
- E. Samples for Verification: For the following products:
 - 1. Window stool material, 6 inches (150 mm) square.
 - 2. One full-size solid surface material window stool, with front edge, 8 by 10 inches (200 by 250 mm), of construction and in configuration specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material window stools to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate window stools similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of window stools.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of window stools by field measurements before window stool fabrication is complete.

PART 2 - PRODUCTS

2.1 SOLID SURFACE WINDOW STOOL MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LG Solid Source Hi Macs – Basis of Design.
 - b. Corian by E. I. du Pont de Nemours and Company.
 - c. Formica Group.
 - 2. Type: Provide Standard type unless Special Purpose type is indicated.
 - 3. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.2 WINDOW STOOL FABRICATION

- A. Fabricate window stools according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
- B. Configuration: Front: Straight, slightly eased at top.
 - 1. Make window stools uniform in thickness and of identical thickness for each type of item; gage back of stool if necessary.
 - 2. Dress joints straight and at right angle to face unless otherwise indicated.
- C. Window Stools:
 - 1. Nominal Thickness: 3/4 inch unless otherwise indicated.
 - 2. Edge Detail: Straight, slightly eased at corners.
 - 3. Ends: Extend stools beyond opening as indicated and finish ends to match exposed edge.
 - 4. Fabricate window stools in one piece unless otherwise indicated.

- D. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Window Stools: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material window stools and conditions under which window stools will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of window stools.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install window stools level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Window Stools: Set window stools on metal blocking shims in a full bed of water-cleanable epoxy adhesive. Hold adhesive back from exposed edges of joints to allow for sealant.
- C. Bond joints with adhesive and draw tight as window stools are set. Mask areas of window stools adjacent to joints to prevent adhesive smears.
- D. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

3.3 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean window stools as work progresses. Remove adhesive and sealant smears immediately.
- B. Clean window stools no fewer than six days after completion of grouting and pointing, using clean water and soft rags or stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage window stools.

END OF SECTION

THIS PAGE IS BLANK

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Wood.
 - 2. Gypsum board.
- B. Paint all exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- C. Marking and Identification of protective construction: Apply painted warnings or signage decals on all fire-resistive and barrier construction in concealed spaces as per paragraph 703.7 of the current edition of the International Building Code.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. **Product Data:** For each type of product. Include preparation requirements and application instructions.
- B. **Samples for Initial Selection:** For each type of topcoat product.
- C. **Samples for Verification:** For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. **Product List:** For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
 - 3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. **Coating Maintenance Manual**
 - 1. Furnish, upon conclusion of the project, a coating maintenance manual. Manual is to include an Area Summary with finish schedule, Area Detail designating where each product/color was used on each surface, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- B. **Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.**
 - 1. **Paint:** 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

- A. **Obtain paint products from one manufacturer only for each type of paint specified.**

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Finishes, Inc.
 - 3. PPG/Dulux.
 - 4. PPG/Glidden.
 - 5. Pratt & Lambert.
 - 6. Sherwin-Williams Company (The).
 - 7. General Paint
 - 8. Kelley-Moore.
- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI (Master Painters Institute) Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction[and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].
1. Flat Paints and Coatings: 50 g/L.
 2. Nonflat Paints and Coatings: 150 g/L.
 3. Dry-Fog Coatings: 400 g/L.
 4. Primers, Sealers, and Undercoaters: 200 g/L.
 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 7. Pretreatment Wash Primers: 420 g/L.
 8. Floor Coatings: 100 g/L.
 9. Shellacs, Clear: 730 g/L.
 10. Shellacs, Pigmented: 550 g/L.
- D. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Colors: As selected by Architect from manufacturer's full range.

2.3 WOOD AND GYPSUM BOARD PRIMERS

- A. Primer, Latex, for Interior Gypsum Board and Wood: MPI #39.
1. VOC Content E Range E2 or E3.
 2. Environmental Performance Rating: EP2 or EP3.
 - a. Sherwin Williams PrepRite ProBlock Latex Primer/Sealer B51W00620
 - b. Benjamin Moore Fresh Start Interior/Exterior All Purpose Primer.
 - c. PPG Seal Grip Int/Ext Acrylic Universal Primer.

2.4 WATER-BASED PAINTS

- A. Institutional Low-Odor/VOC (Flat): MPI #143 (Gloss Level 1).
1. VOC Content: E Range of E3.
 2. Environmental Performance Rating: EPR 4
 - a. Sherwin Williams Harmony Interior Acrylic Flat B05W01051
 - b. Benjamin Moore Eco Spec WB Interior Latex Flat N373
 - c. PPG Dulux Lifemaster Commercial Flat Finish 59111.
 - d. PPG Pure Performance Interior Latex Flat 9-100.

- B. Institutional Low-Odor/VOC Latex (Eggshell): MPI #144 (Gloss Level 2).
 - 1. VOC Content: E Range of E3.
 - 2. Environmental Performance Rating: EPR 4.5.
 - a. Sherwin Williams Harmony Interior Latex Eg-Shel B09W01051.
 - b. Benjamin Moore Natura Waterborne Interior Eggshell 513.
 - c. PPG Dulux Ultra Zero VOC Interior Latex Eggshell Interior Acrylic Eggshell 97900.
 - d. PPG Pure Performance Interior Eggshell Latex 9300XI.
- C. Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).
 - 1. VOC Content: E Range of E3.
 - 2. Environmental Performance Rating: EPR 5.5.
 - a. Sherwin Williams Pro-Industrial Interior Acrylic Semi-Gloss B66-650.
 - b. Benjamin Moore Aura Waterborne Interior Semi-gloss 528.
 - c. PPG Dulux Lifemaster Interior Acrylic Semi-Gloss 59211.
 - d. PPG Wonder Pure Interior Semi-Gloss Latex DRP33XX.
- D. Waterborne Acrylic Dryfall – (Flat) MPI# 118
 - 1. Sherwin Williams Pro Industrial Waterborne Acrylic Dryfall B42W00181.
 - 2. PPG Architectural Glidden Professional Waterborne Dryfall Flat – 1280
 - 3. Pratt and Lambert Krylon Industrial Waterborne Flat Dryfall – K000Z5900.
 - 4. Benjamin Moore Coronado Super Kote 5000 Dryfall Acrylic Latex Flat N110.

2.5 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Engage the services of a qualified testing agency to sample paint materials.
 - 1. Architect to be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 - 1. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Paint interior surfaces in accordance with the following MPI Painting Manual requirements:
- B. Architectural Woodwork:
 - 1. Institutional Low-Odor/VOC Latex System: MPI INT 6.3V.
 - a. Prime Coat: Interior latex-based wood primer.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).
- C. Gypsum Board Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: MPI INT 9.2M.
 - a. Prime Coat: Interior latex primer/sealer.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).

END OF SECTION

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Private-use bathroom accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: Full size, for each exposed product and for each finish specified.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PRIVATE-USE BATHROOM ACCESSORIES

- A. Toilet Tissue Dispenser:

- 1.
 - 2. Description: Single-roll dispenser .
 - 3. Mounting: Recessed.
 - 4. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.

- B. Shower Curtain Rod:

- 1. Project Source 60-in Chrome Single Straight Zinc Fixed Shower Rod Model # 641SMV.
 - 2. Outside Diameter: 1-1/4 inches (32 mm).
 - 3. Mounting: Flanges with exposed fasteners.
 - 4. Rod Material and Finish: Polished Chrome-plated Zinc.
 - 5. Accessories: Integral chrome-plated brass glide hooks.

- C. Grab Bar:

- 1. Item # 68983 Model # LR8942 Moen Home Care Grab-Bar 42-in Stainless Steel Wall Mount Grab Bar
 - 2. Item # 600346 Model # LR8716P Moen Home Care 16-in Peened Wall Mount Grab Bar

3. Mounting: Flanges with concealed fasteners.
 4. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant (peened) texture in grip area.
 5. Outside Diameter: 1-1/2 inches (38 mm).
- D. Soap Dish:
1. Style Selections 25.5-in H Over the Showerhead Steel Satin Nickel Hanging Shower Caddy Model # 41631L.
- E. Medicine Cabinet:
1. Allen + Roth 22.25-in x 30.25-in Rectangle Surface Mirrored Steel Medicine Cabinet Model # 6288.
 2. Mounting: Recessed, for nominal 4-inch (100-mm) wall depth.
 3. Door: Framed mirror door concealing storage cabinet equipped with continuous hinge and spring-buffered, rod-type stop and magnetic door catch.
 4. Shelves: Three, adjustable.
 5. Material and Finish:
- F. Robe Hook:
1. Item # 473224 Model # 10601SN
 2. Residential Essentials 2-Hook Satin Nickel Towel Hook
 3. Description: Double -prong unit.
 4. Material and Finish: Satin Nickel.
- G. Towel Bar:
1. Item # 855707 Model # R23532-CP
 2. KOHLER Lilyfield Polished Chrome Single Towel Bar (Common: 24-in; Actual: 24.0in
 3. Mounting: Flanges with concealed fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

END OF SECTION

SECTION 113100 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Cooking appliances.
 - 2. Refrigeration appliances.
 - 3. Cleaning appliances.

- B. Related Requirements:

- 1. Reference plumbing drawings for Residential Plumbing Fixtures for kitchen sinks, dishwasher air-gap fittings, waste (garbage) disposers, and instant hot-water dispensers.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.

- C. Product Schedule: For appliances. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.

- B. Product Certificates: For each type of appliance.

- C. Field quality-control reports.
- D. Sample Warranties: For manufacturers' special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintains, within fifty miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

1.8 WARRANTY

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain residential appliances from single source.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 RANGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. General Electric Company (GE Appliances).
 - 2. KitchenAid; a division of Whirlpool Corporation.
 - 3. LG Electronics.
 - 4. Maytag; a division of Whirlpool Corporation.
- B. Electric Range: Freestanding range with one oven(s) and complying with AHAM ER-1.
 - 1. Width: 30 inches (762 mm).
 - 2. Electric Burner Elements: Four.
 - a. Coil Type: Manufacturer's standard Controls: Digital panel controls, located on front edge panel of range top. Rear-mounted controls not allowed.

3. Oven Features:

- a. Capacity: 3.3 cu. ft. (0.09 cu. m) .
 - b. Operation: Baking and self-cleaning or catalytic continuous cleaning .
 - c. Broiler: Located in top of oven .
 - d. Oven Door(s): Counterbalanced, removable, with observation window and full-width handle.
 - e. Electric Power Rating:
 - 1) Oven(s): 2400 W .
 - 2) Broiler: 3500 W .
 - f. Controls: Digital panel controls and timer display, located on front edge panel of range top. Rear-mounted controls not allowed.
4. Anti-Tip Device: Manufacturer's standard.
5. Electric Power Supply: 240 V, 60 Hz, 1 phase, 30 A .
6. Material: White enameled steel.

2.4 MICROWAVE OVENS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. General Electric Company (GE Appliances).
- 2. General Electric Company (Hotpoint).
- 3. KitchenAid; a division of Whirlpool Corporation.
- 4. LG Electronics.

B. Microwave Oven :

- 1. Mounting: Undercabinet .
- 2. Type: Conventional .
- 3. Dimensions:
 - a. Width: 24 inches (610 mm) .
 - b. Depth: 19-1/2 inches (495 mm) .
 - c. Height: 18 inches (457 mm) .
- 4. Capacity: 2.0 cu. ft. (0.06 cu. m) .
- 5. Oven Door: Door with observation window and pull handle and pushbutton latch release .
- 6. Exhaust Fan: Variable -speed fan, nonvented, recirculating type with charcoal filter and with manufacturer's standard capacity.
- 7. Microwave Power Rating: 1000 W .
- 8. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A .
- 9. Controls: Digital panel controls and timer display.
- 10. Other Features: Turntable lock-out feature .
- 11. Material: White enameled steel.

2.5 REFRIGERATOR/FREEZERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. General Electric Company (GE Appliances).
 2. General Electric Company (Hotpoint).
 3. KitchenAid; a division of Whirlpool Corporation.
 4. LG Electronics.
- B. Refrigerator/Freezer : Two-door refrigerator/freezer with freezer on bottom and complying with AHAM HRF-1.
1. Type: Freestanding .
 2. Dimensions:
 - a. Width: 30 inches (762 mm) .
 - b. Depth: 33-1/4 inches (845 mm) .
 - c. Height: 70 inches (1778 mm) .
 3. Storage Capacity:
 - a. Refrigeration Compartment Volume: 15.6 cu. ft. (0.44 cu. m) .
 - b. Freezer Volume: 5.13 cu. ft. (0.15 cu. m) .
 - c. Shelf Area: Three adjustable glass shelves, 26 sq. ft. (2.42 sq. m) .
 4. General Features:
 - a. Door Configuration: Overlay.
 - b. Dual refrigeration systems.
 - c. Separate touch-pad temperature controls for each compartment.
 5. Refrigerator Features:
 - a. Interior light in refrigeration compartment.
 - b. Compartment Storage: vegetable crisper and meat compartment .
 - c. Door Storage: Modular compartments .
 - d. Temperature-controlled meat/deli bin.
 6. Freezer Features: One freezer compartment(s) .
 - a. Automatic defrost.
 - b. Interior light in freezer compartment.
 - c. Automatic icemaker and storage bin.
 7. Energy Performance, ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product-labeling program.
 8. Front Panel(s): White enameled steel.
 9. Appliance Color/Finish: White

2.6 DISHWASHERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. General Electric Company (GE Appliances).
2. General Electric Company (Hotpoint).
3. KitchenAid; a division of Whirlpool Corporation.
4. LG Electronics.

- B. Dishwasher: Complying with AHAM DW-1.

1. Type: Built-in under counter.
2. Dimensions:
 - a. Width: 24 inches (610 mm) .
 - b. Depth: 25-3/4 inches (654 mm) .
 - c. Height: 34-1/2 inches (876 mm) .
3. Capacity:
 - a. International Place Settings of China: 12 .
 - b. Water Consumption for Full Load: 3.2 gal. (12 L) per cycle.
4. Sound Level: Maximum 42 dB.
5. Tub and Door Liner: Stainless steel with sealed detergent and automatic rinsing-aid dispensers.
6. Rack System: PVC-coated sliding dish racks, with removable cutlery basket .
7. Controls: Touch-pad controls with four wash cycles and hot-air and heat-off drying cycle options.
8. Features:
 - a. Waste food disposer.
 - b. Self-cleaning food-filter system.
 - c. Hot-water booster heater for 140 deg F (60 deg C) wash water with incoming water at 100 deg F (38 deg C).
 - d. Lock-out feature.
 - e. Half-load option.
 - f. Delay-wash option.
 - g. Digital display panel.
 - h. Water softener.
 - i. Soil-sensing water use control system.
9. Energy Performance, ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product-labeling program.
10. Front Panel white enameled steel Appliance Color/Finish: White gloss.

2.7 CLOTHES WASHERS AND DRYERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. General Electric Company (GE Appliances).
2. General Electric Company (Hotpoint).
3. LG Electronics.
4. Maytag; a division of Whirlpool Corporation.
5. Whirlpool Corporation.

B. Clothes Washer: Complying with AHAM HLW-1.

1. Type: Freestanding, front-loading unit.
2. Dimensions:
 - a. Width: 23-1/2 inches (597 mm) .
 - b. Depth: 29 inches (737 mm) .
 - c. Height: 34-1/2 inches (876 mm) .
3. Drum: Perforated porcelain-enameled steel.
 - a. Capacity: 3.2 cu. ft. (0.09 cu. m).
4. Controls: Touch-pad or Rotary-dial controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.
 - a. Wash Cycles: Six wash cycles, including regular, delicate, and permanent press.
 - b. Wash Temperatures: Three settings.
 - c. Speed Combinations: Four.
5. Electrical Power: 120 V, 60 Hz, 1 phase, 15 A.
6. Motor: Manufacturer's standard with built-in overload protector.
7. Features:
 - a. Self-cleaning lint filter.
 - b. Unbalanced-load compensator.
 - c. Inlet Hoses: Minimum length 60 inches (1525 mm).
 - d. Drain Hoses: Minimum length 48 inches (1220 mm).
 - e. Self-leveling legs.
 - f. Automatic dispenser for bleach fabric softener and [detergent].
 - g. Spin-cycle safety switch.
 - h. End-of-cycle signal.
 - i. Extra-rinse option.
 - j. Delay-wash option.
 - k. Electronic temperature control.
 - l. Water levels automatically set.
8. Energy Performance, ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product-labeling program.
9. Water-Efficient Clothes Washer: Provide clothes washer with modified energy factor greater than or equal to 2.0 and water factor less than 5.5.
10. Appliance Finish: White enameled steel.
11. Front-Panel Finish: White

C. Clothes Dryer: Complying with AHAM HLD-1.

1. Type: Freestanding, frontloading, electric unit.
2. Dimensions:
 - a. Width: 23-1/2 inches (597 mm) .
 - b. Depth: 31 inches (787 mm) .
 - c. Height: 34-1/2 inches (876 mm) .
3. Drum: Perforated porcelain-enameled steel .
 - a. Capacity: 5.7 cu. ft. (0.16 cu. m) .
4. Controls: Touch-pad or Rotary-dial controls for drying cycle, temperatures, and fabric selectors.
5. Electric-Dryer Power: 240 V, 60 Hz, 1 phase, 30 A .
6. Features:
 - a. Removable lint filter.
 - b. Electronic temperature and moisture-level-sensor controls.
 - c. End-of-cycle signal.
 - d. Interior drum light.
 - e. Self-leveling legs.
 - f. Antibacterial cycle.
 - g. Auxiliary drying rack.
 - h. Built-in electrical power fuse.
 - i. Stacking kit to stack dryer over washer.
7. Appliance Finish: White enameled steel.

2.8 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Examine walls, ceilings, and roofs for suitable conditions where microwave ovens with vented exhaust fans will be installed.

- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Solid surface material countertops.
 - 2. Solid surface material backsplashes.
 - 3. Solid surface material end splashes.

- B. Related Requirements:

- 1. Reference Plumbing Drawings for Plumbing Fixtures.

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials.

- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

- 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.

- C. Samples for Initial Selection: For each type of material exposed to view.

- D. Samples for Verification: For the following products:

- 1. Countertop material, 6 inches (150 mm) square.
 - 2. Wood trim, 8 inches (200 mm) long.
 - 3. One full-size solid surface material countertop, with front edge and backsplash, 8 by 10 inches (200 by 250 mm), of construction and in configuration specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops.
- C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
 - 1. Build mockup of typical countertop as shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed (where applicable) but before countertop fabrication is complete.

1.8 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LG Solid Source Hi Macs – Basis of Design.
 - b. Corian by E. I. du Pont de Nemours and Company.
 - c. Formica Group.
 - 2. Type: Provide Standard type unless Special Purpose type is indicated.
 - 3. Colors and Patterns: As selected by Architect from manufacturer's full range.

- B. Plywood: Exterior moisture-resistant softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 ACCESSORIES

- A. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, black , molded-plastic grommets and matching plastic caps with slot for wire passage.
- B. Surface-Mounted Countertop Support brackets: L-shaped bracket fabricated from aluminum T sections designed for supporting 24 inches deep counter; Rakks Model No. EH1824 as manufactured by Rangine Corporation.
 - 1. Size (height by depth by thickness): 18 inches by 24 inches by ¼ inch thick 6063 T6 extruded aluminum.
 - 2. Load capacity per bracket: 450 pounds.
 - 3. Spacing as indicated.

2.3 COUNTERTOP FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WT's "Architectural Woodwork Standards."
 - 1. Grade: Premium.
- B. Configuration:
 - 1. Front: Straight, slightly eased at top .
 - 2. Backsplash: Straight, slightly eased at corner.
 - 3. End Splash: Matching backsplash.
- C. Countertops: 1/2-inch- (12.7-mm-) thick, solid surface material laminated to ¾ inch thick plywood with front edge built up with same material.
- D. Backsplashes: 1/2-inch- (12.7-mm-) thick, solid surface material.
- E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate with loose backsplashes for field assembly.
 - 2. Install integral sink bowls in countertops in the shop.
- F. Joints: Fabricate countertops without joints.
- G. Cutouts and Holes:
 - 1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

- a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch (5 mm) into fixture opening.
 - b. Provide vertical edges, rounded to 3/8-inch (10-mm) radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch (5 mm) into fixture opening.
 - c. Provide 3/4-inch (20-mm) full bullnose edges projecting 3/8 inch (10 mm) into fixture opening.
2. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

2.4 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into corner blocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

- E. Anchor support brackets to wall spaced as indicated and install shims at countertop bearing areas. Make plumb, level, and true.
- F. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 - 1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
 - 2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- G. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- H. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- I. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- J. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION

THIS PAGE IS BLANK

EXAMPLE 8 INCH COURSE ELEVATION DIAGRAM

Bid Amount
8" Courses Needed
To Reach
Required Height

!EXAMPLE!
7 More Courses Needed

56"

40"

Ground Level
Flat Ground Only

Flat Ground
Fixed Rate Price
Ground to 40"

Bid Amount
8" Courses Needed
To Reach
Required Height

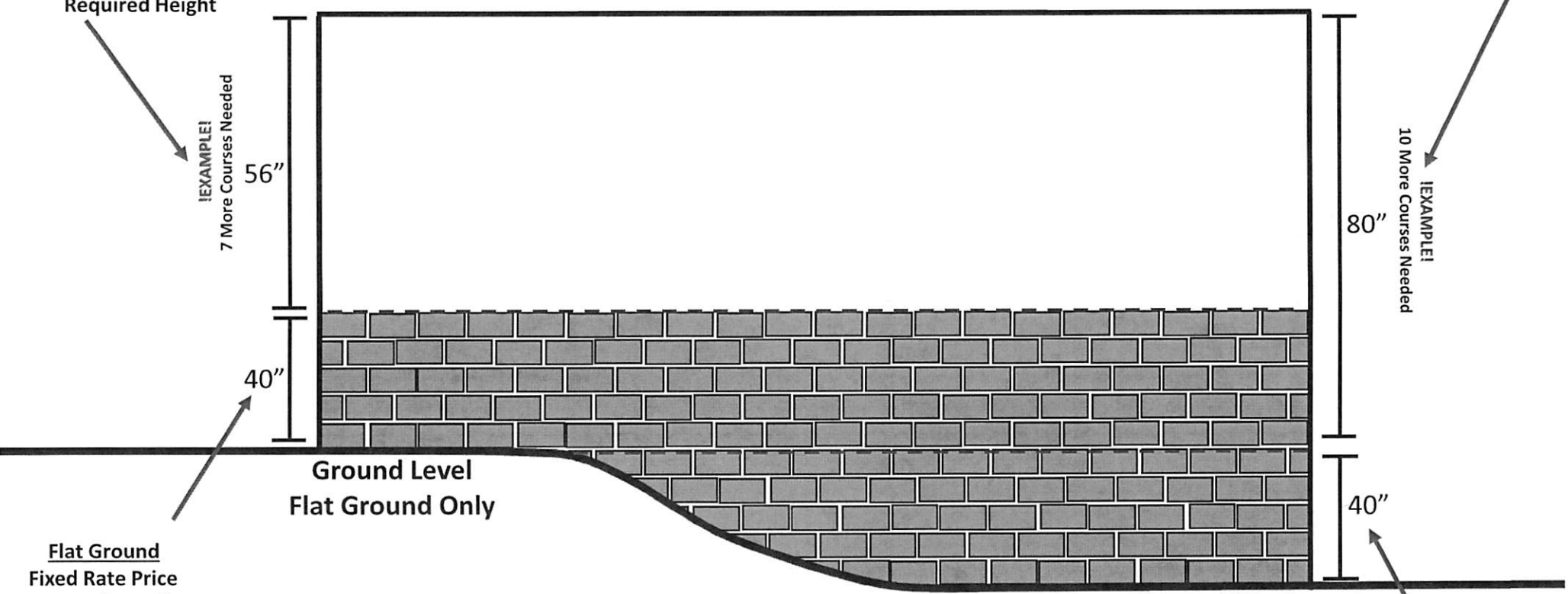
!EXAMPLE!
10 More Courses Needed

80"

40"

Ground Level
Sloped Ground Only

Sloped Ground
Fixed Rate Price
Ground to 40"



WV CDBG-DR Green Retrofit Checklist for Single Family Rehabilitation

This checklist is a revised version of the CPD Green Retrofit Checklist. It promotes energy efficiency and green building practices for single family rehabilitation projects funded by the WV CDBG-DR program. Rise WV will follow the checklist in its entirety and apply all measures within the Checklist to the extent applicable to the particular building type being retrofitted. The phrase "when replacing" in the Checklist refers to the mandatory replacement with specified green improvements, products, and fixtures only when replacing those systems during the normal course of the retrofit.

WATER AND ENERGY CONSERVATION MEASURES

- ☐ **Water-Conserving Fixtures**
Install or retrofit water conserving fixtures in any unit and common facility, use the following specifications: Toilets-- 1.28 gpf; Urinals-- 0.5 gpf; Showerheads-- 2.0 gpm; Kitchen faucets-- 2.0 gpm; and Bathroom faucets-- 1.5gpm. [gpf = gallons per flush; gpm = gallons per minute]
- ☐ **ENERGY STAR Appliances**
Install ENERGY STAR-labeled clothes washers, dishwashers, and refrigerators, if these appliance categories are provided in units or common areas.
- ☐ **Air Sealing: Building Envelope**
Seal all accessible gaps and penetrations in the building envelope. If applicable, use low VOC caulk or foam.
- ☐ **Insulation: Attic** (if applicable to building type)
For attics with closed floor cavities directly above the conditioned space, blow in insulation per manufacturer's specifications to a minimum density of 3.5 Lbs. per cubic foot (CF). For attics with open floor cavities directly above the conditioned space, install insulation to meet or exceed IECC levels.
- ☐ **Insulation: Flooring** (if applicable to building type)
Install \geq R-19 insulation in contact with the subfloor in buildings with floor systems over vented crawl spaces. Install a 6-mil vapor barrier in contact with 100% of the floor of the crawl space (the ground), overlapping seams and piers at least 6 inches.
- ☐ **Duct Sealing** (if applicable to building type)
Seal all ductwork that is accessible, with water based duct mastic.
- ☐ **Air Barrier System**
Ensure a continuous air barrier in any sections of the building envelope where wall finishes have been removed, allowing access to the wall cavities.
- ☐ **Windows**
When replacing windows, install geographically appropriate ENERGY STAR rated windows.
- ☐ **Sizing of Heating and Cooling Equipment**
When replacing, size heating and cooling equipment in accordance with the Air Conditioning Contractors of America (ACCA) Manuals, Parts J and S, or 2012 ASHRAE Handbook--HVAC Systems and Equipment or most recent edition.
- ☐ **Domestic Hot Water Systems**
When replacing domestic water heating system(s), ensure the system(s) meet or exceed the efficiency requirements of ENERGY STAR for Homes' Reference Design. Insulate pipes by at least
- ☐ **Efficient Lighting: Interior Units**
Install ENERGY STAR qualified light fixtures whenever a light fixture is replaced.
- ☐ **Efficient Lighting: Exterior**
Follow the guidance appropriate for the project type: install ENERGY STAR-qualified fixtures or LEDs with a minimum efficacy of 45 lumens/watt; **OR** follow the ENERGY STAR MFHR program guidelines, which require that 80% of outdoor lighting fixtures must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed; **OR** when replacing, install ENERGY STAR compact fluorescents or LEDs with a minimum efficacy of 45 lumens/watt.

INDOOR AIR QUALITY

- ☐ **Air Ventilation: Single Family and Multifamily** (three stories or fewer)
Install an in-unit ventilation system capable of providing adequate fresh air per ASHRAE 62.2 requirements.
- ☐ **Composite Wood Products that Emit Low/No Formaldehyde**
Composite wood products must be certified compliant with California 93120. If using a composite wood product that does not comply with California 93120, all exposed edges and sides must be sealed with low-VOC sealants.
- ☐ **Environmentally Preferable Flooring**
When replacing flooring, use environmentally preferable flooring, including the FloorScore certification. Any carpet products used must meet the Carpet and Rug Institute's Green Label or Green Label Plus certification for carpet, pad, and carpet adhesives.
- ☐ **Low/No VOC Paints and Primers**
All interior paints and primers must be less than or equal to the following VOC levels: Flats--50 g/L; Non-flats--50 g/L; Floor--100 g/L. [g/L = grams per liter; levels are based on a combination of the Master Painters Institute (MPI) and GreenSeal standards.]
- ☐ **Low/No VOC Adhesives and Sealants**
All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District.
- ☐ **Clothes Dryer Exhaust**
Vent clothes dryers directly to the outdoors using rigid-type duct work.
- ☐ **Mold Inspection and Remediation**
Inspect the interior and exterior of the building for evidence of moisture problems. Document the extent and location of the problems, and implement the proposed repairs according to the Moisture section of the EPA Healthy Indoor Environment Protocols for Home Energy Upgrades.
- ☐ **Combustion Equipment**
When installing new space and water-heating equipment, specify power-vented or direct vent combustion equipment.
- ☐ **Mold Prevention: Water Heaters**
Provide adequate drainage for water heaters that includes drains or catch pans with drains piped to the exterior of the dwelling.
- ☐ **Mold Prevention: Surfaces**
When replacing or repairing bathrooms, kitchens, and laundry rooms, use materials that have durable, cleanable surfaces.
- ☐ **Mold Prevention: Tub and Shower Enclosures**
When replacing or repairing tub and/or shower enclosures, use non-paper-faced backing materials such as cement board, fiber cement board, or equivalent in bathrooms.
- ☐ **Integrated Pest Management**
Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate sealing methods to prevent pest entry. [If applicable, provide training to multifamily buildings staff.]
- ☐ **Lead-Safe Work Practices**

For properties built before 1978, if the project will involve disturbing painted surfaces or cleaning up lead contaminated dust or soil, use certified renovation or lead abatement contractors and workers using lead-safe work practices and clearance examinations consistent with the more stringent of EPA's Renovation, Repair, and Painting Rule and HUD's Lead Safe Housing Rule.
- ☐ **Radon Testing and Mitigation** (if applicable based on building location)
For buildings in EPA Radon Zone 1 or 2, test for radon using the current edition of American Association of Radon Scientists and Technologists (AARST)'s Protocols for Radon Measurement in Homes Standard for Single-Family Housing or Duplexes, or AARST's Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings. To install radon mitigation systems in buildings with radon level of 4 pCi/L or more, use ASTM E 2121 for single-family housing or duplexes, or AARST's Radon Mitigation Standards for Multifamily Buildings. For new construction, use AARST's Reducing Radon in New Construction of 1 & 2 Family Dwellings and Townhouses, or ASTM E 1465.

1900 Kanawha Blvd. E.
Building 3, Suite 600
Charleston, WV 25305



WestVirginia.gov
(304) 558-2234
(800) 982-3386

RISE WV
Subcontractor/Laborer/Materialmen Claims and/or Liens
Satisfaction and Discharge Certification

In the event a payment or performance bond is not required for the solicitation and awarding of the RISE WV construction contract, the Contractor/Vendor identified below is responsible and shall provide to the West Virginia Development Office (WVDO) this document certifying that all of the claims and/or liens of Contractor/Vendor's subcontractors, laborers, materialmen, and all persons furnishing material have been paid, satisfied, and discharged. Final payment to the Contractor/Vendor by the WVDO shall not occur until this certification has been executed. The WVDO shall withhold 10% of each residential project pending certification by the Contractor/Vendor that all claims and/or liens have been fully satisfied for the specified project.

IN WITNESS WHEREOF, CONTRACTOR/VENDOR states and affirms under oath that it has satisfied and/or discharged all claims and/or liens by its subcontractors, laborers and/or materialmen.

SIGNED this _____ day of _____, 202_____.

Contractor/Vendor Signature

Contractor/Vendor Full Name (Print)

Company Name

STATE OF _____, COUNTY OF _____

I CERTIFY that on this _____ day of _____, 202_____,
_____, personally came before me, and this person(s)
acknowledged under oath, to my satisfaction, that: he/she is named in and personally signed this
document; and he/she signed, sealed, and delivered this document as his/her act and deed.

The West Virginia Development Office requested bids for the RISE WV program for the reconstruction, replacement, and rehabilitation of homes that were damaged in the June 2016 Floods and severe storms. According to the CDBG DR Certification, the West Virginia Development Office will be following the State procurement policies and worked with the WV Purchasing Division to solicit competitive bids for these construction projects.

On January 30, 2020, HB 4130 was passed to amend the Code of West Virginia, 1931, by adding thereto a new section designated §5-22-1a, relating to the competitive bidding for government construction contracts arising out of declared states of emergency; allowing contracts for construction projects to be procured through competitive bidding on an open-ended basis as to quantity or by unit pricing on estimated quantities; allowing the establishment of multiple award construction contracts; eliminating the need for emergency construction contracts to specify the exact location of construction involved in the solicitation for bids; making the requirement that the entity to whom the contract is awarded furnish payment or performance bonds discretionary for residential projects; requiring contractor to provide release of claims before final payment is released if bonds are not required; and making the award of such contracts subject to other competitive bidding requirements of said code.

ACORD™

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

07/17/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER

Lyon Fry Cadden Ins Agency Inc
P. O. Box 160927
(251) 473-4600
Mobile, AL 36616

CONTACT NAME: Katie Gilmore

PHONE (A/C, No, Ext): 251 473-4600

FAX (A/C, No): 251-450-0032

E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE

NAIC #

INSURER A: Middlesex Insurance Company

23434

INSURER B: Midwest Employers Casualty Company

23612

INSURER C:

INSURER D:

INSURER E:

INSURER F:

INSURED

Persons Services Corp.
4474 Halls Mill Road
Mobile, AL 36693

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> PD Ded:1,000 GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:		A0060738001	07/19/2020	07/19/2021	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$500,000 MED EXP (Any one person) \$5,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$3,000,000 PRODUCTS - COMP/OP AGG \$2,000,000 \$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO OWNED AUTOS ONLY <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> Drive Oth Car <input type="checkbox"/> SCHEDULED AUTOS NON-OWNED AUTOS ONLY		A0060738002	07/19/2020	07/19/2021	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	UMBRELLA LIAB <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> OCCUR <input checked="" type="checkbox"/> CLAIMS-MADE DED RETENTION \$		A0060738003	07/19/2020	07/19/2021	EACH OCCURRENCE \$5,000,000 AGGREGATE \$5,000,000 \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? <input checked="" type="checkbox"/> Y/N (Mandatory In NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	MEWC276903	01/01/2020	01/01/2021	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.I. EACH ACCIDENT \$1,000,000 E.I. DISEASE - EA EMPLOYEE \$1,000,000 E.I. DISEASE - POLICY LIMIT \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 Certificate holder is additional insured as respects general liability coverage, where required by written contract.

CERTIFICATE HOLDER

WV Department of Commerce
Development Office
1900 Kanawha Blvd East
Charleston, WV 25305

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

