# BOXABL

# CASITA B

PREFABRICATED MODULAR DWELLING UNITS

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BOXABL
5345 East North Belt Road
N. Las Vegas, NV 89115
WWW.BOXABL.COM

sevan
DESIGN SOLUTIONS, P.C.
Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
www.sevansolutions.com


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4/13/23
JOSEPH A. DeFILIPPIS No. 6585 STATE OF DELAWARE REGISTERED ARCHITECT

I HEREBY CERTIFY THAT THESE DRAWINGS HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE CODES AND ORDINANCES FOR PREFABRICATED DWELLING UNITS.

MODEL:

DELAWARE
20' CASITA B

PAGE LAYOUT

NOTES:

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PROJECT # : -

DRAWN BY: XX

REVIEWED BY: JD

REVISION:

ISSUE DATE: 03-15-23

SHEET: G1.0

## SCOPE OF WORK

WORK TO INCLUDE:

- THESE UNITS ARE PREFABRICATED FACTORY BUILT ACCESSORY DWELLING UNITS. PLUMBING, ELECTRICAL, & HVAC ARE PRE-INSTALLED, AND ARE CONNECTED TO INCOMING UTILITIES WHEN THE UNIT IS SET ON SITE.
- FOUNDATION SYSTEM IS PERMITTED & INSTALLED SEPARATELY BY THE UNIT OWNER.
- THIS SET IS INTENDED TO BE USED IN CONJUNCTION WITH THE MANUFACTURERS PANEL DRAWINGS AND STRUCTURAL DRAWINGS.

## BUILDING INFORMATION:

### ADDRESS:

| | |
|---|---|
| ADDRESS: | 1234 STREET |
| CITY: | CITY |
| COUNTY: | COUNTY |
| STATE: | DELAWARE |

### BUILDING CODE:

| | |
|---|---|
| BUILDING CODE: | 2015 INTERNATIONAL BUILDING CODE |
| MECHANICAL CODE: | 2015 INTERNATIONAL MECHANICAL CODE |
| ELECTRICAL CODE: | 2020 NATIONAL ELECTRICAL CODE |
| PLUMBING CODE: | 2021 DELAWARE PLUMBING CODE |
| ENERGY CODE: | 2018 INTERNATIONAL ENERGY CONSERVATION CODE |
| FIRE PREVENTION CODE: | 2021 INTERNATIONAL FIRE CODE |

## GENERAL NOTES

THE INFORMATION SHOWN ON THESE DRAWINGS IS BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME TO THE ARCHITECT. THIS INFORMATION CANNOT BE GUARANTEED TO SHOW EVERY EXISTING CONDITION. EACH CONTRACTOR ON THIS PROJECT SHALL READ AND STUDY THE TOTAL SET OF DRAWINGS FOR ALL WORK. CONTRACTORS MUST VISIT THE SITE AND DETERMINE ALL FIELD CONDITIONS. ALL DIMENSIONS SHALL BE VERIFIED AND ALL DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT PRIOR TO BID SUBMISSION.

THE ARCHITECT AND HIS CONSULTANTS DO NOT WARRANTY OR GUARANTEE THE COMPLETENESS OF THE WORK BEYOND A REASONABLE DILIGENCE. IF ANY ERRORS, DISCREPANCIES, OR OMISSIONS ARE FOUND TO EXIST IN THE WORK PRODUCT, THE ARCHITECT SHALL BE PROMPTLY NOTIFIED SO THAT HE MAY HAVE THE OPPORTUNITY TO TAKE WHATEVER STEPS NECESSARY TO RESOLVE THE ISSUE. FAILURE TO PROMPTLY NOTIFY THE ARCHITECT OF SUCH CONDITIONS, SHALL ABSOLVE THE ARCHITECT FROM ANY RESPONSIBILITY OF SUCH FAILURE. ACTION TAKEN WITHOUT THE KNOWLEDGE AND CONSENT OF THE ARCHITECT, IN CONTRADICTION TO THE WORK PRODUCT, OR THE RECOMMENDATIONS OF THE ARCHITECT SHALL BECOME THE RESPONSIBILITY OF THE PARTIES RESPONSIBLE FOR TAKING SUCH ACTION.

THESE DRAWINGS WERE PREPARED BASED ON THE ASSUMPTION THAT ANY CONTRACTOR, SUBCONTRACTOR, SUPPLIER, OR VENDOR INVOLVED IN THE CONSTRUCTION OF THE WORK DESCRIBED HEREIN HAS EXPERIENCE IN THEIR RESPECTIVE AREAS OR DISCIPLINES THAT MAKE UP THE SCOPE OF THE PROJECT.

IT IS NOT THE INTENT OF THESE DRAWINGS TO SHOW EVERY DETAIL OR NUANCE THAT MAY BE REQUIRED TO CONSTRUCT THE WORK SHOWN. IN ADDITION, IT IS ASSUMED THAT EACH CONTRACTOR IS FAMILIAR WITH EACH PORTION OF THEIR WORK, WHETHER THEY ARE CONSTRUCTING OR ASSEMBLING THE REQUIRED COMPONENTS, OR FOLLOWING MANUFACTURER'S GUIDELINES, RECOMMENDATIONS, OR SPECIFICATIONS FOR A PARTICULAR PORTION OF THEIR WORK.

ANY WORK THAT INVOLVES UTILIZING A PRE-MANUFACTURED COMPONENT, OR OTHER FIELD ASSEMBLED OR FIELD APPLIED SYSTEM IS THE SOLE RESPONSIBILITY OF THE ENTITY ENGAGED TO PERFORM THAT WORK. ANY ERRORS, OMISSIONS, DEFECTS, OR DAMAGES CAUSED BY ANY DEVIATION FROM THE MANUFACTURER'S GUIDELINES, RECOMMENDATIONS, OR SPECIFICATIONS, SHALL BE THE SOLE RESPONSIBILITY OF THE ENTITY RESPONSIBLE FOR SUCH ACTION, AND ANY REQUIRED REMEDIES, INCLUDING REPLACEMENT SHALL BE THE RESPONSIBILITY OF THE PARTY RESPONSIBLE FOR THE ERROR, OR OMISSION, THAT CAUSED THE DAMAGE OR DEFECT.

MANUFACTURERS COMPLIANCE CERTIFICATE CAN BE FOUND NEXT TO WATER HEATER IN KITCHEN ON THE WALL AND INSIDE THE ELECTRICAL SUB PANEL DOOR

## PROJECT CONTACTS

OWNER:
BOXABL
5345 EAST NORTH BELT ROAD
LAS VEGAS, NV 89115

ELECTRICAL ENGINEER
DICKERSON ENGINEERING, INC
3343 NORTH RIDGE
ARLINGTON HEIGHTS, IL 60004
847-966-0290
DAVIS DICKERSON

ARCHITECT
SEVAN DESIGN SOLUTIONS P.C.
3025 HIGHLAND PARKWAY,
SUITE 850
DOWNERS GROVE, ILLINOIS
630-733-9647
JOE DEFILIPPIS

MECHANICAL & PLUMBING ENGINEER
WCW ENGINEERS, INC.
760 CREEL DRIVE
WOOD DALE, IL 60191
630-595-8800
JOSEPH G. THOMAS

## BUILDING DATA

| | |
|---|---|
| OCCUPANCY CLASSIFICATION: | IRC ACCESSORY STRUCTURE OR DWELLING UNIT |
| TOTAL BUILDING AREA: | 361 SQFT |
| BUILDING HEIGHT: | 10'-9" |
| CONSTRUCTION TYPE: | II-B |

CASITAS DESIGNED FOR THE WORST CASE ULTIMATE WIND SPEED AND EXPOSURE CONDITIONS IN DELAWARE : 105 mph (REQ'D); 155 mph (ACTUAL), EXPOSURE C. SEISMIC LOADS ARE NEGLIGIBLE

TESTS PASSED:
NFPA 286 CORNER BURN TEST
ASTM E84 NON-COMBUSTIBLE MATERIAL CONSTRUCTION

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Generated by RES*check-Web* Software

# Compliance Certificate

Project Boxabl DE

Energy Code: **2018 IECC**
Location: **Wilmington, Delaware**
Construction Type: **Single-family**
Project Type: **New Construction**
Conditioned Floor Area: **361 ft2**
Glazing Area **6%**
Climate Zone: **4 (5110 HDD)**
Permit Date:
Permit Number:

Construction Site:
1234 Main Street
Delaware

Owner/Agent:
Boxabl
Delaware

Designer/Contractor:
Lisa Latal
Sevan Multi-Site Solutions
3025 Highland Pwky
Downers Grove, IL 60515
lisa.latal@sevansolutions.com

**Compliance: Passes using UA trade-off**

Compliance: **13.3% Better Than Code** | Maximum UA: **135** | Your UA: **117** | Maximum SHGC: **0.40** | Your SHGC: **0.25**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules.
It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Slab-on-grade tradeoffs are no longer considered in the UA or performance compliance path in REScheck. Each slab-on-grade assembly in the specified climate zone must meet the minimum energy code insulation R-value and depth requirements.

## Envelope Assemblies

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Prop. U-Factor | Req. U-Factor | Prop. UA | Req. UA |
|---|---|---|---|---|---|---|---|
| Ceiling: Structural Insulated Panels (SIPs) | 361 | | 27.9 | 0.037 | 0.026 | 13 | 9 |
| Wall: Structural Insulated Panels | 1,444 | | 23.5 | 0.046 | 0.060 | 62 | 81 |
| Door: Glass Door (over 50% glazing) SHGC: 0.25 | 22 | | | 0.340 | 0.320 | 8 | 7 |
| Window: Vinyl Frame SHGC: 0.25 | 66 | | | 0.340 | 0.320 | 22 | 21 |
| Floor: Structural Insulated Panels | 361 | | 27.9 | 0.034 | 0.047 | 12 | 17 |

*Compliance Statement:* The proposed building design described here is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2018 IECC requirements in RES*check* Version : REScheck-Web and to comply with the mandatory requirements listed in the RES*check* Inspection Checklist.

Name - Title | Signature | Date



RES*check* Software Version : REScheck-Web

# Inspection Checklist

Energy Code: 2018 IECC

Requirements: 0.0% were addressed directly in the RES*check* software

Text in the "Comments/Assumptions" column is provided by the user in the REScheck Requirements screen. For each reirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

| Section # & Req.ID | Pre-Inspection/Plan Review | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 103.1, 103.2 [PR1][1] | Construction drawings and documentation demonstrate energy code compliance for the building envelope. Thermal envelope represented on construction documents. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 103.1, 103.2, 403.7 [PR3][1] | Construction drawings and documentation demonstrate energy code compliance for lighting and mechanical systems. Systems serving multiple dwelling units must demonstrate compliance with the IECC Commercial Provisions. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 302.1, 403.7 [PR2][2] | Heating and cooling equipment is sized per ACCA Manual S based on loads calculated per ACCA Manual J or other methods approved by the code official. | Heating: Btu/hr____ Cooling: Btu/hr____ | Heating: Btu/hr____ Cooling: Btu/hr____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Foundation Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| 303.2.1 [FO11][2] | A protective covering is installed to protect exposed exterior insulation and extends a minimum of 6 in. below grade. | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.9 [FO12][2] | Snow- and ice-melting system controls installed. | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Framing / Rough-In Inspection | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 402.1.1, 402.3.1, 402.3.3, 402.5 [FR2][1] | Glazing U-factor (area-weighted average). | U-____ | U-____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | *See the Envelope Assemblies table for values.* |
| 303.1.3 [FR4][1] | U-factors of fenestration products are determined in accordance with the NFRC test procedure or taken from the default table. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.4.1.1 [FR23][1] | Air barrier and thermal barrier installed per manufacturer's instructions. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.4.3 [FR20][1] | Fenestration that is not site built is listed and labeled as meeting AAMA /WDMA/CSA 101/I.S.2/A440 or has infiltration rates per NFRC 400 that do not exceed code limits. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.4.5 [FR16][2] | IC-rated recessed lighting fixtures sealed at housing/interior finish and labeled to indicate ≤2.0 cfm leakage at 75 Pa. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.1 [FR12][1] | Supply and return ducts in attics insulated >= R-8 where duct is >= 3 inches in diameter and >= R-6 where < 3 inches. Supply and return ducts in other portions of the building insulated >= R-6 for diameter >= 3 inches and R-4.2 for < 3 inches in diameter. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.2 [FR13][1] | Ducts, air handlers and filter boxes are sealed with joints/seams compliant with International Mechanical Code or International Residential Code, as applicable. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.5 [FR15][3] | Building cavities are not used as ducts or plenums. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.7 [FR28][3] | Ducts declared to be within the conditioned space are either 1) completely within the continuous air barrier and within the building thermal envelope, 2) buried within ceiling insulation in accordance with Section R403.3.6 and the air handler is located completely within the continuous air barrier and within the building thermal envelope and the duct leakage is <= 1.5 cfm / 100 square feet of conditioned floor area served by the duct system, or 3) the ceiling insulation R-value installed against and above the insulated duct >= to the proposed ceiling insulation R-value, less the R-value of the insulation on the | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Framing / Rough-In Inspection | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 403.4 [FR17][2] | HVAC piping conveying fluids above 105 ºF or chilled fluids below 55 ºF are insulated to ≥R-3. | R-____ | R-____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.4.1 [FR24][1] | Protection of insulation on HVAC piping. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.3 [FR18][2] | Hot water pipes are insulated to ≥R-3. | R-____ | R-____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.6 [FR19][2] | Automatic or gravity dampers are installed on all outdoor air intakes and exhausts. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Insulation Inspection | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 303.1 [IN13][2] | All installed insulation is labeled or the installed R-values provided. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.1.1, 402.2.6 [IN1][1] | Floor insulation R-value. | R-____ ☐ Wood ☐ Steel | R-____ ☐ Wood ☐ Steel | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | *See the Envelope Assemblies table for values.* |
| 303.2, 402.2.8 [IN2][1] | Floor insulation installed per manufacturer's instructions and in substantial contact with the underside of the subfloor, or floor framing cavity insulation is in contact with the top side of sheathing, or continuous insulation is installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.1.1, 402.2.5, 402.2.6 [IN3][1] | Wall insulation R-value. If this is a mass wall with at least ½ of the wall insulation on the wall exterior, the exterior insulation requirement applies (FR10). | R-____ ☐ Wood ☐ Mass ☐ Steel | R-____ ☐ Wood ☐ Mass ☐ Steel | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | *See the Envelope Assemblies table for values.* |
| 303.2 [IN4][1] | Wall insulation is installed per manufacturer's instructions. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

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ISSUE DATE: 12/01/22
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| Section # & Req.ID | Final Inspection Provisions | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 402.1.1, 402.2.1, 402.2.2, 402.2.6 [FI1][1] | Ceiling insulation R-value. | R-____ ☐ Wood ☐ Steel | R-____ ☐ Wood ☐ Steel | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | *See the Envelope Assemblies table for values.* |
| 303.1.1.1, 303.2 [FI2][1] | Ceiling insulation installed per manufacturer's instructions. Blown insulation marked every 300 ft². | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.2.3 [FI22][2] | Vented attics with air permeable insulation include baffle adjacent to soffit and eave vents that extends over insulation. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.2.4 [FI3][1] | Attic access hatch and door insulation ≥R-value of the adjacent assembly. | R-____ | R-____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 402.4.1.2 [FI17][1] | Blower door test @ 50 Pa. <=5 ach in Climate Zones 1-2, and <=3 ach in Climate Zones 3-8. | ACH 50 =____ | ACH 50 =____ | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.3 [FI27][1] | Ducts are pressure tested to determine air leakage with either: Rough-in test: Total leakage measured with a pressure differential of 0.1 inch w.g. across the system including the manufacturer's air handler enclosure if installed at time of test. Postconstruction test: Total leakage measured with a pressure differential of 0.1 inch w.g. across the entire system including the manufacturer's air handler enclosure. | ____ cfm/100 ft² | ____ cfm/100 ft² | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.4 [FI4][1] | Duct tightness test result of <=4 cfm/100 ft2 across the system or <=3 cfm/100 ft2 without air handler @ 25 Pa. For rough-in tests, verification may need to occur during Framing Inspection. | ____ cfm/100 ft² | ____ cfm/100 ft² | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.3.2.1 [FI24][1] | Air handler leakage designated by manufacturer at <=2% of design air flow. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.1.1 [FI9][2] | Programmable thermostats installed for control of primary heating and cooling systems and initially set by manufacturer to code specifications. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.1.2 [FI10][2] | Heat pump thermostat installed on heat pumps. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.1 [FI11][2] | Circulating service hot water systems have automatic or accessible manual controls. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Final Inspection Provisions | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
|---|---|---|---|---|---|
| 403.6.1 [FI25][2] | All mechanical ventilation system fans not part of tested and listed HVAC equipment meet efficacy and air flow limits per Table R403.6.1. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.2 [FI26][2] | Hot water boilers supplying heat through one- or two-pipe heating systems have outdoor setback control to lower boiler water temperature based on outdoor temperature. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.1.1 [FI28][2] | Heated water circulation systems have a circulation pump. The system return pipe is a dedicated return pipe or a cold water supply pipe. Gravity and thermos-syphon circulation systems are not present. Controls for circulating hot water system pumps start the pump with signal for hot water demand within the occupancy. Controls automatically turn off the pump when water is in circulation loop is at set-point temperature and no demand for hot water exists. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.1.2 [FI29][2] | Electric heat trace systems comply with IEEE 515.1 or UL 515. Controls automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.2 [FI30][2] | Demand recirculation water systems have controls that manage operation of the pump and limit the temperature of the water entering the cold water piping to <= 104ºF. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 403.5.4 [FI31][2] | Drain water heat recovery units tested in accordance with CSA B55.1. Potable water-side pressure loss of drain water heat recovery units < 3 psi for individual units connected to one or two showers. Potable water-side pressure loss of drain water heat recovery units < 2 psi for individual units connected to three or more showers. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 404.1 [FI6][1] | 90% or more of permanent fixtures have high efficacy lamps. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 404.1.1 [FI23][3] | Fuel gas lighting systems have no continuous pilot light. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |
| 401.3 [FI7][2] | Compliance certificate posted. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)



| Section # & Req.ID | Final Inspection Provisions | Plans Verified Value | Field Verified Value | Complies? | Comments/Assumptions |
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| 303.3 [FI18][3] | Manufacturer manuals for mechanical and water heating systems have been provided. | | | ☐Complies ☐Does Not ☐Not Observable ☐Not Applicable | |

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ISSUE DATE: 12/01/22
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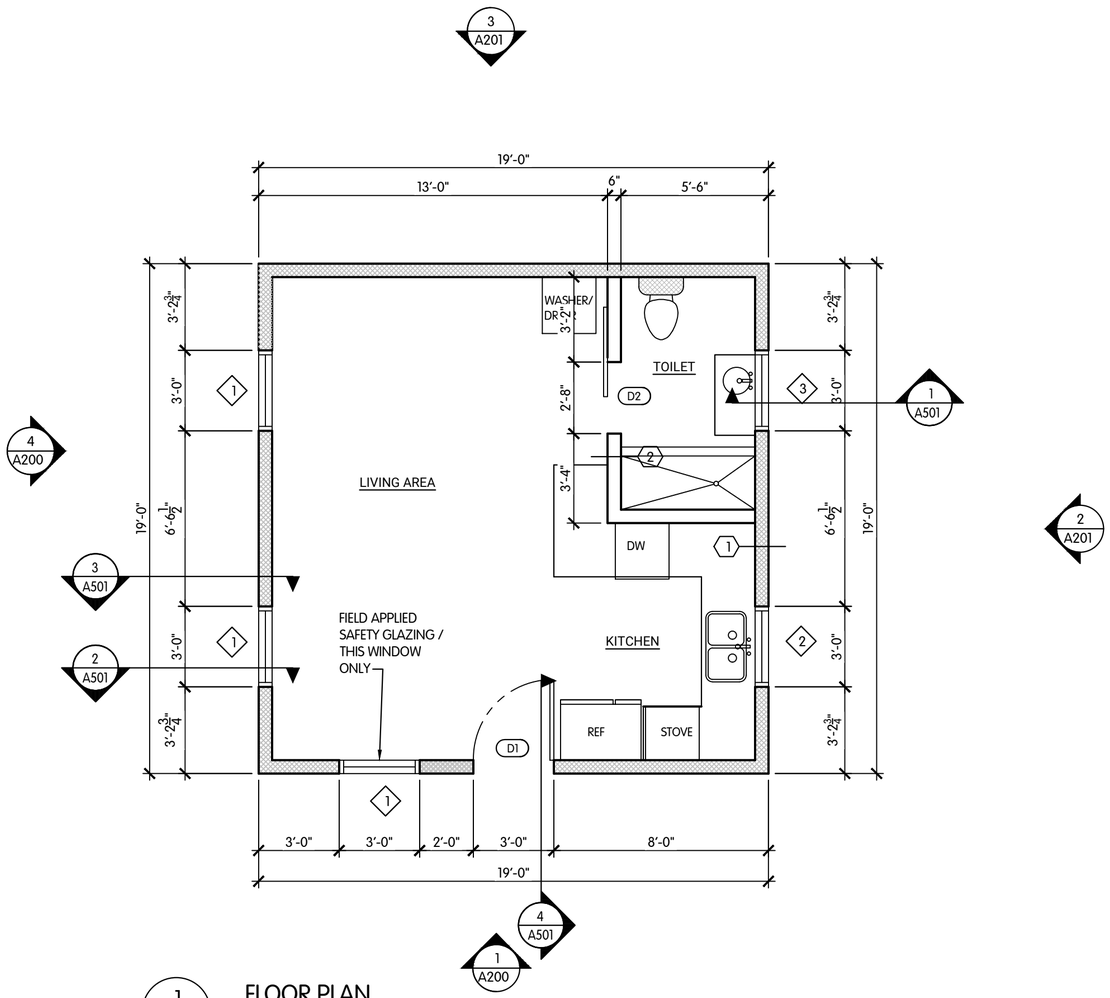


1 / A1.0 FLOOR PLAN

SCALE: 1/4" = 1'-0"

## LEGEND

- 1 — KEY NOTE
- SIP PANEL
- EXISTING WALL
- 1 — WINDOW TAG SEE A600
- # — WALL TYPE TAG. SEE 2/A100
- D# — DOOR TAG SEE A600

NOTE:

SEE MANUFACTURER'S DRAWINGS FOR UTILITY CONNECTIONS, PANEL DETAILS, MODULAR CONNECTIONS & ALL RELATED STRUCTURAL DETAILS

## WINDOW & DOOR SCHEDULE

| NUMBER | PRODUCT | CONFIGURATION | SIZE | MATERIAL | U-FACTOR | SOLAR HEAT GAIN (SHGC) | NOTES |
|---|---|---|---|---|---|---|---|
| 1 | WINDOW | SINGLE HUNG | 3'-0" X 6'-0" | VINYL | 0.400 | 0.25 | |
| 2 | WINDOW | FIXED | 3'-0" X 4'-0" | VINYL | 0.400 | 0.25 | |
| 3 | WINDOW | FIXED | 3'-0" X 2'-0" | VINYL | 0.400 | 0.25 | |
| D1 | DOOR | ENTRY DOOR | 3'-0" X 8'-0" | FIBERGLASS | 0.400 | 0.25 | |
| D2 | DOOR | TOILET DOOR | 2'-8" X 8'-0" | BARN DOOR | 0 | 0 | BARN-STYLE SLIDER |


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4/13/23
JOSEPH A. DeFILIPPIS No. 6585 STATE OF DELAWARE REGISTERED ARCHITECT

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MODEL:

DELAWARE
20' CASITA B

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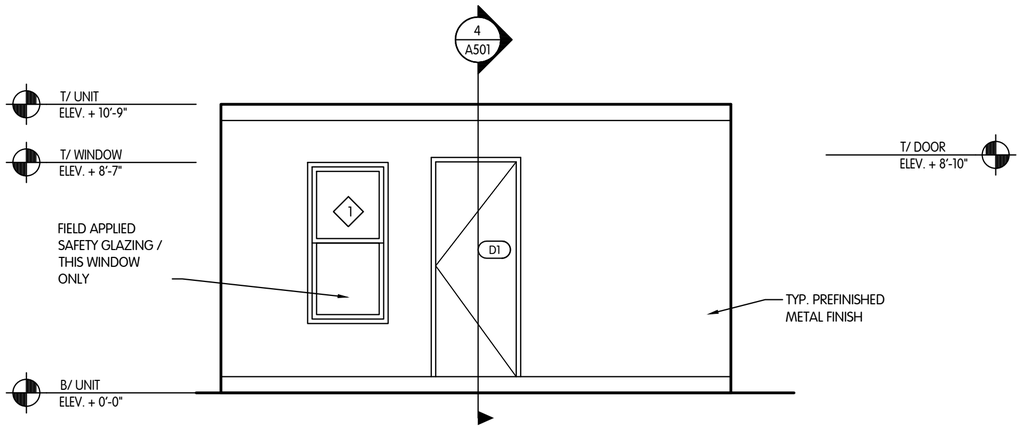
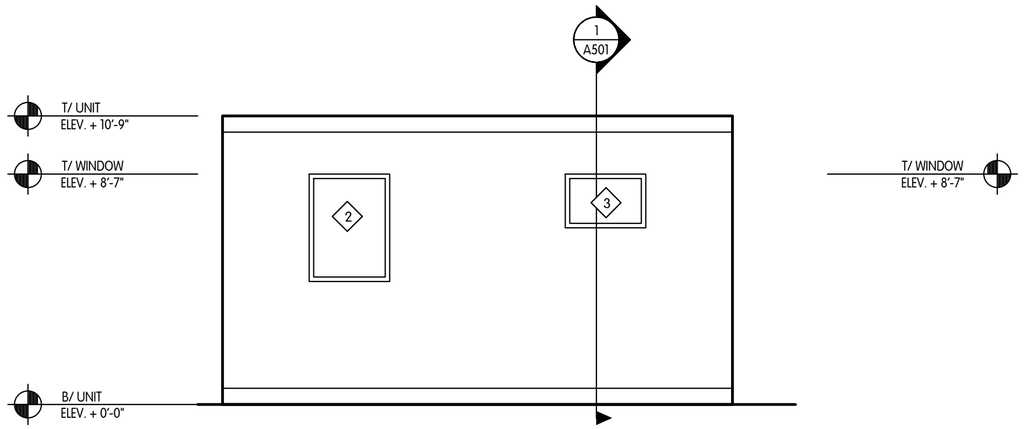
## EXTERIOR FINISHES:

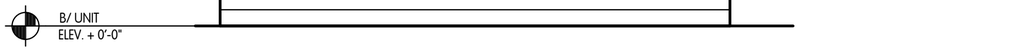
24 GAUGE METAL PANEL INSTALLED BY MANUFACTURER



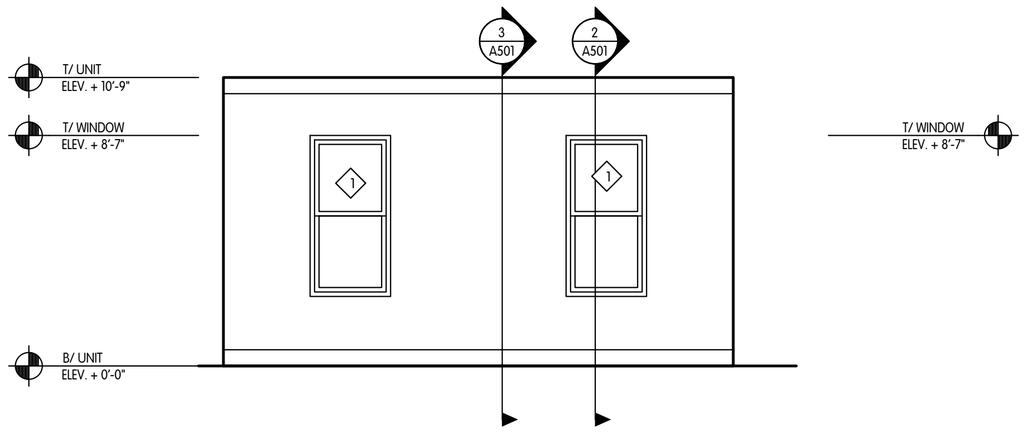

1 A2.0 FRONT SIDE
SCALE: 1/4" = 1'-0"




2 A2.0 RIGHT SIDE
SCALE: 1/4" = 1'-0"




3 A2.0 BACK SIDE
SCALE: 1/4" = 1'-0"




4 A2.0 LEFT SIDE
SCALE: 1/4" = 1'-0"

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MODEL:

DELAWARE
20' CASITA B

PAGE LAYOUT

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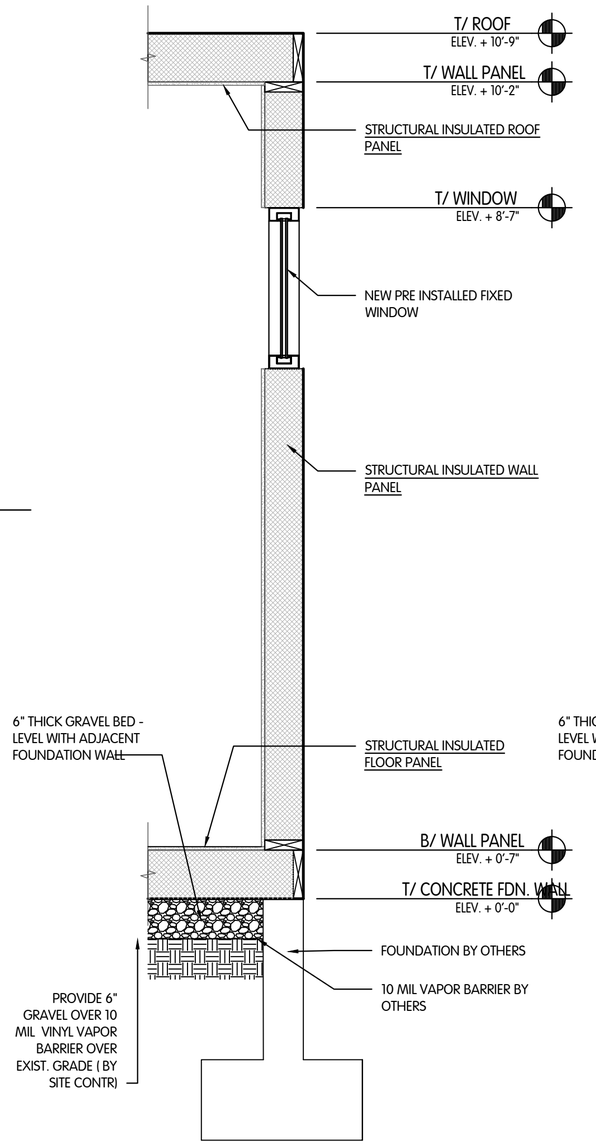
# STANDARD WALL CONSTRUCTION TYPES

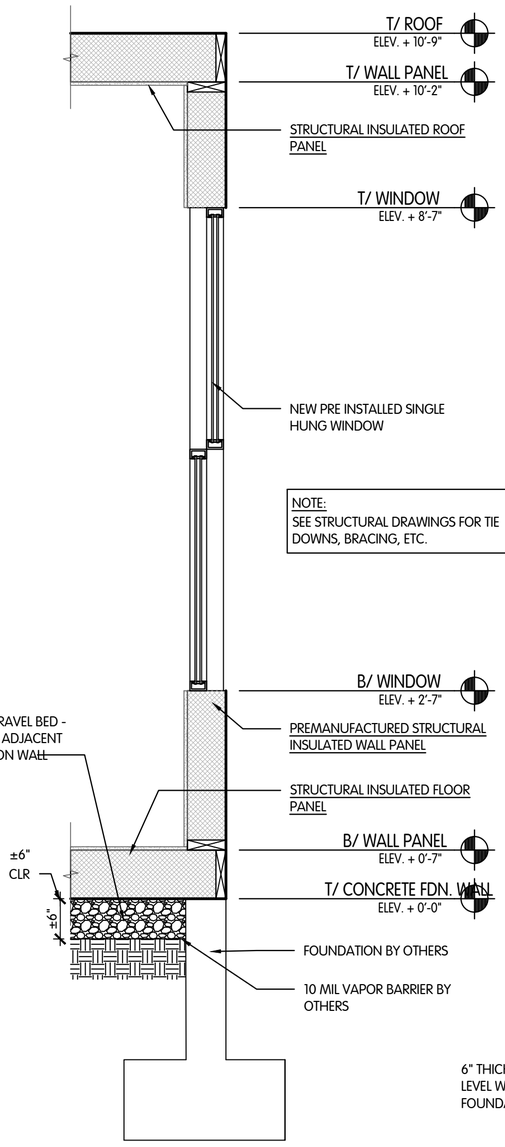
TYPICAL STRUCTURAL INSULATED WALL PANEL
1/4" MgO BOARD ADHERED TO 5 3/4" EPS FOAM INSULATION W/ 24 GAUGE METAL PANEL AS OUTSIDE FINISH.

TYPICAL STRUCTURAL INSULATED ROOF PANEL
1/4" MgO BOARD ADHERED TO 7 1/4" EPS FOAM INSULATION W/ TPO ROOFING MEMBRANE AS OUTSIDE FINISH

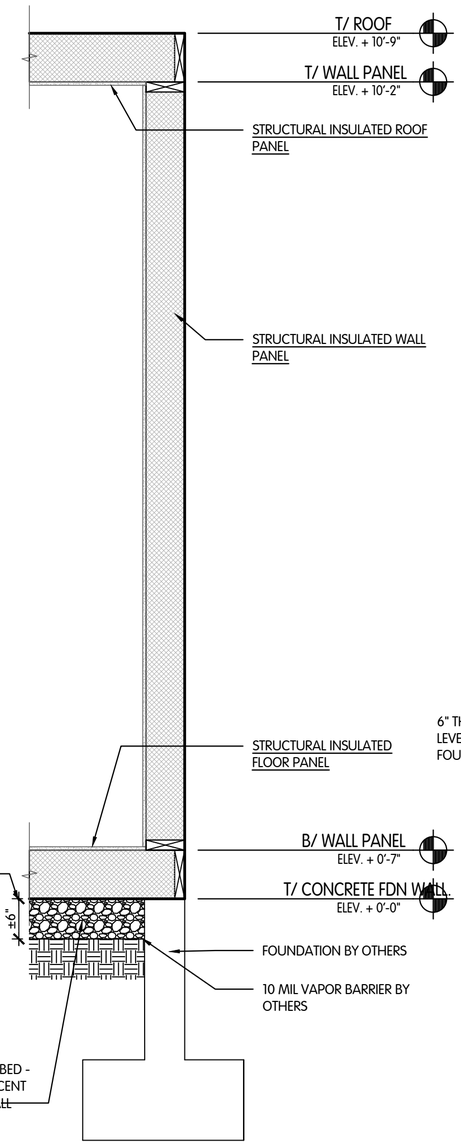
TYPICAL STRUCTURAL INSULATED FLOOR PANEL
1/4" MgO BOARD ADHERED TO 7 1/4" EPS FOAM INSULATION W/ 24 GAUGE METAL PANEL AS OUTSIDE FINISH.




1 A3.0 WALL SECTION
SCALE: 3/4" = 1'-0"




2 A3.0 WALL SECTION
SCALE: 3/4" = 1'-0"




3 A3.0 WALL SECTION
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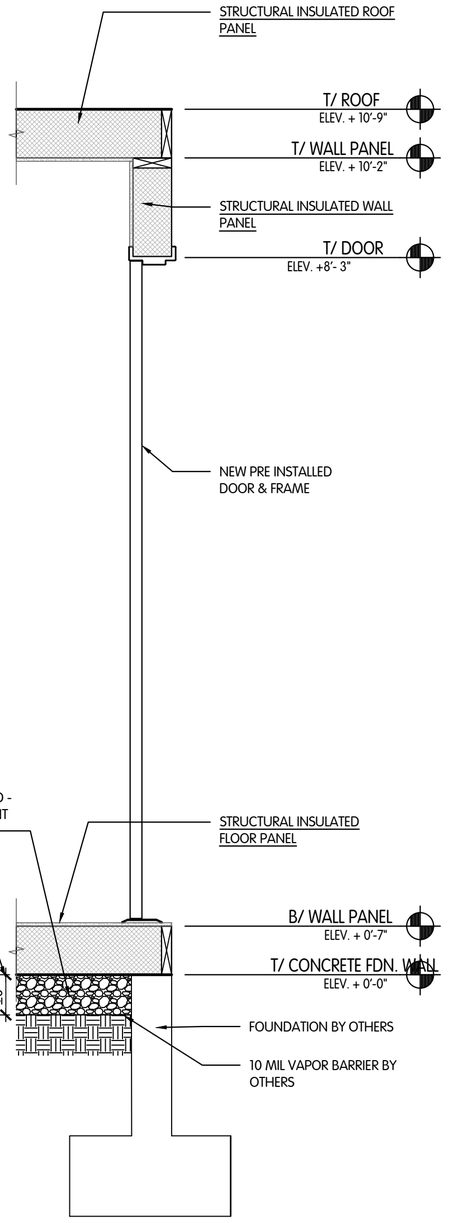


4 A3.0 WALL SECTION
SCALE: 3/4" = 1'-0"


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GENERAL

1. MECHANICAL SYSTEMS SHALL BE INSTALL IN ACCORDANCE WITH ALL APPLICABLE BUILDING CODES.

2. DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURERS STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS AS REQUIRED. FURNISH AND INSTALL DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS AND MATERIALS NECESSARY TO FACILITATE THE SYSTEMS FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED. THE WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND SUBJECT TO INSPECTION.

3. THE MECHANICAL SYSTEMS SHALL BE COMPLETE WITH ALL NECESSARY APPURTENANCES FOR A COMPLETE OPERATING SYSTEM.

4. THE CONTRACTOR SHALL WARRANTEE ALL MATERIAL AND GUARANTEE ALL WORKMANSHIP FOR ONE YEAR FROM SUBSTANTIAL COMPLETION.

BASIC MATERIALS AND METHODS

1. MATERIALS SHALL BEAR UNDERWRITERS LABEL WHERE SUCH STANDARDS HAVE BEEN ESTABLISHED AND LISTED BY UNDERWRITER'S LABORATORIES, INC. MATERIALS, EQUIPMENT AND APPLIANCES SHALL CONFORM TO THE LATEST STANDARDS OF:
   - AMCA -AIR MOVING AND CONDITIONING ASSOCIATIONS, INC.
   - SMACNA -SHEET METAL AND AIR CONDITIONING CONTRACTOR NATIONAL ASSOCIATION, INC.
   - ASHRAE -AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
   - ASME -AMERICAN SOCIETY OF MECHANICAL ENGINEERS
   - ASTM -AMERICAN SOCIETY FOR TESTING MATERIALS
   - NEMA -NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
   - ARI -AIR CONDITIONING AND REFRIGERATION INSTITUTE
   - ANSI -AMERICAN NATIONAL STANDARDS INSTITUTE

COORDINATION

1. COORDINATE WITH GENERAL CONTRACTOR FOR ALLOWABLE DAYS OF WEEK AND TIMES OF DAY FOR SYSTEMS SHUT DOWNS AS REQUIRED FOR THE CONSTRUCTION WORK.

2. THE MECHANICAL CONTRACTOR SHALL COORDINATE DUCTWORK INSTALLATION WITH ARCHITECTS/OWNERS REPRESENTATIVE IN FIELD AND OTHER TRADES.

3. THE MECHANICAL CONTRACTOR SHALL COORDINATE VOLTAGE OF ALL EQUIPMENT WITH ELECTRICAL PRIOR TO ORDERING EQUIPMENT.

INSTALLATION

1. CORE-DRILL OR SAW-CUT FLOOR, WALL, ROOF, ETC. AS REQUIRED FOR PIPING OR DUCTWORK AND FIRE-STOP OPENING AROUND PIPE OR DUCTWORK. VERIFY LOCATION OF STRUCTURAL BEAMS, JOISTS, ETC. BEFORE DRILLING OR CUTTING. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

2. WHEREVER FOUNDATION WALLS, OUTSIDE WALLS, ROOFS, ETC. ARE CUT FOR INSTALLATION OF SYSTEMS, THEY SHALL BE PATCHED TO MATCH EXISTING CONSTRUCTION AND SEALED WEATHER-TIGHT. WORK SHALL BE PERFORMED BY CRAFTSMEN SKILLED IN THEIR RESPECTIVE TRADES.

3. ALL DUCTWORK AND PIPING SHALL BE ROUTED ABOVE THE SUSPENDED CEILING SPACE, UNLESS OTHERWISE NOTED ON PLANS.

4. ALL DUCTWORK AND PIPING THAT IS EXPOSED TO VIEW SHALL BE ROUTED AS HIGH AS POSSIBLE AND TIGHT TO THE UNDERSIDE OF THE STRUCTURAL STEEL ABOVE.

5. ALL OUTSIDE AIR INTAKES SHALL BE A MINIMUM OF 10'-0" AWAY FROM EXHAUST DISCHARGE OPENINGS AND PLUMBING VENT STACKS.

EQUIPMENT

1. THE MECHANICAL CONTRACTOR SHALL INSTALL MECHANICAL SYSTEMS AS SHOWN, NOTED AND SPECIFIED. EQUIPMENT MAY NOT BE SUBSTITUTED UNLESS WRITTEN APPROVAL BY THE ARCHITECT, ENGINEER OR OWNER'S REPRESENTATIVE IS OBTAINED. ANY CHANGES TO THE DUCTWORK LAYOUT WILL NECESSITATE SUBMISSION OF SHEET METAL SHOP DRAWINGS FOR ENGINEER'S REVIEW. ANY UNAUTHORIZED CHANGES WILL BE REMOVED AT CONTRACTOR'S EXPENSE, IF DEEMED NECESSARY BY ARCHITECT, ENGINEER, OR OWNER'S REPRESENTATIVE.

2. UPON SELECTION OF THE MECHANICAL APPLIANCES, SUBMIT THE MANUFACTURER'S INSTALLATION INSTRUCTIONS TO THE BUILDING DEPARTMENT, INCLUDING LISTING FOR OUTSIDE INSTALLATION WHERE APPLICABLE.

AIR DISTRIBUTION

1. ALL DUCTWORK SHALL BE FABRICATED ACCORDING TO THE SMACNA LOW VELOCITY DUCT MANUAL, ASHRAE HANDBOOK VOLUME "HVAC SYSTEMS AND EQUIPMENT", AND TYPICAL DUCTWORK DETAILS SHOWN IN THESE DRAWINGS. ALL ELBOWS SHALL HAVE PROPER RADIUS. SIZES SHOW ON PLAN ARE INSIDE FREE AREA.

2. ALL FLEXIBLE DUCTWORK SHALL FACTORY ASSEMBLED CLASS 1 AIR DUCT (UL 181) WITH FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEX DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR 2" W.C. PRESSURE AND 0 TO 250 DEGREE TEMPERATURE. MAXIMUM STRETCHED OUT LENGTH SHALL BE AS PER CODES.

3. PROVIDE UL APPROVED FIRE DAMPERS FOR ALL PENETRATIONS THROUGH FIRE RATED WALLS, PARTITIONS, CEILINGS, AND FLOORS. INSTALL FIRE DAMPERS AS PER MANUFACTURER'S DIRECTIONS AND PER UL GUIDELINES. PROVIDE ACCESS DOORS IN DUCTWORK AND ACCESS PANELS IN BUILDING CONSTRUCTION AS REQUIRED FOR SERVICING OF FIRE DAMPERS.

4. ALL BRANCH SUPPLY DUCTS SHALL HAVE (VD) MANUAL VOLUME DAMPERS INSTALLED FOR BALANCING.

5. PROVIDE A VOLUME DAMPER FOR EVERY INLET AND OUTLET (DIFFUSERS, REGISTERS, GRILLES, ETC.) OF THE DUCTWORK DISTRIBUTION SYSTEMS WHETHER SHOWN OR NOT ON THE PLANS. PROVIDE ADDITIONAL VOLUME DAMPERS OR EXTRACTORS AT BRANCH TAKE-OFFS FROM DUCTWORK MAINS AS REQUIRED TO ACHIEVE AIR VOLUME DISTRIBUTION AND BALANCING.

6. ALL DUCTWORK TRANSITIONS SHALL BE (FOT) "FLAT ON TOP", UNLESS OTHERWISE SPECIFIED ON PLAN.

7. ALL CONTRACTOR FABRICATED AND MANUFACTURER FABRICATED COMPONENTS OF THE OUTSIDE AIR, SUPPLY AIR, RETURN AIR AND EXHAUST SYSTEMS SHALL BE CONSTRUCTED AND INSTALLED AIR-TIGHT. THE INSTALLED SYSTEMS SHALL BE PRESSURE TESTED AS SPECIFIED. PIPE OPENINGS IN SYSTEM COMPONENTS SHALL HAVE SHEET METAL BAFFLES, SET IN SEALANT, TO PREVENT LEAKAGE.

AUTOMATIC TEMPERATURE CONTROLS

1. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONTROL WIRING AS REQUIRED. THERMOSTATS SHALL BE AS SPECIFIED OR AS FURNISHED WITH THE EQUIPMENT. PROVIDE TRANSFORMERS AS REQUIRED.

TESTING AND BALANCING

1. BALANCING CONTRACTOR SHALL BALANCE SYSTEMS TO AIR QUANTITIES SHOWN ON PLAN. BALANCING CONTRACTOR SHALL USE DUCT MOUNTED MANUAL DAMPERS FOR AIR SYSTEM BALANCING. USE OF A TERMINAL DAMPER IS NOT ACCEPTABLE.
2. TESTING AND BALANCING CONTRACTOR SHALL TEST ALL HVAC EQUIPMENT TO ENSURE PROPER OPERATION, TEST ALL CONTROLS TO ENSURE PROPER OPERATION, CALIBRATION AND ADJUSTMENT OF CONTROLS, AND TEST ECONOMIZERS TO ENSURE PROPER OPERATION.

3. THE ARCHITECT AND/OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED 48 HOURS OR MORE PRIOR TO FINAL TESTING AND BALANCING WORK SO THAT THEY AND/OR THE ENGINEER MAY BE PRESENT TO OBSERVE THIS WORK. THE BALANCING CONTRACTOR SHALL SUBMIT WRITTEN REPORTS OF ALL AIR FLOW READINGS, STATIC PRESSURES, GPM RATES, PRESSURE READINGS, TEMPERATURE READINGS, MOTOR AMPERAGE, ETC., TO DOCUMENT PROPERLY OPERATING AND BALANCED MECHANICAL SYSTEMS IN ALL AREAS. A COPY OF THE TEST AND BALANCE REPORT SHALL BE SUBMITTED TO THE AUTHORITIES HAVING JURISDICTION PRIOR TO FINAL INSPECTION AND REQUESTING OCCUPANCY.

CLOSEOUT DOCUMENTATION

1. THE CONTRACTOR SHALL FURNISH TO THE BUILDING OWNER WITHIN 90 DAYS OF DATE OF RECEIPT OF THE CERTIFICATE OF OCCUPANCY THE FOLLOWING;
   A. OPERATING AND MAINTENANCE MANUAL. MANUAL SHALL CONSIST OF MANUFACTURER'S RECOMMENDATIONS, PROGRAMMING PROCEDURES AND DATA POINTS, NARRATIVE AND OTHER MEANS OF ILLUSTRATING TO THE OWNER HOW THE BUILDING, EQUIPMENT AND SYSTEMS ARE INTENDED TO BE INSTALLED, MAINTAINED AND OPERATED.
   B. AS-BUILT HVAC DRAWINGS.
   C. BALANCE REPORT OF HVAC SYSTEMS.

## MECHANICAL ABBREVIATIONS

| | |
|---|---|
| A.D. | ACCESS DOOR |
| A.F.F. | ABOVE FINISHED FLOOR |
| ACCU | AIR COOLED CONDENSING UNIT |
| CC | COOLING COIL |
| CV | CONTROL VALVE |
| EF | EXHAUST AIR FAN |
| F.C.U | FAN COIL UNIT |
| HX | HEAT EXCHANGER |
| N.C | NEW CONNECTION TO EXISTING |
| N.T.S. | NOT TO SCALE |
| S.C.D. | SEE CONSTRUCTION DRAWINGS |
| SF | SUPPLY AIR FAN |
| S.S. | STAINLESS STEEL |
| T | THERMOSTAT |
| U.N.O. | UNLESS NOTED OTHERWISE |
| ARCH | ARCHITECT OR ARCHITECTURAL |
| BLD'G | BUILDING |
| BOT. | BOTTOM |
| CL'G. | CEILING |
| CONC. | CONCRETE |
| DET. | DETAIL |
| DN. | DOWN |
| DWG. | DRAWING |
| E.A.T. | ENTERING AIR TEMPERATURE |
| GA. | GAUGE |
| H/AC | HEATING AND AIR CONDITIONING |
| L.A.T. | LEAVING AIR TEMPERATURE |
| MT'D | MOUNTED |
| S.S.T. | SATURATED SUCTION TEMPERATURE |
| T.S.P. | TOTAL STATIC PRESSURE |
| W/ | WITH |
| Ø | DIAMETER/ROUND |
| 0'-0" | ELEVATION FOR BOTTOM OF DUCT FROM FINISH FLOOR |

## MECHANICAL SYMBOLS

| | |
|---|---|
| T DEVICE | THERMOSTAT WITH DEVICE CONTROLLED. |
| CD | CONDENSATE DRAINAGE PIPING |
| L | REFRIGERANT LIQUID PIPING |
| S | REFRIGERANT SUCTION PIPING |
| | LINE SIZE GATE VALVE |
| | LINE SIZE BALL VALVE (2" & SMALLER) OR LINE SIZE BUTTERFLY VALVE (2-1/2" & LARGER) |
| | LINE SIZE BALANCING VALVE |
| | LINE SIZE CHECK VALVE |
| | LINE SIZE UNION |

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PROFESSIONAL SEAL

JOSEPH GREGORY THOMAS
REGISTERED
No. 12172
DELAWARE
PROFESSIONAL ENGINEER

DATE:4/11/23
EXPIRATION DATE: 6/30/24

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DELAWARE
20' CASITA B

PAGE LAYOUT
MECHANICAL NOTES
SYMBOLS
& ABBREVIATIONS

| DATE | REV | DESCRIPTION |
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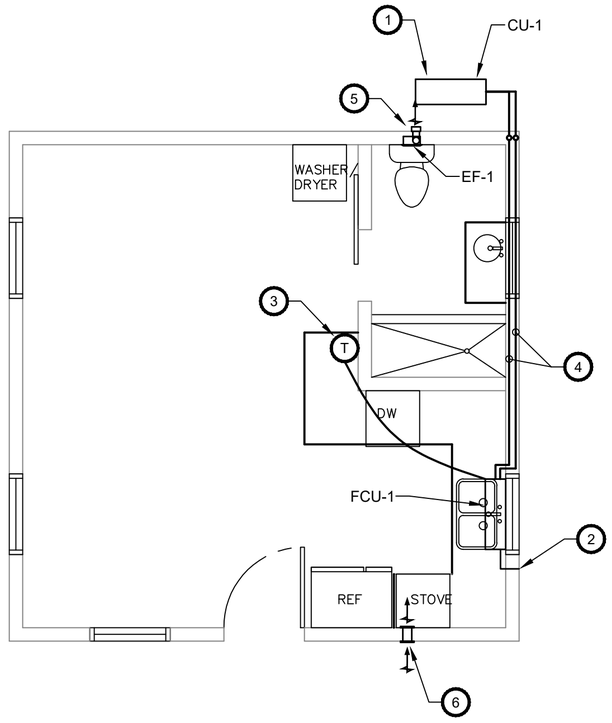
H:\23187\Dwg\Boxabl B\23187_DE_M1.0 B.dwg, M1.0, 4/11/2023 1:18:15 PM, 1:1

# PLAN NOTES

| | |
|---|---|
| 1 | NEW CONDENSING UNIT, CU-1. PROVIDE CONCRETE PAD TO HAVE THE CONDENSING UNIT ON A LEVEL SURFACE. COORDINATE EXACT LOCATION WITH ARCHITECT AND BUILDING OWNER. |
| 2 | TERMINATE CONDENSATE DRAIN FROM FCU-1. PROVIDE SPLASH BLOCK ON GRADE. COORDINATE EXACT LOCATION WITH ARCHITECT AND BUILDING OWNER. |
| 3 | PROVIDE THERMOSTAT. |
| 4 | REFRIGERANT PIPING ROUTED IN WALL, SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SIZING. |
| 5 | PROVIDE HOODED WALL CAP. |
| 6 | INTAKE FOR WHOLE HOUSE VENTILATION SYSTEM. VENT-US MODEL PS-101. |

WHOLE HOUSE VENTILATION SYSTEM SHALL BE COMPRISED OF TOILET EXHAUST FAN, 70 CFM AND INTAKE LOUVER. VENTILATION RATE OF 20 CFM IS BASED ON EQUATION 15-1 USING 361 SQUARE FEET AND ONE BEDROOM. PER THESE CAPACITIES THE TOILET EXHAUST FAN WILL OPERATE 29% OF EACH 4 HOUR SEGMENT.




## 1 MECHANICAL PLAN

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ISSUE DATE: 04/11/23
SHEET: M2.0


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# FAN COIL UNIT SCHEDULE

| DESIG'N. | MFG'R. | MODEL NO. | AIR QUANTITY (CFM) | COOLING | | | | | HEATING | | | ELECTRICAL | | | | COMPRESSOR | TYPE OF MOUNTING | HSPF | SEER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | E.A.T. DB °F/WB °F | L.A.T. DB °F/WB °F | TOTAL CAPACITY (BTU/HR) | REFRIGERANT | REFRIGERANT CHARGE | E.A.T. (°F) | L.A.T. (°F) | TOTAL CAPACITY @ 47°F | VOLTAGE | PHASE (Ø) | MCA | MOCP | | | | | |
| CU-1 | MITSUBISHI | MUZ-WR12NA | | | | | | | | | | 230 | 1 | 10 | 15 | ROTORY INVERTER | ON GRADE | | | |
| | LG | LSU120HFV3 | | | | | | | | | | 230 | 1 | 10 | 15 | | | | | |
| FCU-1 | MITSUBISHI | MSZ-WR12NA | 400 | 75.0/62.3 | 55.0/53.4 | 12,000 | R410A | 1 LB 12 OZ | 60.0 | 88.2 | 12,200 | | | | | | WALL HUNG | 8.50 | 16.00 | |
| | LG | LSN120HFV3 | 459 | | | | | | | | | | | | | | | 9.00 | 17.00 | |

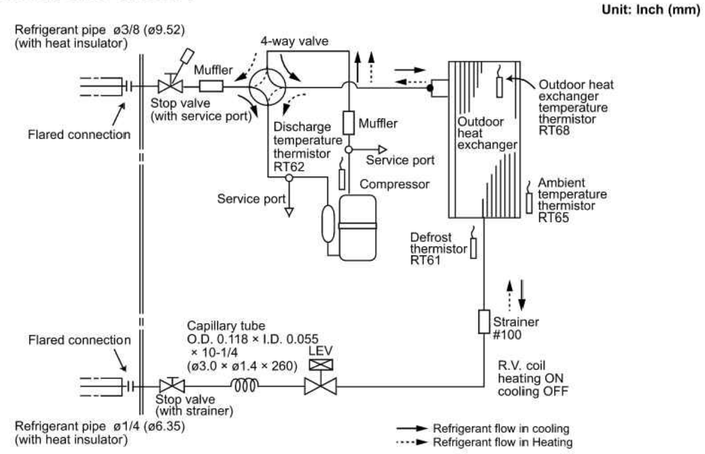
NOTE: UNITS TO BE MANUFACTURER BY MITSUBISHI, LG OR AN EQUIVALENT UNIT.

# EXHAUST FAN SCHEDULE

| DESIG'N | SERVICE | MFG'R | MODEL NO. | TYPE | CFM | STATIC PRESSURE ("W.C.) | DRIVE | ELECTRICAL | | | BACKDRAFT DAMPER | OPER. WEIGHT (LBS.) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | H.P. (WATTS) | PHASE (Ø) | VOLTAGE | | | |
| EF-1 | RESTROOM | ADDVENT | ABF 70 | WALL | 70 | 0.250 | DIRECT | (60) | 1 | 115 | GRAVITY | 8 | |
| | | DELTA | SLM 70 | | | | | (11.5) | | | | | |

**MUZ-WR09NA MUZ-WR12NA**

**Unit: Inch (mm)**




## REFRIGERATION PIPING SYSTEM SCHEMATIC DETAIL

NOT TO SCALE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5345 East North Belt Road
N. Las Vegas, NV 89115
WWW.BOXABL.COM

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DESIGN SOLUTIONS, P.C.
Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
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PROFESSIONAL SEAL

JOSEPH GREGORY THOMAS REGISTERED No. 12172 DELAWARE PROFESSIONAL ENGINEER

DATE:4/11/23
EXPIRATION DATE: 6/30/24

I HEREBY CERTIFY THAT THESE DRAWINGS HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE CODES AND ORDINANCES FOR PREFABRICATED DWELLING UNITS.

MODEL:

DELAWARE
20' CASITA B

PAGE LAYOUT

MECHANICAL DETAILS

| REV | DESCRIPTION | DATE |
|---|---|---|
| | ISSUE FOR PERMIT | 4/14/23 |


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PROJECT # :

DRAWN BY: NK

REVIEWED BY: JT

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ISSUE DATE: 04/11/23

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# ELECTRICAL SPECIFICATIONS:

E1. A QUALIFIED ELECTRICIAN SHALL FURNISH AND INSTALL ALL LABOR, TOOLS, MATERIAL, EQUIPMENT, SERVICES, AND RELATED ACCESSORIES NECESSARY FOR THE COMPLETE INSTALLATION OF ELECTRICAL WORK SHOWN ON THE DRAWINGS, SPECIFIED IN THE NOTES, AND REQUIRED BY LOCAL CODE AUTHORITIES.

E2. ALL WORK SHALL COMPLY WITH THE 2020 DELEWARE ELECTRICAL CODE (NEC) AND 2015 DELEWARE RESIDENTIAL CODE (IRC).

E3. OBTAIN AND PAY FOR ALL PERMITS AND FEES RELATING TO ELECTRICAL SYSTEM.

E4. IT IS INTENDED THAT ALL ITEMS OF WORK AND SYSTEMS BE COMPLETE AND WIRED COMPLETE IN ALL DETAILS, READY FOR SATISFACTORY OPERATION AND SERVICE. APPARATUS REQUIRED SHALL BE FURNISHED, EVEN THOUGH NOT SPECIFICALLY MENTIONED HEREIN, OR SHOWN ON THE DRAWINGS.

E5. PROVIDE GROUNDING OF ELECTRICAL WORK IN STRICT ACCORDANCE WITH THE APPLICABLE CODES AND THEIR AUTHORITIES.

E6. COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO ANY INSTALLATION.

E7. PROVIDE CODE APPROVED CLEARANCES AROUND ELECTRICAL EQUIPMENT.

E8. MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL CONFORM TO THE NEMA STANDARDS, NATIONAL ELECTRICAL CODE (NEC) IN EVERY CASE, WHERE SUCH STANDARDS HAVE BEEN ESTABLISHED. ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES, FITTINGS AND OTHER EQUIPMENT SHALL BE LISTED AND LABELED BY A QUALIFIED TESTING AGENCY AND SHALL BE CONNECTED IN AN APPROVED MANNER WHEN INSTALLED.

E9. TESTING – AFTER WIRES ARE IN PLACE AND CONNECTED TO DEVICES AND EQUIPMENT, THE SYSTEM SHALL BE TESTED FOR SHORTS AND GROUNDS. ALL HOT WIRES, IF SHORTED OR GROUNDED, SHALL BE REMOVED AND REPLACED.

E10. ALL METERS, INSTRUMENTS, CABLE CONNECTION, EQUIPMENT, OR APPARATUS NECESSARY FOR MAKING ALL TESTS, SHALL BE FURNISHED BY THIS CONTRACTOR AT HIS OWN EXPENSE.

E11. AFTER THE COMPLETION OF THE INSTALLATION, THE ENTIRE SYSTEM SHALL BE THOROUGHLY CLEANED. CLEAN ALL FOREIGN MATTER, PAINT, OIL, DIRT, UNREQUIRED LABELS, GREASE, AND STICKERS FROM FIXTURES AND EQUIPMENT. REMOVE FROM THE PREMISES ALL RUBBISH, DEBRIS, ETC. ACCUMULATED BY THE ELECTRICAL INSTALLATION.

E12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EQUIPMENT AND SYSTEMS AGAINST HARMFUL EXPOSURE, OR ACCUMULATION OF DUST/MOISTURE, FLOODING, CORROSION, OR OTHER FORMS OF DAMAGE. CLEAN AND RESTORE DAMAGED FINISHES AND EQUIPMENT TO PLACE INSTALLATION IN A LIKE–NEW CONDITION.

E13. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL INTERIOR WIRING SHALL BE NM–B CABLE. ELECTRICIAN SHALL PROVIDE EXTENSION OF ALL CABLE FROM JUNCTION BOX TO ELECTRICAL PANEL. PROVIDE CODE COMPLIANT RACEWAY AND WIRING FROM INTERIOR JUNCTION BOX TO EXTERIOR PANEL. SEAL OPENING WEATHERTIGHT. PROVIDE INTERCONNECTION OF CABLES BETWEEN THE WALLS AND ROOF PANELS. THERE MAY BE SEVERAL CIRCUITS IN EACH PANEL. EACH IS LABLED WITH CIRCUIT NAME, CONNECT CIRCUITS OF LIKE NAMES.

E14. DISCONNECT SWITCHES SHALL BE QUICK–MAKE, QUICK–BREAK TYPE IN NEMA ENCLOSURE TO MATCH LOCATION AND USE. SWITCHES SHALL BE LISTED FOR THEIR USE.

E15. PANEL/LOAD CENTER SHALL BE AS SHOWN ON THE DRAWINGS WITH 150A–2P MAIN BREAKER, 225A BUSSING AND BRANCH BREAKERS AS SCHEDULED. UNIT IS PROVIDED IN A NEMA 3R ENCLOSURE FOR EXTERIOR MOUNTING. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL BREAKERS AS REQUIRED. PANEL/LOAD CENTERS SHALL BE SQUARE D QO SEREIS WITH QO BREAKERS OR EATON, SEIMENS OR GENERAL ELECTRIC EQUIVELENT. TERMINATE ALL CABLING AND WIRING AT PANEL/LOAD CENTER IN ACCORDANCE WITH NEC REQUIREMENTS.

E16. INSTALL COMBINATION WASHER/DRYER BACKBOX WIRING AND PLUG IN PARTITION WALL.

E17. ASSEMBLE AND INSTALL PENDANT LIGHT FURNISHED WITH UNIT. PENDANT LIGHT SHALL BE LISTED PER 410.10(D).

E18. INSTALL SMOKE DETECTOR FURNISHED WITH UNIT.

E19. ASSEMBLE AND INSTALL EXTERIOR SCONCE LIGHT FURNISHED WITH UNIT BY FRONT DOOR. SEAL LIGHT TO EXTERIOR WALL TO BE WEATHER TIGHT.

E20. ALL EQUIPMENT LOCATED OUTDOORS SHALL BE WEATHERPROOF TYPE.

E21. FURNISH AND INSTALL A COMPLETE AND OPERABLE SYSTEM OF SERVICE AND DISTRIBUTION FROM THE UTILITY COMPANY TRANSFORMERS OR FROM FEED FROM ANOTHER STRUCTURE TO THE PANEL/LOAD CENTER AS REQUIRED. PROVIDE A 120/240V., 1PH., 3W. SERVICE OR FEEDER TO THE LOAD CENTER RATED AT 150 AMPERES. MINIMUM FEEDER SIZE TO THE HOUSE SHALL BE 3 # 1/0 AWG COPPER CONDUCTORS. COORDINATE FINAL GROUNDING WITH METHOD OF FEEDING. SUGGESTED SERVICE GROUNDING DETAIL IS FOR UTILITY FED BUILDING.

E22. TWO SMALL APPLIANCE 20A BRANCH CIRCUITS HAVE BEEN PROVIDED PER NEC 210.11 (C)(1) SERVING ONLY ABOVE COUNTER RECEPTACLES.

E23. LAUNDRY AREA 20A BRANCH CIRCUITS HAS BEEN PROVIDED PER NEC 210.11 (C)(2) SERVING ONLY LAUNDRY AREA.

E24. INDIVIDUAL APPLIANCE BRANCH CIRCUITS HAVE BEEN PROVIDED SERVING DEDICATED APPLIANCES INCLUDING HEAT A/C UNIT, DISHWASHER, REFRIGERATOR, MICROWAVE AND ELECTRIC RANGE.

E25. BATHROOM RECEPTACLE 20A BRANCH CIRCUIT HAS BEEN PROVIDED PER NEC 210.11 (C)(3) SERVING ONLY BATHROOM RECEPTACLES.

E26. RECEPTACLE OUTLETS HAVE BEEN INSTALLED IN ACCORDANCE WITH NEC 210.52. ALL RECEPTACLES SHALL BE LISTED AND GROUNDED TYPE AND INSTALLED IN ACCORDANCE WITH NEC 406.4. ALL RECEPTACLES SHALL BE PROVIDED WITH AFCI PROTECTION. ALL 15A AND 20A KITCHEN, BATHROOM, LAUNDRY, DISHWASHER, DISPOSAL AND OUTDOOR RECEPTACLES SHALL BE GFCI TYPE. ALL OUTDOOR RECEPTACLES SHALL BE WEATHER RESISTANT TYPE WITH WEATHERPROOF COVERS AND WEATHER SEALED TO BUILDING FRAME

E27. PROVIDE GROUNDING AND BONDING SHALL BE PROVIDED PER NEC 250.

E28. FITTINGS AND CONNECTORS THAT ARE INTENDED TO BE CONCEALED AT THE TIME OF ASSEMBLY SHALL BE LISTED AND IDENTIFIED FOR THE INTERCONNECTION OF BUILDING COMPONENTS. SUCH FITTING SHALL BE EQUAL TO THE WIRING METHOD EMPLOYED IN INSULATION, TEMPERATURE RISE, AND FAULT–CURRENT WITHSTANDING AND SHALL BE CAPABLE OF ENDURING THE VIBRATION AND SHOCK OCCURRING IN TRANSPORT.

E29. GROUNDING OF BOTH ELECTRICAL AND NON ELECTRICAL METAL PARTS SHALL BE THROUGH CONNECTION TO A GROUNDING BUS IN THE PANEL/LOAD CENTER AND SHALL BE CONNECTED THROUGH THE GREEN–COLORED INSULATED CONDUCTOR IN THE FEEDER WIRING TO THE GROUNDING BUS IN THE SERVICE ENTRANCE EQUIPMENT.

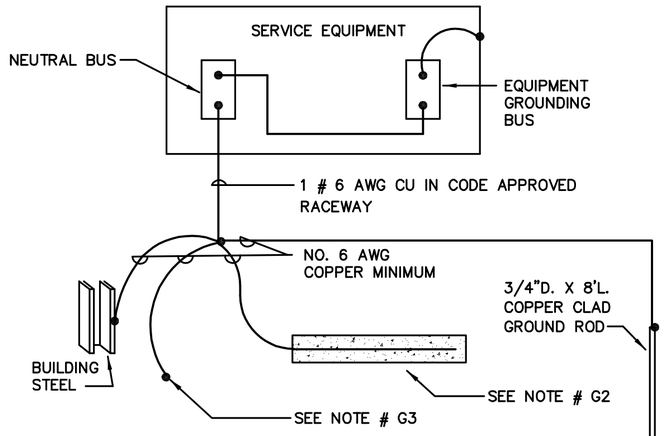
E30. THE INSTALLATION OF THE SERVICE EQUIPMENT SHALL COMPLY WITH ARTICLE 230. MEANS SHALL BE PROVIDED FOR THE CONNECTION OF A GROUNDING ELECTRODE CONDUCTOR TO THE SERVICE EQUIPMENT AND ROUTING IT OUTSIDE THE STRUCTURE. BONDING AND GROUNDING OF THE SERVICE SHALL BE IN ACCORDANCE WITH ARTICLE 250. THE MANUFACTURER SHALL INCLUDE IN ITS WRITTEN INSTALLATION INSTRUCTIONS ONE METHOD OF GROUNDING THE SERVICE EQUIPMENT AT THE INSTALLATION SITE. THE INSTRUCTIONS SHALL CLEARLY STATE THAT OTHER METHODS OF GROUNDING ARE FOUND IN ARTICLE 250. THE MINIMUM SIZE GROUNDING ELECTRODE CONDUCTOR SHALL BE # 6 AWG COPPER.

A WARNING LABEL SHALL BE MOUNTED ON OR ADJACENT TO THE SERVICE EQUIPMENT. THE LABEL SHALL STATE THE FOLLOWING:
"WARNING DO NOT PROVIDE ELECTRICAL POWER UNTIL THE GROUNDING ELECTRODE(S) IS INSTALLED AND CONNECTED (SEE INSTALLATION INSTRUCTIONS)."

WHERE THE SERVICE EQUIPMENT IS NOT INSTALLED IN OR ON THE UNIT, THE INSTALLATION SHALL COMPLY WITH THE OTHER PROVISIONS OF THE NEC.

## SYMBOL LIST

| SYMBOL | DESCRIPTION |
|---|---|
| (J), (J) | JUNCTION BOX – WALL OR CEILING MOUNTED |
| S^D | SINGLE POLE LIGHT SWITCH – "D" DENOTES NEMA SSL 7A APPROVED DIMMER SWITCH |
| | NON – FUSED DISCONNECT SWITCH |
| | FUSED DISCONNECT SWITCH |
| | MOTOR CONNECTION – H.P. AS NOTED ON DRAWINGS |
| | NM–B CABLE RUN CONCEALED IN CEILING OR WALLS.<br>X DENOTES GROUND WIRE<br>\| DENOTES NEUTRAL CONDUCTOR<br>\| DENOTES HOT CONDUCTOR |
| | LOAD CENTER |
| | DUPLEX RECEPTACLE (NEMA 5–20R) (+18" AFF UNLESS NOTED OTHERWISE) |
| | DUPLEX RECEPTACLE (NEMA 5–20R) (MOUNTED 6" ABOVE COUNTER TOP UNLESS NOTED OTHERWISE) |
| | DUPLEX CONVENIENCE OUTLET (NEMA 5–15R) |
| | SPECIAL OUTLET. REFER TO POWER PLAN ON SHEET E1.0 FOR REQUIREMENTS |
| | SINGLE NEMA 5–20R RECEPTACLE |
| SD | CEILING MOUNTED SMOKE ALARM |
| A. | DENOTES AMPERES |
| A.C. | DENOTES ABOVE COUNTER |
| A.F.F. | DENOTES ABOVE FINISHED FLOOR |
| AFCI | DENOTES ARC FAULT CIRCUIT INTERRUPTER |
| C. | DENOTES CONDUIT |
| GFCI | DENOTES GROUND FAULT CIRCUIT INTERRUPTER |
| GRD. | DENOTES GROUND |
| M.L.O. | DENOTES MAIN LUGS ONLY |
| WP | DENOTES WEATHERPROOF (NEMA 3R) |




## SUGGESTED SERVICE GROUND DETAIL

NO SCALE

NOTES:

G1. CONTRACTOR SHALL OBTAIN APPROVAL FROM LOCAL CODE AUTHORITIES BEFORE INSTALLING GROUNDING.

G2. CONCRETE ENCASED ELECTRODE ENCASED BY A MINIMUM OF 2" OF CONCRETE ON ALL SIDES LOCATED WITHIN AND NEAR THE BOTTOM OF A CONCRETE FOOTING OR FOUNDATION. ELECTRODE SHALL CONSIST OF A MINIMUM OF 20' OF BARE COPPER CONDUCTOR (# 4) WHERE APPLICABLE. (SEE NEC 250.52 (A) (3) (2))

G3. BOND TO REBAR STUBOUT IN FOUNDATION PER NEC 250 WHERE APPLICABLE (SEE NEC 250.52 (A) (3) (1))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5345 East North Belt Road
N. Las Vegas, NV 89115
WWW.BOXABL.COM

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Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
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PROFESSIONAL SEAL

DAVIS L. DICKENSON LICENSE No. 18222 DELAWARE PROFESSIONAL ENGINEER

SIGNATURE

04/14/2023 DATE | 06/30/2024 EXPIRATION DATE

MODEL:

DELEWARE
20' CASITA B

PAGE LAYOUT

NOTES:

| DATE | REV | DESCRIPTION |
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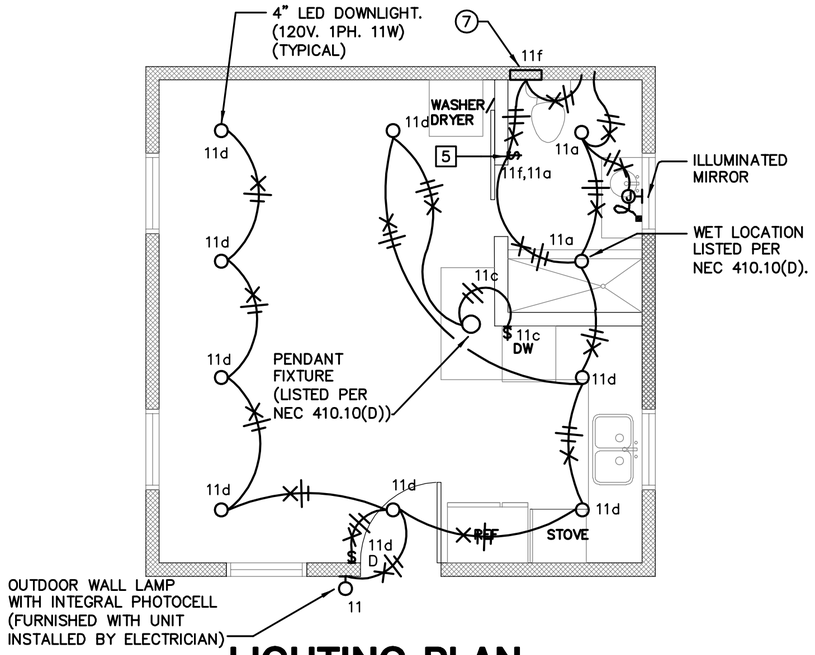
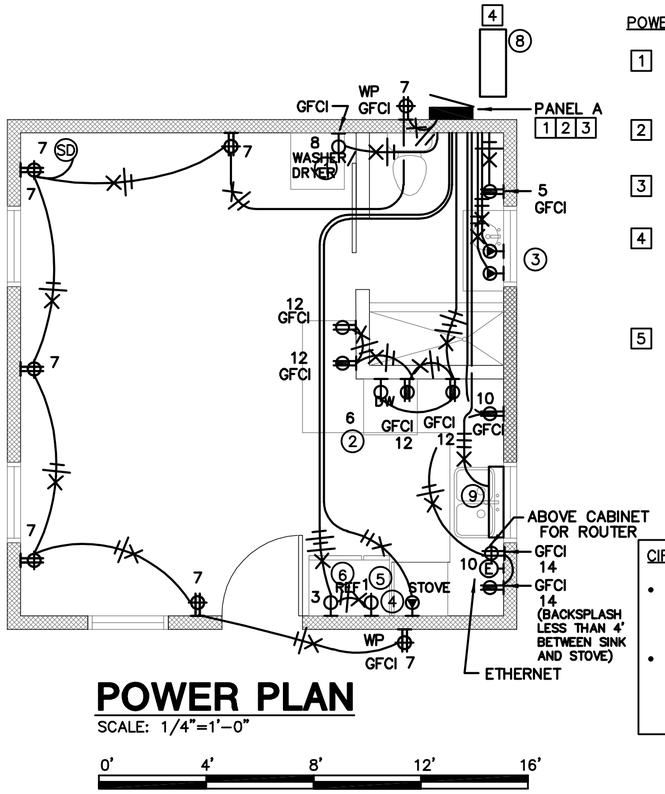



## LIGHTING PLAN

SCALE: 1/4"=1'-0"

0' 4' 8' 12' 16'




## POWER PLAN

SCALE: 1/4"=1'-0"

0' 4' 8' 12' 16'

**POWER NOTES:**

1. ELECTRICIAN TO RECEIVE, INSTALL ASSEMBLE AND WIRE OUTDOOR LOAD CENTER COMPLETE. TERMINATE CABLE AND WIRE AT LOAD CENTER.
2. ELECTRICIAN TO PROVIDE ELECTRICAL FEEDER/ELECTRICAL SERVICE FROM SITE TO LOAD CENTER.
3. ELECTRICIAN TO PROVIDE SERVICE GROUND/BUILDING GROUND PER NEC REQUIREMENTS.
4. ELECTRICIAN TO WIRE OUTDOOR CONDENSER UNIT EXTEND WIRING AND INTERCONNECT WIRING FROM INDOOR FAN COIL PER MANUFACTURERS DIRECTIONS. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR AS TO NOT IMPEDE CODE REQUIRED CLEARANCE FOR ELECTRICAL PANELS/SERVICE DISCONNECTS.
5. PROVIDE COMBO BATH FAN/LIGHT SWITCH WITH VENTILATION CONTROL & DELAY TIMER. (LEGRAND RADIANT 4 BUTTON DIGITAL TIMER # RT2BKCCV4)

**CIRCUIT PROTECTION NOTES:**

- ARC FAULT CIRCUIT INTERRUPTER PROTECTION SHALL BE PROVIDED FOR ALL 15 AND 20A BRANCH CIRCUITS SUPPLYING OUTLETS AND DEVICES IN ACCORDANCE WITH NEC 210.12(A).
- GROUND FAULT CIRCUIT INTERRUPTER PROTECTION SHALL BE PROVIDED FOR ALL 15A AND 20A RECEPTACLES AND EQUIPMENT IN ACCORDANCE WITH NEC 210.8.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PANEL DESIGNATION | A | | | | | | | | | |
| TOTAL AREA (SQ FT) | 361 | | SERVICE: | | 120/240V., 1PH., 3W. | | | | | |
| GENERAL LIGHTING | | | | | | | | | | |
| LOAD CALC | AREA | 361 | X | | | | 3 | WT/SQ FT | 1083 | W GEN. LTG |
| | | | | | | | 2 | WT/SQ FT | 722 | W GEN. RECPT. |
| SMALL APPLIANCE | | 2 | X | 1 | QTY OF UNITS | X | 1500 | WATTS | 3000 | W SM. APP. |
| LAUNDRY | | 1 | X | 1 | QTY OF UNITS | X | 1500 | WATTS | 1500 | W LAUNDRY |
| | | | | | SUBTOTAL | | | | 6305 | |
| **DEMAND** | | | | | | | | | | |
| 1ST 20 KW | | AT | 100% | | 6305 | | | = | 6,305 | |
| NEXT 120 KW | | AT | 35% | | 0 | | ACTUAL | = | 0 | |
| REMAINING KW | | AT | 25% | | 0 | | ACTUAL | = | 0 | |
| WATER HEATER | | | | | 18000 | X | 100% | = | 18,000 | |
| DISHWASHER | | | | | 1200 | X | 100% | = | 1,200 | |
| MISC | | | | | MISC | X | 100% | = | 0 | |
| MISC | | | | | 0 | X | 100% | = | 0 | |
| FAN COIL | | | | | 240 | X | 100% | = | 240 | |
| AC | | | | | 2400 | X | 100% | = | 2,400 | |
| ELECTRIC DRYER | | | | | 0 | X | 100% | = | 0 | |
| ELECTRIC RANGE | | | | NEC 220.55 | 7800 | X | 80% | = | 6,240 | |
| LARGEST MOTOR | | | | | 0 | X | 25% | = | 0 | |
| **TOTAL DEMAND:** | | | | | | | | | 34,385 | WATTS |
| **VOLTAGE:** | 240 | | 1 | PHASE | | | | | 34 | KW |
| **AMPS:** | 143.3 | | | | | | | | | |
| **MINIMUM SERVICE SIZE:** | | 143 | AMPS | | | | | | | |
| **MININIMUM SERVICE SIZE:** | | 150 | AMPS | | | | | | | |

### EQUIPMENT SCHEDULE

| MARK | EQUIPMENT DESCRIPTION | VOLTAGE | PHASE | AMPS | RECEPTACLE TYPE | CIRCUIT DATA: CIRCUIT NUMBER | CONDUCTORS: QTY. | CONDUCTORS: SIZE | CONDUCTORS: EQ. GND. | | HEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | WASHER DRYER | 120 | 1 | 10.0 | 5-20R | A-8 | 2 | #12 | #12 | | 18" A.F.F. |
| 2 | DISHWASHER | 120 | 1 | 10.0 | 5-20R | A-6 | 2 | #12 | #12 | | 18" A.F.F. |
| 3 | WATER HEATER | 240 | 1 | 2 @ 40A | 6-50R(2) | A-(14,16), (18,20) HANDLE TIE | 2 | # 8 | #10 | | 18" A.F.F. |
| 4 | RANGE | 240 | 1 | 75 | 6-50R | A-(2,4) | 2 | #8 | #10 | | 18" A.F.F. |
| 5 | REFRIGERATOR | 120 | 1 | 12 | 5-20R | A-1 | 2 | #12 | #12 | | 18" A.F.F. |
| 6 | MICROWAVE/HOOD | 120 | 1 | 12 | 5-20R | A-3 | 2 | #12 | #12 | | 84" A.F.F. |
| 7 | EXHAUST FAN EF-1 | 120 | 1 | 11 WATTS | - | A-11f | 2 | #12 | #12 | | - |
| 8 | OUTDOOR CONDENSER CU-1 | 240 | 1 | 15.0 | - | A-(13,15) | 2 | #10 | #10 | | - |
| 9 | FAN COIL UNIT FCU-1 | 240 | 1 | 1.0 | - | WIRE TO CU-1 | 3 | #12 | #12 | | - |

## PANEL DATA SCHEDULE

**PANEL NAME: _A_**

LOCATION OUTDOOR
SERVICE 120/240V.,1PH.,3W.
MAIN BREAKER 150A-2P
MAIN LUGS ONLY 225A
NEUTRAL BUS 225A
GROUND BUS YES
SHORT CIRCUIT RATING 10,000 RMS SYM AMPS

| | CONNECTED LOAD | | DEMAND LOAD | |
|---|---|---|---|---|
| PHASE A | 18.55 | KVA | 16.51 | KVA |
| PHASE B | 20.54 | KVA | 18.14 | KVA |
| TOTAL | 39.09 | KVA | 34.65 | KVA |
| | 163 | AMPS | 144 | AMPS |

DEMAND LOAD

| | | |
|---|---|---|
| L: LIGHTING | 0.00 | KVA |
| R: RECEPTACLES | 13.34 | KVA |
| M: MOTORS | 21.12 | KVA |
| P: PANELS | 0.00 | KVA |
| T: TRANSFORMERS | 0.00 | KVA |
| E: EQUIPMENT | 0.00 | KVA |
| S & X: SPARE & SPACE | 0.19 | KVA |

FLUSH ☐ SURFACE ■

NOTES: NEMA 3R – SERVICE ENTRANCE RATED – INSTALLING CONTRACTOR TO PROVIDE MINIMUM OF 150A INCOMING SERVICE CONDUCTORS
* DENOTES LOCK-OUT CLIP: ** DENOTES GFI BREAKER: *** DENOTES VIA TIMECLOCK: **** DENOTES VIA CONTACTOR

| CIRCUIT USE | CONNECTED LOAD A | CONNECTED LOAD B | CCT. NO. | CIRCUIT BREAKER | CIRCUIT BREAKER | CCT. NO. | CONNECTED LOAD A | CONNECTED LOAD B | CIRCUIT USE |
|---|---|---|---|---|---|---|---|---|---|
| R: REFRIGERATOR | 1,200 | | 1 | 20A-1PAFGCI | 50A-2P | 2 | 3,900 | | R: RANGE |
| R: MICROWAVE | | 1,200 | 3 | 20A-1PAFGCI | | 4 | | 3,900 | R: |
| R: BATHROOM RECEPTACLE | 360 | | 5 | 20A-1P AFCI | 20A-1PAFGCI | 6 | 1,200 | | R: DISHWASHER |
| R: LIVING ROOM EXTERIOR RECEPT | | 1,520 | 7 | 20A-1P AFCI | 20A-1P ACFI | 8 | | 1,500 | R: WASHER DRYER |
| S: SPARE | 193 | | 9 | 20A-1P | 20A-1P ACFI | 10 | 1,500 | | R: KITCHEN CIRCUIT 1 |
| M: BATH/KITCHEN/LIVING ROOM LTS | | 720 | 11 | 15A-1P AFCI | 20A-1P ACFI | 12 | | 1,500 | R: KITCHEN CIRCUIT 2 |
| M: CU-1/FCU-1 | 1,200 | | 13 | 30A-2P | 40A-2P | 14 | 4,500 | | M: WATER HEATER PLUG 1 |
| M: | | 1,200 | 15 | | | 16 | | 4,500 | M: |
| X: BLANKSPACE | 0 | | 17 | BLANKSPACE | 40A-2P | 18 | 4,500 | | M: WATER HEATER PLUG 2 |
| X: BLANKSPACE | | 0 | 19 | BLANKSPACE | | 20 | | 4,500 | M: |
| SUB TOTAL | 2,953 | 4,640 | | | | | 15,600 | 15,900 | SUB TOTAL |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5345 East North Belt Road
N. Las Vegas, NV 89115
WWW.BOXABL.COM

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DESIGN SOLUTIONS, P.C.
Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
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PROFESSIONAL SEAL

DAVIS L. DICKENSON LICENSE No. 18222 DELAWARE PROFESSIONAL ENGINEER

SIGNATURE
04/14/2023 DATE
06/30/2024 EXPIRATION DATE

MODEL:
DELEWARE
20' CASITA B

PAGE LAYOUT

NOTES:

| REV | DATE | DESCRIPTION |
|---|---|---|
| | 4/14/23 | ISSUE FOR PERMIT |


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PROJECT # : 22190
DRAWN BY: NR/SB
REVIEWED BY: SB/DD
REVISION:
ISSUE DATE: 04/14/2023
SHEET: E2.0

GENERAL

1. ALL WORK SHALL BE IN ACCORDANCE WITH ALL AUTHORITIES HAVING JUSIDICTION AND SUBJECT TO INSPECTION.
2. HOOK-UP CHARGES, PERMITS AND ALL OTHER EXPENSES RELATED TO A COMPLETE AND FUNCTIONING PLUMBING SYSTEM ARE INCLUDED AS PART OF THE PLUMBING WORK.
3. ALL AUTHORITIES HAVING JURISDICTION SHALL BE NOTIFIED AT LEAST THREE WORKING DAYS PRIOR TO COMMENCEMENT OF WORK.
4. THE WORK INCLUDED PROVIDING THE PLUMBING SYSTEM AND PROVIDING NEW MATERIALS, FITTINGS AND ACCESSORIES NECESSARY FOR A COMPLETE FUNCTIONING PLUMBING SYSTEM.
5. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR PLUMBING WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, FIXTURE AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURER'S STANDARD ROUGH-IN DRAWINGS FOR PLUMBING FIXTURES FOR EXACT LOCATIONS.

BASIC MATERIALS AND METHODS

1. MATERIALS SHALL BEAR UNDERWRITER LABEL WHERE SUCH STANDARDS HAVE BEEN ESTABLISHED AND LISTED BY UNDERWRITER LABORATORIES, INC. MATERIALS, EQUIPMENT AND APPLIANCES SHALL CONFORM TO THE LATEST STANDARDS OF:
   ANSI -AMERICAN NATIONAL STANDARDS INSTITUTE
   ASHRAE -AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
   ASME -AMERICAN SOCIETY OF MECHANICAL ENGINEERS
   ASTM -AMERICAN SOCIETY FOR TESTING ENGINEERS
   NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION

COORDINATION

1. COORDINATE WITH THE WORK OF OTHER TRADES.
2. REFER TO ARCHITECTURAL DRAWINGS OR CONSULT ARCHITECT FOR EXACT LOCATION OF FIXTURES, EQUIPMENT, ETC., AND FINAL FINISHED ELEVATIONS PRIOR TO ANY INSTALLATION WORK.
3. COORDINATE WITH GENERAL CONTRACTOR WHO SHALL CONSULT WITH THE OWNER FOR ALLOWABLE DAYS THAT WORK CAN BE PERFORMED AND TO SCHEDULE SYSTEM SHUT DOWNS AS REQUIRED FOR RELOCATION OF RISERS, ETC.

INSTALLATION - GENERAL

1. LISTED AND APPROVED THROUGH PENETRATION SYSTEM SHALL BE USED ON ALL PLUMBING PENETRATIONS OF FIRE RATED ASSEMBLIES.
2. EXPOSED PIPING IN FINISHED AREA SHALL BE WITH CHROME PLATED ESCUTCHEON AT PIPE ENTRY TO FINISHED AREA.
3. ALL PIPING SHALL BE CONCEALED IN CABINETS AND FIXED FURNISHINGS UNLESS OTHERWISE INDICATED.
4. CUT AND PATCH EXISTING FLOOR, WALL OR CEILING CONSTRUCTION AS REQUIRED FOR THE INSTALLATION WORK.
5. SLEEVE OR CORE-DRILL FLOOR SLABS, WALLS, ETC. AS REQUIRED FOR PIPING AND FIRE STOP OPENING AROUND PIPE. VERIFY LOCATION OF STRUCTURAL BEAMS, JOIST, ETC. BEFORE DRILLING.
6. WHEREVER FOUNDATION WALLS, OUTSIDE WALLS, ROOF, ETC. ARE PENETRATED FOR INSTALLATION OF SYSTEMS, THEY SHALL BE PATCHED TO MATCH EXISTING CONSTRUCTION AND SEALED WEATHER TIGHT. WORK SHALL BE PERFORMED BY CRAFTSMAN SKILLED IN THEIR RESPECTIVE TRADES.
7. ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK INCLUDING DUCTS AND ELECTRICAL CONDUIT. AT ALL CONNECTIONS BETWEEN FERROUS PIPING AND NONFERROUS PIPING, PROVIDE AN ISOLATING DIELECTRIC UNION.
8. PROVIDE ALL FITTINGS, ACCESSORIES, OFFSETS AND MATERIALS NECESSARY TO FACILITATE THE PLUMBING SYSTEMS FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED.
9. PIPING ROUTED IN EXTERIOR WALLS SHALL BE ROUTED ON THE INTERIOR SIDE OF BUILDING WALL INSULATION.
10. ACCESS PANELS SHALL BE PROVIDED WHERE CONCEALED CONTROL DEVICES, VALVES, CLEANOUTS, ETC. ARE CONCEALED WITHIN CEILINGS AND WALLS. WHERE ACCESS FOR ADJUSTMENT AND MAINTENANCE IS POSSIBLE THRU LAY-IN SUSPENDED CEILINGS, ACCESS PANELS ARE NOT REQUIRED.
11. THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION, CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. SET FIXTURES LEVEL AND IN PROPER ALIGNMENT. INSTALL SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES. INSTALL SILICONE SEALANT BETWEEN FIXTURES AND ADJACENT MATERIAL FOR SANITARY JOINT.

DOMESTIC WATER PIPING

1. PROVIDE PRESSURE REDUCING VALVE ON PLUMBING SYSTEMS WHERE THE INCOMING WATER SERVICE PRESSURE IS IN EXCESS OF 80 PSI.
2. HOT AND COLD WATER PIPING SHALL BE PEX TUBING. PROVIDE WATER HAMMER ARRESTORS PER DRAWINGS.
3. PROVIDE ISOLATION VALVES FOR EACH BRANCH OFF MAIN SUPPLY.
4. SHUT-OFF VALVES WITH UNIONS SHALL BE PROVIDED FOR SERVICE TO EACH PLUMBING FIXTURE OR OTHER EQUIPMENT ITEM TO FACILITATE ISOLATION FOR REPAIR OR REPLACEMENT.
5. VALVE LOCATION TAGS REQUIRED ON ALL SHUT-OFFS AND LOCATION CHART REQUIRED.
6. THE DOMESTIC WATER SYSTEM SHALL BE FLUSHED, PRESSURE TESTED AND PURIFIED. TEST WATER UNDER 80-100 PSIG HYDROSTATIC PRESSURE FOR 15 MINUTES MINIMUM. WHEN TESTING INDICATES MATERIALS OR WORKMANSHIP IS DEFICIENT, REPLACE OR REPAIR AS REQUIRED, AND REPEAT UNTIL STANDARDS ARE ACHIEVED. ALL PIPING SYSTEMS SHALL BE SUBJECTED TO A DISINFECTION PROCEDURE PER THE RULES AND REGULATIONS OF THE LOCAL AUTHORITIES.

SANITARY SEWER, STORM SEWER, AND VENT PIPING

1. ALL OPENINGS IN DRAINAGE AND/OR VENT SYSTEMS AS A RESULT OF DEMOLITION OR INSTALLATION ROUGH-IN SHALL BE PROTECTED WITH A TEST PLUG THAT IS SECURELY LOCKED IN PLACE UNTIL FINAL FINISHED CONNECTIONS ARE INSTALLED.
2. PROVIDE A COMPLETE SYSTEM OF PVC VENT PIPING WITH AIR ADMITTANCE VALVES.
3. CONDENSATE AND INDIRECT DRAIN PIPING SHALL BE TYPE PVC UP TO 1" ID.
4. DRAINAGE PIPING UNDERGROUND AND OUTSIDE THE BUILDING SHALL BE PVC PIPE AND FITTINGS. (ALTERNATE MATERIALS MAY BE ALLOWED IF APPROVED BY LOCAL CODE AUTHORITIES.)
5. DRAINAGE PIPING INSIDE THE BUILDING SHALL BE PVC PIPE AND FITTINGS WITH SCHEDULE 40 PVC VENTS TO AIR ADMITTANCE VALVES.
6. PROVIDE CLEANOUTS AT THE END OF EACH HORIZONTAL RUN, AND AT THE BASE OF ALL VERTICAL WASTE AND DRAIN PIPES. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPES THEY SERVE. FIELD VERIFY LOCATION OF ALL EXISTING CLEANOUTS AND ADJUST TO NEW FINISHED FLOOR ELEVATIONS AND PROVIDE ACCESS PANELS FOR ALL WALLS AND CEILINGS.
7. ALL DRAINAGE PIPING SHALL BE UNIFORMLY PITCHED, 1/4" PER FOOT UNLESS OTHERWISE REQUIRED BY EXISTING CONDITIONS, MINIMUM SLOPE SHALL BE PER CODE.
8. ALL FLOOR DRAINS SHALL BE CONNECTED TO THE SANITARY SEWER SYSTEM.
9. THE DRAINAGE SYSTEMS SHALL BE FLUSHED AND PRESSURE TESTED.

SUBSTITUTIONS

1. THE NAMING OF MANUFACTURER'S IN THE SPECIFICATIONS SHALL NOT BE CONSTRUED AS ELIMINATING THE MATERIALS, PRODUCTS OR SERVICES OF OTHER MANUFACTURER'S AND SUPPLIERS HAVING EQUIVALENT ITEMS. ANY SUBSTITUTED ITEMS MUST BE EQUAL TO THOSE SPECIFIED, PROVIDE COST SAVINGS AND BE AVAILABLE TO MEET THE CONSTRUCTION SCHEDULE.

## PLUMBING SYMBOLS

| | |
|---|---|
| —CWS— | COLD WATER SUPPLY PIPING |
| —HWS— | HOT WATER SUPPLY PIPING |
| — SAN — | SANITARY WASTE PIPING |
| - - -V- - - | SANITARY VENT PIPING |
| —— - —— | COLD WATER SUPPLY PIPING |
| —— - - —— | HOT WATER SUPPLY PIPING |
| - - - - - - - | SANITARY VENT PIPING |
| BFP | BACKFLOW PREVENTER |
| CO | CLEANOUT |
| CP | CHROME PLATED |
| DN | DOWN |
| DW | DISHWASHER |
| ET | EXPANSION TANK |
| FD | FLOOR DRAIN |
| GALV | GALVANIZED |
| INV. EL. | INVERT ELEVATION |
| IM | ICE MAKER |
| LAV | LAVATORY |
| NC | NEW CONNECTION |
| PRV | PRESSURE REDUCING VALVE |
| PSIG | POUNDS PER SQUARE INCH |
| S | SANITARY |
| SHR | SHOWER |
| SK | SINK |
| TMV | THERMOSTATIC MIXING VALVE |
| V | VENT |
| VTR | VENT THRU ROOF |
| W | WASTE |
| WC | WATER CLOSET |
| WH | WATER HEATER |
| | LINE SIZE BALL GATE VALVE |
| | LINE SIZE BALANCING VALVE |
| | LINE SIZE BALL VALVE (2" & SMALLER) OR LINE SIZE BUTTERFLY VALVE (2-1/2" & LARGER) |
| | LINE SIZE CHECK VALVE |
| | LINE SIZE UNION |
| | PRESSURE REDUCING VALVE |
| | PRESSURE RELIEF VALVE |
| | REDUCER |
| | THERMOMETER |

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5345 East North Belt Road
N. Las Vegas, NV 89115
WWW.BOXABL.COM

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DESIGN SOLUTIONS, P.C.
Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
www.sevansolutions.com

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PROFESSIONAL SEAL

JOSEPH GREGORY THOMAS
REGISTERED
No. 12172
DELAWARE
PROFESSIONAL ENGINEER

DATE:4/11/23
EXPIRATION DATE: 6/30/24

I HEREBY CERTIFY THAT THESE DRAWINGS HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE CODES AND ORDINANCES FOR PREFABRICATED DWELLING UNITS.

MODEL:

DELAWARE
20' CASITA B

PAGE LAYOUT
PLUMBING NOTES, SYMBOLS & ABBREVIATIONS

| DESCRIPTION | REV | DATE |
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REVISION:
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H:\23187\Dwg\Boxabl B\23187_DE_P1.0 B.dwg April 11, 2023 - 1:17pm joe.thomas
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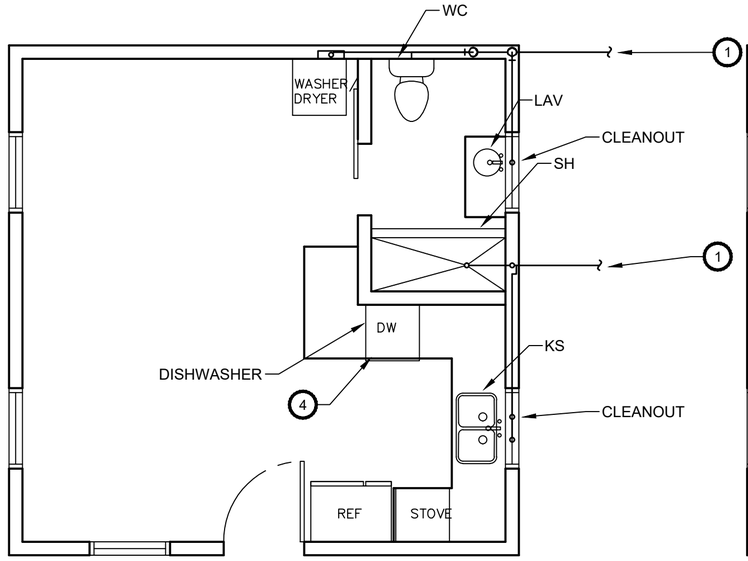
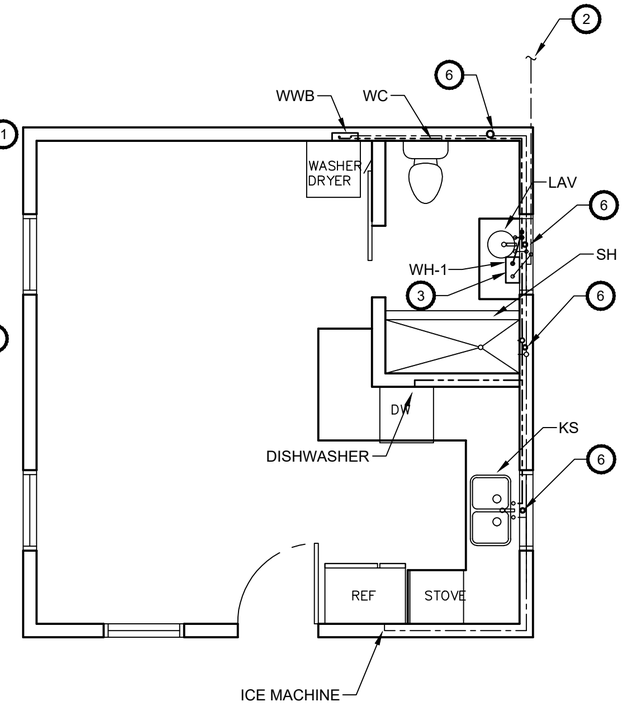


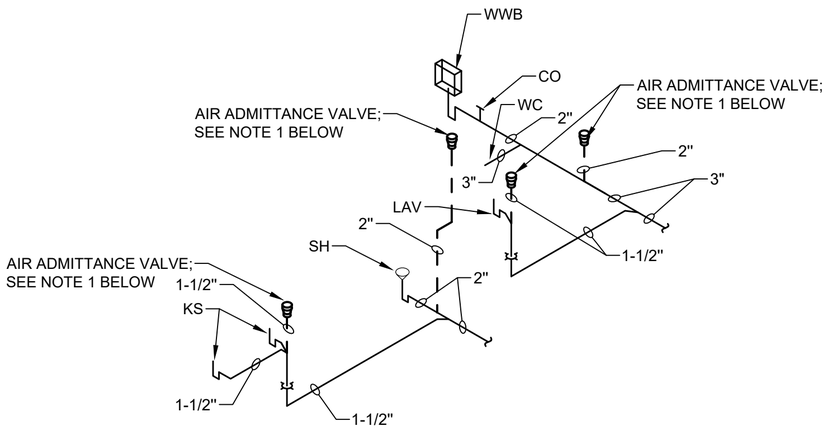

## 1 PLUMBING SANITARY PLAN

1/4" = 1'-0"




## 2 PLUMBING DOMESTIC WATER PLAN

1/4" = 1'-0"

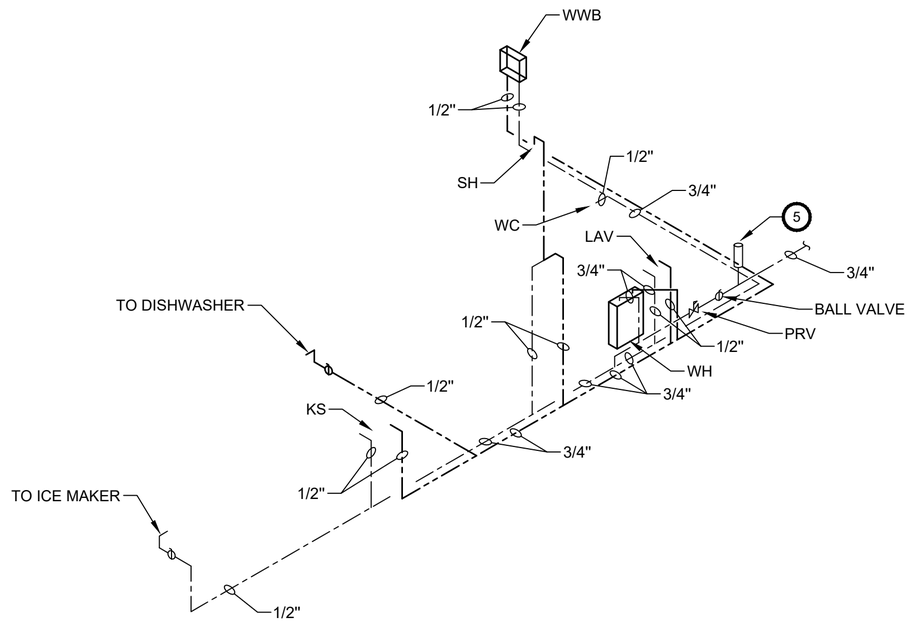



NOTES:

1. AIR ADMITTANCE VALVE SHALL BE ACCESSIBLE AND RATED FOR THE FIXTURES IT IS SERVING.

## 3 PLUMBING SANITARY ISOMETRIC

NOT TO SCALE




## 4 PLUMBING DOMESTIC WATER ISOMETRIC

NOT TO SCALE

## PLAN NOTES

| | |
|---|---|
| 1 | PROVIDE 2" & 3" SANITARY PIPING TO THE NEW BOXABL HOUSE. COORDINATE WITH CIVIL DRAWINGS THE EXACT LOCATION OF THE NEW SANITARY PIPING. |
| 2 | PROVIDE 3/4" DOMESTIC COLD WATER TO NEW BOXABL HOUSE. COORDINATE WITH CIVIL DRAWINGS THE EXACT LOCATION OF THE NEW DOMESTIC COLD WATER PIPING. |
| 3 | TANK-LESS ELECTRIC WATER HEATER. |
| 4 | EXTEND 5/8" HOSE FROM DISHWASHER TO PRE-INSTALLED AIR GAP DEVICE LOCATED IN THE KITCHEN SINK TAILPIECE ABOVE THE 'P' TRAP. |
| 5 | WHOLE HOUSE WATER HAMMER ARRESTOR MIFAB MODEL CL-A-NPB. |
| 6 | AIR ADMITTANCE VALVE, EACH INSTALLED AIR ADMITTANCE VALVE IS RATED FOR 24 DFU. |

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Corporate Office:
3025 Highland Parkway | Suite 850
Downers Grove, IL 60515
info@sevansolutions.com
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REGISTERED
No. 12172
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PROFESSIONAL ENGINEER

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MODEL:

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PLUMBING PLANS

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DRAWN BY: NK

REVIEWED BY: JT

REVISION:

ISSUE DATE: 04/11/23

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H:\23187\Dwg\Boxabl B\23187_DE_P2.0 B.dwg April 11, 2023 - 1:16pm joe.thomas
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# FIXTURE SCHEDULES

| FIXTURE | TYPE | MFG'R. | MODEL NO. | COLOR | FAUCET | TRAP | TRIM | SUPPLY FITTING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| WC | WATER CLOSET | SANIFLUSH | 083 & 005 | WHITE | N/A | INTERGRAL P-TRAP | N/A | 3/8" | 1.28 GALLONS/FLUSH |
| LAV | LAVATORY | BEELEE | BL6790BH | MATTE BLACK | 1.2 GPM | N/A | MATTE BLACK | 3/8" | |
| KS | KITCHEN FAUCET | MOEN | 5925BL | MATTE BLACK | 1.5 GPM | N/A | MATTE BLACK | 3/8" | |
| SH | SHOWER | MOEN | T2472EPBL | MATTE BLACK | 1.75 GPM | N/A | MATTE BLACK | 1/2" | |
| WWB-1 | WASHER WALL BOX | SIOUX CHIEF | 688-G10 | WHITE | N/A | N/A | N/A | 2 @1/2" | |

# WATER HEATER SCHEDULE

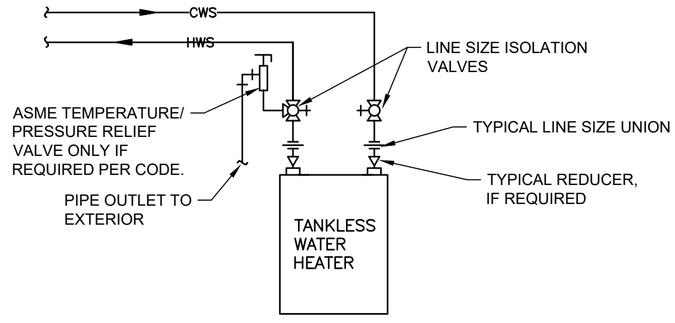
| DESIG'N. | TYPE | MFG'R. | MODEL NO. | STORAGE GALLON CAPACITY | ELECTRICAL | | | RECOVERY AT 80°F RISE (GPM) | TANK LINING | WARRANTY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | KW | VOLTAGE | AMPS | | | | |
| WH-1 | TANK-LESS | A.O. SMITH | R4LA-180E | N/A | 18.0 | 240V-1Ø | 75.0 | 1.5 | N/A | YES | |

## WATER SUPPLY FIXTURE UNITS

| Quantity | Fixture Tag | Fixture | Occupancy | Type of Supply Control | Load Values in water supply fixture units (wsfu) | | | Total Load Values in water supply fixture units (wsfu) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cold | Hot | Total | Cold | Hot | Total |
| 1 | DW | Dishwashing machine | Private | Automatic | 0.00 | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 |
| 1 | IM | Ice Macine | Private | 3/8" valve | 0.25 | 0.00 | 0.25 | 0.25 | 0.00 | 0.25 |
| 1 | KS | Kitchen sink | Private | Faucet | 1.00 | 1.00 | 1.40 | 1.00 | 1.00 | 1.40 |
| 1 | LAV | Lavatory | Private | Faucet | 0.50 | 0.50 | 0.70 | 0.50 | 0.50 | 0.70 |
| 1 | SH | Shower head | Private | Mixing valve | 1.00 | 1.00 | 1.40 | 1.00 | 1.00 | 1.40 |
| 1 | WM | Washing machine (8 lb) | Private | Automatic | 1.00 | 1.00 | 1.40 | 1.00 | 1.00 | 1.40 |
| 1 | WC | Water closet | Private | Flush tank | 2.20 | 0.00 | 2.20 | 2.20 | 0.00 | 2.20 |
| | | | | Total WSFU | | | | 5.95 | 4.90 | 8.75 |

## DRAINAGE FIXTURE UNITS

| Quantity | Fixture Tag | Fixture Type | Drainage Fixture Unit Value As Load Factors | Minimum Size of Trap (inches) | Total Drainage Fixture Unit Value As Load Factors |
|---|---|---|---|---|---|
| 1 | WM | Automatic clothes washers, residential | 2.00 | 2.00 | 2.00 |
| 1 | DW | Dishwashing machine, domestic | 2.00 | 1.50 | 2.00 |
| 1 | KS | Kitchen sink, domestic | 2.00 | 1.50 | 2.00 |
| 1 | LAV | Lavatory | 1.00 | 1.25 | 1.00 |
| 1 | SH1 | Shower Flow Rate 5.7 gpm or less | 2.00 | 1.50 | 2.00 |
| 1 | WC | Water closet, private (1.6 gpf) | 3.00 | | 3.00 |
| | | Total DFU's | | | 12.00 |




NOTE
SEE PLANS FOR ALL PIPE SIZES

## DOMESTIC WATER HEATER DETAIL - TANKLESS - SINGLE

NOT TO SCALE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