

Family Friendly submission Lincoln Block Inc.

Lincoln Block Inc.

4030 99th Ave NE Lake Stevens, WA 98258

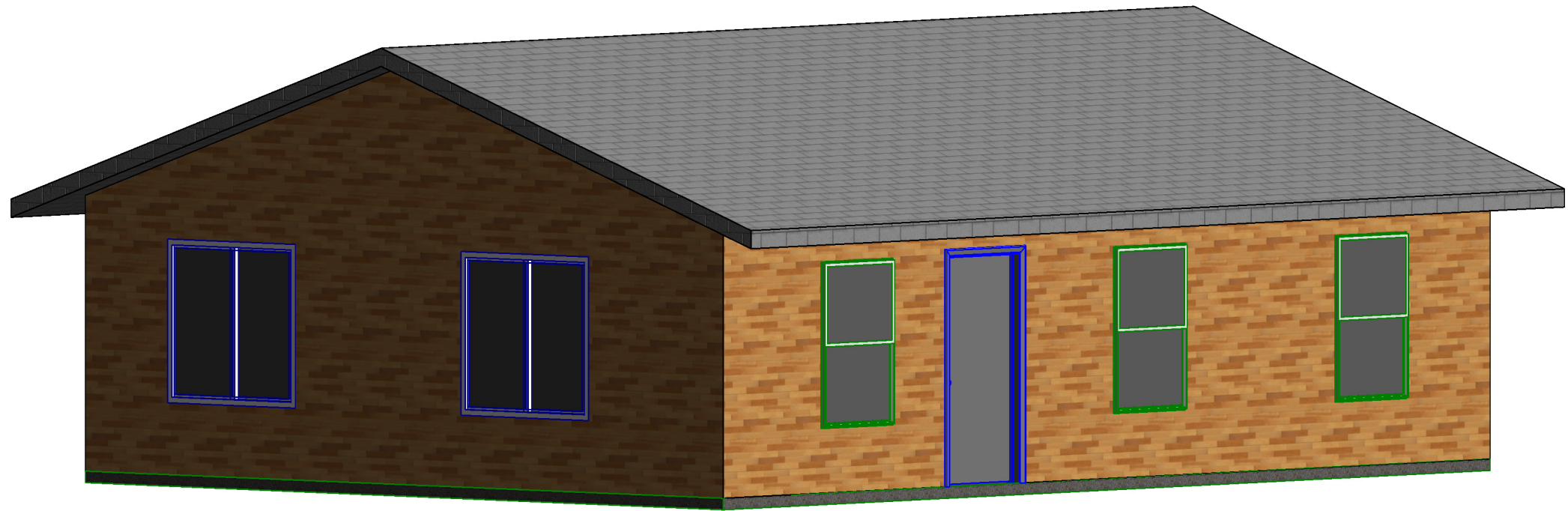
425-330-8697

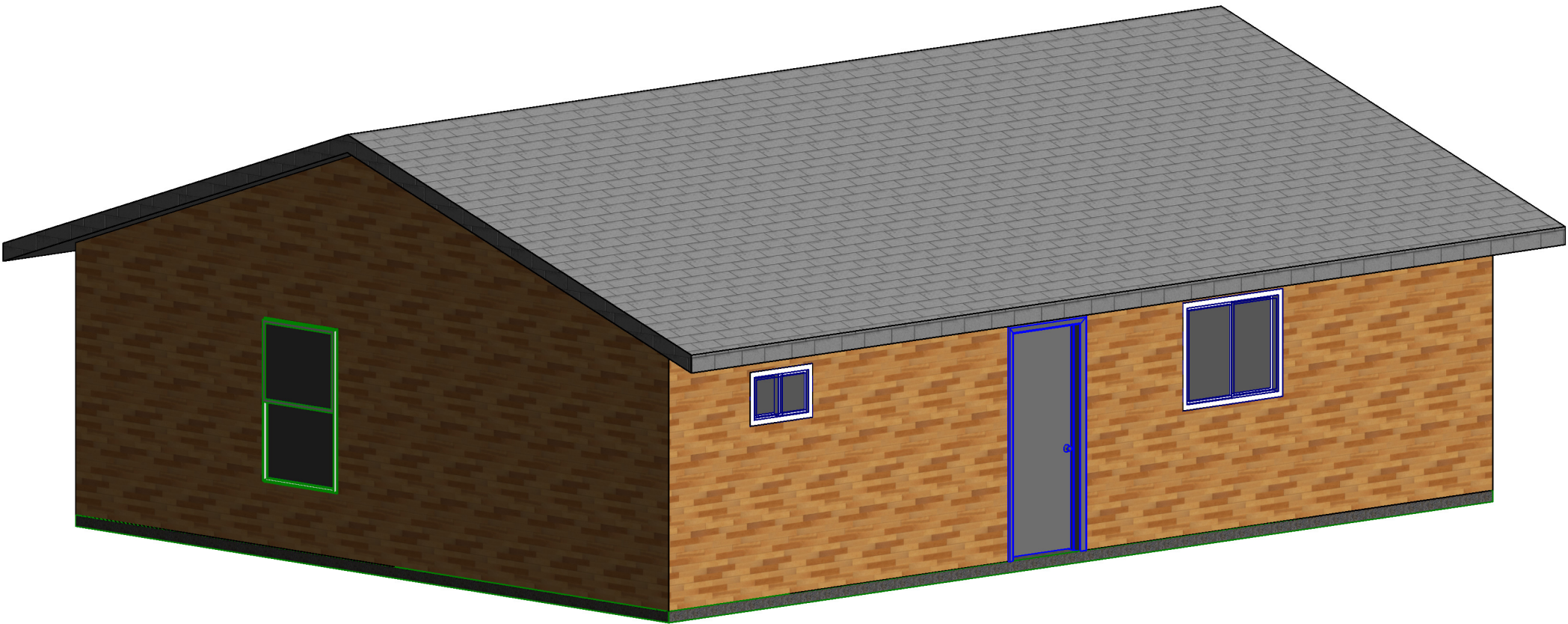
Project description

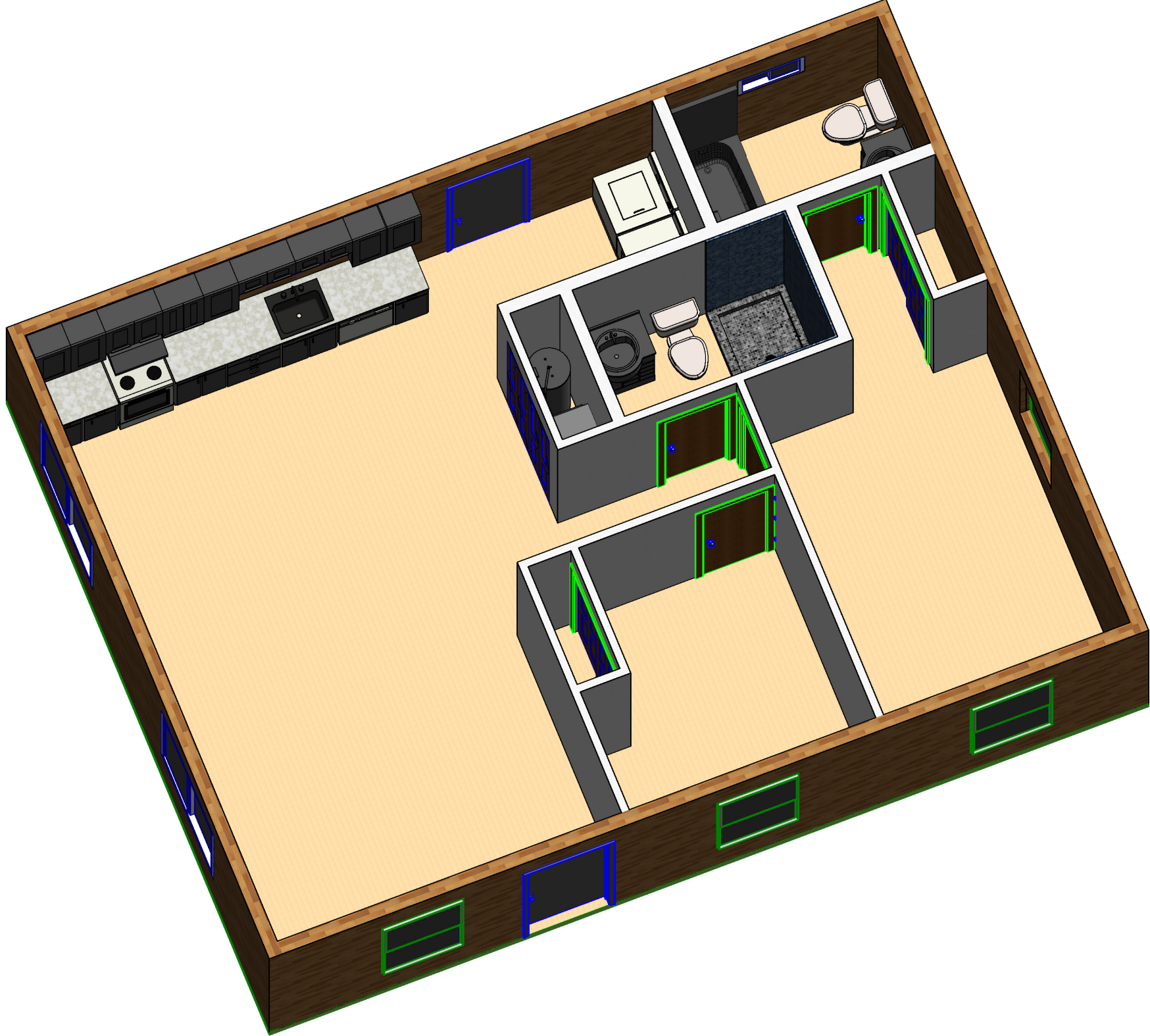
The 25x33 **825** sq. ft rambler features 2 bedrooms, 1 bathroom, and an open concept kitchen and living room. Its affordability, durability, low maintenance, and superior energy efficiency makes it a perfect fit for a small family. Lincoln Block is highly insulated which not only helps with heating and cooling, it also provides great sound proofing and noise reduction giving the family more privacy even if the DADU is located close to the main home.

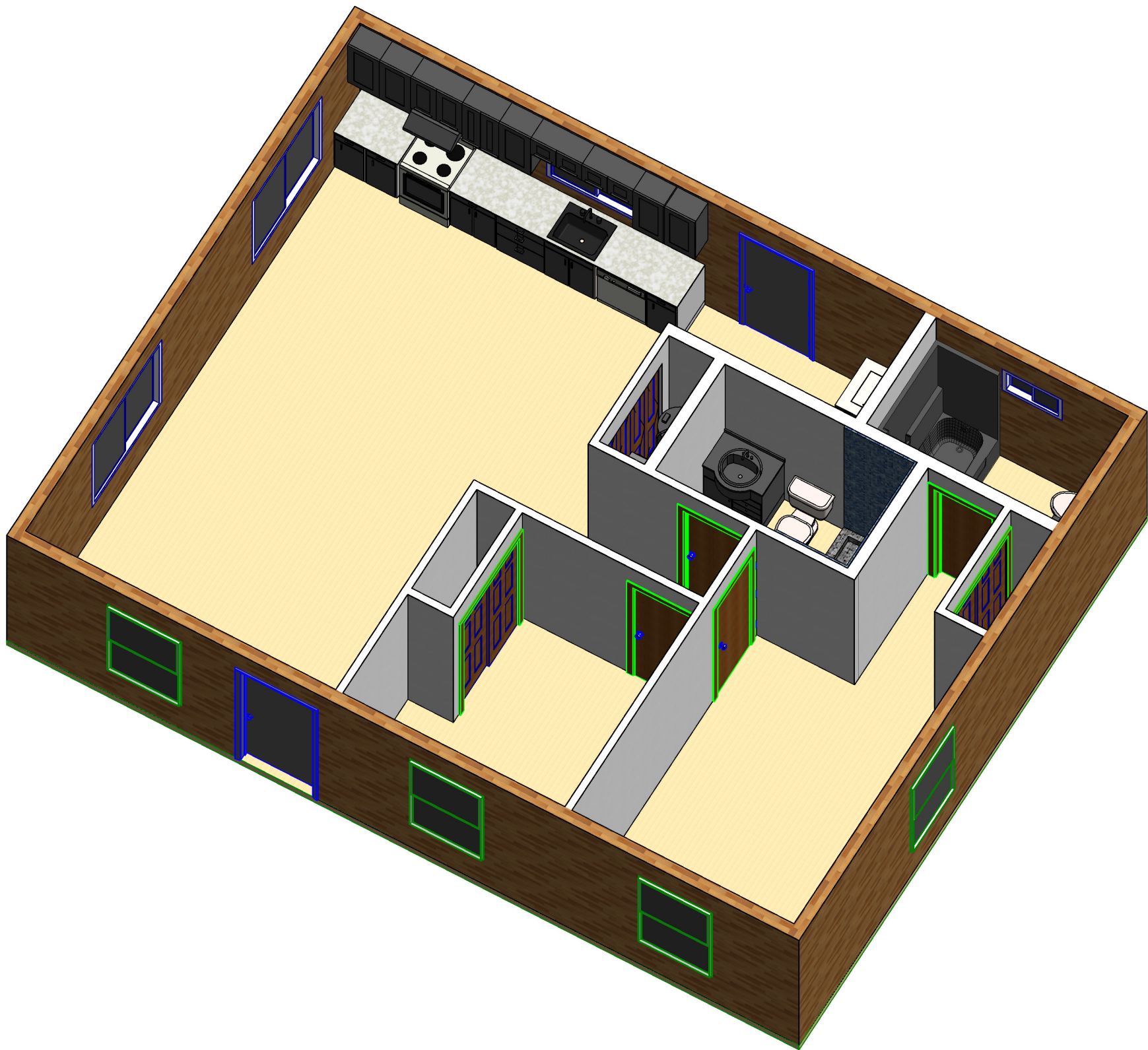
Project Narrative-

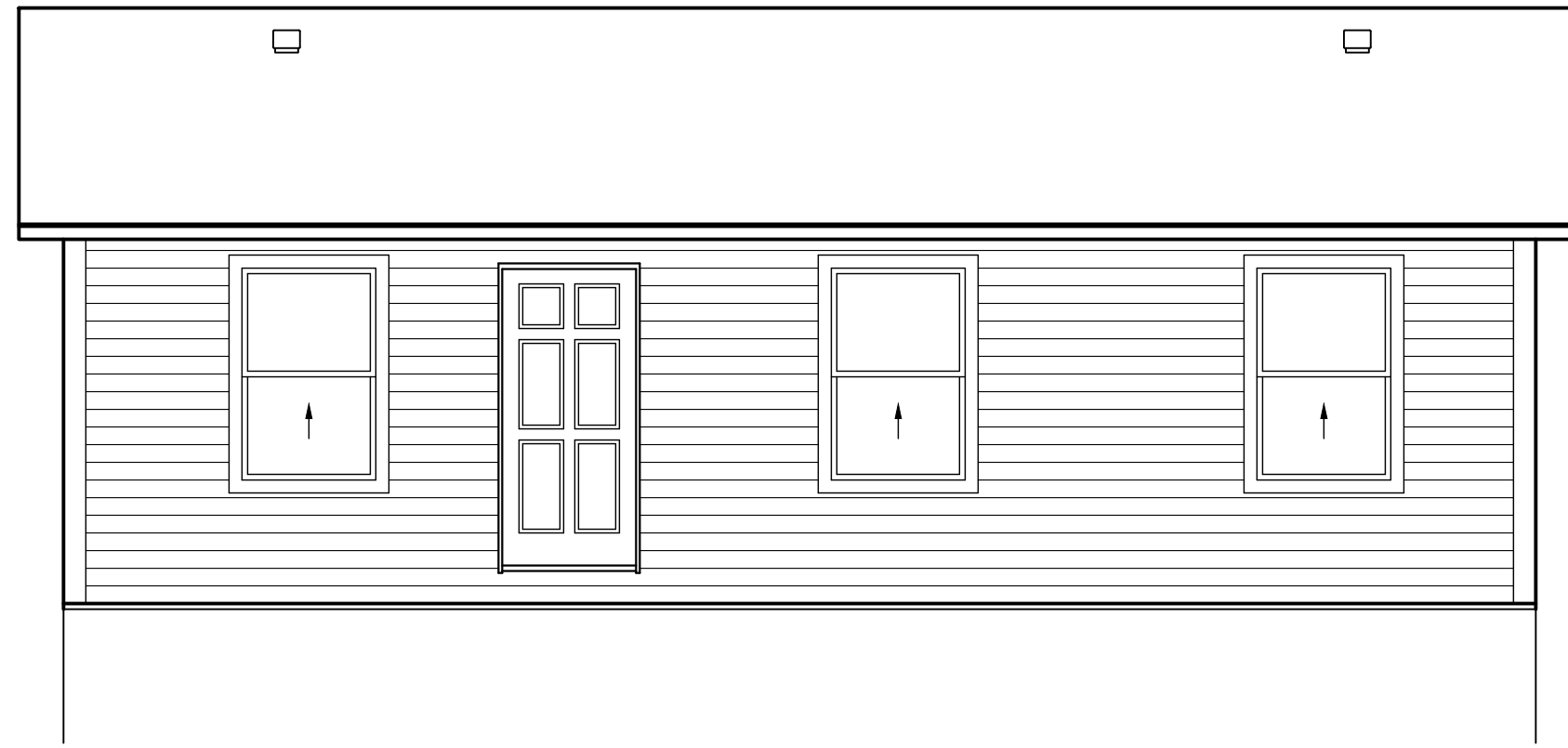
At Lincoln Block we pride ourselves in providing a high-quality product with a lower cost of goods. This gives our customers the ability to customize finishes utilizing the wide variety of goods available to them according to their budget. This rambler and the prices shown are using basic finishes. Lincoln Block is a truly green and sustainable building product that provides superior insulation and thermal retention that has saved our customers over 50% in their heating and energy bills. Lincoln Block is made using wood that would have otherwise been destined to become pallets or wood chips. We rescue this wood from the mills and give it new life turning it into a modular wood building block that can be used to build the DADU featured here. Our mission is to provide an alternative building method that can give the people a low cost, high quality building that will stand the test of time. It requires low maintenance and is perfect for families looking for an affordable alternative in housing. Our building system is easy to learn and does not require specialized tools or knowledge, making this a perfect fit for the DIY enthusiast, further bringing down the cost of construction for those willing to take on their own projects. Living in a wood home is healthier- as it absorbs rather than emits carbon dioxide. Its beauty appeals to a wide variety of cultures and backgrounds. Lincoln Block buildings can be built quickly, simply, and whether it is done by the homeowner or our partner AmyWorks we are able to provide the strongest, most affordable, energy efficient DADU available on the market.



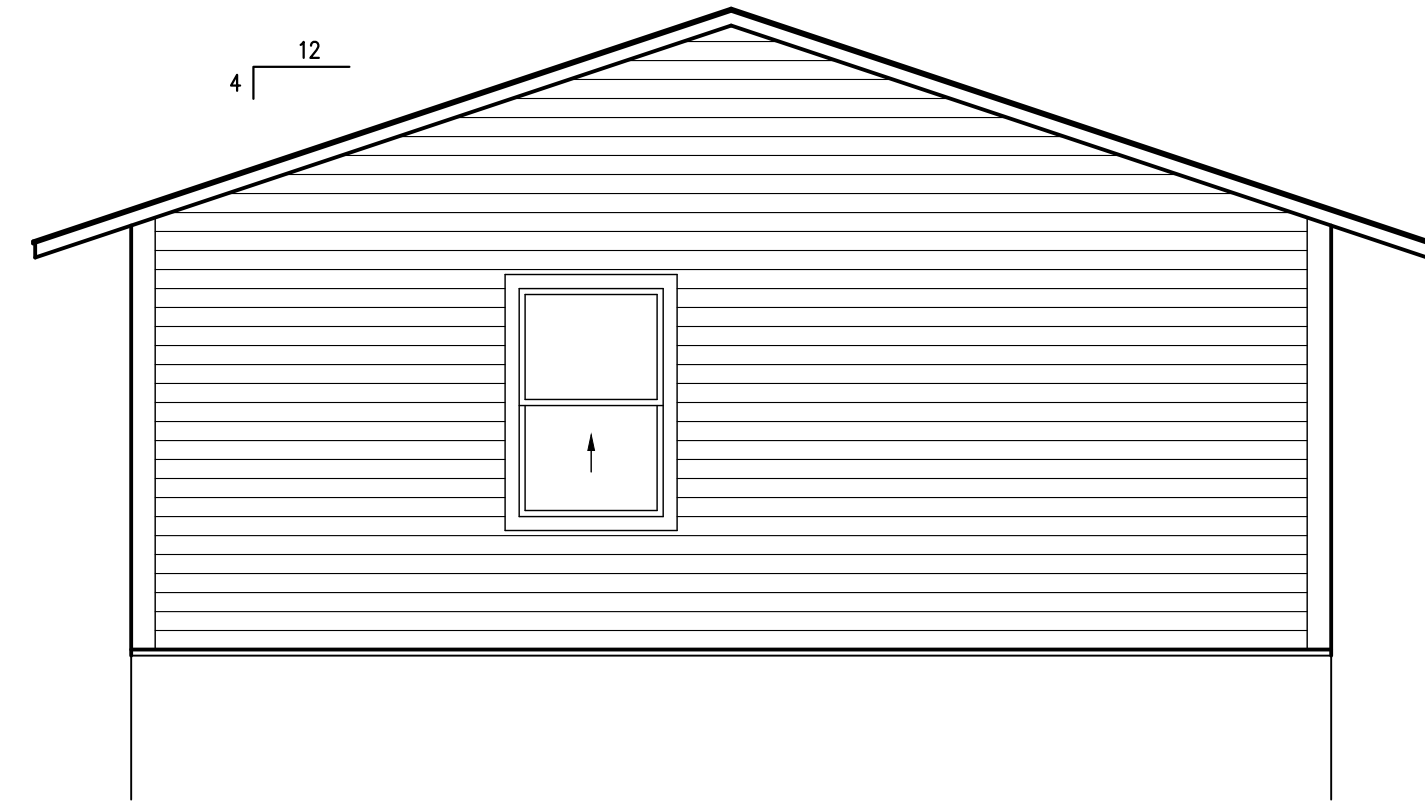




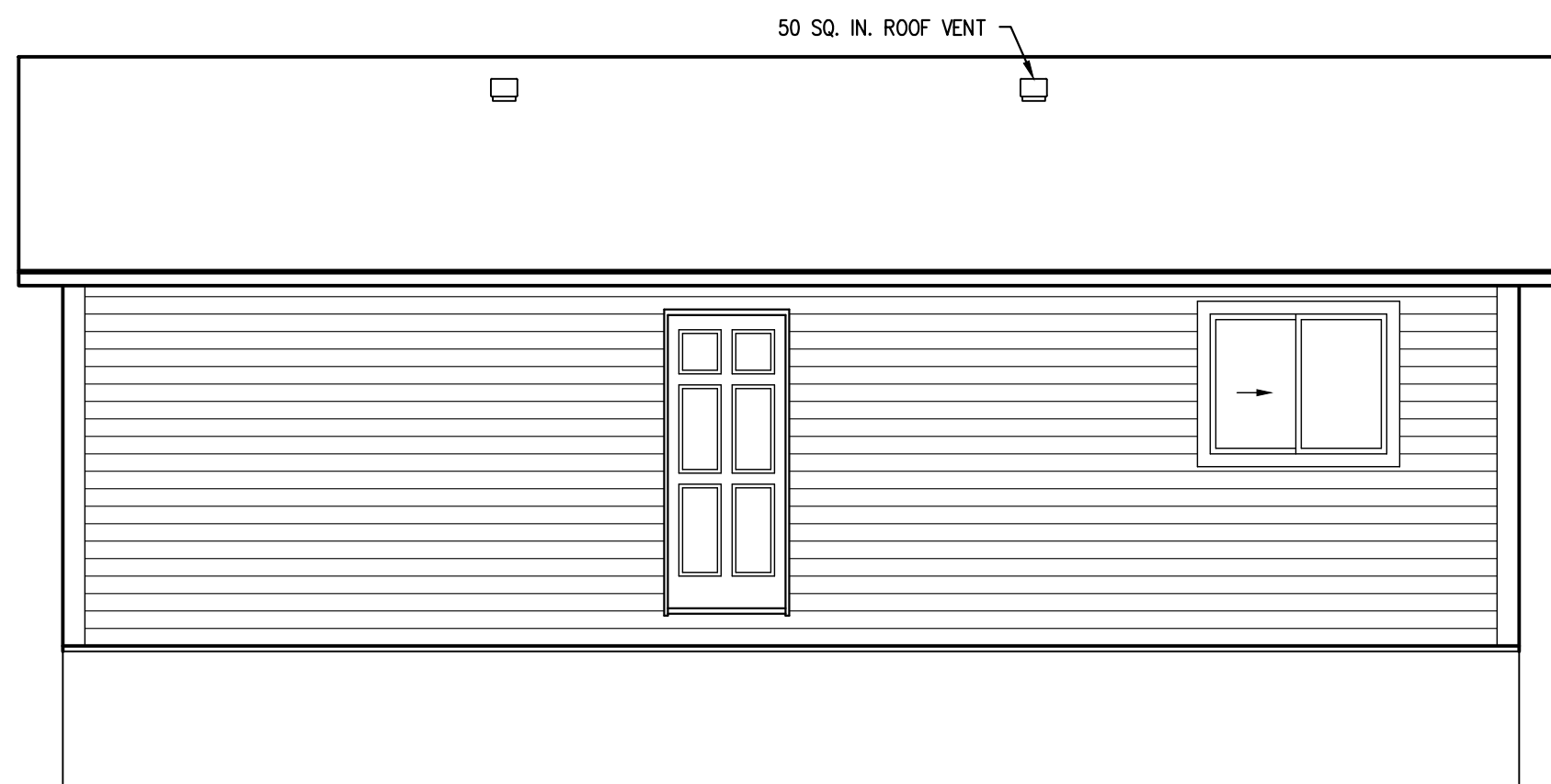




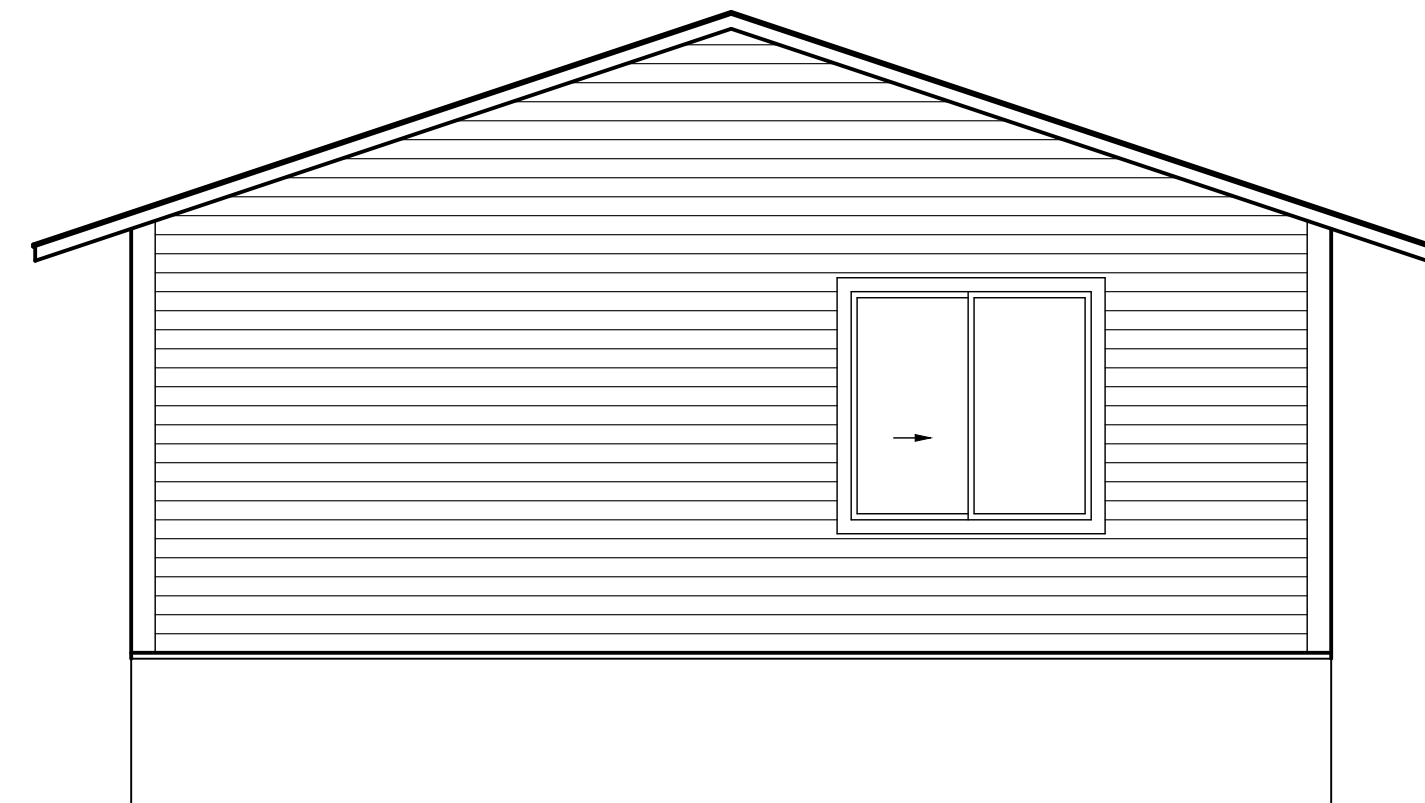
FRONT ELEVATION SCALE: 1/4" = 1'-0"



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



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



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

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 (425) 330-8697 WWW.LINCOLNBLOCK.COM

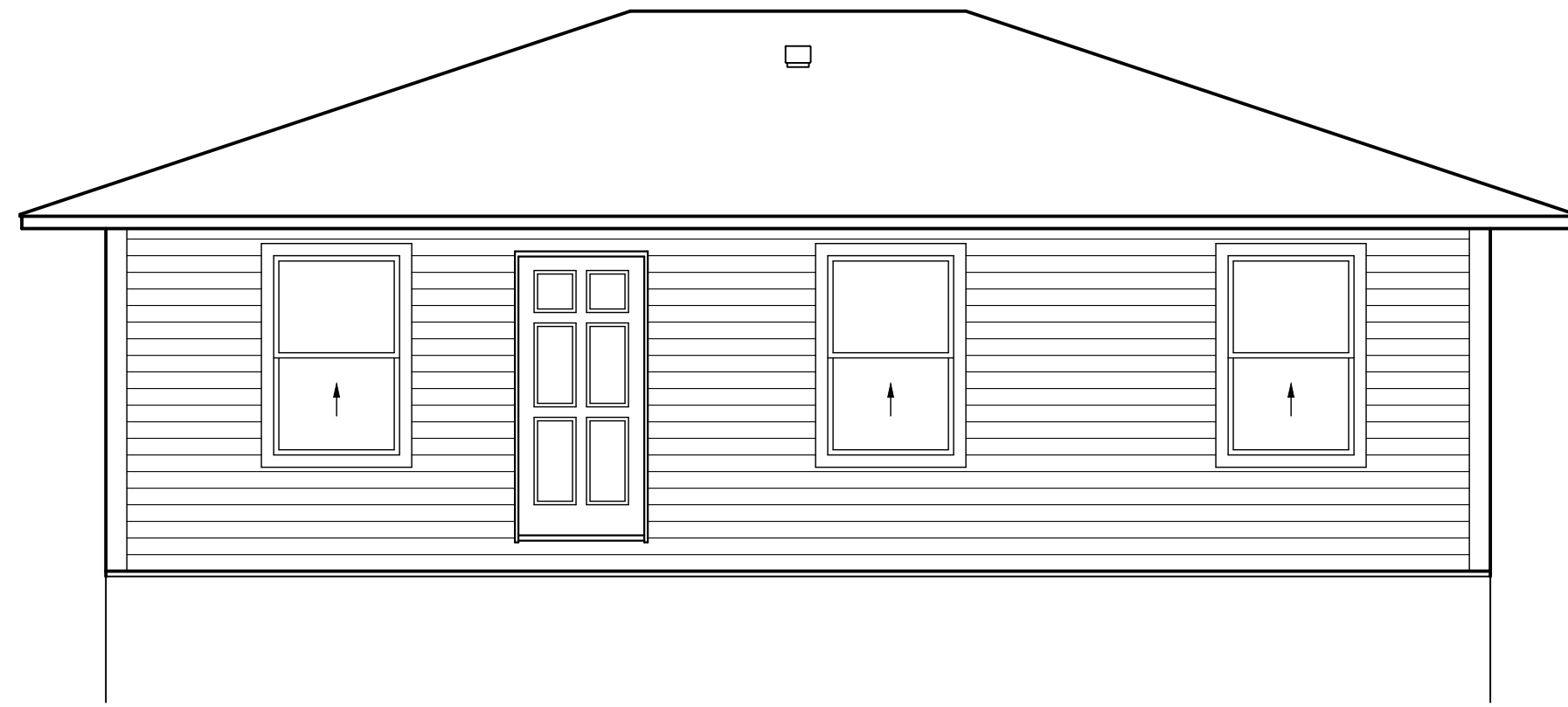
DRAWN: 4-12-19
 BY: TJP
 REVISED: 2-7-20

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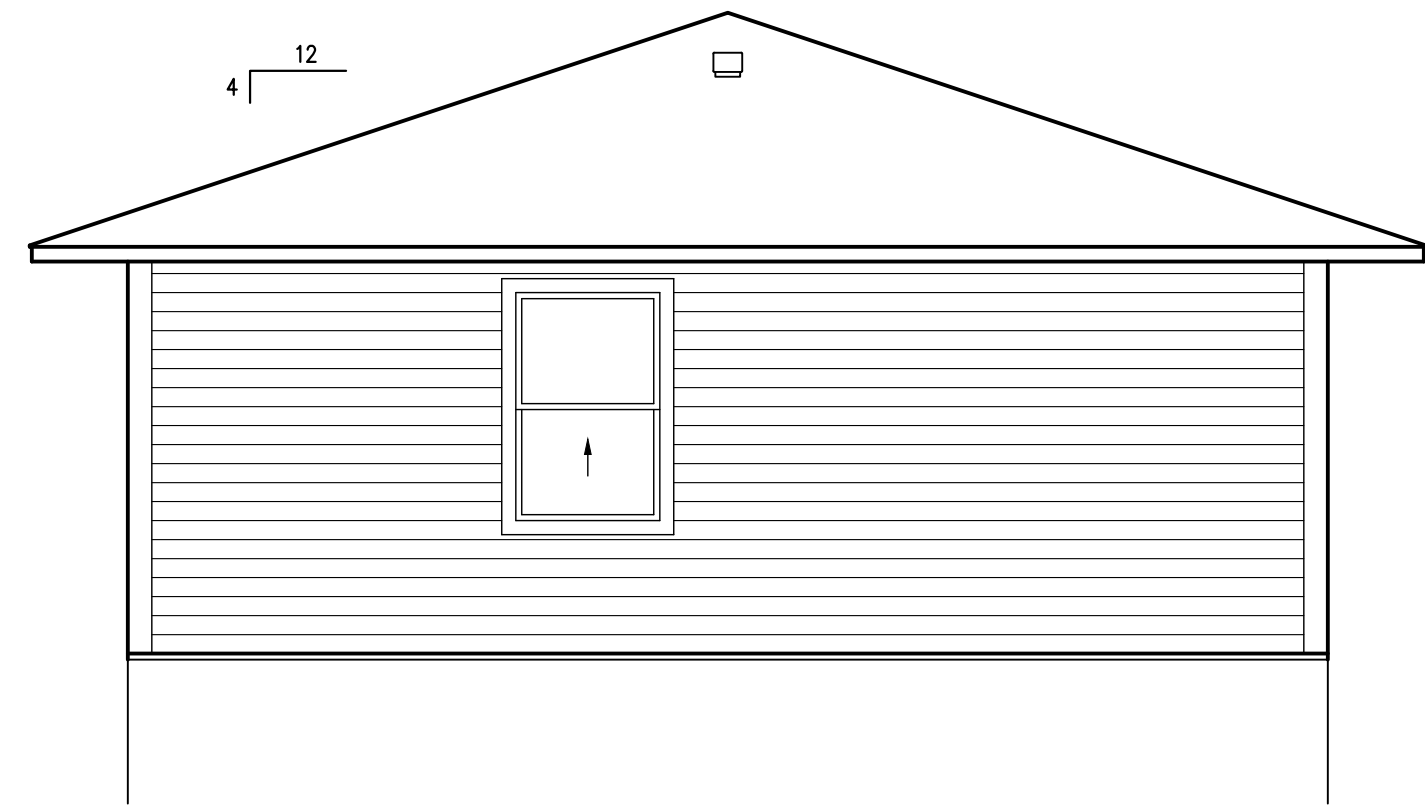
F O R

25X33 BASIC
 825 SQ FT
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 LINCOLN BLOCK, INC. LAKE STEVENS, WASHINGTON

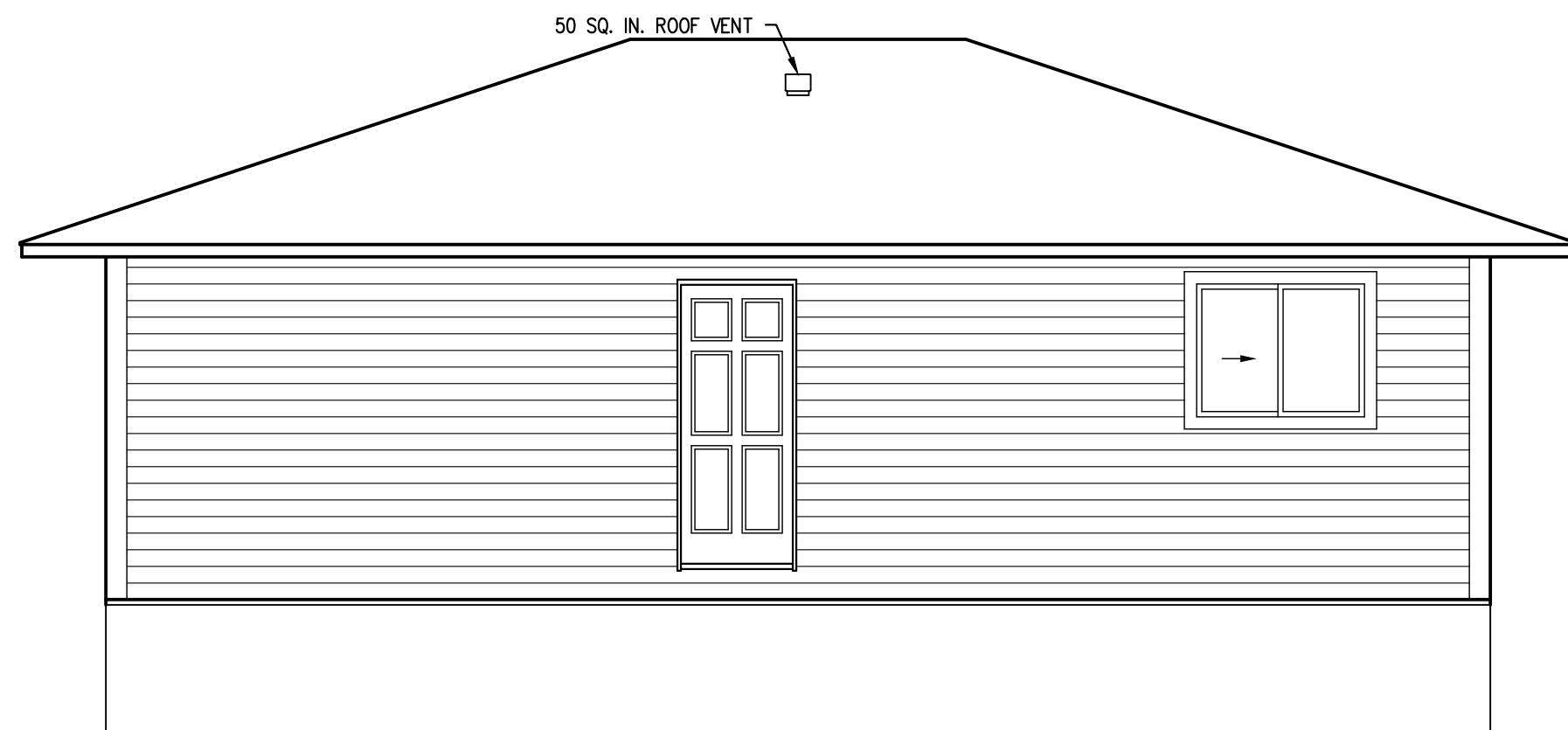
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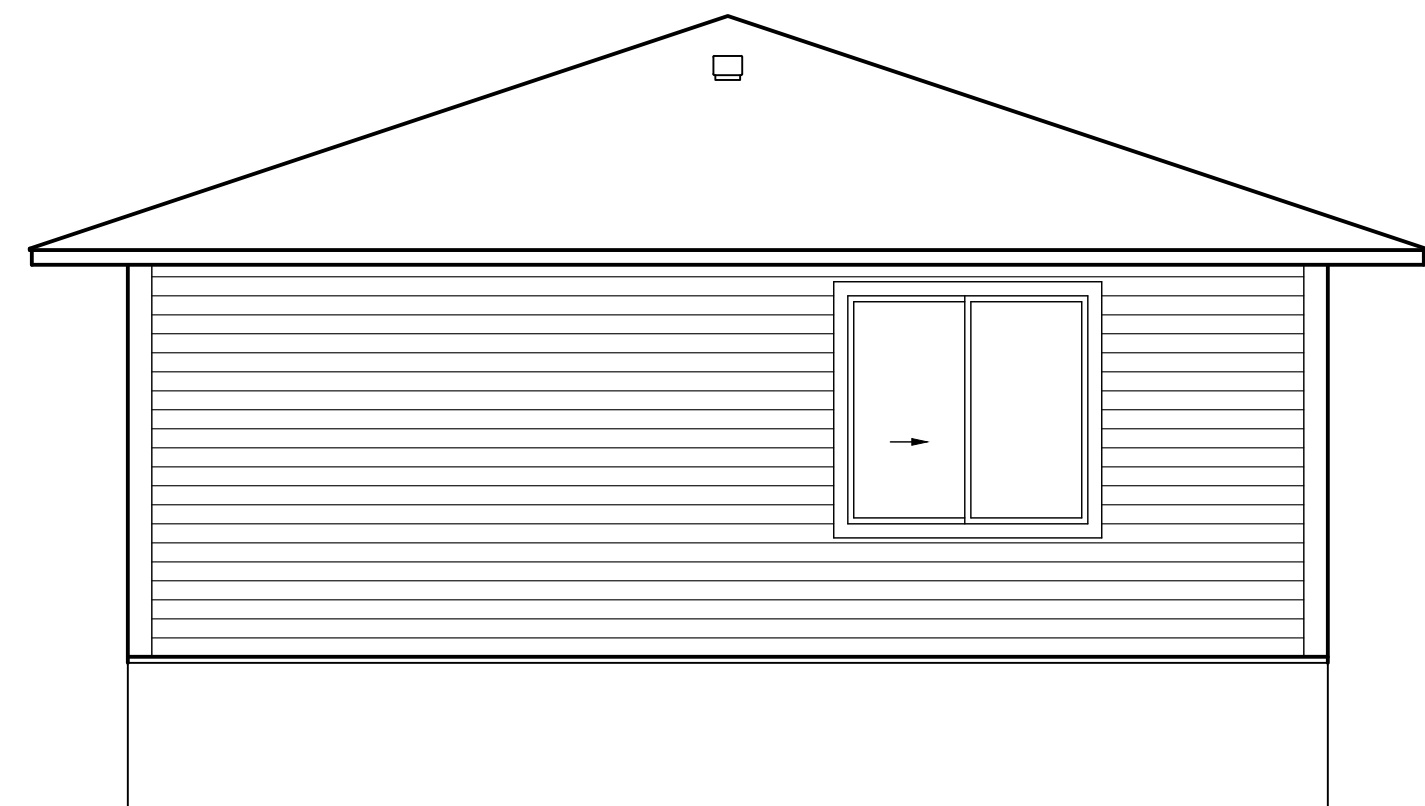
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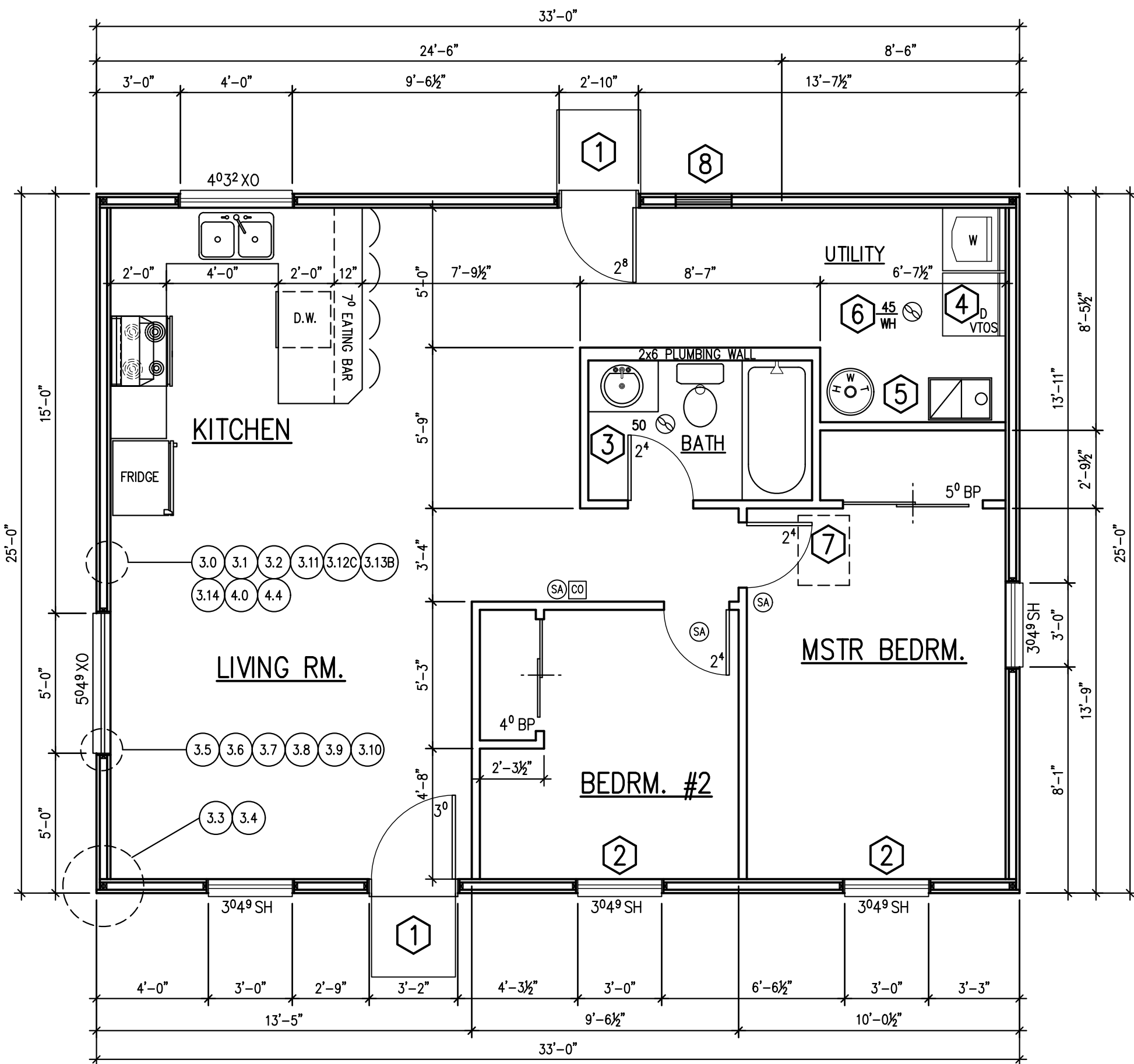
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25X33 BASIC

825 SQ FT
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1.2
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MAIN FLOOR PLAN SCALE: 1/4" = 1'-0"
825 SQ. FT.

ELECTRICAL LEGEND

- (SA) SMOKE ALARM PER R314 AS AMENDED & LISTED PER UL 217 AND NFPA 72. SMOKE ALARMS TO BE PROVIDED IN NEW DWELLING UNITS, AND WHERE ALTERATIONS, REPAIRS OR ADDITIONS REQUIRING A PERMIT OCCUR, OR WHERE ONE OR MORE SLEEPING UNITS ARE ADDED OR CREATED IN EXISTING DWELLINGS. WORK INVOLVING THE EXTERIOR SURFACES OF THE DWELLING, AND INSTALLATION, ALTERATION OR REPAIRS OF PLUMBING, ELECTRICAL OR MECHANICAL SYSTEMS ARE EXEMPT FROM THE REQUIREMENTS OF THIS SECTION. SMOKE ALARMS TO BE INTERCONNECTED EXCEPT WHERE ALTERATIONS OR REPAIRS DO NOT EXPOSE THE STRUCTURE UNLESS THERE IS AN ATTIC CRAWL SPACE OR BASEMENT AVAILABLE FOR ACCESS. SMOKE ALARMS ARE TO BE POWERED BY THE BUILDING WIRING WITH BATTERY BACKUP. BATTERY POWER IS ALLOWED IN BUILDINGS WITHOUT COMMERCIAL POWER OR WHEN INSTALLED PER R314.2.2. SMOKE DETECTORS SHALL BE INSTALLED NOT LESS THAN 3 FT HORIZONTALLY FROM THE DOOR OR OPENING OF A BATHROOM THAT CONTAINS A TUB OR SHOWER. R314. IONIZATION SMOKE ALARMS: SHALL NOT BE INSTALLED LESS THAN 20 FT HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE. IONIZATION SMOKE ALARMS WITH AN ALARM-SILENCING SWITCH SHALL NOT BE INSTALLED LESS THAN 10 FT HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE. PHOTO ELECTRIC SMOKE ALARMS: SHALL NOT BE INSTALLED LESS THAN 6 FT HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE. R314.
- (CO) CARBON MONOXIDE ALARM PER R315 AS AMENDED & LISTED PER UL 2034. COMBINATION CARBON MONOXIDE SMOKE ALARMS SHALL BE LISTED IN ACCORDANCE w/ UL 2034 AND UL 217. INSTALL OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON EACH LEVEL OF THE DWELLING AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE A FUEL BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM OR ITS ATTACHED BATHROOM, A CARBON MONOXIDE ALARM SHALL BE INSTALLED WITHIN THE BEDROOM. CARBON MONOXIDE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM THE BUILDING WIRING WITH BATTERY BACKUP. CARBON MONOXIDE ALARMS MAY BE BATTERY POWERED IN BUILDINGS WITHOUT COMMERCIAL POWER OR WHEN INSTALLED DURING ALTERATIONS, REPAIRS AND ADDITIONS PER R315.2.2.
- (45 WH) CONTINUOUS OPERATION COMBINATION SPOT AND WHOLE HOUSE EXHAUST PER METHOD 1, IRC M1507.3.4, IRC 2015 AS AMENDED. SEE WHOLE HOUSE VENTILATION NOTES ON MECHANICAL SHEET FOR SIZING FORMULA, REQUIREMENTS & OPTIONS. WHOLE HOUSE FAN: LABEL SHALL BE AFFIXED TO THE CONTROL THAT READS "WHOLE HOUSE VENTILATION (SEE OPERATING INSTRUCTIONS)" 2015 IRC M 1507.3.2
- (50) 50 CFM MIN. EXHAUST FAN - VENT TO EXTERIOR.

- (5) **INTERIOR FURNACE & WATER HEATER**
U.L. APPROVED APPLIANCES INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, UPC, & IMC. AUTO SHUTOFF SWITCH REQUIRED FOR GAS OR PROPANE. INSTALL WATER HEATER ON A GALVANIZED STEEL PAN WITH DRAIN PER UPC. SET ELECTRIC WATER HEATER ON R-10 INCOMPRESSIBLE INSULATED BASE IF INSTALLED IN AN UNHEATED AREA OR ON A CONCRETE SLAB. INSTALL SEISMIC STRAPS WITHIN TOP 1/2 AND BOTTOM 1/2 (4" MINIMUM ABOVE CONTROLS). PROVIDE PRESSURE RELIEF LINE TO EXTERIOR. FOR FUEL FIRED APPLIANCES, PROVIDE 2 SCREENED COMBUSTION INLETS, ONE WITHIN 12" OF CEILING & ONE WITHIN 12" OF FLOOR, WITH A MINIMUM NET FREE AREA OF 1 SQ. IN. PER 4,000 BTU/H OF TOTAL INPUT RATING OF ALL APPLIANCES IN THE ENCLOSURE. INSTALL FUEL-FIRED APPLIANCES IN SEALED ENCLOSURE WITH A WEATHERSTRIPPED SOLID SELF-CLOSING DOOR. ENCLOSURE NOT TO BE USED FOR OTHER PURPOSES.
- (6) **WHOLE HOUSE FAN PER IRC M1507.3.2**
LABEL SHALL BE AFFIXED TO THE CONTROL THAT READS "WHOLE HOUSE VENTILATION (SEE OPERATING INSTRUCTIONS)".
- (7) **ATTIC ACCESS PER R807.1**
22"x30" MINIMUM ROUGH FRAMED OPENING LOCATED IN A HALLWAY OR OTHER READILY ACCESSIBLE LOCATION. INSULATE AND WEATHERSTRIP DOOR. 12" HEIGHT INSULATION DAM. 30" MINIMUM CLEAR HEADROOM.
- (8) **CRAWL ACCESS R408.4**
18"x24" MINIMUM THRU FLOOR ACCESS w/ TIGHT FIT WEATHERSTRIPPED INSULATED DOOR OR 16" HEIGHT x 24" MINIMUM THROUGH WALL CRAWL ACCESS w/ DOOR. IF ANY PART IS BELOW GRADE, PROVIDE A 16"x24" MINIMUM AREA WAY TO EXTEND BELOW THE OPENING THRESHOLD. THROUGH WALL ACCESS OPENINGS SHALL NOT BE LOCATED UNDER A DOOR TO THE RESIDENCE.

- GENERAL NOTES**
- FOR WINDOWS WITH OPERABLE OPENINGS MORE THAN 72" ABOVE THE FINISHED GRADE OR SURFACE BELOW, THE LOWEST PART OF THE CLEAR OPENING SHALL BE 24" MINIMUM ABOVE THE FLOOR. EXCEPTIONS: FULLY OPEN WINDOWS WHERE A 4" SPHERE MAY NOT PASS THROUGH OR WHERE FALL PREVENTION DEVICES ARE PROVIDED PER ASTM F 2090 OR R312.2.2.
- PROVIDE SAFETY GLASS PER IRC R308.
- SKYLIGHTS TO BE DOUBLE PANEL, SHATTER RESISTANT APPROVED RIGID PLASTIC, LAMINATED SAFETY GLASS, FULLY TEMPERED GLASS, HEAT-STRENGTHENED GLASS, OR WIRED GLASS. PROVIDE 4" MINIMUM CURB (OR SELF FLASHING ASSEMBLY WITH 3:12 MINIMUM PITCH OR PER MANUFACTURER INSTRUCTIONS).
- HOSE BIBBS TO BE BACKFLOW PREVENTION AND FREEZE RESISTANT TYPE.
- ALL HOLDDOWNS, FRAMING ANCHORS & SHEARWALL NAILING MUST BE INSPECTED BEFORE COVERING.
- (1) **LANDINGS & STAIRS AT EXT. DOORS R311.3**
THERE SHALL BE A LANDING OR FLOOR ON EACH SIDE OF EACH EXTERIOR DOOR. THE WIDTH OF THE LANDING SHALL NOT BE LESS THAN THE DOOR SERVED. EVERY LANDING SHALL HAVE A MINIMUM DIMENSION OF 36" IN THE DIRECTION OF TRAVEL. THE SLOPE SHALL NOT EXCEED 2%.
 - LANDINGS AT REQUIRED EGRESS DOORS SHALL NOT BE MORE THAN 1 1/2" LOWER THAN THE TOP OF THE THRESHOLD. EXCEPTION: THE LANDING ON THE EXTERIOR SIDE SHALL BE NOT MORE THAN 7/8" BELOW THE TOP OF THE THRESHOLD PROVIDED THE DOOR DOES NOT SWING OVER THE LANDING.
 - WHERE EXTERIOR LANDINGS SERVING THE REQUIRED EGRESS DOOR ARE NOT AT GRADE, THEY SHALL BE PROVIDED WITH A RAMP (R311.8) OR STAIRWAY (R311.7) TO GRADE.
 - DOORS OTHER THAN THE REQUIRED EGRESS DOOR SHALL BE PROVIDED WITH LANDINGS NOT MORE THAN 7/8" BELOW THE TOP OF THE THRESHOLD. EXCEPTION: A TOP LANDING IS NOT REQUIRED WHERE A STAIRWAY OF NOT MORE THAN TWO RISERS IS LOCATED ON THE EXTERIOR SIDE PROVIDED THE DOOR DOES NOT SWING OVER THE STAIRWAY.
 - STORM AND SCREEN DOORS SHALL BE PERMITTED TO SWING OVER EXTERIOR STAIRS AND LANDINGS.

- (2) **EGRESS WINDOWS PER R310**
EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL HAVE A HEIGHT OF NOT MORE THAN 44 INCHES MEASURED FROM THE FINISHED FLOOR TO THE BOTTOM OF THE CLEAR OPENING. EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQUARE FEET (5.0 S.F. AT GRADE FLOOR) THE MINIMUM NET CLEAR OPENING HEIGHT SHALL BE 24 INCHES, THE MINIMUM NET CLEAR OPENING WIDTH SHALL BE 20 INCHES, AND EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL BE OPERATIONAL FROM THE INSIDE OF THE ROOM WITHOUT THE USE OF KEYS, TOOLS OR SPECIAL KNOWLEDGE.
- (3) **BATHROOM NOTES**
FIREBLOCK TUBS AND SHOWERS PER R302.11. 30"x30" MINIMUM CLEAR SPACE IN SHOWER. 22" MINIMUM WIDTH SHOWER DOOR TO OPEN OUTWARD IF HINGED. 30" WIDE X 24" DEEP CLEAR SPACE REQUIRED OUTSIDE SHOWER DOOR. ENCLOSURES TO BE SAFETY GLASS. NONABSORBENT SURFACE UP 6" WITH SHOWER. USE CEMENT BOARD OR CEMENT FIBER BOARD FOR TILE BACKING. VAPOR BARRIER NOT PERMITTED BEHIND W.P. GWB AT EXT. WALL. 2.5 GPM SHOWER FLOW RESTRICTOR. TUB OR SHOWER CONTROL VALVES TO BE PRESSURE BALANCE OR THERMOSTATIC MIXING TYPE. 1.6 GAL PER FLUSH MAXIMUM TOILETS. 15" CLEAR SPACE REQUIRED. EACH SIDE FROM 1/4 OF TOILET & 21" CLEAR SPACE REQUIRED IN FRONT. INSTALL 2x10 BLOCKING FOR TOWEL BARS UP 48" ABOVE FLOOR OR BELOW SILL HEIGHT IF AT WINDOW. INSTALL BLOCKING FOR T.P. HOLDERS. INSULATE EXTERIOR WALLS ADJACENT TO SHOWERS AND TUBS AND INSTALL AIR BARRIER SEPARATING THEM FROM THE SHOWERS AND TUBS.
- (4) **DRYER VENT PER IRC M1502.4**
THE SIZE AND MAXIMUM LENGTH OF THE DRYER EXHAUST DUCT SHALL BE DETERMINED BY THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CODE OFFICIAL SHALL BE PROVIDED WITH A COPY OF THE INSTALLATION INSTRUCTIONS FOR THE MAKE AND MODEL OF THE DRYER AT THE CONCEALMENT INSPECTION. WHERE THE EXHAUST DUCT EQUIVALENT LENGTH EXCEEDS 35 FEET, THE EQUIVALENT LENGTH OF THE EXHAUST DUCT SHALL BE IDENTIFIED ON A PERMANENT LABEL OR TAG. THE LABEL OR TAG SHALL BE LOCATED WITHIN 6 FEET OF THE EXHAUST DUCT CONNECTION.

ALL HOLDDOWNS, FRAMING ANCHORS & SHEARWALL NAILING MUST BE INSPECTED BEFORE COVERING.

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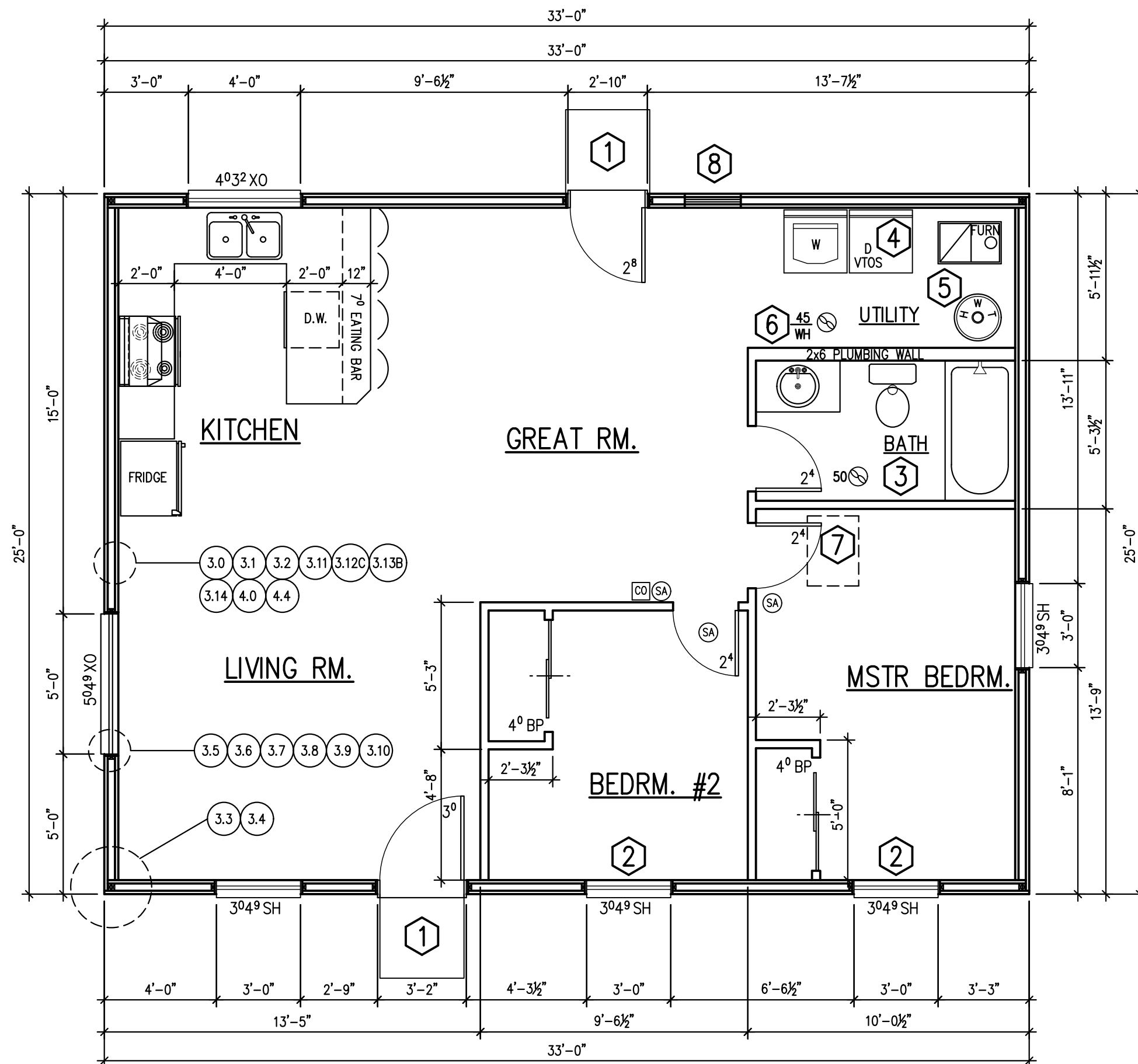
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F O R

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ELECTRICAL LEGEND

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- 6 WHOLE HOUSE FAN PER IRC M1507.3.2
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18"x24" MINIMUM THRU FLOOR ACCESS w/ TIGHT FIT WEATHERSTRIPPED INSULATED DOOR OR 16" HEIGHT x 24" MINIMUM THROUGH WALL CRAWL ACCESS w/ DOOR. IF ANY PART IS BELOW GRADE, PROVIDE A 16"x24" MINIMUM AREAWAY TO EXTEND BELOW THE OPENING THRESHOLD. THROUGH WALL ACCESS OPENINGS SHALL NOT BE LOCATED UNDER A DOOR TO THE RESIDENCE.

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 - LANDINGS AT REQUIRED EGRESS DOORS SHALL NOT BE MORE THAN 1/2" LOWER THAN THE TOP OF THE THRESHOLD. EXCEPTION: THE LANDING ON THE EXTERIOR SIDE SHALL BE NOT MORE THAN 7/8" BELOW THE TOP OF THE THRESHOLD PROVIDED THE DOOR DOES NOT SWING OVER THE LANDING.
 - WHERE EXTERIOR LANDINGS SERVING THE REQUIRED EGRESS DOOR ARE NOT AT GRADE, THEY SHALL BE PROVIDED WITH A RAMP (R311.8) OR STAIRWAY (R311.7) TO GRADE.
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- 2 EGRESS WINDOWS PER R310
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FIREBLOCK TUBS AND SHOWERS PER R302.11. 30"x30" MINIMUM CLEAR SPACE IN SHOWER. 22" MINIMUM WIDTH SHOWER DOOR TO OPEN OUTWARD IF HINGED. 30" WIDE X 24" DEEP CLEAR SPACE REQUIRED OUTSIDE SHOWER DOOR. ENCLOSURES TO BE SAFETY GLASS. NONABSORBENT SURFACE UP 6" WITH SHOWER. USE CEMENT BOARD OR CEMENT FIBER BOARD FOR TILE BACKING. VAPOR BARRIER NOT PERMITTED BEHIND W.P. CWB AT EXT. WALL. 2.5 GPM SHOWER FLOW RESTRICTOR. TUB OR SHOWER CONTROL VALVES TO BE PRESSURE BALANCE OR THERMOSTATIC MIXING TYPE. 1.6 GAL PER FLUSH MAXIMUM TOILETS. 15" CLEAR SPACE REQUIRED. EACH SIDE FROM 1/4 OF TOILET & 21" CLEAR SPACE REQUIRED IN FRONT. INSTALL 2x10 BLOCKING FOR TOWEL BARS UP 48" ABOVE FLOOR OR BELOW SILL HEIGHT IF AT WINDOW. INSTALL BLOCKING FOR T.P. HOLDERS. INSULATE EXTERIOR WALLS ADJACENT TO SHOWERS AND TUBS AND INSTALL AIR BARRIER SEPARATING THEM FROM THE SHOWERS AND TUBS.
- 4 DRYER VENT PER IRC M1502.4
THE SIZE AND MAXIMUM LENGTH OF THE DRYER EXHAUST DUCT SHALL BE DETERMINED BY THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CODE OFFICIAL SHALL BE PROVIDED WITH A COPY OF THE INSTALLATION INSTRUCTIONS FOR THE MAKE AND MODEL OF THE DRYER AT THE CONCEALMENT INSPECTION. WHERE THE EXHAUST DUCT EQUIVALENT LENGTH EXCEEDS 35 FEET, THE EQUIVALENT LENGTH OF THE EXHAUST DUCT SHALL BE IDENTIFIED ON A PERMANENT LABEL OR TAG. THE LABEL OR TAG SHALL BE LOCATED WITHIN 6 FEET OF THE EXHAUST DUCT CONNECTION.

ALL HOLDDOWNS, FRAMING ANCHORS & SHEARWALL NAILING MUST BE INSPECTED BEFORE COVERING.

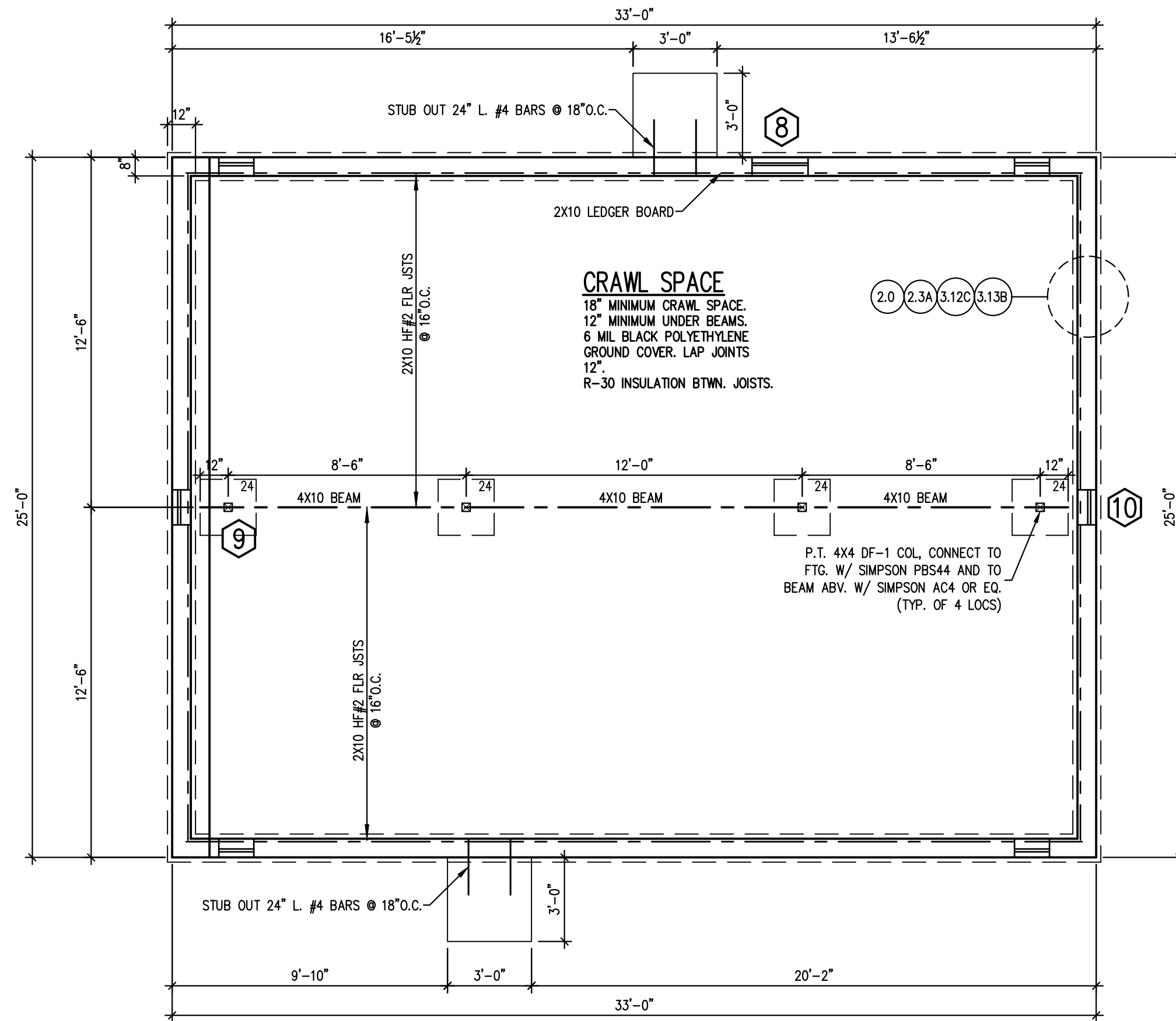
THE ORIGINAL
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 4030 99TH AVE N.E., LAKE STEVENS, WA 98258
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 825 SQ FT
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FOUNDATION PLAN SCALE: 1/4" = 1'-0"

ALL HOLDDOWNS, FRAMING ANCHORS & SHEARWALL NAILING MUST BE INSPECTED BEFORE COVERING.

FOOTING SCHEDULE		
MARK	HxWxD	REINF. BAR
12	6x12x12	
15	7x15x15	
18	8x18x18	
20	9x20x20	
24	10x24x24	(3)#4 EA. WY.
30	12x30x30	(3)#4 EA. WY.
36	12x36x36	(4)#4 EA. WY.
15C	8x15 CONT.	(2)#4 CONTIN.

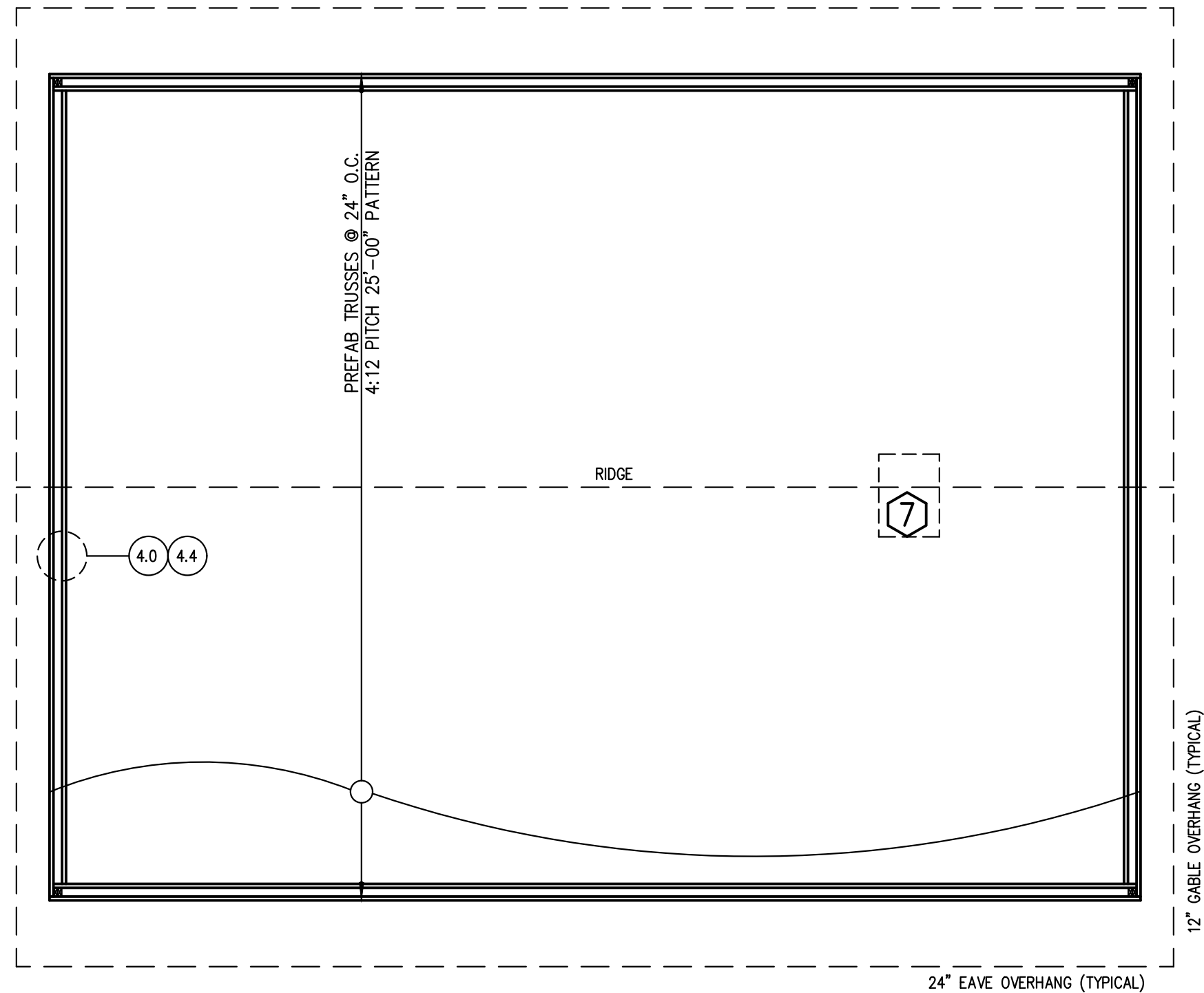
ALL EXTERIOR FOOTINGS TO EXTEND 18" BLW FIN. GRADE MIN. UNLESS NOTED OTHERWISE. STRIP ALL WOOD FORMS PRIOR TO BACKFILLING.

- 8 CRAWL ACCESS R408.4**
18"x24" MINIMUM THRU FLOOR ACCESS w/ TIGHT FIT WEATHERSTRIPPED INSULATED DOOR OR 16" HEIGHT x 24" MINIMUM THROUGH WALL CRAWL ACCESS w/ DOOR. IF ANY PART IS BELOW GRADE, PROVIDE A 16"x24" MINIMUM AREAWAY TO EXTEND BELOW THE OPENING THRESHOLD. THROUGH WALL ACCESS OPENINGS SHALL NOT BE LOCATED UNDER A DOOR TO THE RESIDENCE.
- 9 CRAWL SPACE POSTS AND BEAMS**
POSTS TO BE 4x4 (4x6 MINIMUM AT BEAM SPLICES) UNLESS NOTED OTHERWISE. POST BASES UP 8" MINIMUM ABOVE CRAWL GRADE OR USE PRESSURE TREATED. PROTECT UNTREATED POST BASE WITH TYPE 90 ROOFING. SECURE BASE WITH STRAP OR ENGINEERED CONNECTOR EMBEDDED IN FOOTING PER INTERMEDIATE BEARING SUPPORT DETAIL. PROVIDE POSITIVE POST TO BEAM AND BEAM TO JOISTS CONNECTIONS TO RESIST UPLIFT AND LATERAL DISPLACEMENT. LAP JOIST SPLICES 3" MINIMUM AND FACE NAIL WITH 3-10d MINIMUM. INSTALL SOLID BLOCKING BETWEEN JOISTS OVER EACH INTERMEDIATE SUPPORT. 1/2" MINIMUM CLEARANCE REQUIRED AT TOPS, SIDES AND ENDS OF UNTREATED WOOD GIRDERS ENTERING EXTERIOR FOUNDATION WALLS. LAMINATE MULTIPLE JOISTS WITH 2 ROWS 16d @ 16" O.C. STAGGERED.
- 10 CRAWL SPACE VENTILATION / R408**
PROVIDE 396 SQ. IN. MINIMUM NET (1/300) INSTALL 6 8"x16" SCREENED VENTS X 75.4 SQ. IN. NET FREE = 452.4 SQ. IN. AT LEAST ONE VENT TO BE PLACED WITHIN 3' OF EACH CORNER OF THE BUILDING. ONE SIDE OF THE BUILDING MAY HAVE NO VENTS.

- TREATED WOOD NOTES:**
- R317.1 LOCATION REQUIRED. PROTECTION OF WOOD AND WOOD BASED PRODUCTS FROM DECAY SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS BY THE USE OF NATURALLY DURABLE WOOD OR WOOD THAT IS PRESERVATIVE-TREATED IN ACCORDANCE WITH AWPA U1 FOR THE SPECIES, PRODUCT, PRESERVATIVE AND END USE. PRESERVATIVES SHALL BE LISTED IN SECTION 4 OF AWPA U1.
 - 1. WOOD JOISTS OR THE BOTTOM OF A WOOD STRUCTURAL FLOOR WHEN CLOSER THAN 18" OR WOOD GIRDERS WHEN CLOSER THAN 12" TO THE EXPOSED GROUND IN CRAWL SPACES OR UNEXCAVATED AREA LOCATED WITHIN THE PERIPHERY OF THE BUILDING FOUNDATION.
 - 2. ALL WOOD FRAMING MEMBERS THAT REST ON CONCRETE OR MASONRY EXTERIOR FOUNDATION WALLS AND ARE LESS THAN 8" FROM THE EXPOSED GROUND.
 - 3. SILLS AND SLEEPERS ON A CONCRETE OR MASONRY SLAB THAT IS DIRECT CONTACT WITH THE GROUND UNLESS SEPARATED FROM SUCH SLAB BY AN IMPERVIOUS MOISTURE BARRIER.
 - 4. THE ENDS OF WOOD GIRDERS ENTERING EXTERIOR MASONRY OR CONCRETE WALLS HAVING CLEARANCES OF LESS THAN 1/2" ON TOPS, SIDES AND ENDS.
 - 5. WOOD SIDING, SHEATHING AND WALL FRAMING ON THE EXTERIOR OF A BUILDING HAVING A CLEARANCE OF LESS THAN 6" FROM THE GROUND OR LESS THAN 2" MEASURED VERTICALLY FROM CONCRETE STEPS, PORCH SLABS, PATIO SLABS, AND SIMILAR HORIZONTAL SURFACES EXPOSED TO THE WEATHER.
 - 6. WOOD STRUCTURAL MEMBERS SUPPORTING MOISTURE-PERMEABLE FLOORS OR ROOFS THAT ARE EXPOSED TO THE WEATHER, SUCH AS CONCRETE OR MASONRY SLABS, UNLESS SEPARATED FROM SUCH FLOORS OR ROOFS BY AN IMPERVIOUS MOISTURE BARRIER.
 - 7. WOOD FURRING STRIPS OR OTHER WOOD FRAMING MEMBERS ATTACHED DIRECTLY TO THE INTERIOR OF EXTERIOR MASONRY WALLS OR CONCRETE WALLS BELOW GRADE EXCEPT WHERE AN APPROVED VAPOR RETARDER IS APPLIED BETWEEN THE WALL AND THE FURRING STRIPS OR FRAMING MEMBERS.

R317.1.1. FIELD CUT END, NOTCHES, AND DRILLED HOLES OF PRESSURE TREATED WOOD SHALL BE RETREATED IN THE FIELD PER AWPA M4.

R317.3.1. FASTENERS FOR PRESSURE PRESERVATIVE AND FIRE-RETARDANT-TREATED WOOD SHALL BE OF HOT-DIPPED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE, OR COPPER. SHEARWALL BOTTOM PLATE NAILING AND ALL NAILING AT PRESERVATIVE TREATED WOOD MEMBERS SHALL BE HOT-DIPPED ZINC-COATED GALVANIZED STEEL OR STAINLESS STEEL NAILS. ZINC COATING WEIGHTS AS REQUIRED PER ASTM A 153. IN THE ABSENCE OF MANUFACTURER'S RECOMMENDATIONS, A MINIMUM OF ASTM A 653 TYPE G185 ZINC-COATED GALVANIZED STEEL, OR EQUIVALENT, SHALL BE USED.



ROOF FRAMING PLAN SCALE: 1/4" = 1'-0"

GENERAL SPECIFICATIONS:

CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS & BUILDING DIMENSIONS, & SHALL REPORT ANY VARIATIONS TO THE DESIGNER FOR RESOLUTION PRIOR TO CONSTRUCTION. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED.

CODES: 2015 INTERNATIONAL RESIDENTIAL CODE (IRC), 2015 WASHINGTON STATE ENERGY CODE (WSEC), 2015 UNIFORM PLUMBING CODE (UPC), 2015 INTERNATIONAL MECHANICAL CODE (IMC), AND ALL OTHER APPLICABLE CODES.

STRUCTURAL:

SEISMIC ZONE D1/D2 PER FIG. R301.2(2) & ENGINEERING
 WIND (EXP. B) BASIC SPEED: 85 MPH PER FIG. R301.2(4)
 COMPONENT/CLADDING LOADS /TABLE R301.2(2)

TABLE R301.5 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS

LOADING	LIVE	DEAD	TOTAL
ROOF (GROUND SNOW)	35 PSF	10 PSF	45 PSF
UNINHABITABLE ATTICS - NO STORAGE	10 PSF	10 PSF	20 PSF
UNINHABITABLE ATTICS - LIMITED STORAGE	20 PSF	10 PSF	30 PSF
HABITABLE ATTICS & ATTICS w/ FIXED STAIRS	30 PSF	10 PSF	40 PSF
BALCONIES (EXTERIOR) AND DECKS	60 PSF	10 PSF	70 PSF
FIRE ESCAPES	40 PSF		
GUARDRAILS/HANDRAILS	200 LBS	AT TOP ANY DIRECTION	
GUARDRAILS IN-FILL	50 LBS	APPLIED TO 1 SQ. FT.	
PASSENGER VEHICLE GARAGES	50 PSF	IF ELEVATED 2,000 LB PT.	
ROOMS OTHER THAN SLEEPING ROOMS	40 PSF	10 PSF	50 PSF
SLEEPING ROOMS	30 PSF	10 PSF	40 PSF
STAIRS	40 PSF	10 PSF	50 PSF
		OR 300 LB PT. LOAD ON 4 SQ. IN.	

ALL BEAMS, GIRDERS, HEADERS, RAFTERS, & JOISTS TO BE HEM FIR NO. 2 OR BETTER AS NOTED ON PLANS. GLUED LAMINATED TIMBERS SHALL BE MANUFACTURED & IDENTIFIED AS REQUIRED IN AITC A190.1 & ASTM D3737.

PLYWOOD INDEX: CD. ROOF & SUBFLOOR SHEATHING PER TABLE R503.2.1.1(1). WALL SHEATHING PER TABLE R602.3(3) & R602.3(4). SHEATHING FASTENERS PER TABLES R602.3(1) & (2).

STRUCTURAL MEMBER FASTENERS PER TABLE R602.3(1).

WOOD IN CONTACT WITH CONCRETE, NEAR GROUND, OR WOOD EXPOSED TO WEATHER TO BE PRESSURE TREATED OR NATURALLY DURABLE WOOD PER R317.

CONCRETE & REBAR:
 REBAR TO BE 60,000 PSI - GRADE 60 ASTM A706. WALL REBAR SHALL BE PLACED NO CLOSER TO THE OUTSIDE FACE THAN 1/2 THE WALL THICKNESS. REBAR COVER PER ACI 318. FOOTINGS TO BEAR ON 1500 PSF MINIMUM UNDISTURBED SOIL. CONCRETE TO BE MINIMUM F'c = 2500 PSI @ 28 DAYS (3,000 PSI FOR GARAGE/CARPORT SLABS, EXTERIOR PATIO SLABS ON GRADE, & WEATHER EXPOSED BASEMENT, FOUNDATION WALLS, PORCHES, AND STEPS w/ 5%-7% AIR ENTRAINMENT). MINIMUM DESIGN EQUIV. FLUID PRESSURE = 35 PCF OR PER SOILS ANALYSIS.

USP STRUCTURAL CONNECTORS OF EQUIVALENT STRENGTH MAY BE SUBSTITUTED FOR SIMPSON HOLDDOWNS, STRAPS, AND CONNECTORS

ROOF & ATTIC VENTILATION

ALL VENTS TO BE SCREENED w/ 1/4" CORROSION RESISTANT METAL MESH. (3) 2" HOLES PER VENT BLOCK = 7.0 SQ. IN. NET AREA (74%). LOCATE VENT BLOCKS AT CORNERS & EVENLY BETWEEN FOR ATTICS. INSTALL VENT BLOCK EA. RAFTER SPACE FOR CATHEDRAL ROOFS. THE MINIMUM NET FREE VENTILATING AREA SHALL BE 1/150 OF THE AREA OF THE VENTED SPACE. EXCEPTION: THE MINIMUM NET FREE VENTILATING AREA SHALL BE 1/300 OF THE VENTED SPACE PROVIDED THE FOLLOWING CONDITION IS MET: AT LEAST 40% AND NOT MORE THAN 50% OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATORS LOCATED IN THE UPPER PORTION OF THE ATTIC OR RAFTER SPACE. UPPER VENTILATORS SHALL BE LOCATED NO MORE THAN 3 FEET BELOW THE RIDGE OR HIGHEST POINT OF THE SPACE, MEASURED VERTICALLY, WITH THE BALANCE OF THE REQUIRED VENTILATION PROVIDED BY EAWE OR CORNICE VENTS. WHERE THE LOCATION OF WALL OR ROOF FRAMING MEMBERS CONFLICTS WITH THE INSTALLATION OF UPPER VENTILATORS, INSTALLATION MORE THAN 3 FEET BELOW THE RIDGE OR HIGHEST POINT OF THE SPACE SHALL BE PERMITTED.

EAWE BAFFLES:
 FOR AIR PERMEABLE INSULATIONS IN VENTED ATTICS, A BAFFLE SHALL BE INSTALLED ADJACENT TO SOFFIT AND EAWE VENTS. BAFFLES SHALL MAINTAIN AN OPENING EQUAL OR GREATER THAN THE SIZE OF THE VENT. THE BAFFLE SHALL EXTEND OVER THE TOP OF THE ATTIC INSULATION. THE BAFFLE SHALL BE PERMITTED TO BE ANY SOLID MATERIAL. WSEC.R402.2.3

ATTIC

AREA = 825 SF
 825 + 300 = 2.75 SF VENTILATION REQ'D
 LOWER PART OF ATTIC:
 INSTALL 32 VENT BLOCKS* @ .0492 SF NET EA. = 1.5744 SF NET
 UPPER PART OF ATTIC:
 INSTALL 4 AF50 ROOF VENTS @ .347 SF NET EA. = 1.496 SF NET
 TOTAL VENTING PROVIDED: 3.0704 SF

TRUSSES TO BE DESIGNED & MANUFACTURED PER ANSI/TPI 1. DESIGN BY STATE LICENSED ENGR. & MANUFACTURED AT APPROVED PLANT. SUBMIT TRUSS DESIGN DRAWINGS TO BUILDING OFFICIAL FOR APPROVAL PRIOR TO INSTALLATION & SHIP DRAWINGS TO JOB SITE WITH TRUSSES. DESIGN DRAWINGS TO INCLUDE ALL LOADS, LUMBER INFO., CONNECTIONS, HANGERS, PERMANENT REQ'D BRACING LOCATIONS, & RELATED INFORMATION AS SPECIFIED PER R802.10.1. TRUSSES TO BE BRACED TO PREVENT ROTATION & TO PROVIDE LATERAL STABILITY PER TRUSS DESIGN DRAWINGS, BUILDING PLANS, & PER BUILDING LATERAL ENGINEERING. FIELD CUTS OR MODIFICATION OF TRUSSES NOT PERMITTED WITHOUT ENGINEER'S CALCS. / DTLS. AND PRIOR APPROVAL BY THE BUILDING DEPARTMENT. BOTTOM CHORD OF TRUSSES TO BE HELD OFF OF NON-BEARING INTERIOR WALLS WITH SIMPSON STC ROOF TRUSS CLIP OR EQUIVALENT. GABLE END TRUSS TO HAVE VERTICAL MEMBERS 24" o.c. FOR SIDING. GABLE END TRUSS TO BE SHEATHED & NAILED PER WALL BELOW.

7 ATTIC ACCESS PER R807.1
 22"x30" MINIMUM ROUGH FRAMED OPENING LOCATED IN A HALLWAY OR OTHER READILY ACCESSIBLE LOCATION. INSULATE AND WEATHERSTRIP DOOR. 12" HEIGHT INSULATION DAM. 30" MINIMUM CLEAR HEADROOM.

ROOFING OPTIONS:

- SHAKE/SHINGLE ROOF: INTERWV. w/ 18" WIDE STRIPS OF TYPE 30 FELT. NAIL w/ (2) GALV. FASTENERS PER EACH PIECE TO 1/2" CDX PLYWOOD SHEATHING OR EQUIVALENT. PROVIDE 1/2" CCX PLYWOOD SHEATHING @ OVERHANGS.
- COMPOSITION ROOF: 0/ NONPERF. TYPE 15 FELT. NAIL w/ (4) GALV. FASTN'R PER EA PIECE 0/ 1/2" CDX PLYWD SHTG. OR EQUIV. w/ 1/2" CCX @ 0/HANGS.
- CONCRETE TILE ROOF: 0/ TYPE 30 FELT. NAIL w/ (2) GALV. FASTENERS PER EA PIECE OVER 1/2" CDX PLYWD SHTG. OR EQUIV. w/ 1/2" CCX @ 0/HANGS.
- METAL ROOF: INSTALL PER MFG. SPECS. 0/ TYPE 15 FELT 0/ 1/2" CDX PLYWD SHEATHING OR EQUIVALENT w/ 1/2" CCX PLYWOOD SHEATHING @ 0/HANGS.
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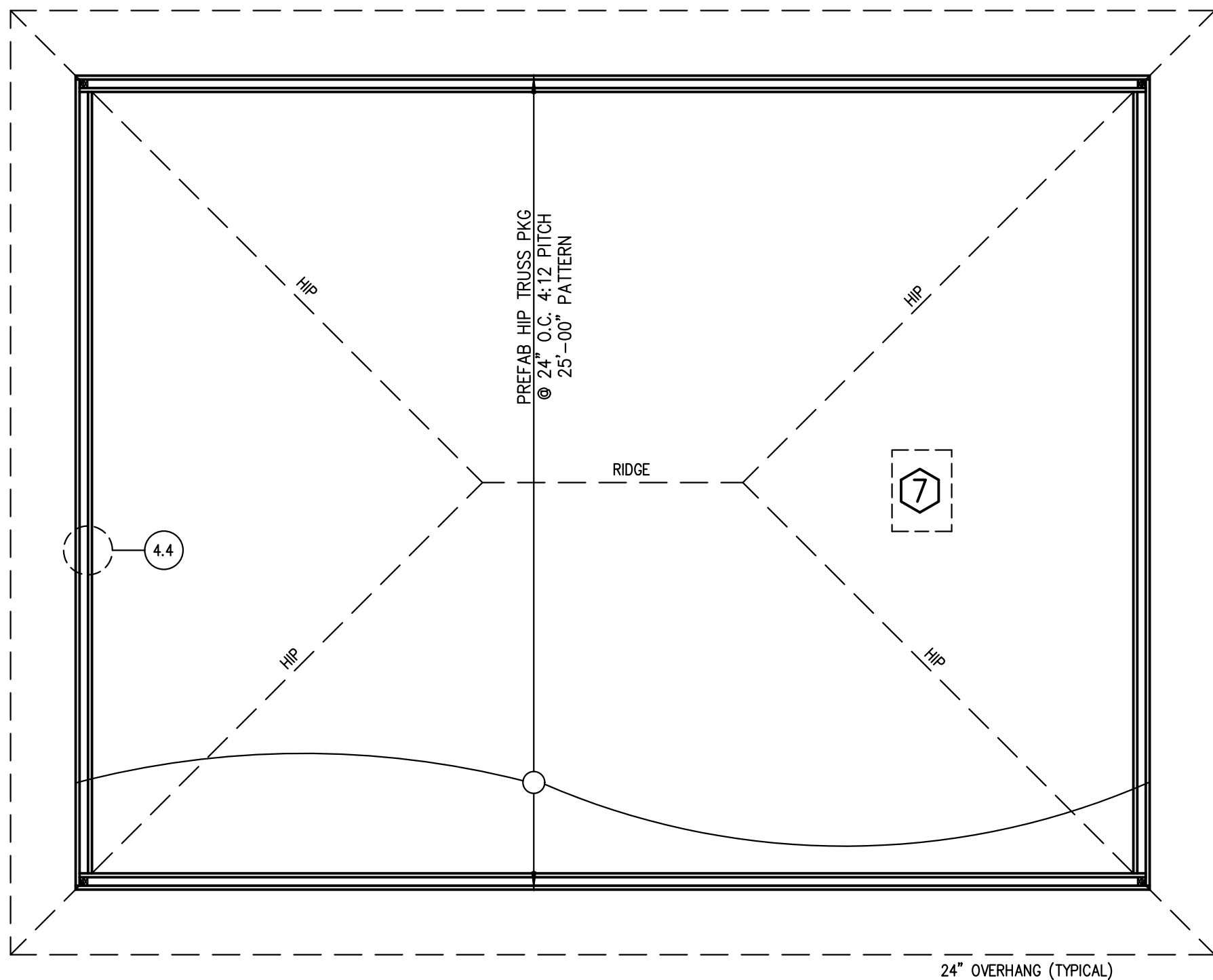
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 825 SQ FT
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GENERAL MECHANICAL PROVISIONS:

HEATING & COOLING EQUIPMENT:

THE INTERIOR DESIGN TEMPERATURES USED FOR HEATING AND COOLING LOAD CALCULATIONS SHALL BE A MAXIMUM OF 72°F (22°C) FOR HEATING AND MINIMUM OF 75°F (24°C) FOR COOLING PER R302 OF THE 2015 IRC. COOLING OUTDOOR DESIGN TEMPERATURES SHALL BE SELECTED FROM APPENDIX C PER R302.2. HEATING AND COOLING EQUIPMENT SHALL BE SIZED IN ACCORDANCE WITH ACCA MANUAL S BASED ON BUILDING LOADS CALCULATED IN ACCORDANCE WITH ACCA MANUAL J OR OTHER APPROVED HEATING AND COOLING CALCULATION METHODOLOGIES PER R403.7 WSEC. SYSTEMS SERVING MULTIPLE DWELLING UNITS SHALL COMPLY WITH SECTIONS C403 AND C404 OF THE IECC – COMMERCIAL PROVISIONS IN LIEU OF SECTION R403 PER R403.8 WSEC EQUIPMENT AND APPLIANCES HAVING AN IGNITION SOURCE AND LOCATED IN A GARAGE SHALL BE ELEVATED SO THAT THE SOURCE OF IGNITION IS NOT LESS THAN 18 INCHES ABOVE THE FLOOR SURFACE PER IMC SECTION 304.3.

POTABLE WATER HEATERS AND HOT WATER STORAGE TANKS SHALL BE LISTED AND LABELED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE INTERNATIONAL PLUMBING CODE AND THE INTERNATIONAL MECHANICAL CODE. ALL WATER HEATERS SHALL BE CAPABLE OF BEING REMOVED WITHOUT FIRST REMOVING A PERMANENT PORTION OF THE BUILDING STRUCTURE. THE POTABLE WATER CONNECTIONS AND RELIEF VALVES FOR ALL WATER HEATERS SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL PLUMBING CODE. DOMESTIC ELECTRIC WATER HEATERS SHALL COMPLY WITH UL 174 OR UL 1453. OIL-FIRED WATER HEATERS SHALL COMPLY WITH UL 732. SOLID-FUEL-FIRED WATER HEATERS SHALL COMPLY WITH UL 2523. THERMAL SOLAR WATER HEATERS SHALL COMPLY WITH CHAPTER 14 AND UL 174 OR UL 1453, PER IMC 1002.1.

FUEL BURNING EQUIPMENT LOCATED WITHIN THE BUILDING ENVELOPE TO BE PROVIDED WITH COMBUSTION AIR PER THE INTERNATIONAL FUEL GAS CODE (IFGC), FUEL BURNING EQUIPMENT LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL COMPLY WITH IMC 303.6.

FUEL-FIRED FURNACE OR SERVICE WATER HEATER SHALL NOT BE LOCATED IN OR OBTAIN COMBUSTION AIR FROM A BEDROOM, BATHROOM, TOILET ROOM, OR CLOSET. EXCEPTIONS: 1. DIRECT VENT APPLIANCES THAT OBTAIN ALL COMBUSTION AIR DIRECTLY FROM THE OUTDOORS. 2. SOLID FUEL-FIRED APPLIANCES, PROVIDED THAT THE ROOM IS NOT A CONFINED SPACE AND THE BUILDING IS NOT OF UNUSUALLY TIGHT CONSTRUCTION. 3. APPLIANCES INSTALLED IN A DEDICATED ENCLOSURE IN WHICH ALL COMBUSTION AIR IS TAKEN DIRECTLY FROM THE OUTDOORS PER CHAPTER 7 IMC. THE ENCLOSURE SHALL HAVE A WEATHER-STRIPPED SOLID DOOR. CENTRAL FURNACES TO BE INSTALLED IN CLOSETS, OR CONFINED SPACES SUCH AS ALCOVES, SHALL HAVE MANUFACTURER'S SPECIFICATIONS LISTING SUCH LOCATIONS AS ACCEPTABLE. FURNACES SHALL BE INSTALLED PER IMC 306.1.1. FURNACES WITH A FIREBOX OPEN TO THE ATMOSPHERE SHALL HAVE AT LEAST 6" WORKING SPACE ALONG THE FRONT COMBUSTION CHAMBER SIDE, COMBUSTION AIR OPENINGS ALONG THE REAR OR SIDE OF THE COMPARTMENT PER IMC CHAPTER 7.

WARM AIR FURNACES INSTALLED IN ATTICS OR CRAWL SPACES SHALL COMPLY WITH IMC SECTION 306.3 AND 306.4 RESPECTIVELY.

PROPANE GAS-BURNING APPLIANCES SHALL NOT BE INSTALLED IN A PIT, BASEMENT, OR SIMILAR LOCATION WHERE HEAVIER THAN AIR GAS MIGHT COLLECT. THE APPLIANCES SHALL NOT BE INSTALLED IN AN ABOVE GRADE, UNDER FLOOR SPACE OR BASEMENT, UNLESS SUCH LOCATION IS PROVIDED WITH AN APPROVED MEANS FOR REMOVAL OF UNBURNED GAS (APPROVAL MUST BE GRANTED BY THE BUILDING DEPARTMENT).

CHIMNEYS AND VENTS:

EVERY APPLIANCE DESIGNED TO BE VENTED SHALL BE CONNECTED TO A VENTING SYSTEM COMPLYING WITH CHAPTER 8 OF THE INTERNATIONAL MECHANICAL CODE (IMC). EVERY FACTORY BUILT CHIMNEY, TYPE L VENT, TYPE B GAS VENT, OR TYPE BW GAS VENT SHALL BE INSTALLED PER ITS MANUFACTURER'S LISTING, INSTRUCTIONS, AND APPLICABLE PROVISIONS OF CHAPTER 8 IMC.

GAS VENTS TO COMPLY WITH CHAPTER 5 OF THE INTERNATIONAL FUEL GAS CODE (IFGC). GAS VENTS SHALL TERMINATE IN ACCORDANCE WITH ONE OF THE FOLLOWING. GAS VENTS WITH AN INTERNAL DIAMETER OF 12" OR LESS AND ARE LOCATED NOT LESS THAN 8' FROM A VERTICAL WALL OR SIMILAR OBSTRUCTION SHALL TERMINATE ABOVE THE ROOF IN ACCORDANCE WITH IFGC FIGURE 503.6.4.

AS PROVIDED FOR DIRECT-VENT SYSTEMS IN IFGC SECTION 503.2.3. AS PROVIDED FOR APPLIANCES WITH INTEGRAL VENTS IN IFGC SECTION 503.2.4. AS PROVIDED FOR MECHANICAL DRAFT SYSTEMS IN IFGC SECTION 503.3.3. AS PROVIDED FOR VENTILATING HOODS AND EXHAUST SYSTEMS PER IFGC 503.3.4. MINIMUM HEIGHT PER IFGC 503.6.5. A TYPE B OR L GAS VENT SHALL TERMINATE AT LEAST 5 FEET IN VERTICAL HEIGHT ABOVE THE HIGHEST CONNECTED APPLIANCE DRAFT HOOD OR FLUE COLLAR. A TYPE B-W GAS VENT SHALL TERMINATE AT LEAST 12 FEET IN VERTICAL HEIGHT ABOVE THE BOTTOM OF THE WALL FURNACE.

TYPE L VENTING SYSTEMS SHALL TERMINATE NOT LESS THAN 2 FEET ABOVE THE ROOF THROUGH WHICH IT PASSES, NOT LESS THAN 2 FEET ABOVE ANY ANY PORTION OF THE BUILDING WITHIN 10'-0" PER SECTION 802.5 IMC.

VENT CONNECTORS SHALL BE USED TO CONNECT APPLIANCES TO THE VERTICAL CHIMNEY OR VENT PER IMC 803, EXCEPT WHERE THE CHIMNEY OR VENT IS ATTACHED DIRECTLY TO THE APPLIANCE. CONNECTORS SHALL BE LOCATED ENTIRELY WITHIN THE ROOM IN WHICH THE APPLIANCE IS LOCATED, EXCEPT AS PROVIDED FOR IN SECTION 803.10.4. WHERE PASSING THROUGH AN UNHEATED SPACE, A CONNECTOR SHALL NOT BE CONSTRUCTED OF SINGLE-WALL PIPE. THE CONNECTOR SHALL NOT BE SMALLER THAN THE SIZE OF THE FLUE COLLAR SUPPLIED BY THE MANUFACTURER OF THE APPLIANCE. CONNECTORS SHALL RISE VERTICALLY TO THE CHIMNEY OR VENT WITH A MINIMUM PITCH EQUAL TO ONE-FOURTH UNIT VERTICAL IN 12 UNITS HORIZONTAL (2% SLOPE). CONNECTORS SHALL HAVE A MINIMUM CLEARANCE TO COMBUSTIBLES IN ACCORDANCE WITH IMC TABLE 803.10.6.

IRC 302.5.2 DUCTS IN GARAGE

DUCTS IN THE GARAGE AND DUCTS PENETRATING THE WALLS OR CEILING SEPARATING THE DWELLING FROM THE GARAGE SHALL BE CONSTRUCTED OF NO. 26 GAUGE MINIMUM SHEET STEEL OR OTHER APPROVED MATERIAL AND SHALL NOT HAVE OPENINGS INTO THE GARAGE.

MECHANICAL WHOLE-HOUSE VENTILATION PER IRC 1507 (WASHINGTON AMENDMENT)
 IRC SECTION 1507.1.1 DISCHARGE. THE AIR REMOVED BY EVERY MECHANICAL SYSTEM SHALL BE DISCHARGED TO THE OUTDOORS IN ACCORDANCE WITH SECTION M1506.2. AIR SHALL NOT BE W/EXHAUSTED INTO AN ATTIC, SOFFIT, RIDGE VENT OR CRAWL SPACE. EXCEPTION: WHOLE-HOUSE VENTILATION-TYPE ATTIC FANS THAT DISCHARGE INTO THE ATTIC SPACE OF DWELLING UNITS HAVING PRIVATE ATTICS SHALL BE PERMITTED.

IRC SECTION M1502 CLOTHES DRYER EXHAUST IRC M1502.1 GENERAL. CLOTHES DRYERS SHALL BE EXHAUSTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

IRC 1502.2 INDEPENDENT EXHAUST SYSTEMS. DRYER EXHAUST SYSTEMS SHALL BE INDEPENDENT OF ALL OTHER SYSTEMS AND SHALL CONVEY THE MOISTURE TO THE OUTDOORS. THIS SECTION SHALL NOT APPLY TO LISTED AND LABELED CONDENSING (DUCTLESS) CLOTHES DRYERS.

IRC M1502.3 DUCT TERMINATION. EXHAUST DUCTS SHALL TERMINATE ON THE OUTSIDE OF THE BUILDING. EXHAUST DUCT TERMINATIONS SHALL BE IN ACCORDANCE WITH THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. IF THE MANUFACTURER'S INSTRUCTIONS DO NOT SPECIFY A TERMINATION LOCATION, THE EXHAUST DUCT SHALL TERMINATE NOT LESS THAN 3 FEET IN ANY DIRECTION FROM OPENINGS INTO BUILDINGS. EXHAUST DUCT TERMINATIONS SHALL BE EQUIPPED WITH A BACKDRAFT DAMPER. SCREENS SHALL NOT BE INSTALLED AT THE DUCT TERMINATION.

IRC M1502.1 MATERIAL AND SIZE. DRYER EXHAUST DUCTS SHALL HAVE A SMOOTH INTERIOR FINISH AND SHALL BE CONSTRUCTED OF METAL A MINIMUM 0.0157-INCH THICK (#28 GA). THE EXHAUST DUCT SIZE SHALL BE 4 INCHES NOMINAL IN DIAMETER.

M1502.4.2 DUCT INSTALLATION. EXHAUST DUCTS SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED 12 FEET AND SHALL BE SECURED IN PLACE. THE INSERT END OF THE DUCT SHALL EXTEND INTO THE ADJOINING DUCT OR FITTING IN THE DIRECTION OF AIRFLOW. EXHAUST DUCT JOINTS SHALL BE SEALED IN ACCORDANCE WITH SECTION M1601.4.1 AND SHALL BE MECHANICALLY FASTENED. DUCTS SHALL NOT BE JOINED WITH SCREWS OR SIMILAR FASTENERS THAT PROTRUDE MORE THAN 1/8 INCH INTO THE INSIDE OF THE DUCT.

IRC M1502.4.3 TRANSITION DUCT. TRANSITION DUCTS USED TO CONNECT THE DRYER TO THE EXHAUST DUCT SYSTEM SHALL BE A SINGLE LENGTH THAT IS LISTED AND LABELED IN ACCORDANCE WITH UL 2158A. TRANSITION DUCTS SHALL BE A MAXIMUM OF 8 FEET IN LENGTH. TRANSITION DUCTS SHALL NOT BE CONCEALED WITHIN CONSTRUCTION.

M1502.4.4 DRYER EXHAUST DUCT POWER VENTILATORS. DOMESTIC DRYER EXHAUST DUCT POWER VENTILATORS SHALL CONFORM TO UL 705 FOR USE IN DRYER EXHAUST DUCT SYSTEMS. THE DRYER EXHAUST DUCT POWER VENTILATOR SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

M1502.4.5 DUCT LENGTH. THE MAXIMUM ALLOWABLE EXHAUST DUCT LENGTH SHALL BE DETERMINED BY ONE OF THE METHODS SPECIFIED IN SECTIONS M1502.4.5.1 THROUGH M1502.4.5.3.

M1502.4.5.1 SPECIFIED LENGTH. THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE 35 FEET FROM THE CONNECTION TO THE TRANSITION DUCT FROM THE DRYER TO THE OUTLET TERMINAL WHERE FITTINGS ARE USED, THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE REDUCED IN ACCORDANCE WITH TABLE M1502.4.5.1. THE MAXIMUM LENGTH OF THE EXHAUST DUCT DOES NOT INCLUDE THE TRANSITION DUCT.

IRC M1502.4.3 TRANSITION DUCT. TRANSITION DUCTS USED TO CONNECT THE DRYER TO THE EXHAUST DUCT SYSTEM SHALL BE A SINGLE LENGTH THAT IS LISTED AND LABELED IN ACCORDANCE WITH UL 2158A. TRANSITION DUCTS SHALL BE A MAXIMUM OF 8 FEET IN LENGTH. TRANSITION DUCTS SHALL NOT BE CONCEALED WITHIN CONSTRUCTION.

M1502.4.4 DRYER EXHAUST DUCT POWER VENTILATORS. DOMESTIC DRYER EXHAUST DUCT POWER VENTILATORS SHALL CONFORM TO UL 705 FOR USE IN DRYER EXHAUST DUCT SYSTEMS. THE DRYER EXHAUST DUCT POWER VENTILATOR SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

M1502.4.5 DUCT LENGTH. THE MAXIMUM ALLOWABLE EXHAUST DUCT LENGTH SHALL BE DETERMINED BY ONE OF THE METHODS SPECIFIED IN SECTIONS M1502.4.5.1 THROUGH M1502.4.5.3.

M1502.4.5.1 SPECIFIED LENGTH. THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE 35 FEET FROM THE CONNECTION TO THE TRANSITION DUCT FROM THE DRYER TO THE OUTLET TERMINAL WHERE FITTINGS ARE USED, THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE REDUCED IN ACCORDANCE WITH TABLE M1502.4.5.1. THE MAXIMUM LENGTH OF THE EXHAUST DUCT DOES NOT INCLUDE THE TRANSITION DUCT.

M1502.4.5.2 MANUFACTURER'S INSTRUCTIONS. THE SIZE AND MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE DETERMINED BY THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CODE OFFICIAL SHALL BE PROVIDED WITH A COPY OF THE INSTALLATION INSTRUCTIONS FOR THE MAKE AND MODEL OF THE DRYER AT THE CONCEALMENT INSPECTION. IN THE ABSENCE OF FITTING EQUIVALENT LENGTH CALCULATIONS FROM THE DRYER MANUFACTURER, TABLE M1502.4.4.1 SHALL BE USED.

M1502.4.5.3 DRYER EXHAUST DUCT POWER VENTILATOR. THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE DETERMINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR THE DUCT POWER VENTILATOR.

M1502.4.5.4 LENGTH IDENTIFICATION. WHERE THE EXHAUST DUCT EQUIVALENT LENGTH EXCEEDS 35 FEET, THE EQUIVALENT LENGTH OF THE EXHAUST DUCT SHALL BE IDENTIFIED ON A PERMANENT LABEL OR TAG LOCATED WITHIN 6 FEET OF THE EXHAUST DUCT CONNECTION.

M1502.4.7 EXHAUST DUCT REQUIRED. WHERE SPACE FOR A CLOTHES DRYER IS PROVIDED AN EXHAUST DUCT SYSTEM SHALL BE INSTALLED. WHERE THE CLOTHES DRYER IS NOT INSTALLED AT THE TIME OF OCCUPANCY THE EXHAUST DUCT SHALL BE CAPPED OR PLUGGED IN THE SPACE IN WHICH IT ORIGINATES AND IDENTIFIED AND MARKED "FUTURE USE." EXCEPTION: WHERE A LISTED CONDENSING CLOTHES DRYER IS INSTALLED PRIOR TO OCCUPANCY OF THE STRUCTURE.

M1502.5 PROTECTION REQUIRED. PROTECTIVE SHIELD PLATES SHALL BE PLACED WHERE NAILS OR SCREWS FROM FINISH OR OTHER WORK ARE LIKELY TO PENETRATE THE CLOTHES DRYER EXHAUST DUCT. SHIELD PLATES SHALL BE PLACED ON THE FINISHED FACE OF FRAMING MEMBERS WHERE THERE IS LESS THAN 1 1/4 INCHES BETWEEN THE DUCT AND THE FINISHED FACE OF THE FRAMING MEMBER. PROTECTIVE SHIELD PLATES SHALL BE CONSTRUCTED OF STEEL HAVE A MINIMUM THICKNESS OF 0.062 INCH AND SHALL NOT EXTEND LESS THAN 2 INCHES ABOVE SOLE PLATES AND BELOW TOP PLATES.

IRC M1502.4.5.1 DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH		
DRYER EXHAUST DUCT FITTING TYPE	EQUIVALENT LENGTH	
4" RADIUS MITERED 45-DEGREE ELBOW	2'-6"	
4" RADIUS MITERED 90-DEGREE ELBOW	5'-0"	
6" RADIUS SMOOTH 45-DEGREE ELBOW	1'-0"	
6" RADIUS SMOOTH 90-DEGREE ELBOW	1'-9"	
8" RADIUS SMOOTH 45-DEGREE ELBOW	1'-0"	
8" RADIUS SMOOTH 90-DEGREE ELBOW	1'-9"	
10" RADIUS SMOOTH 45-DEGREE ELBOW	9"	
10" RADIUS SMOOTH 90-DEGREE ELBOW	1'-6"	

FOR SI: 1 INCH = 25.4 MM, 1 FOOT = 304.8 MM, 1 DEGREE = 0.0175 RAD.

M1502.4.5.2 MANUFACTURER'S INSTRUCTIONS. THE SIZE AND MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE DETERMINED BY THE DRYER MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CODE OFFICIAL SHALL BE PROVIDED WITH A COPY OF THE INSTALLATION INSTRUCTIONS FOR THE MAKE AND MODEL OF THE DRYER AT THE CONCEALMENT INSPECTION. IN THE ABSENCE OF FITTING EQUIVALENT LENGTH CALCULATIONS FROM THE DRYER MANUFACTURER, TABLE M1502.4.4.1 SHALL BE USED.

M1502.4.5.3 DRYER EXHAUST DUCT POWER VENTILATOR. THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE DETERMINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR THE DUCT POWER VENTILATOR.

M1502.4.5.4 LENGTH IDENTIFICATION. WHERE THE EXHAUST DUCT EQUIVALENT LENGTH EXCEEDS 35 FEET, THE EQUIVALENT LENGTH OF THE EXHAUST DUCT SHALL BE IDENTIFIED ON A PERMANENT LABEL OR TAG LOCATED WITHIN 6 FEET OF THE EXHAUST DUCT CONNECTION.

M1502.4.7 EXHAUST DUCT REQUIRED. WHERE SPACE FOR A CLOTHES DRYER IS PROVIDED AN EXHAUST DUCT SYSTEM SHALL BE INSTALLED. WHERE THE CLOTHES DRYER IS NOT INSTALLED AT THE TIME OF OCCUPANCY THE EXHAUST DUCT SHALL BE CAPPED OR PLUGGED IN THE SPACE IN WHICH IT ORIGINATES AND IDENTIFIED AND MARKED "FUTURE USE." EXCEPTION: WHERE A LISTED CONDENSING CLOTHES DRYER IS INSTALLED PRIOR TO OCCUPANCY OF THE STRUCTURE.

M1502.5 PROTECTION REQUIRED. PROTECTIVE SHIELD PLATES SHALL BE PLACED WHERE NAILS OR SCREWS FROM FINISH OR OTHER WORK ARE LIKELY TO PENETRATE THE CLOTHES DRYER EXHAUST DUCT. SHIELD PLATES SHALL BE PLACED ON THE FINISHED FACE OF FRAMING MEMBERS WHERE THERE IS LESS THAN 1 1/4 INCHES BETWEEN THE DUCT AND THE FINISHED FACE OF THE FRAMING MEMBER. PROTECTIVE SHIELD PLATES SHALL BE CONSTRUCTED OF STEEL HAVE A MINIMUM THICKNESS OF 0.062 INCH AND SHALL NOT EXTEND LESS THAN 2 INCHES ABOVE SOLE PLATES AND BELOW TOP PLATES.

WHOLE-HOUSE VENTILATION PER IRC 1507 (WASHINGTON AMENDMENT)
 M1507.1 GENERAL. LOCAL EXHAUST AND WHOLE-HOUSE MECHANICAL VENTILATION SYSTEMS AND EQUIPMENT SHALL BE DESIGNED IN ACCORDANCE WITH THIS SECTION.

M1507.2 RECIRCULATION OF AIR. EXHAUST AIR FROM BATHROOMS AND TOILET ROOMS SHALL NOT BE RECIRCULATED WITHIN A RESIDENCE OR TO ANOTHER DWELLING UNIT AND SHALL BE EXHAUSTED DIRECTLY TO THE OUTDOORS. EXHAUST AIR FROM BATHROOMS AND TOILET ROOMS SHALL NOT DISCHARGE INTO AN ATTIC, CRAWL SPACE OR OTHER AREAS OF THE BUILDING.

M1507.3 COMPLIANCE. EACH DWELLING UNIT OR GUESTROOM SHALL BE EQUIPPED WITH A MECHANICAL WHOLE-HOUSE VENTILATION SYSTEM COMPLYING WITH SECTION M1507.3.4. M1507.3.5. M1507.3.6 OR M1507.3.7. COMPLIANCE ALSO PERMITTED TO BE DEMONSTRATED THROUGH COMPLIANCE WITH THE INTERNATIONAL MECHANICAL CODE OR ASHRAE STANDARD 62.2.

M1507.3.2 CONTROL AND OPERATION.
 1. LOCATION OF CONTROLS. CONTROLS FOR ALL VENTILATION SYSTEMS SHALL BE READILY ACCESSIBLE BY THE OCCUPANT.
 2. INSTRUCTIONS. OPERATING INSTRUCTIONS FOR WHOLE-HOUSE VENTILATION SYSTEMS SHALL BE PROVIDED TO THE OCCUPANT BY THE INSTALLER OF THE SYSTEM.
 3. LOCAL EXHAUST SYSTEMS. LOCAL EXHAUST SYSTEMS SHALL BE CONTROLLED BY MANUAL SWITCHES, DEHUMIDISTATS, TIMERS, OR OTHER APPROVED MEANS.

4. CONTINUOUS WHOLE-HOUSE VENTILATION SYSTEMS. CONTINUOUS WHOLE-HOUSE VENTILATION SYSTEMS SHALL OPERATE CONTINUOUSLY. EXHAUST FANS, FORCED-AIR SYSTEM FANS, OR SUPPLY FANS SHALL BE EQUIPPED WITH AN "ON" AS OVERRIDE CONTROLS. CONTROLS SHALL BE CAPABLE OF OPERATING THE VENTILATION SYSTEM WITHOUT ENERGIZING OTHER ENERGY-CONSUMING APPLIANCES. A LABEL SHALL BE AFFIXED TO THE CONTROLS THAT READS "WHOLE-HOUSE VENTILATION (SEE OPERATING INSTRUCTIONS)."
 5. INTERMITTENT WHOLE-HOUSE VENTILATION SYSTEMS. INTERMITTENT WHOLE-HOUSE VENTILATION SYSTEMS SHALL COMPLY WITH THE FOLLOWING:

5.1. THEY SHALL BE CAPABLE OF OPERATING INTERMITTENTLY AND CONTINUOUSLY.
 5.2. THEY SHALL HAVE CONTROLS CAPABLE OF OPERATING THE EXHAUST FANS, FORCED-AIR SYSTEM FANS, OR SUPPLY FANS WITHOUT ENERGIZING OTHER ENERGY-CONSUMING APPLIANCES.
 5.3. THE VENTILATION RATE SHALL BE ADJUSTED ACCORDING TO THE EXCEPTION IN SECTION 403.8.5.1.

5.4. THE SYSTEM SHALL BE DESIGNED SO THAT IT CAN OPERATE AUTOMATICALLY BASED ON THE TYPE OF CONTROL TIMER INSTALLED.
 5.5. THE INTERMITTENT MECHANICAL VENTILATION SYSTEM SHALL OPERATE AT LEAST ONE HOUR OUT OF EVERY FOUR.

5.6. THE SYSTEM SHALL HAVE A MANUAL CONTROL AND AUTOMATIC CONTROL, SUCH AS A 24-HOUR CLOCK TIMER.
 5.7. AT THE TIME OF FINAL INSPECTION, THE AUTOMATIC CONTROL SHALL BE SET TO OPERATE THE WHOLE-HOUSE FAN ACCORDING TO THE SCHEDULE USED TO CALCULATE THE WHOLE-HOUSE FAN SIZING.

5.8. A LABEL SHALL BE AFFIXED TO THE CONTROL THAT READS "WHOLE-HOUSE VENTILATION (SEE OPERATING INSTRUCTIONS)."
 M1507.3.2.1 OPERATING INSTRUCTIONS. INSTALLERS SHALL PROVIDE THE MANUFACTURER'S INSTALLATION, OPERATING INSTRUCTIONS, AND A WHOLE-HOUSE VENTILATION SYSTEM OPERATION DESCRIPTION.

M1507.3.2.1 OPERATING INSTRUCTIONS. INSTALLERS SHALL PROVIDE THE MANUFACTURER'S INSTALLATION, OPERATING INSTRUCTIONS, AND A WHOLE-HOUSE VENTILATION SYSTEM OPERATION DESCRIPTION.

M1507.3.3 MECHANICAL VENTILATION RATE. THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM SHALL PROVIDE OUTDOOR AIR TO EACH HABITABLE SPACE AT A CONTINUOUS RATE OF NOT LESS THAN THAT DETERMINED IN ACCORDANCE WITH TABLE M1507.3.3(1).

EXCEPTION: THE WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM IS PERMITTED TO OPERATE INTERMITTENTLY WHERE THE SYSTEM HAS CONTROLS THAT ENABLE OPERATION FOR NOT LESS THAN 25 PERCENT OF EACH 4-HOUR SEGMENT AND THE VENTILATION RATE PRESCRIBED IN TABLE M1507.3.3(1) IS MULTIPLIED BY THE FACTOR DETERMINED IN ACCORDANCE WITH TABLE M1507.3.3(2).

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{ab}

M1507.3.3(1) CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

METHOD #1, IRC M1507.3.4 WHOLE-HOUSE VENTILATION USING EXHAUST FANS. M1507.3.4.1 WHOLE-HOUSE VENTILATION FANS. EXHAUST FANS PROVIDING WHOLE-HOUSE VENTILATION SHALL HAVE A FLOW RATING AT 0.25 INCHES WATER GAUGE AS SPECIFIED IN TABLE M1507.3.3(1). MANUFACTURER'S FAN FLOW RATINGS SHALL BE DETERMINED ACCORDING TO HVI 916 OR AMCA 210.

M1507.3.4.2 FAN NOISE. WHOLE-HOUSE FANS LOCATED 4 FEET OR LESS FROM THE INTERIOR GRILLE SHALL HAVE A SONE RATING OF 1.0 OR LESS MEASURED AT 0.1 INCHES WATER GAUGE. MANUFACTURER'S NOISE RATINGS SHALL BE DETERMINED AS PER HVI 915 (MARCH 2009). REMOTELY MOUNTED FANS SHALL BE ACOUSTICALLY ISOLATED FROM THE STRUCTURAL ELEMENTS OF THE BUILDING AND FROM ATTACHED DUCT WORK USING INSULATED FLEXIBLE DUCT OR OTHER APPROVED MATERIAL.

M1507.3.4.3 FAN CONTROLS. THE WHOLE-HOUSE VENTILATION FAN SHALL MEET THE REQUIREMENTS OF SECTION M1507.3.2 AND M1507.3.2.1.

M1507.3.4.4 VENTILATION OPENINGS. EACH HABITABLE SPACE SHALL BE PROVIDED WITH OUTDOOR AIR INLETS OR OPERABLE WINDOWS WITH AN OPENABLE AREA NOT LESS THAN 4 SQUARE INCHES OF NET FREE AREA OF OPENING FOR EACH 10 CFM OF OUTDOOR AIR REQUIRED BY TABLE M1507.3.3(1). WHERE OUTDOOR AIR SUPPLIES ARE SEPARATED FROM EXHAUST POINTS BY DOORS, PROVISIONS SHALL BE MADE TO ENSURE AIR FLOW BY INSTALLATION OF DISTRIBUTION DUCTS, UNDERCUTTING DOORS, INSTALLATION OF GRILLES, TRANSOMS, OR SIMILAR MEANS. DOORS SHALL BE UNDERCUT TO A MINIMUM OF 1/2 INCH ABOVE THE SURFACE OF THE FINISH FLOOR COVERING.

INDIVIDUAL ROOM OUTDOOR AIR INLETS SHALL:
 1. HAVE CONTROLLABLE AND SECURE OPENINGS;
 2. BE SLEEVED OR OTHERWISE DESIGNED SO AS NOT TO COMPROMISE THE THERMAL PROPERTIES OF THE WALL OR WINDOW IN WHICH THEY ARE PLACED;
 3. ANY INLET OR COMBINATION OF INLETS WHICH PROVIDE 10 CFM AT 10 PASCALS ARE DEEMED EQUIVALENT TO 4 SQUARE INCHES NET FREE AREA.

VENTILATION OPENING SHALL BE SCREENED OR OTHERWISE PROTECTED FROM ENTRY BY LEAVES OR OTHER MATERIAL. OPENINGS SHALL BE CONTROLLABLE, SECURABLE AND SHALL BE DESIGNED TO NOT COMPROMISE THE THERMAL PROPERTIES OF THE BUILDING ENVELOPE. VENTILATION OPENINGS SHALL BE LOCATED SO AS NOT TO TAKE AIR FROM THE FOLLOWING AREAS:

1. CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, UNLESS SUCH VENT OUTLET IS 3 FEET ABOVE THE OUTDOOR AIR INLET.
 2. WHERE IT WILL PICK UP OBJECTIONABLE ODORS, FUMES OR FLAMMABLE VAPORS.
 3. A HAZARDOUS OR UNSANITARY LOCATION.
 4. A ROOM OR SPACE HAVING ANY FUEL-BURNING APPLIANCES THEREIN.

5. CLOSER THAN 10 FEET FROM A VENT OPENING OF A PLUMBING DRAINAGE SYSTEM UNLESS THE VENT OPENING IS AT LEAST 3 FEET ABOVE THE AIR INLET.
 6. ATTIC, CRAWL SPACES, OR GARAGES.
 7. ASPHALT ROOFS UNLESS IT IS SHOWN THAT NO OTHER LOCATION IS PERMISSIBLE. IN SUCH CASES THE INLET OPENING SHALL BE LOCATED A MINIMUM OF 2 FEET FROM THE NEAREST SURFACE OF THE ASPHALT ROOFING, MEASURED FROM THE INTAKE OPENING.

METHOD #2, M1507.3.5.1 INTEGRATED WHOLE-HOUSE VENTILATION SYSTEMS. INTEGRATED WHOLE-HOUSE VENTILATION SYSTEMS SHALL PROVIDE OUTDOOR AIR AT THE RATE CALCULATED USING SECTION M1507.3.3. INTEGRATED FORCED-AIR VENTILATION SYSTEMS SHALL DISTRIBUTE OUTDOOR AIR TO EACH HABITABLE SPACE THROUGH THE FORCED-AIR SYSTEM DUCTS. INTEGRATED FORCED-AIR VENTILATION SYSTEMS SHALL HAVE AN OUTDOOR AIR INLET DUCT CONNECTING A TERMINAL ELEMENT ON THE OUTSIDE OF THE BUILDING TO THE RETURN AIR PLENUM OF THE FORCED-AIR SYSTEM, AT A POINT WITHIN 4 FEET UPSTREAM OF THE AIR HANDLER. THE OUTDOOR AIR INLET DUCT CONNECTION TO THE RETURN AIR STREAM SHALL BE LOCATED UPSTREAM OF THE FORCED-AIR SYSTEM BLOWER AND SHALL NOT BE CONNECTED DIRECTLY INTO A FURNACE CABINET TO PREVENT THERMAL SHOCK TO THE HEAT EXCHANGER. THE SYSTEM WILL BE EQUIPPED WITH A MOTORIZED DAMPER CONNECTED TO THE AUTOMATIC VENTILATION CONTROL AS SPECIFIED IN SECTION M1507.3.2. THE REQUIRED FLOW RATE SHALL BE VERIFIED BY FIELD TESTING WITH A FLOW HOOD OR A FLOW MEASURING STATION.

M1507.3.5.2 VENTILATION DUCT INSULATION. ALL SUPPLY DUCTS IN THE CONDITIONED SPACE SHALL BE INSULATED TO A MINIMUM OF R-4.

M1507.3.5.3 OUTDOOR AIR INLETS. INLETS SHALL BE SCREENED OR OTHERWISE PROTECTED FROM ENTRY BY LEAVES OR OTHER MATERIAL. OUTDOOR AIR INLETS SHALL BE LOCATED SO AS NOT TO TAKE AIR FROM THE FOLLOWING AREAS:

1. CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, UNLESS SUCH VENT OUTLET IS 3 FEET ABOVE THE OUTDOOR AIR INLET.
 2. WHERE IT WILL PICK UP OBJECTIONABLE ODORS, FUMES OR FLAMMABLE VAPORS.
 3. A HAZARDOUS OR UNSANITARY LOCATION.
 4. A ROOM OR SPACE HAVING ANY FUEL-BURNING APPLIANCES THEREIN.

5. CLOSER THAN 10 FEET FROM A VENT OPENING OF A PLUMBING DRAINAGE SYSTEM UNLESS THE VENT OPENING IS AT LEAST 3 FEET ABOVE THE AIR INLET.
 6. ATTIC, CRAWL SPACES, OR GARAGES.

METHOD #3, M1507.3.6, WHOLE-HOUSE VENTILATION USING A SUPPLY FAN. SUPPLY FAN VENTILATION SYSTEMS SHALL DISTRIBUTE OUTDOOR AIR TO EACH HABITABLE SPACE THROUGH THE FORCED-AIR SYSTEM DUCTS OR THROUGH DEDICATED DUCTS TO EACH HABITABLE SPACE. SUPPLY FANS SHALL HAVE THE CAPACITY TO PROVIDE THE AMOUNT OF OUTDOOR AIR SPECIFIED IN TABLE M1507.3.3(1) AT 0.40 INCHES WATER GAUGE AS PER HVI 916. THE OUTDOOR AIR MUST BE FILTERED BEFORE IT IS DELIVERED TO HABITABLE SPACES. THE FILTER MAY BE LOCATED AT THE INTAKE EXHAUST, IN LINE WITH THE FAN, OR IN THE CASE OF A CONNECTION TO THE RETURN PLENUM OF THE AIR HANDLER, USING THE FURNACE FILTER. AN OUTDOOR AIR INLET SHALL BE CONNECTED TO EITHER THE SUPPLY OR RETURN AIR STREAM.

M1507.3.6.2 DUCTS. AN OUTDOOR AIR INLET DUCT CONNECTION TO THE SUPPLY AIR STREAM SHALL BE LOCATED DOWNSTREAM OF THE FORCED-AIR SYSTEM BLOWER. IF CONNECTED TO THE RETURN AIR STREAM IT SHALL BE LOCATED AT LEAST 4 FEET UPSTREAM OF THE FORCED-AIR SYSTEM BLOWER AND ITS FILTER. NEITHER SHALL BE CONNECTED DIRECTLY INTO A FURNACE CABINET. THE DUCT SHALL BE SIZED IN ACCORDANCE WITH TABLE M1507.3.6.2. THE TERMINAL ELEMENT ON THE OUTSIDE OF THE BUILDING SHALL BE SIZED 2 INCHES DIA. LARGER THAN THE OUTDOOR AIR INLET DUCT.

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

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 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.6.2
 PRESCRIPTIVE SUPPLY FAN DUCT SIZING

TABLE M1507.3.

POST CERTIFICATE WITHIN 3' OF ELECTRICAL PANEL:

R401.3 CERTIFICATE (MANDATORY). A PERMANENT CERTIFICATE SHALL BE COMPLETED BY THE BUILDER OR REGISTERED DESIGN PROFESSIONAL AND POSTED ON A WALL IN THE SPACE WHERE THE FURNACE IS LOCATED, A UTILITY ROOM, OR AN APPROVED LOCATION INSIDE THE BUILDING. WHEN LOCATED ON AN ELECTRICAL PANEL, THE CERTIFICATE SHALL NOT COVER OR OBSTRUCT THE VISIBILITY OF THE CIRCUIT DIRECTORY LABEL, SERVICE DISCONNECT LABEL, OR OTHER REQUIRED LABELS. THE CERTIFICATE SHALL LIST THE PREDOMINANT R-VALUES OF INSULATION INSTALLED IN OR ON CEILING/ROOF, WALLS, FOUNDATION (SLAB, BELOW-GRADE WALL, AND/OR FLOOR) AND DUCTS OUTSIDE CONDITIONED SPACES; U-FACTORS FOR FENESTRATION AND THE SOLAR HEAT GAIN COEFFICIENT (SHGC) OF FENESTRATION, AND THE RESULTS FROM ANY REQUIRED DUCT SYSTEM AND BUILDING ENVELOPE AIR LEAKAGE TESTING DONE ON THE BUILDING. WHERE THERE IS MORE THAN ONE VALUE FOR EACH COMPONENT, THE CERTIFICATE SHALL LIST THE VALUE COVERING THE LARGEST AREA. THE CERTIFICATE SHALL LIST THE TYPES AND EFFICIENCIES OF HEATING, COOLING AND SERVICE WATER HEATING EQUIPMENT. WHERE A GAS-FIRED UNVENTED ROOM HEATER, ELECTRIC FURNACE, OR BASEBOARD ELECTRIC HEATER IS INSTALLED IN THE RESIDENCE, THE CERTIFICATE SHALL LIST "GAS-FIRED UNVENTED ROOM HEATER," "ELECTRIC FURNACE" OR "BASEBOARD ELECTRIC HEATER," AS APPROPRIATE. AN EFFICIENCY SHALL NOT BE LISTED FOR GAS-FIRED UNVENTED ROOM HEATERS, ELECTRIC FURNACES OR ELECTRIC BASEBOARD HEATERS

DESIGN CONDITIONS:
 R302.1 INTERIOR DESIGN CONDITIONS. THE INTERIOR DESIGN TEMPERATURES USED FOR HEATING AND COOLING LOAD CALCULATIONS SHALL BE A MAXIMUM OF 72°F (22°C) FOR HEATING AND MINIMUM OF 75°F (24°C) FOR COOLING.
 R302.2 EXTERIOR DESIGN CONDITIONS. THE HEATING OR COOLING OUTDOOR DESIGN TEMPERATURES SHALL BE SELECTED FROM APPENDIX C.

BUILDING THERMAL ENVELOPE REQUIREMENTS:

INSULATION:

UNLESS NOTED OTHERWISE, INSULATION TO BE PER WSEC TABLE R402.1.1, CLIMATE ZONES 5 AND MARINE 4, AND THE SPECIFIC REQUIREMENTS OF SECTIONS R402.2.1 THROUGH R402.2.11.

FENESTRATION:

R402.3 FENESTRATION (PRESCRIPTIVE). IN ADDITION TO THE REQUIREMENTS OF SECTION R402, FENESTRATION SHALL COMPLY WITH SECTIONS R402.3.1 THROUGH R402.3.5.

AIR LEAKAGE:

R402.4 AIR LEAKAGE (MANDATORY). THE BUILDING THERMAL ENVELOPE SHALL BE CONSTRUCTED TO LIMIT AIR LEAKAGE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTIONS R402.4.1 THROUGH R402.4.4.

R402.4.1 BUILDING THERMAL ENVELOPE. THE BUILDING THERMAL ENVELOPE SHALL COMPLY WITH SECTIONS R402.4.1.1 AND R402.4.1.2. THE SEALING METHODS BETWEEN DISSIMILAR MATERIALS SHALL ALLOW FOR DIFFERENTIAL EXPANSION AND CONTRACTION.

R402.4.1.1 INSTALLATION. THE COMPONENTS OF THE BUILDING THERMAL ENVELOPE AS LISTED IN TABLE R402.4.1.1 SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THE CRITERIA LISTED IN TABLE R402.4.1.1, AS APPLICABLE TO THE METHOD OF CONSTRUCTION. WHERE REQUIRED BY THE CODE OFFICIAL, AN APPROVED THIRD PARTY SHALL INSPECT ALL COMPONENTS AND VERIFY COMPLIANCE.

R402.4.1.2 TESTING. THE BUILDING OR DWELLING UNIT SHALL BE TESTED AND VERIFIED AS HAVING AN AIR LEAKAGE RATE OF NOT EXCEEDING 5 AIR CHANGES PER HOUR. TESTING SHALL BE CONDUCTED WITH A BLOWER DOOR AT A PRESSURE OF 0.2 INCHES W.G. (50 PASCALS). WHERE REQUIRED BY THE CODE OFFICIAL, TESTING SHALL BE CONDUCTED BY AN APPROVED THIRD PARTY. A WRITTEN REPORT OF THE RESULTS OF THE TEST SHALL BE SIGNED BY THE PARTY CONDUCTING THE TEST AND PROVIDED TO THE CODE OFFICIAL. TESTING SHALL BE PERFORMED AT ANY TIME AFTER CREATION OF ALL PENETRATIONS OF THE BUILDING THERMAL ENVELOPE. ONCE VISUAL INSPECTION HAS CONFIRMED SEALING (SEE TABLE R402.4.1.1), OPERABLE WINDOWS AND DOORS MANUFACTURED BY SMALL BUSINESS SHALL BE PERMITTED TO BE SEALED OFF AT THE FRAME PRIOR TO THE TEST. DURING TESTING:

1. EXTERIOR WINDOWS AND DOORS, FIREPLACE AND STOVE DOORS SHALL BE CLOSED, BUT NOT SEALED, BEYOND THE INTENDED WEATHERSTRIPPING OR OTHER INFILTRATION CONTROL MEASURES;
 2. DAMPERS INCLUDING EXHAUST, INTAKE, MAKEUP AIR, BACKDRAFT AND FLUE DAMPERS SHALL BE CLOSED, BUT NOT SEALED BEYOND INTENDED INFILTRATION CONTROL MEASURES;
 3. INTERIOR DOORS, IF INSTALLED AT THE TIME OF THE TEST, SHALL BE OPEN, ACCESS HATCHES TO CONDITIONED CRAWL SPACES AND CONDITIONED ATTICS SHALL BE OPEN;
 4. EXTERIOR OPENINGS FOR CONTINUOUS VENTILATION SYSTEMS AND HEAT RECOVERY VENTILATORS SHALL BE CLOSED AND SEALED;
 5. HEATING AND COOLING SYSTEMS, IF INSTALLED AT THE TIME OF THE TEST, SHALL BE TURNED OFF; AND
 6. SUPPLY AND RETURN REGISTERS, IF INSTALLED AT THE TIME OF THE TEST, SHALL BE FULLY OPEN.
- EXCEPTIONS: (1)ADDITIONS LESS THAN 500 SQUARE FEET OF CONDITIONED FLOOR AREA. (2)ADDITIONS TESTED WITH THE EXISTING HOME HAVING A COMBINED MAXIMUM LEAKAGE RATE OF 7 AIR CHANGES/HR. TO QUALIFY FOR THIS EXCEPTION, THE DATE OF CONSTRUCTION OF THE EXISTING HOUSE MUST BE PRIOR TO THE 2009 WSEC.

SYSTEMS:

R403.1 CONTROLS (MANDATORY). AT LEAST ONE THERMOSTAT SHALL BE PROVIDED FOR EACH SEPARATE HEATING AND COOLING SYSTEM.

R403.1.1 PROGRAMMABLE THERMOSTAT. WHERE THE PRIMARY HEATING SYSTEM IS A FORCED-AIR FURNACE, AT LEAST ONE THERMOSTAT PER DWELLING UNIT SHALL BE CAPABLE OF CONTROLLING THE HEATING AND COOLING SYSTEM ON A DAILY SCHEDULE TO MAINTAIN DIFFERENT TEMPERATURE SET POINTS AT DIFFERENT TIMES OF THE DAY. THE THERMOSTAT SHALL ALLOW FOR, AT A MINIMUM, A 5-2 PROGRAMMABLE SCHEDULE (WEEKDAYS/WEEKENDS) AND BE CAPABLE OF PROVIDING AT LEAST TWO PROGRAMMABLE SETBACK PERIODS PER DAY. THIS THERMOSTAT SHALL INCLUDE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C). THE THERMOSTAT SHALL INITIALLY BE PROGRAMMED WITH A HEATING TEMPERATURE SET POINT NO HIGHER THAN 70°F (21°C) AND A COOLING TEMPERATURE SET POINT NO LOWER THAN 78°F (26°C). THE THERMOSTAT AND/OR CONTROL SYSTEM SHALL HAVE AN ADJUSTABLE DEADBAND OF NOT LESS THAN 10°F. EXCEPTIONS:

1. SYSTEMS CONTROLLED BY AN OCCUPANT SENSOR THAT IS CAPABLE OF SHUTTING THE SYSTEM OFF WHEN NO OCCUPANT IS SENSED FOR A PERIOD OF UP TO 30 MINUTES.
2. SYSTEMS CONTROLLED SOLELY BY A MANUALLY OPERATED TIMER CAPABLE OF OPERATING THE SYSTEM FOR NO MORE THAN TWO HOURS.

R403.1.2 HEAT PUMP SUPPLEMENTAL HEAT (MANDATORY). UNITARY AIR COOLED HEAT PUMPS SHALL INCLUDE CONTROLS THAT MINIMIZE SUPPLEMENTAL HEAT USAGE DURING START-UP, SET-UP, AND DEFROST CONDITIONS. THESE CONTROLS SHALL ANTICIPATE NEED FOR HEAT AND USE COMPRESSION HEATING AS THE FIRST STAGE OF HEAT. CONTROLS SHALL INDICATE WHEN SUPPLEMENTAL HEATING IS BEING USED THROUGH VISUAL MEANS (E.G., LED INDICATORS). HEAT PUMPS EQUIPPED WITH SUPPLEMENTARY HEATERS SHALL BE INSTALLED WITH CONTROLS THAT PREVENT SUPPLEMENTAL HEATER OPERATION ABOVE 40°F. AT FINAL INSPECTION THE AUXILIARY HEAT LOCK OUT CONTROL SHALL BE SET TO 35°F OR LESS.

R403.3 DUCTS. DUCTS AND AIR HANDLERS SHALL BE IN ACCORDANCE WITH SECTIONS R403.3.1 THROUGH R403.3.5.

R403.3.1 INSULATION (PRESCRIPTIVE). DUCTS OUTSIDE THE BUILDING THERMAL ENVELOPE SHALL BE INSULATED TO A MINIMUM OF R-8. DUCTS WITHIN A CONCRETE SLAB OR IN THE GROUND SHALL BE INSULATED TO R-10 WITH INSULATION DESIGNED TO BE USED BELOW GRADE. EXCEPTION: DUCTS OR PORTIONS THEREOF LOCATED COMPLETELY INSIDE THE BUILDING ENVELOPE. DUCTS LOCATED IN CRAWL SPACES DO NOT QUALIFY FOR THIS EXCEPTION.

R403.3.2 SEALING (MANDATORY). DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH EITHER THE INTERNATIONAL MECHANICAL CODE OR INTERNATIONAL RESIDENTIAL CODE, AS APPLICABLE.

EXCEPTIONS:
 1. AIR-IMPERMEABLE SPRAY FOAM PRODUCTS SHALL BE PERMITTED TO BE APPLIED WITHOUT ADDITIONAL JOINT SEALS.
 2. FOR DUCTS HAVING A STATIC PRESSURE CLASSIFICATION OF LESS THAN 2 INCHES OF WATER COLUMN (500 PA), ADDITIONAL CLOSURE SYSTEMS SHALL NOT BE REQUIRED FOR CONTINUOUSLY WELDED JOINTS AND SEAMS, AND LOCKING-TYPE JOINTS AND SEAMS OF OTHER THAN SNAP-LOCK AND BUTTON-LOCK TYPES.

R403.3.2.1 SEALED AIR HANDLER. AIR HANDLERS SHALL HAVE A MANUFACTURER'S DESIGNATION FOR AN AIR LEAKAGE OF NO MORE THAN 2 PERCENT OF THE DESIGN AIR FLOW RATE WHEN TESTED IN ACCORDANCE WITH ASHRAE 193.

R403.3.3 DUCT TESTING (MANDATORY). DUCTS SHALL BE LEAK TESTED IN ACCORDANCE WITH WSU RS-33, USING THE MAXIMUM DUCT LEAKAGE RATES SPECIFIED. EXCEPTION: THE TOTAL LEAKAGE TEST OR LEAKAGE TO THE OUTDOORS IS NOT REQUIRED FOR DUCTS AND HANDLERS LOCATED ENTIRELY WITHIN THE BUILDING THERMAL ENVELOPE. FOR FORCED AIR DUCTS, A MAXIMUM OF 10 LINEAR FEET OF RETURN DUCTS AND 5 LINEAR FEET OF SUPPLY DUCTS MAY BE LOCATED OUTSIDE THE CONDITIONED SPACE. ALL METALLIC DUCTS LOCATED OUTSIDE THE CONDITIONED SPACE MUST HAVE BOTH TRANSVERSE AND LONGITUDINAL JOINTS SEALED WITH MASTIC. IF FLEX DUCTS ARE USED, THEY CANNOT CONTAIN SPLICES. FLEX DUCT CONNECTIONS MUST BE MADE WITH NYLON STRAPS AND INSTALLED USING A PLASTIC STRAPPING TENSIONING TOOL. DUCTS LOCATED IN CRAWL SPACES DO NOT QUALIFY FOR THIS EXCEPTION. A WRITTEN REPORT OF THE RESULTS SHALL BE SIGNED BY THE PARTY CONDUCTING THE TEST AND PROVIDED TO THE CODE OFFICIAL.

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R403.3.4. DUCT LEAKAGE (MANDATORY). THE TOTAL LEAKAGE OF THE DUCTS, WHERE MEASURED IN ACCORDANCE WITH SECTION R403.3.3, SHALL BE AS FOLLOWS: 1. ROUGH-IN TEST: TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CFM (113.3 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. (25 PA) ACROSS THE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTERS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST. IF THE AIR HANDLER IS NOT INSTALLED AT THE TIME OF THE TEST, TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 3 CFM (85 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA. 2. POSTCONSTRUCTION TEST: LEAKAGE TO OUTDOORS SHALL BE LESS THAN OR EQUAL TO 4 CFM (113.3 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA OR TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CFM (113.3 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA WHEN TESTED AT A PRESSURE DIFFERENTIAL OF 0.1 INCHES W.G. (25 PA) ACROSS THE ENTIRE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE. ALL REGISTER BOOTHS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST.

R403.3.5 BUILDING CAVITIES (MANDATORY). BUILDING FRAMING CAVITIES SHALL NOT BE USED AS DUCTS OR PLENUMS. INSTALLATION OF DUCTS IN EXTERIOR WALLS, FLOORS OR CEILINGS SHALL NOT DISPLACE REQUIRED ENVELOPE INSULATION R403.4 MECHANICAL SYSTEM PIPING INSULATION (MANDATORY). MECHANICAL SYSTEM PIPING CAPABLE OF CARRYING FLUIDS ABOVE 105°F (41°C) OR BELOW 55°F (13°C) SHALL BE INSULATED TO A MINIMUM OF R-6. EXCEPTION: UP TO 200 FEET OF HYDRONIC SYSTEM PIPING INSTALLED WITHIN THE CONDITIONED SPACE MAY BE INSULATED WITH A MINIMUM OF 1/2-INCH INSULATION WITH A K VALUE OF 0.28.

R403.4.1 PROTECTION OF PIPING INSULATION. PIPING INSULATION EXPOSED TO WEATHER SHALL BE PROTECTED FROM DAMAGE, INCLUDING THAT CAUSED BY SUNLIGHT, MOISTURE, EQUIPMENT MAINTENANCE, AND WIND, AND SHALL PROVIDE PROTECTION FROM SOLAR RADIATION THAT CAN CAUSE DEGRADATION OF THE MATERIAL. ADHESIVE TAPE SHALL NOT BE PERMITTED.

R403.5 SERVICE HOT WATER SYSTEMS. ENERGY CONSERVATION MEASURES FOR SERVICE HOT WATER SYSTEMS SHALL BE IN ACCORDANCE WITH SECTIONS R403.5.1 THROUGH R403.5.5.

R403.5.1 HEATED WATER CIRCULATION AND TEMPERATURE MAINTENANCE SYSTEM (MANDATORY). HEATED WATER CIRCULATION SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION R403.5.1.1. HEAT TRACE TEMPERATURE MAINTENANCE SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION R403.5.1.2. AUTOMATIC CONTROLS, TEMPERATURE SENSORS AND PUMPS SHALL BE ACCESSIBLE. MANUAL CONTROLS SHALL BE READILY ACCESSIBLE.

R403.5.1.1 CIRCULATION SYSTEMS. HEATED WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. GRAVITY AND THERMO-SYPHON CIRCULATION SYSTEMS SHALL BE PROHIBITED. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.

R403.5.1.2 HEAT TRACE SYSTEMS. ELECTRIC HEAT TRACE SYSTEMS SHALL COMPLY WITH IEEE 515.1 OR UL 515. CONTROLS FOR SUCH SYSTEMS SHALL AUTOMATICALLY ADJUST THE ENERGY INPUT TO THE HEAT TRACING TO MAINTAIN THE DESIRED WATER TEMPERATURE IN THE PIPING IN ACCORDANCE WITH THE TIMES WHEN HEATED WATER IS USED IN THE OCCUPANCY.

R403.5.2 DEMAND RECIRCULATION SYSTEMS. A WATER DISTRIBUTION SYSTEM HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED WATER SUPPLY PIPE BACK TO THE HEATED WATER SOURCE THROUGH A COLD WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING: 1. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE. 2. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD WATER PIPING TO 104°F (40 °C).

R403.5.3 HOT WATER PIPE INSULATION (PRESCRIPTIVE). INSULATION FOR HOT WATER PIPE, BOTH WITHIN AND OUTSIDE THE CONDITIONED SPACE, SHALL HAVE A MINIMUM THERMAL RESISTANCE (R-VALUE) OF R-3. EXCEPTION: PIPE INSULATION IS PERMITTED TO BE DISCONTINUOUS WHERE IT PASSES THROUGH STUDS, JOISTS OR OTHER STRUCTURAL MEMBERS AND WHERE THE INSULATED PIPES PASS OTHER PIPING, CONDUIT OR VENTS, PROVIDED THE INSULATION IS INSTALLED TIGHT TO EACH OBSTRUCTION.

R403.5.4 DRAIN WATER HEAT RECOVERY UNITS. DRAIN WATER HEAT RECOVERY UNITS SHALL COMPLY WITH CSA 55.2. DRAIN WATER HEAT RECOVERY UNITS SHALL BE IN ACCORDANCE WITH CSA 55.1. POTABLE WATER-SIDE PRESSURE LOSS OF DRAIN WATER HEAT RECOVERY UNITS SHALL BE LESS THAN 3 PSI (20.7 kPa) FOR INDIVIDUAL UNITS CONNECTED TO ONE OR TWO SHOWERS. POTABLE WATER-SIDE PRESSURE LOSS OF DRAIN WATER HEAT RECOVERY UNITS SHALL BE LESS THAN 2 PSI (13.8 kPa) FOR INDIVIDUAL UNITS CONNECTED TO THREE OR MORE SHOWERS.

R403.5.5 ELECTRIC WATER HEATER INSULATION. ALL ELECTRIC WATER HEATERS IN UNHEATED SPACES OR ON CONCRETE FLOORS SHALL BE PLACED ON AN INCOMPRESSIBLE, INSULATED SURFACE WITH A MINIMUM THERMAL RESISTANCE OF R-10.

R403.6 MECHANICAL VENTILATION (MANDATORY). THE BUILDING SHALL BE PROVIDED WITH VENTILATION THAT MEETS THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE OR INTERNATIONAL MECHANICAL CODE, AS APPLICABLE, OR WITH OTHER APPROVED MEANS OF VENTILATION. OUTDOOR AIR INTAKES AND EXHAUSTS SHALL HAVE AUTOMATIC OR GRAVITY DAMPERS THAT CLOSE WHEN THE VENTILATION SYSTEM IS NOT OPERATING.

R403.6.1 WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY. MECHANICAL VENTILATION SYSTEM FANS SHALL MEET THE EFFICACY REQUIREMENTS OF TABLE R403.6.1. EXCEPTION: WHERE MECHANICAL VENTILATION FANS ARE INTEGRAL TO TESTED AND LISTED HVAC EQUIPMENT, THEY SHALL BE POWERED BY AN ELECTRONICALLY COMMUTATED MOTOR.

TABLE R403.6.1
MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
RANGE HOODS	ANY	2.8 CFM/WATT	ANY
IN-LINE FAN	ANY	2.8 CFM/WATT	ANY
BATHROOM, UTILITY ROOM	10	1.4 CFM/WATT	<90
BATHROOM, UTILITY ROOM	90	2.8 CFM/WATT	ANY

TABLE R402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	5 AND MARINE 4
FENESTRATION U-FACTOR ^b	0.30
SKYLIGHT ^b U-FACTOR	0.50
GLAZED FENESTRATION SHGC ^{b,c}	NR
CEILING R-VALUE ^k	49
WOOD FRAME WALL ^{d,m,n} R-VALUE	21 int
MASS WALL R-VALUE ^l	21/21
FLOOR R-VALUE	30 ^g
BELOW-GRADE ^{e,m} WALL R-VALUE	10/15/21 int+TB
SLAB ^d R-VALUE & DEPTH	10, 2 ft

For SI: 1 foot=304.8mm, ci=continuous insulation, int= intermediate framing

^a R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the compressed R-value of the insulation from Appendix Table A101.4 shall not be less than the R-value specified in the table.
^b fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
^c *10/15/21+TB* means R-10 continuous insulation on the exterior of the wall, or R-15 continuous insulation on the interior of the wall, or R-21 cavity insulation plus a thermal break between the slab and the basement wall at the interior of the basement wall. *10/15/21-TB* shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the wall. *TB* means thermal break between the slab and basement wall on grade floors. See R402.2.9.1.
^d There are no SHGC requirements in the Marine Zone.
^e Reserved.
^f Reserved.
^g The second R-value applies when more than half the insulation is on the interior of the mass wall.
^h Reserved.
ⁱ Reserved.
^j For single rafter- or joist-vaulted ceilings, the insulation may be reduced to R-38.
^k Reserved.
^l Int. (intermediate framing) denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.
^m Log and solid timber walls with a minimum average thickness of 3.5 inches are exempt from this insulation requirement.

TABLE R402.4.1.1
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	CRITERIA ^a
AIR BARRIER AND THERMAL BARRIER	A CONTINUOUS AIR BARRIER SHALL BE INSTALLED IN THE BUILDING ENVELOPE. EXTERIOR THERMAL ENVELOPE CONTAINS A CONTINUOUS AIR BARRIER. BREAKS OR JOINTS IN THE AIR BARRIER SHALL BE SEALED. AIR-PERMEABLE INSULATION SHALL NOT BE USED AS A SEALING MATERIAL.
CAVITY INSULATION INSTALLATION	ALL CAVITIES IN THE THERMAL ENVELOPE SHALL BE FILLED WITH INSULATION. THE DENSITY OF THE INSULATION SHALL BE AT THE MANUFACTURER'S PRODUCT RECOMMENDATION AND SAID DENSITY SHALL BE MAINTAINED FOR ALL VOLUME OF EACH CAVITY. BATT TYPE INSULATION SHALL SHOW NO VOIDS OR GAPS AND MAINTAIN AN EVEN DENSITY FOR THE ENTIRE CAVITY. BATT INSULATION SHALL BE INSTALLED IN THE RECOMMENDED CAVITY DEPTH. WHERE AN OBSTRUCTION IN THE CAVITY DUE TO SERVICES, BLOCKING, BRACING OR OTHER OBSTRUCTION EXISTS, THE BATT PRODUCT WILL BE CUT TO FIT THE REMAINING DEPTH OF THE CAVITY. WHERE THE BATT IS CUT AROUND OBSTRUCTIONS, LOOSE FILL INSULATION SHALL BE PLACED TO FILL ANY SURFACE OR CONCEALED VOIDS. AND AT THE MANUFACTURER'S SPECIFIED DENSITY. WHERE FACED BATT IS USED, THE INSTALLATION TABS MUST BE STAPLED TO THE FACE OF THE STUD. THERE SHALL BE NO COMPRESSION TO THE BATT AT THE EDGES OF THE CAVITY DUE TO INSET STAPLING INSTALLATION TABS. INSULATION THAT UPON INSTALLATION READILY CONFORMS TO AVAILABLE SPACE SHALL BE INSTALLED FILLING THE ENTIRE CAVITY AND WITHIN THE MANUFACTURER'S DENSITY RECOMMENDATION.
CEILING/ATTIC	THE AIR BARRIER IN ANY DROPPED CEILING/SOFFIT SHALL BE ALIGNED WITH THE INSULATION AND ANY GAPS IN THE AIR BARRIER SEALED. ACCESS OPENINGS, DROP DOWN STAIR OR KNEE WALL DOORS TO UNCONDITIONED ATTIC SPACES SHALL BE SEALED. BATT INSULATION INSTALLED IN ATTIC ROOF ASSEMBLIES MAY BE COMPRESSED AT EXTERIOR WALL LINES TO ALLOW FOR REQUIRED ATTIC VENTILATION.
WALLS	THE JUNCTION OF THE FOUNDATION AND SILL PLATE SHALL BE SEALED. THE JUNCTION OF THE TOP PLATE AND TOP OF EXTERIOR WALLS SHALL BE SEALED. KNEE WALLS SHALL BE SEALED. CAVITIES WITHIN CORNERS AND HEADERS OF FRAME WALLS SHALL BE INSULATED BY COMPLETELY FILLING THE CAVITY WITH A MATERIAL HAVING A THERMAL RESISTANCE OF R-3 PER INCH MINIMUM. EXTERIOR THERMAL ENVELOPE INSULATION FOR FRAMED WALLS SHALL BE INSTALLED IN SUBSTANTIAL CONTACT AND CONTINUOUS ALIGNMENT WITH THE AIR BARRIER.
WINDOWS, SKYLIGHTS AND DOORS	THE SPACE BETWEEN WINDOW/DOOR JAMBS AND FRAMING AND SKYLIGHTS AND FRAMING SHALL BE SEALED.
RIM JOISTS	RIM JOISTS SHALL BE INSULATED AND INCLUDE THE AIR BARRIER.
FLOORS (INCLUDING ABOVE-GARAGE AND CANTILEVERED FLOORS)	INSULATION SHALL BE INSTALLED TO MAINTAIN PERMANENT CONTACT WITH UNDERSIDE OF SUBFLOOR DECKING. THE AIR BARRIER SHALL BE INSTALLED AT ANY EXPOSED EDGE OF INSULATION.
CRAWL SPACE WALLS	WHERE PROVIDED IN LIEU OF FLOOR INSULATION, INSULATION SHALL BE PERMANENTLY ATTACHED TO THE CRAWLSPACE WALLS. EXPOSED EDGES IN UNVENTED CRAWL SPACES SHALL BE COVERED WITH A CLASS 1 VAPOR RETARDER WITH OVERLAPPING JOINTS TAPED.
SHAFTS, PENETRATIONS	DUCT SHAFTS, UTILITY PENETRATIONS, AND FLUE SHAFTS OPENING TO EXTERIOR OR UNCONDITIONED SPACE SHALL BE SEALED.
NARROW CAVITIES	BATTS IN NARROW CAVITIES SHALL BE CUT TO FIT AND INSTALLED TO THE CORRECT DENSITY WITHOUT ANY VOIDS OR GAPS OR COMPRESSION. NARROW CAVITIES SHALL BE FILLED BY INSULATION THAT ON INSTALLATION READILY CONFORMS TO THE AVAILABLE CAVITY SPACE.
GARAGE SEPARATION	AIR SEALING SHALL BE PROVIDED BETWEEN THE GARAGE AND CONDITIONED SPACES.
RECESSED LIGHTING	RECESSED LIGHT FIXTURES INSTALLED IN THE BUILDING THERMAL ENVELOPE SHALL BE AIR TIGHT, IC RATED, AND SEALED TO THE DRYWALL.
PLUMBING AND WIRING	BATT INSULATION SHALL BE CUT NEATLY TO FIT AROUND WIRING AND PLUMBING IN EXTERIOR WALLS. THERE SHALL BE NO VOIDS OR GAPS OR COMPRESSION WHERE CUT TO FIT. INSULATION THAT ON INSTALLATION READILY CONFORMS TO AVAILABLE SPACE SHALL EXTEND BEHIND PIPING AND WIRING.
SHOWER/TUB ON EXTERIOR WALL	EXTERIOR WALLS ADJACENT TO SHOWERS AND TUBS SHALL BE INSULATED AND THE AIR BARRIER INSTALLED SEPARATING THEM FROM THE SHOWERS AND TUBS.
ELECTRICAL/PHONE BOX ON EXTERIOR WALLS	THE AIR BARRIER SHALL BE INSTALLED BEHIND ELECTRICAL OR COMMUNICATION BOXES OR AIR SEALED BOXES SHALL BE INSTALLED.
HVAC REGISTER BOOTHS	HVAC REGISTER BOOTHS THAT PENETRATE BUILDING THERMAL ENVELOPE SHALL BE SEALED TO THE SUBFLOOR OR DRYWALL.
CONCEALED SPRINKLERS	WHEN REQUIRED TO BE SEALED, CONCEALED FIRE SPRINKLERS SHALL ONLY BE SEALED IN A MANNER THAT IS RECOMMENDED BY THE MANUFACTURER. CAULKING OR OTHER ADHESIVE SEALANTS SHALL NOT BE USED TO FILL VOIDS BETWEEN FIRE SPRINKLER COVER PLATES AND WALLS OR CEILINGS.

^a In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

R403.7 EQUIPMENT SIZING AND EFFICIENCY RATING (MANDATORY). HEATING AND COOLING EQUIPMENT SHALL BE SIZED IN ACCORDANCE WITH ACCA MANUAL S BASED ON BUILDING LOADS CALCULATED IN ACCORDANCE WITH ACCA MANUAL J OR OTHER APPROVED HEATING AND COOLING CALCULATION METHODOLOGIES. THE OUTPUT CAPACITY OF HEATING AND COOLING EQUIPMENT SHALL NOT BE GREATER THAN THAT OF THE SMALLEST AVAILABLE EQUIPMENT SIZE THAT EXCEEDS THE LOADS CALCULATED, INCLUDING ALLOWABLE OVERSIZING LIMITS. NEW OR REPLACEMENT HEATING AND COOLING EQUIPMENT SHALL HAVE AN EFFICIENCY RATING EQUAL TO OR GREATER THAN THE MINIMUM REQUIRED BY FEDERAL LAW FOR THE GEOGRAPHIC LOCATION WHERE THE EQUIPMENT IS INSTALLED.

R403.7.1 ELECTRIC RESISTANCE ZONE HEATED UNITS. ALL DETACHED ONE- AND TWO-FAMILY DWELLINGS AND MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES) UP TO THREE STORIES IN HEIGHT ABOVE GRADE PLAN USING ELECTRIC ZONAL HEATING AS THE PRIMARY HEAT SOURCE SHALL INSTALL AN INVERTER-DRIVEN DUCTLESS MINI-SPLIT HEAT PUMP IN THE LARGEST ZONE IN THE DWELLING. BUILDING PERMIT DRAWINGS SHALL SPECIFY THE HEATING EQUIPMENT TYPE AND LOCATION OF THE HEATING SYSTEM. EXCEPTION: TOTAL INSTALLED HEATING CAPACITY OF 2KW PER DWELLING OR LESS.

R403.8 SYSTEMS SERVING MULTIPLE DWELLING UNITS (MANDATORY). SYSTEMS SERVING MULTIPLE DWELLING UNITS SHALL COMPLY WITH SECTIONS C403 AND C404 OF THE WSEC-COMMERCIAL PROVISIONS IN LIEU OF SECTION R403.

R403.9 SNOW MELT SYSTEM CONTROLS (MANDATORY). SNOW AND ICE-MELTING SYSTEMS, SUPPLIED THROUGH ENERGY SERVICE TO THE BUILDING, SHALL INCLUDE AUTOMATIC CONTROLS CAPABLE OF SHUTTING OFF THE SYSTEM WHEN THE PAVEMENT TEMPERATURE IS ABOVE 50°F, AND NO PRECIPITATION IS FALLING AND AN AUTOMATIC OR MANUAL CONTROL THAT WILL ALLOW SHUTOFF WHEN THE OUTDOOR TEMPERATURE IS ABOVE 40°F.

ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS:

R406.1 SCOPE. THIS SECTION ESTABLISHES OPTIONS FOR ADDITIONAL CRITERIA TO BE MET FOR ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES, AS DEFINED IN SECTION 101.2 OF THE INTERNATIONAL RESIDENTIAL CODE TO DEMONSTRATE COMPLIANCE WITH THIS CODE.
 R406.2 ADDITIONAL ENERGY EFFICIENCY REQUIREMENTS (MANDATORY). EACH DWELLING UNIT IN A RESIDENTIAL BUILDING SHALL COMPLY WITH SUFFICIENT OPTIONS FROM TABLE R406.2 SO AS TO ACHIEVE THE FOLLOWING MINIMUM NUMBER OF CREDITS:

1. SMALL DWELLING UNIT: 1.5 CREDITS
 DWELLING UNITS LESS THAN 1500 SQUARE FEET IN CONDITIONED FLOOR AREA WITH LESS THAN 300 SQUARE FEET OF FENESTRATION AREA. ADDITIONS TO EXISTING BUILDING THAT ARE GREATER THAN 500 SQUARE FEET OF HEATED FLOOR AREA BUT LESS THAN 1500 SQUARE FEET.
2. MEDIUM DWELLING UNIT: 3.5 CREDITS
 ALL DWELLING UNITS THAT ARE NOT INCLUDED IN #1 OR #3.
 EXCEPTION: DWELLING UNITS SERVING R-2 OCCUPANCIES SHALL REQUIRE 2.5 CREDITS.
3. LARGE DWELLING UNIT: 4.5 CREDITS
 DWELLING UNITS EXCEEDING 5000 SQUARE FEET OF CONDITIONED FLOOR AREA.
 EXCEPTION: DWELLING UNITS SERVING R-2 OCCUPANCIES SHALL REQUIRE 2.5 CREDITS.
4. ADDITIONS LESS THAN 500 SQUARE FEET...0.5 CREDITS
 THE DRAWINGS INCLUDED WITH THE BUILDING PERMIT APPLICATION SHALL IDENTIFY WHICH OPTIONS HAVE BEEN SELECTED AND THE POINT VALUE OF EACH OPTION, REGARDLESS OF WHETHER SEPARATE MECHANICAL, PLUMBING, ELECTRICAL, OR OTHER PERMITS ARE UTILIZED FOR THE PROJECT.

ELECTRICAL POWER AND LIGHTING SYSTEMS:

R404.1 LIGHTING EQUIPMENT (MANDATORY). A MINIMUM OF 75 PERCENT OF PERMANENTLY INSTALLED LAMPS IN LIGHTING FIXTURES SHALL BE HIGH-EFFICACY LAMPS.

R404.1.1 LIGHTING EQUIPMENT (MANDATORY). FUEL GAS LIGHTING SYSTEMS SHALL NOT HAVE CONTINUOUSLY BURNING PILOT LIGHTS.

HIGH EFFICACY LAMPS:
 COMPACT FLOURESCENT LAMPS, T-8 OR SMALLER DIAMETER LINEAR FLOURESCENT LAMPS, OR LAMPS WITH A MINIMUM EFFICACY OF:
 1. 60 LUMENS PER WATT FOR LAMPS OVER 40 WATTS;
 2. 50 LUMENS PER WATT FOR LAMPS OVER 15 WATTS TO 40 WATTS;
 3. 40 LUMENS PER WATT FOR LAMPS 15 WATTS OR LESS.

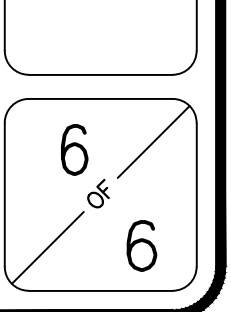
THE ORIGINAL
LINCOLN BLOCK, INC.
 4030 99TH AVE N.E.
 LAKE STEVENS, WA 98258
 (425) 330-8697
 WWW.LINCOLNBLOCK.COM

DRAWN: 4-12-19
 BY: TJP
 REVISED: 2-7-20

LINCOLN BLOCK
 4030 99TH AVE NE
 LAKE STEVENS, WA 98258
 425-330-8697

F O R

25X33 BASIC
 825 SQ FT
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Basic materials package \$79,999

Estimated cost of construction

\$80,000-\$120,000 this is a range but includes construction of Lincoln Block cabin, plumbing, electrical, basic comp roof, delivery and cleanup.

Major Materials

Lincoln Block building block

Insulation

Sheetrock for ceiling and interior walls

All lumber for interior framing

Roof Trusses

All plywood for floor and roof NO OSB

Standard snap together laminate flooring

Wood defender exterior stain

Cedar Trim

Standard Comp roofing

Electric Hot water tank

Standard sinks, toilet and cabinetry

Steel exterior doors

Vinyl Windows

Standard interior paint grade doors

List of Mechanical Systems

Standard Baseboard heat

Basic appliances