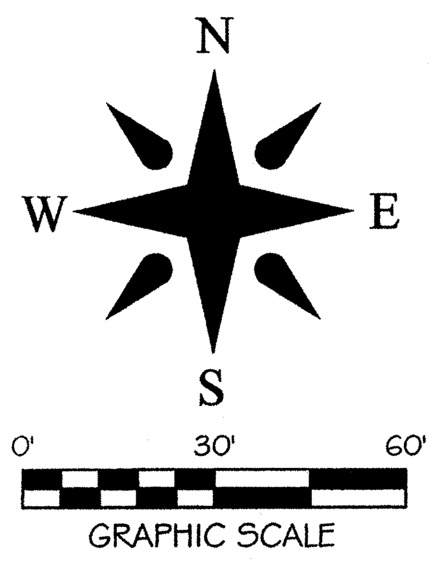
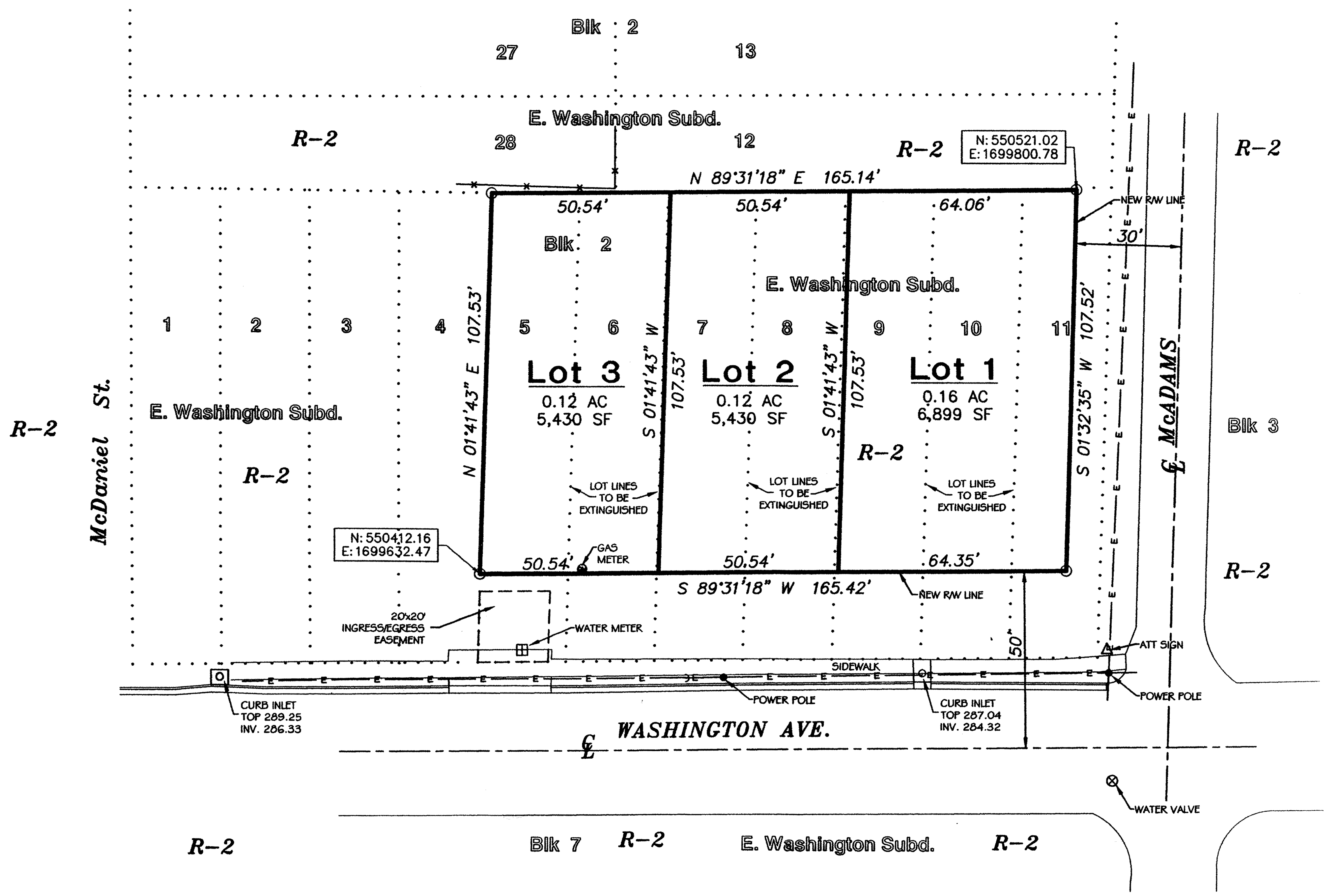


NOTES:

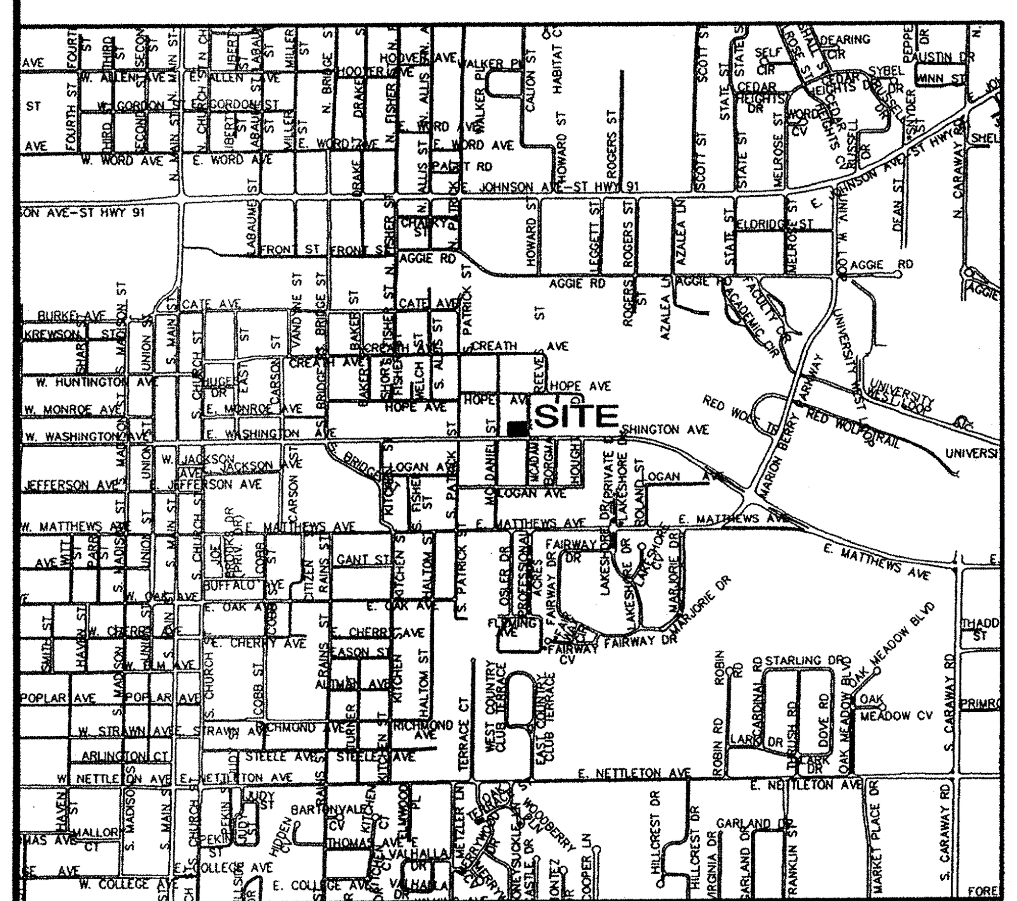
1) All bearings are based on Arkansas North State Plane Coordinate system.
2) The closure precision of the plat is in excess of 1' in _______'.
3) The research completed for this survey includes our own research at the courthouse.
4) All corner monuments set are ½" rebar, unless otherwise noted on the plat.
5) Owner: Mr. Artis Scott
6) Flood Plain: This tract does not lie within the 100-yr Flood Plain per Flood Insurance rate map of Craighead Co., AR, and incorporated areas, Community Panel No. 05031C0044 C, dated 09-27-91. This tract does lie within a Zone "X" Flood Plain, per the map referenced above.
7) Current Zoning: R-2 (25' front setback, 20' rear setback, and 7.5' side setback.)
8) THE REQUIRED RIGHT-OF-WAY DEDICATION ALONG CREATH AVE. AND PATRICK ST. CAUSE THIS LOT TO BECOME A NON-CONFORMING LOT. WITHIN THE ORDINANCES OF THE CITY OF JONESBORO, WHEN THAT SITUATION ARISES, THE BULK REQUIREMENTS OF THE LOT, INCLUDING LOT AREA AND BUILDING SETBACKS MAY BE REDUCED BY 25%.
   a) Min. setback 25' 25'x0.75=18.75'
   b) Min. lot depth 100': 100'x0.75-75'
   c) Min. lot area for Duplex 7,200 s.f.: 7,200x0.75=5,400 s.f.



SCOTT REPLAT

OF

LOTS 5, 6, 7, 8, 9, 10, & 11, BLOCK 2
OF EAST WASHINGTON SUBDIVISION
OF BLOCKS 15, 16, 17, 22, 23, & 24 OF
PATRICK'S THIRD ADDITION
JONESBORO, ARKANSAS



VICINITY MAP 1"=2000 ft.

CERTIFICATE OF OWNERSHIP:

We hereby certify that we are the owners of the property shown and described hereon, that we adopt the plan of subdivision and dedicate perpetual use of all streets and easements as noted.

Artis Scott

CERTIFICATE OF SURVEY:

To all parties interested in Title to these premises: I hereby certify that I have prior to this day made a survey of the above described property as shown on the Plat of Survey hereon. The property lines and corner monuments, to the best of my knowledge and ability, are correctly established: the improvements are as shown on the Plat of Survey. Encroachments, if any, as disclosed by Survey, are shown hereon.

Drawn By:	RE	Checked by:	GH
Date	Scale	Job No.	Sheet No.
03-01-19	1"=30'	118130	1 of 1
Section	Township	Range	County
17	14N	04E	CRAIGHEAD

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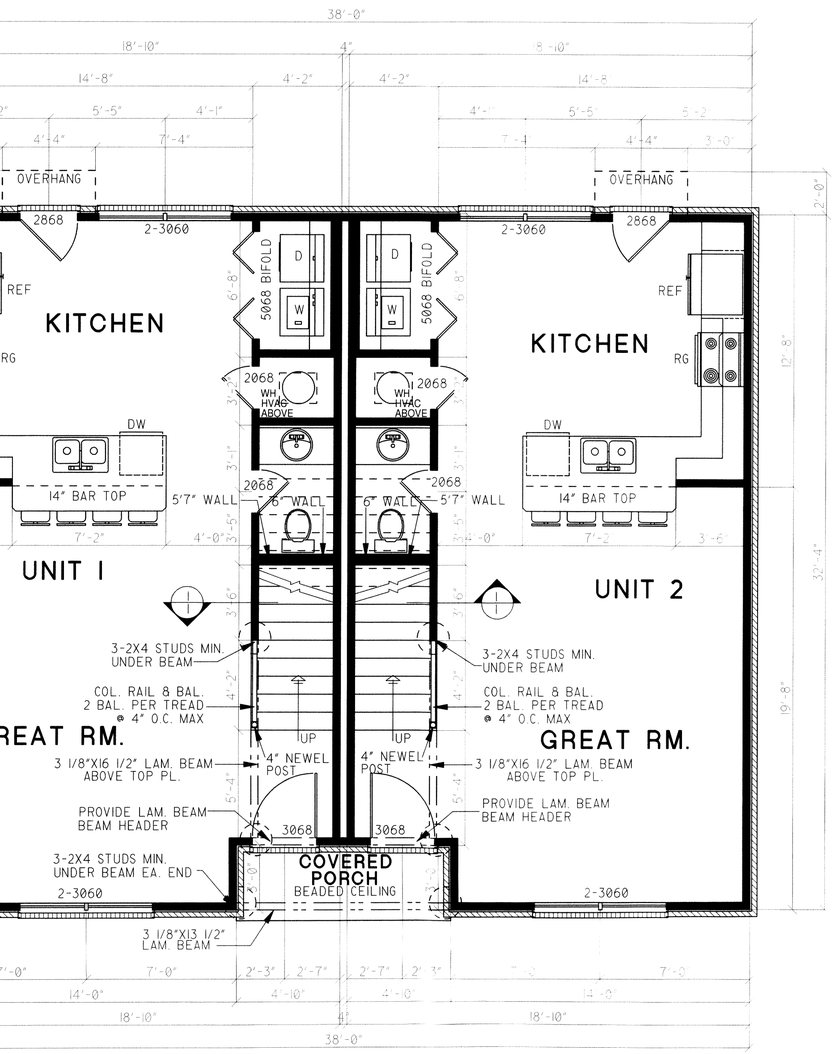
REPLAT
PT. E. WASHINGTON SUBD.
JONESBORO, ARKANSAS
FOR
MR. ARTIS SCOTT

CERTIFICATE OF AUTHORIZATION
CIVILOGIC
No. 329
ARKANSAS-ENGINEER

REGISTERED PROFESSIONAL SURVEYOR
GEORGE M. HAMMAN
03-01-19

JOB NO.: 118130
SHEET NUMBER
1 of 1



MAIN FLOOR

TION AND OTES:

FOLLOWS PER SQ FT:

	LIVE	DEAD	DEFLECT LIMIT
	40 LB	10 LB	L/360
AREAS)	30 LB	10 LB	L/360
	10 LB	5 LB	L/240
	20 LB	10 LB	L/240
EILING)	30 LB SNOW	15 LB	L/240
LING)	30 LB	7 LB	L/180
	60 LB	10 LB	L/360

ADJUSTED TO REFLECT THE SLIDEOFF FACTOR, PITCH. RAFTER SIZES MAY HAVE TO BE TE HIGHER SNOW LOADS. ES.

UGLAS-FIR-LARCH, HEM-FIR OR WITH FB=1450 AND E=1.6 MINIMUM.

BE FREE FROM ALL SPLITS, CHECKS OR SHAKES.

WISE, PROVIDE DOUBLE HEADER JOISTS AND OPENINGS, DOUBLE JOISTS UNDER ALL OUBLE 2X12 HEADERS WITH 1/2" PLYWOOD,GLUED OR ALL OPENINGS IN 2X6 WALLS, DOUBLE 2X12 ER FOR ALL OPENINGS IN 2X4 WALLS.

3/4" TONGUE AND GROOVE SUBFLOOR WITH

HALL CONSIST OF (3)2X12 STRINGERS,5/4" OR 4" THICK RISERS OR MATERIALS FABRICATED ACTURER.

7. ALL WOOD PLATES IN CONTACT WITH CONCRETE SHALL BE "PRESSURE TREATED" & SILICONE SEALED.

8. "MICRO-LAM" BEAMS SHALL HAVE BENDING STRESS: FB=2,800 PSI. VERIFY WITH LOCAL CODES.

9. SPECIAL UPLIFT CONNECTORS AS INDICATED AT CANTILEVERED JOISTS SHALL BE "SIMPSON STRONG TIE" ANCHORS OR EQUAL.

10. MINIMUM HEADER SIZE SHALL BE (2)12"X6" UNLESS NOTED OTHERWISE EXTERIOR WALLS SHALL BE (2) 2X12 WITH 1/2" PLYWOOD.

11. ALL STRUCTURAL STEEL SHALL CONFORM WITH ASTM SPECIFICATION A-36.

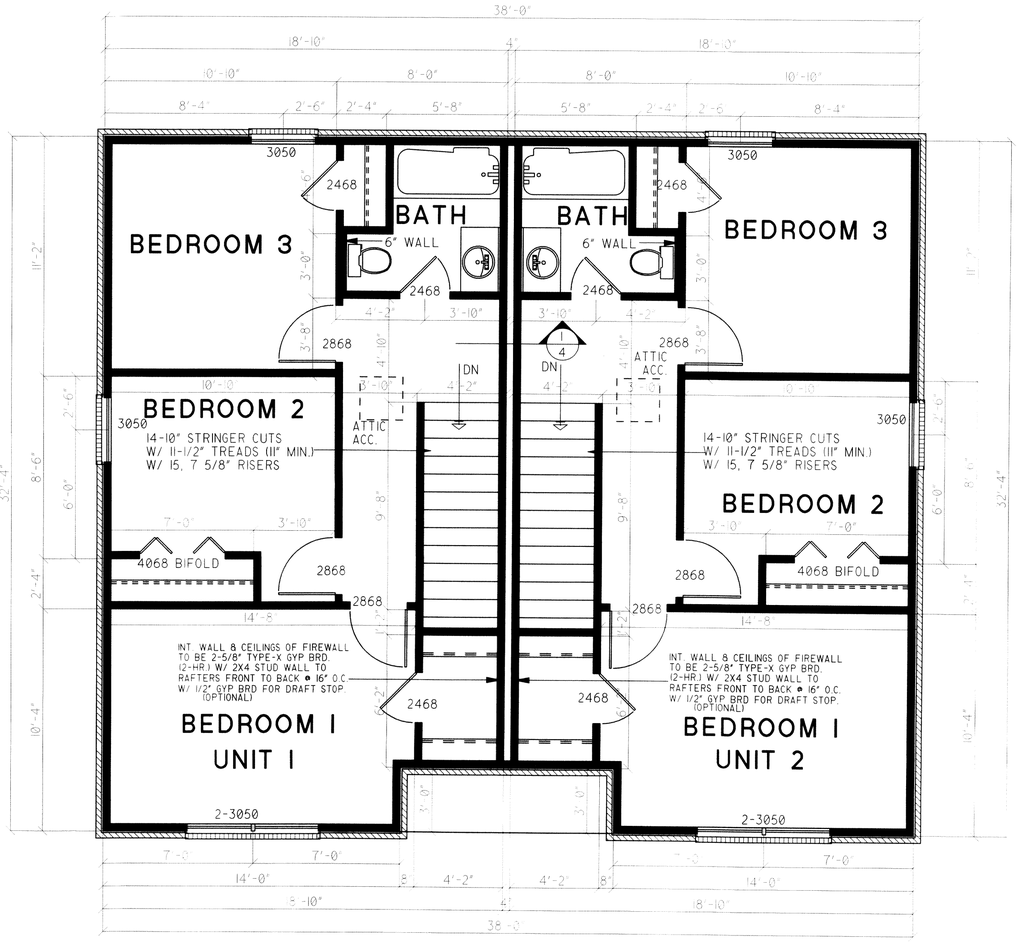
12. UNLESS OTHERWISE NOTED, PROVIDE A 2X PLATE BOLTED TO THE TOP FLANGE OF ALL STEEL BEAMS WITH 3/8" DIAMETER BOLTS STAGGERED AT 24" ON CENTER. RIGIDLY FASTEN ALL CONNECTING RAFTERS AND JOISTS AS APPROVED BY GOVERNING CODES, UNLESS OTHERWISE NOTED.

13. FLOOR FRAMING LAYOUT SHALL BE COORDINATED WITH THE GENERAL AND HVAC CONTRACTORS TO PROVIDE ACCESS CHASES AND UNOBSTRUCTED RUNS FOR HVAC DUCT WORK. FLOOR TRUSS LAYOUT TO BE ENGINEERED BY TRUSS MANUFACTURE.

14. PROVIDE BRIDGING OR BLOCKING AT MIDSPAN OF JOISTS/RAFTERS/TRUSSES, MAXIMUM SPACING BETWEEN BEARING WALL AND BLOCKING IS 8'-0".

15. THESE FRAMING PLANS WERE DESIGNED USING STANDARD CONSTRUCTION PRACTICES. THEY CONFORM TO STANDARD BUILDING CODES. DUE TO VARIATIONS IN LOCAL CODES AND GEOLOGICAL CONDITIONS REVISIONS MAY BE REQUIRED TO THESE PLANS.

16. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LOCAL CODES, REGULATIONS, AND FHA/VA MPS. THE BUILDER SHALL VERIFY ALL CONDITIONS BEFORE BEGINNING CONSTRUCTION. CONSULT WITH LOCAL STRUCTURAL ENGINEERS AND CODE OFFICIALS PRIOR TO USING THE FRAMING MATERIALS PROVIDED TO INSURE COMPLIANCE WITH CODES AND STRUCTURAL INTEGRITY.



UPPER FLOOR

FLOOR PLAN NOTES:

1. ALL STRUCTURAL INFORMATION SHOWN FOR REFERENCE PURPOSES ONLY. CONTRACTOR SHALL HAVE LICENSED STRUCTURAL ENGINEER REVIEW AND DESIGN ALL STRUCTURAL ELEMENTS SUCH AS ALL FRAMING WALLS, BEAMS, CONNECTIONS, HEADERS, JOISTS AND RAFTERS.

2. ALL DIMENSIONS ARE FROM FACE OF STUD TO FACE OF STUD UNLESS NOTED OTHERWISE.

3. WINDOW SIZES INDICATED ON PLANS ARE NOTED BY APPROXIMATE ROUGH OPENING SIZE, REFER TO PLANS AND EXTERIOR ELEVATIONS FOR WINDOW TYPES.

4. COORDINATE LOCATION OF UTILITY METERS WITH SITE PLAN AND LOCATE AWAY FROM PUBLIC VIEW. VISUAL IMPACT SHALL BE MINIMIZED, I.E. MOUNT AS LOW AS POSSIBLE.

5. PREFABRICATED FIREPLACE CONSTRUCTION SHALL MEET OR EXCEED ALL APPLICABLE CODES REGARDING USE OF FIRE SEPARATIONS, CLEARANCES, ETC. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL ITEMS AND CONSTRUCTION MEET OR EXCEED CODE. OVERALL FLUE HEIGHT SHALL BE COORDINATED TO MATCH HEIGHT SHOWN ON PLANS AND SHALL NOT EXCEED THE TOP OF CHIMNEY CHASE AS CONSTRUCTED.

6. CONTRACTOR SHALL COORDINATE ALL CLOSET SHELVING REQUIREMENTS.

7. DO NOT SCALE DRAWINGS. FOLLOW DIMENSIONS ONLY.

8. CONTRACTOR SHALL FIELD VERIFY ALL CABINET DIMENSIONS BEFORE FABRICATION.

9. BEDROOM WINDOWS SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQ.FT., A MINIMUM NET CLEAR OPENABLE WIDTH OF 20", A MINIMUM NET CLEAR OPENABLE HEIGHT OF 24" AND HAVE A MAXIMUM FINISH SILL HEIGHT OF 43" FROM FINISH FLOOR.

10. ALL GLASS LOCATED WITHIN 18" OF FLOOR, 12" OF A DOOR OR LOCATED WITHIN 60" OF FLOOR AT BATHTUBS, WHIRLPOOLS, SHOWERS, SAUNAS, STEAM ROOMS OR HOT TUBS SHALL BE TEMPERED.

11. ALL EXPOSED INSULATION SHALL HAVE A FLAME SPREAD RATING OF LESS THAN 25 AND A SMOKE DENSITY RATING OF LESS THAN 450.

12. PROVIDE COMBUSTION AIR VENTS, WITH SCREEN AND BACK DAMPER, FOR FIREPLACES, WOOD STOVES AND ANY APPLIANCE WITH AN OPEN FLAME.

13. BATHROOMS AND UTILITY ROOMS SHALL BE VENTED TO THE OUTSIDE WITH A MINIMUM OF A 90 CFM FAN. RANGE HOODS SHALL ALSO BE VENTED TO OUTSIDE.

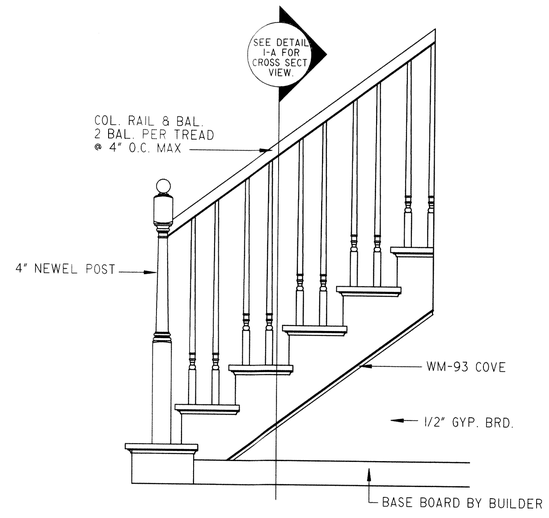
14. ATTIC HVAC UNITS SHALL BE LOCATED WITHIN 20' OF ITS SERVICE OPENING. RETURN AIR GRILLES SHALL NOT BE LOCATED WITHIN 10 FEET OF A GAS FIRED APPLIANCE.

15. ALL WALLS AND CEILINGS IN GARAGE AND GARAGE STORAGE AREAS TO HAVE 5/8" TYPE-X GYP. BOARD W/ 1-HOUR FIRE RATING. ALL EXT. DOORS IN GARAGE TO BE METAL OR SOLID CORE DOORS INCLUDING DOORS ENTERING HEAT/COOLED PORTION OF RESIDENCE.

16. ALL FIREPLACE CHASE WALLS SHALL BE INSULATED INSIDE AND OUTSIDE. PROVIDE HORIZONTAL "DRAFT STOPS" AT EACH FLOOR LEVEL BY PACKING 6" (R-19) INSULATION BETWEEN 2X4 JOISTS.

17. ALL INTERIOR WALLS SHALL BE COVERED WITH 1/2" GYPSUM BOARD, WITH METAL CORNER REINFORCING, TAPE, FLOAT AND SAND. (3 COATS) USE 5/8" GYPSUM BOARD ON CEILINGS WHEN SUPPORTING MEMBERS ARE 24" O.C. OR GREATER. USE 1/2" GYPSUM BOARD ON CEILING MEMBERS LESS THAN 24" O.C.

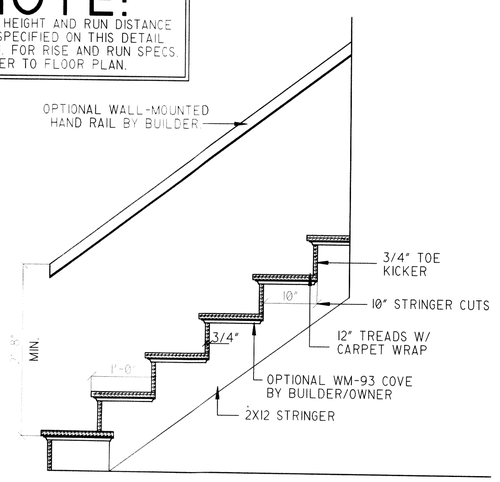
18. ALL BATH AND TOILET AREA WALLS AND CEILINGS SHALL HAVE WATER RESISTANT GYPSUM BOARD.



1 STAIR DETAIL

SCALE 3/4" = 1'-0"

NOTE:
STAIR RISE HEIGHT AND RUN DISTANCE ARE NOT SPECIFIED ON THIS DETAIL AND SECTION. FOR RISE AND RUN SPECS. REFER TO FLOOR PLAN.



1-A STAIR SECTIONAL

SCALE 3/4" = 1'-0"

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Nelson Design Group, LLC

FLOOR PLAN SPECIFICATIONS

HEAT/COOLED MAIN FLOOR UNITS 1,2:	594 SQ. FT.
HEAT/COOLED UPPER UNITS 1,2:	554 SQ. FT.
HEAT/COOLED TOTAL 1,2 UNIT:	1,148 SQ. FT.
HEAT/COOLED TOTAL ALL UNITS:	2,296 SQ. FT.
COVERED PORCH:	30 SQ. FT.

NOTE:

1 - MAIN FLOOR CEILINGS TO BE 8' UNLESS NOTED.
2 - UPPER FLOOR CEILINGS TO BE 8' UNLESS NOTED.
3 - BUILDER TO APPROVE & VERIFY ALL PLANS BEFORE CONSTRUCTION.
4 - VERIFY ALL PLANS W/ LOCAL BUILDING CODES.
5 - HVAC & W.H. TO BE IN ATTIC UNLESS OTHERWISE NOTED.
6 - PROVIDE SHUT-OFF VALVE FOR ALL GAS APPLIANCES. REFERENCE IRC SECTION G2419
7 - ALL GLASS LOCATED WITHIN 18" OF FLOOR, 12" OF A DOOR OR LOCATED WITHIN 60" OF FLOOR AT BATHTUBS, WHIRLPOOLS, SHOWERS, SAUNAS, STEAM ROOMS OR HOT TUBS SHALL BE TEMPERED TO COMPLY WITH IRC SECTION R308.4.8

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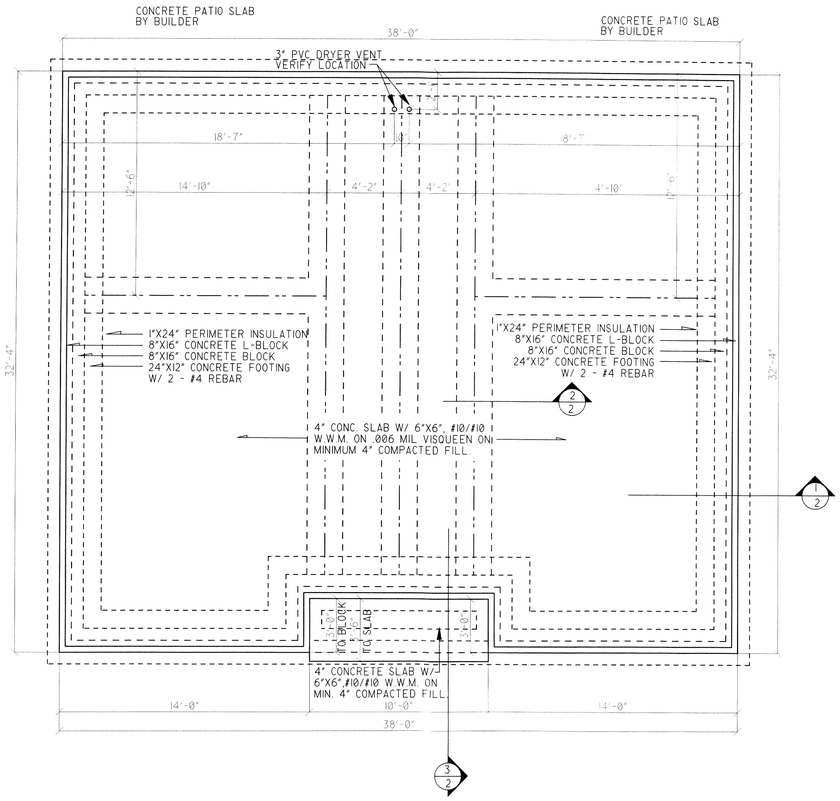
Scott Duplex

MAIN AND UPPER FLOOR PLAN / NOTES

CAD DESIGNED

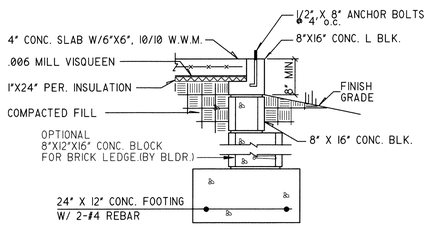


NOTE:

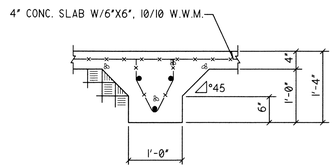
1.- BUILDER TO VERIFY ALL SOIL CONDITIONS BEFORE CONSTRUCTING FOUNDATION. IF POOR CONDITIONS EXIST CONSULT A STRUCTURAL ENGINEER.
2.- BUILDER TO VERIFY FOUNDATIONS DETAILS W/ LOCAL BUILDING CODES.
3. VERIFY ALL FLOOR OUTLETS, RANGE & DRYER VENTS IN SLAB.

NOTE:

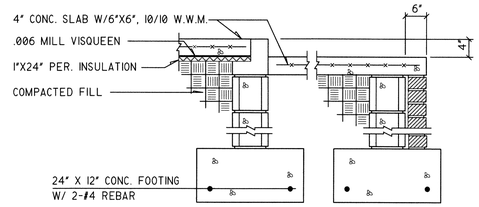
ALL DIMENSIONS ARE FROM EXTERIOR STUD WALL. WHEN LAYING 8"X12"X16" COURSES, ALLOW 4" TO ALL EXTERIOR DIMENSIONS FOR OPTIONAL BRICK LEDGE.



1 FOUNDATION DETAIL
3/4" = 1'-0"



2 BEARING FTG DETAIL
3/4" = 1'-0"



3 STEP DOWN DETAIL
3/4" = 1'-0"

GENERAL NOTES:

In case of conflict between the General Notes below and the specifications the more rigid requirement shall govern unless amended in writing by the Engineer.

DESIGN DATA

1. Design Codes - (All latest editions unless noted)
   - -American Concrete Institute (ACI)
   - -American Institute of Steel Construction (AISC)
   - -American Welding Society (AWS)
   - -Southern Standard Building Code (SSBC)
   - -American National Standards Institute, Inc. (ANSI A58.1-1982) Minimum Design Loads for Buildings and Other Structures
2. Material Specifications and Design Stresses
   - -Anchor Bolts and Embedded Steel.....Fy = 36,000 psi (ASTM A36)
   - -Structural Steel UNO.....Fy = 36,000 psi (ASTM A36)
   - -Cast-in-place Concrete
   - -Footings.....F'c = 3,000 psi at 28-days.
   - -Interior slabs-on-grade.....F'c = 3,000 psi at 28-days.
   - -Ext. exposed concrete (air entrained).....F'c = 4,000 psi at 28-days.
   - -Reinforcing Steel
   - -#2 and #3 bar3 only.....Fy = 40,000 psi (ASTM A615, Grade 40)
   - -#4 and larger bars.....Fy = 60,000 psi (ASTM A615, Grade 60)
3. Design Soil Bearing Pressures
   - -Reference Soil and Foundation Investigation by Grubbs, Garner, & Hoskyn, Inc. Consulting Engineers, Little Rock, AR.
   - -Footings on natural soils are designed for a maximum soil bearing pressure of 2,000 psf.
   - -Footings on compacted engineered fill are designed for maximum soil bearing pressure of 2,000 psf.
   - -If the soil at the footing bearing elevations shown is of questionable bearing value, the Engineer or Architect shall be notified immediately.
   - -After footing excavations are completed and before placing concrete, the excavated area shall be inspected and approved by the Owner selected independent testing laboratory as specified.

GENERAL INFORMATION

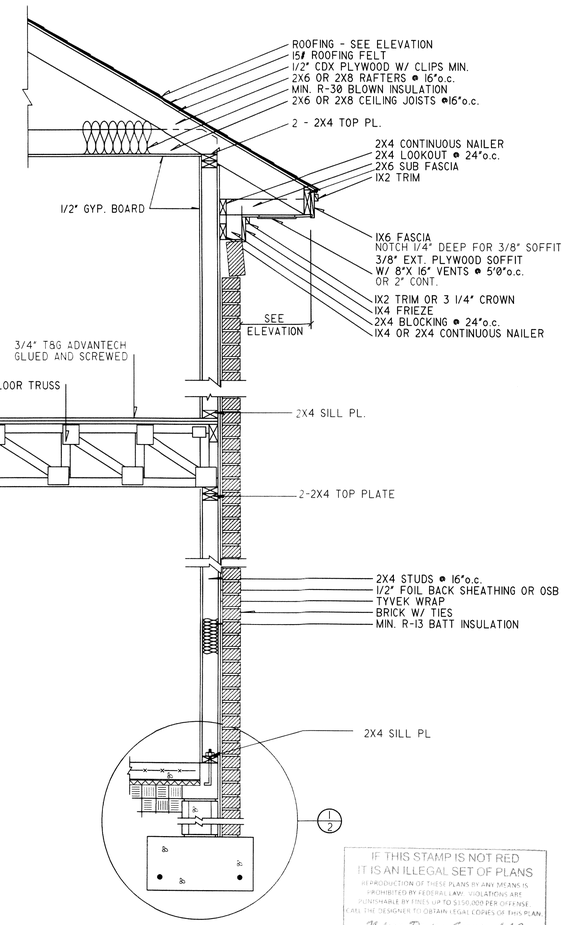
1. All columns shall be centered on grid lines unless noted otherwise.
2. All column footings shall be centered on columns unless noted otherwise.
3. All wall footings shall be centered on walls unless noted otherwise.
4. For concrete reinforcing at corners, see typical corner bar detail.
5. For slab-on-grade construction joint detail, see typical slab-on-grade detail.
6. All fill material under structure shall be sandy clay or clayey sand exhibiting a liquid limit less than 35. Fill material shall be placed in loose lifts not to exceed 8" and compacted to a density of not less than 95% of Modified Proctor Maximum Dry Density (ASTM D-1557) at or slightly wet of optimum moisture content. In place moisture and density of each lift shall be determined by in-situ field tests prior to placing additional fill.
7. Where noted C.J. on plan, provide Keyed Joint in floor slab.
8. A 6-mil polyethylene film vapor barrier shall be placed below all interior slabs-on-grade.
9. Provide a 4-inch clean medium to coarse sand or gravel compacted drainage fill below all interior slabs-on-grade.

CAST-IN-PLACE CONCRETE

1. Arrangement and bending of reinforcing steel shall be in accordance with ACI detailing manual, latest edition.
2. Reinforcing steel shall be new and all bars over #2 shall be deformed.
3. Where reinforcing bars are shown continuous, lap bars 36-bar diameters or 24-bar diameters at tension or compression splices respectively (12" minimum).
4. Provide suitable wire spacers, chairs, ties, etc., for supporting reinforcing steel in the proper position while placing concrete.
5. Concrete protective covering for reinforcement at surfaces not exposed directly to the ground shall be 3/4" for slabs, joists, and walls and 1-1/2" for beam stirrups and column ties or spirals.
6. Concrete protective covering for reinforcement at surfaces which will be exposed to the weather or be in contact with the ground shall be 2" for bars larger than #5 and 1-1/2" for #5 bars or smaller. Provide 3" cover below and at ends of footing bars.
7. Location and sizes of openings, sleeve, etc., required for other trades must be verified by these trades before placing concrete.

CONCRETE MASONRY UNITS

1. Place vertical reinforcing bars at corners, jambs of openings, below beam bearing, and in walls as indicated on the drawings.
2. Dowell vertical reinforcing bars out of the structure below with bars of the same size and spacing above.
3. Lap splice bars in masonry 40 bar diameters.
4. Place horizontal bars in 8" deep bond beam units at top of wall.
5. Continue bond beam units and reinforcing uninterrupted around corners and across wall intersections.
6. Metal masonry-course reinforcing shall be truss type conforming to ASTM A82, not less than 9 gauge, galvanized at exterior walls. Furnish material with prefabricated corners and tees. Reinforcing shall be used in all partitions, spaced 16" o.c., vertically, joints lapped 6". Place reinforcing in first bed joint above and below all concrete slabs and wall openings.
7. Load bearing concrete masonry units shall conform to ASTM C90, Grade N, Type I, with minimum average compressive strength on net area of 1,100 psi and minimum net area compressive strength of individual units shall be 1,500 psi.
8. Non-loan bearing concrete masonry units shall conform to ASTM C129, Type I.
9. Mortar shall be Type N conforming to property or protection requirements of ASTM C476.
10. All masonry fill concrete shall have a minimim strength at 28-days f'c = 3,000 psi, maximum aggregate shall be 3/8" and shall be placed in maximum lifts of 4'-0".
11. All grout shall conform to ASTM C476, Fine Grout.



SLAB FOUNDATION SECTIONAL DETAIL
3/4" = 1'-0"

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REVISIONS	BY
	24x36

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MICHAEL E. NELSON
P.B.D. Cert. No. AR-104

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DATE	4/4/2019
SCALE	1/4" = 1'-0"
BUILDER	
JOB	MENC115-19
DRAWN BY	SMN

2 OF 5

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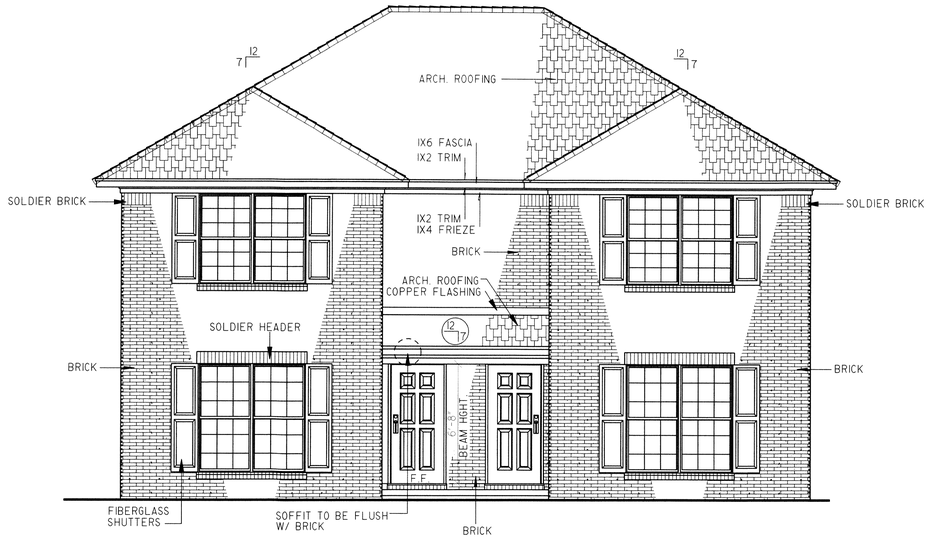
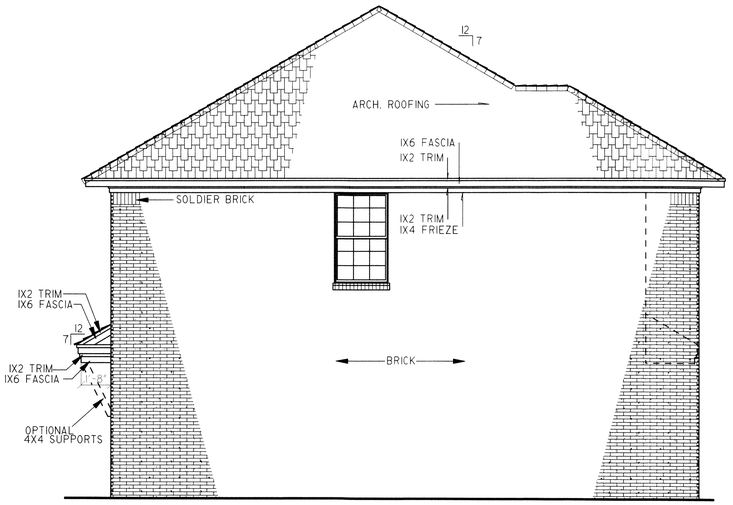
Scott Duplex

FOUNDATION (SLAB) PLAN / NOTES

CAD DESIGNED



FRONT ELEVATION



LEFT ELEVATION

ELEVATION NOTES:

1. GUTTERS AND DOWNSPOUTS ARE NOT SHOWN FOR CLARITY. DOWNSPOUTS SHALL BE LOCATED TOWARDS THE FRONT AND REAR OF THE HOUSE. LOCATE DOWNSPOUTS IN NON-VISUALLY OFFENSIVE LOCATIONS, FOR EXAMPLE, FRONT WALL OF HOUSE, BESIDE PORCH COLUMNS, ETC. GENERAL CONTRACTOR SHALL VERIFY EXISTING GRADES AND COORDINATE ANY NECESSARY ADJUSTMENTS TO HOUSE WITH OWNER.

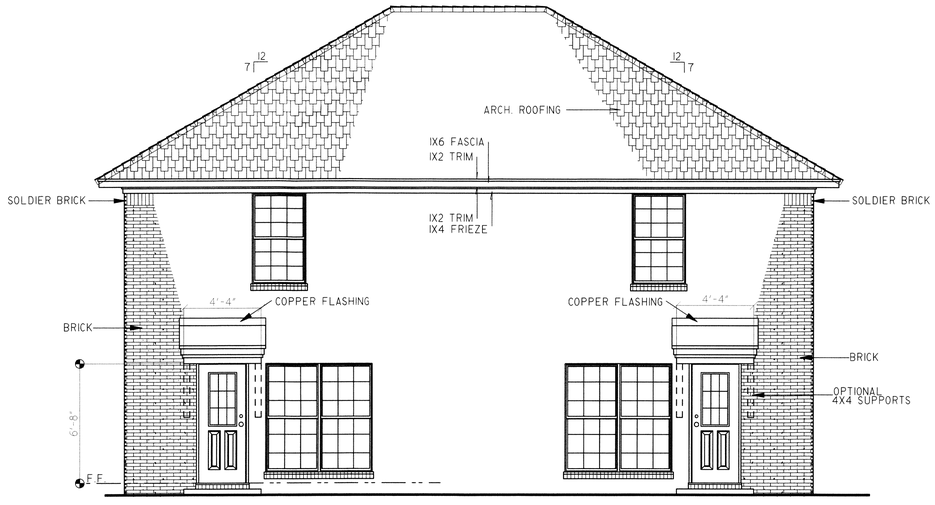
2. PLUMBING AND HVAC VENTS SHALL BE GROUPED IN ATTIC TO LIMIT ROOF PENETRATIONS AND TO BE LOCATED AWAY FROM PUBLIC VIEW, I.E. AT THE REAR OF THE HOUSE AND SHALL BE PRIMED AND PAINTED TO MATCH ROOF COLOR.

3. PROVIDE ATTIC VENTILATION PER LOCAL CODE REQUIREMENTS.

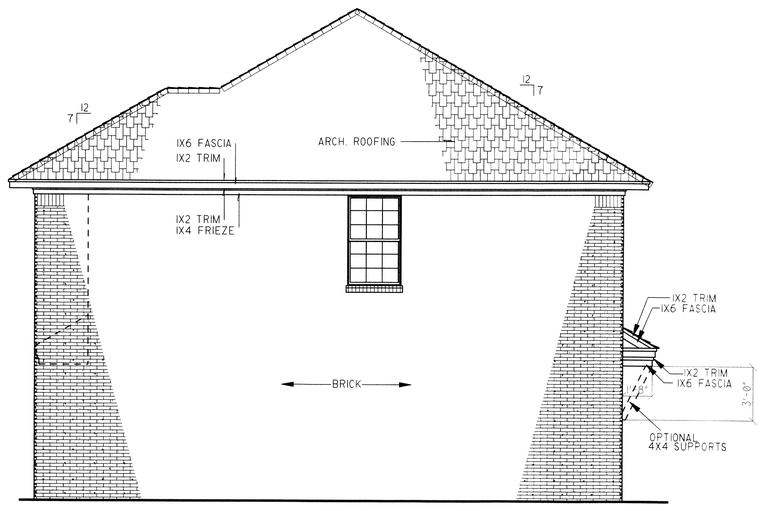
4. EXTERIOR FLASHING SHALL BE CORRECTLY INSTALLED AT ALL CONNECTIONS BETWEEN ROOFS, WALLS, CHIMNEYS, PROJECTIONS AND PENETRATIONS AS REQUIRED BY APPROVED CONSTRUCTION PRACTICES.

5. CONTRACTOR SHALL PROVIDE ADEQUATE ATTIC VENTILATIONS / ROOF VENTS PER LOCAL GOVERNING CODE. INSTALL CONTINUOUS RIDGE VENTILATION AND PAINT TO MATCH ROOF. PROVIDE APPROPRIATE SOFFIT VENTILATION AT OVERHANGS.

REVISIONS	BY
	24x36



REAR ELEVATION



RIGHT ELEVATION

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DATE	4/4/2019
SCALE	1/4" = 1'-0"
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JOB	MENC115-19
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ELEVATIONS / NOTES

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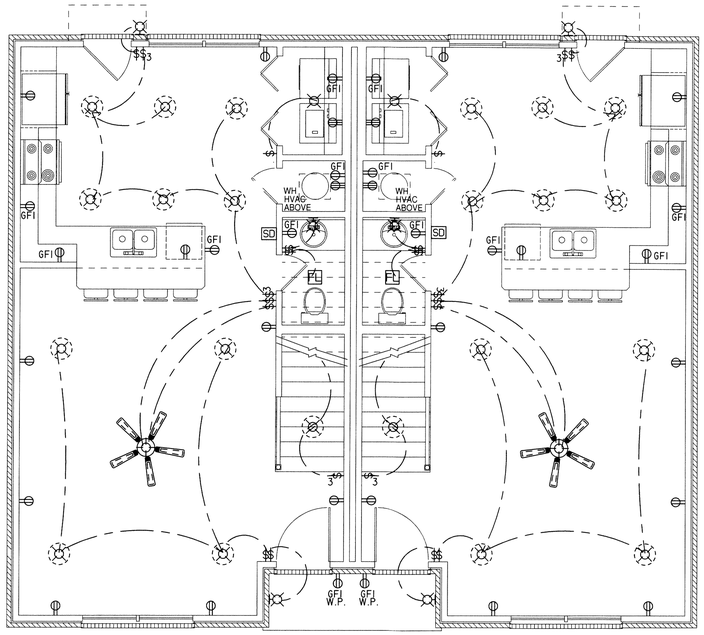
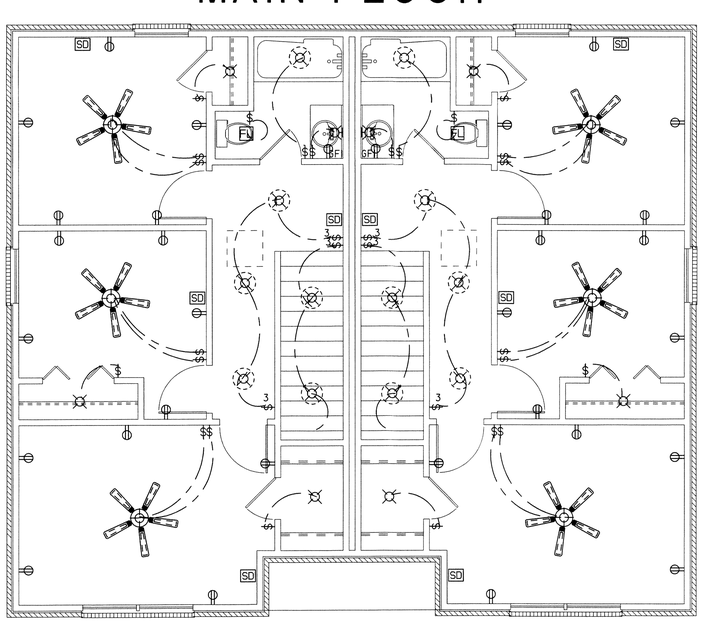
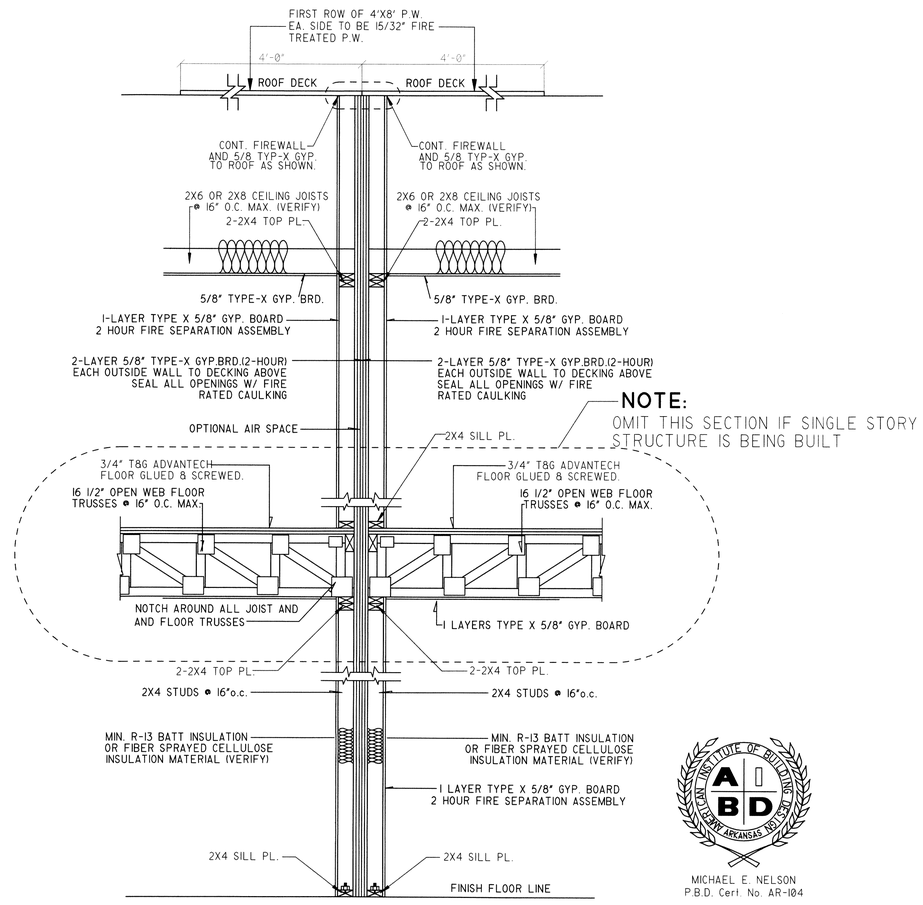


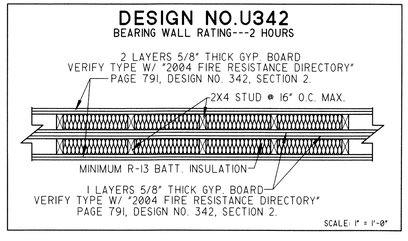
MAIN FLOOR

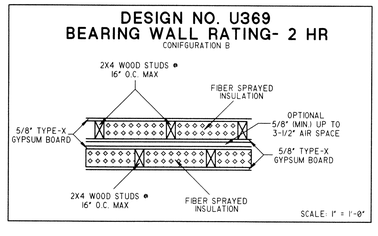


UPPER FLOOR



NOTE:
OMIT THIS SECTION IF SINGLE STORY STRUCTURE IS BEING BUILT





TYPICAL
① FIREWALL SECTIONAL DETAIL
3/4" = 1'-0"

NOTE:
1 - OWNER TO VERIFY & APPROVE ALL ELECTRICAL & POSSIBLE FLOOR OUTLET LOCATIONS NOT NOTED.
2 - PROVIDE ARC-FAULT INTERRUPTER PROTECTION FOR ALL BEDROOMS. REFERENCE IRC SECTION E3902.
3 - OWNER TO LOCATE AND VERIFY PHONE & CABLE JACKS.
4 - SEE OWNER FOR ALL OUTDOOR ELECTRICAL NEEDS AND LIGHTING.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
Ⓕ	EXHAUST FAN
	CEILING FAN
	CEILING FAN W/ LIGHT
FL	EXHAUST FAN W/ LIGHT
HLV	HEAT, LIGHT AND VENT
	LIGHT
	4' FLORESCENT LIGHT
	2' X 4' FLORESCENT LIGHT
	6" RECESSED CAN LIGHT
	3" RECESSED CAN LIGHT
	FLOOD LIGHT
	WALL MOUNTED LIGHT
	ELECTRICAL OUTLET
	220V ELECTRICAL OUTLET
	CEILING MOUNTED OUTLET
	FLOOR MOUNTED OUTLET
	HIDDEN OUTLET
	SWITCHED OUTLET
	BREAKER BOX
	PHONE
SD	SMOKE DETECTOR
$	SWITCH
$$	STACKED SWITCHES
3	THREE WAY
4	FOUR WAY
GFI	GROUND FAULT INTERRUPTER
W.P.	WATERPROOF
	ELECTRICAL WIRE
TV	CABLE TV
	TRACK LIGHTING

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ELECTRICAL PLANS / NOTES

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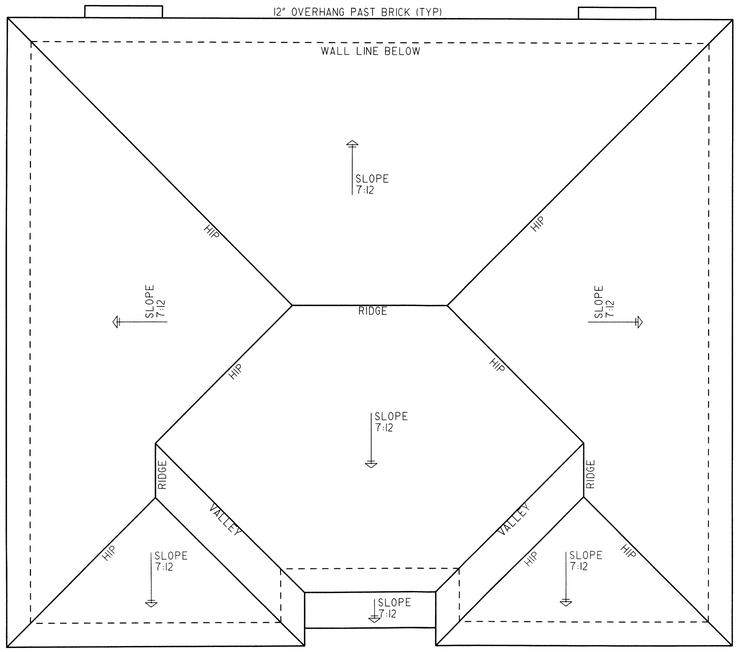
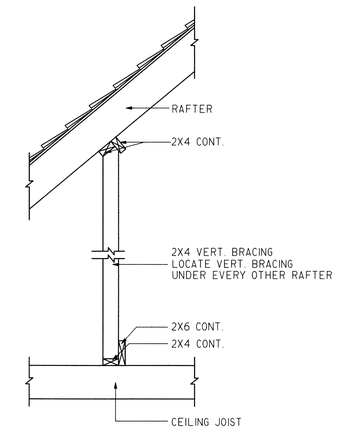
SCALE	1/4" = 1'-0"
BUILDER	
JOB	MENC1115-19
DRAWN BY	SMN



ROOF PLAN

1/4" = 1'-0"

NOTE:
1.- MAIN ROOF PITCH TO BE 7:12 UNLESS NOTED.
2.- MAIN PLATE LINE TO BE 8'-0" UNLESS NOTED.

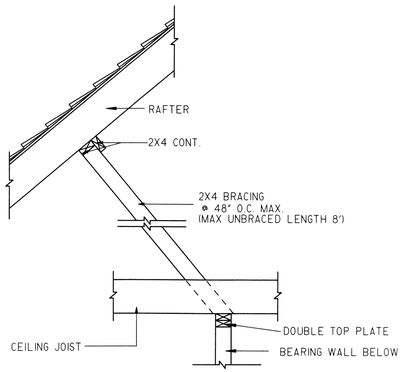


RAFTER BRACING DETAIL

3/4" = 1'-0"

FRAMING NOTES:

1.- RAFTERS TO BE SUPPORTED BY CONT. BRACING FOR HORIZONTAL SPANS OF 15'-0" OR GREATER.
2.- SUPPORT ALL HIP, VALLEY, AND RIDGES @ 8'-0" O.C. MAX.
3.- ALL RAFTERS TO BEAR ON SECOND FLOOR WALLS WHERE APPLICABLE.
4.- RAFTERS MAY BE SPLICED ONLY @ CONT. BRACING OR SECOND FLOOR WALLS.
5.- RAFTERS TO BE PLACED IN COMPLIANCE WITH ALL LOCAL CODES.
EXAMPLES:
A.- 2X6 RAFTERS @ 16" O.C. MAX. WITH 1/2" P.W. DECKING.
B.- 2X6 RAFTERS @ 24" O.C. MAX. WITH 5/8" P.W. DECKING.
C.- 2X8 RAFTERS @ 24" O.C. MAX. WITH 5/8" P.W. DECKING.
D.- 2X8 RAFTERS @ 16" O.C. MAX. WITH 1/2" P.W. DECKING.
6.- FASCIA OVERHANG TO BE 12" (TYP.) UNLESS NOTED ON ELEVATIONS.
7.- ALL HIP / VALLEY RAFTERS TO BE 2X10 UNLESS NOTED.



OPT. RAFTER BRACING DETAIL (PURLIN)

3/4" = 1'-0"

NOTE:
PURLINS ARE PERMITTED TO BE INSTALLED TO REDUCE THE SPAN OF RAFTERS. PURLINS SHALL BE SUPPORTED BY 2-INCH BY 4-INCH BRACES INSTALLED TO BEARING WALLS AT A SLOPE OF NOT LESS THAN 45 DEGREES. THE BRACES SHALL NOT BE SPACED MORE THAN 48" APART ON CENTER AND THE UNBRACED LENGTH OF BRACES SHALL NOT EXCEED 8 FT. PULINS SHALL BE CONTINUOUS. (REFER IRC R802.5.1)

INSULATION NOTES:

1. PROVIDE R-19 BATT INSULATION IN 2X6 WALLS, R-13 IN 2X4 WALLS, MINIMUM R-30 INSULATION IN FLAT CEILINGS AND R-30 MINUMUM BLANKET INSULATION IN VAULTED CEILINGS. ALLOW 1/2" MINIMUM AIRSPACE BETWEEN SHEATHING AND INSULATION, FACE FOIL DOWN TO WARM SIDE.

2. INSTALL SIDE WALL AND CEILING INSULATION IN CONTINUOUS BLANKETS WITHOUT HOLES FOR ELECTRICAL BOXES, LIGHT FIXTURES OR HEATING DUCTWORK. CAULK ALL OPENINGS IN EXTERIOR WALL CONSTRUCTION.

3. INSTALL 6 MIL POLYETHYLENE VAPOR BARRIER AGAINST INSIDE OF ALL INSULATION. LAP JOINTS 18" MINIMUM.

4. FLOORS OVER UNHEATED SPACE SHALL HAVE R-25 FOIL BACK INSULATION BETWEEN JOISTS.

5. SLAB EDGE INSULATION R-5.

6. HVAC DUCTS LOCATED IN UNHEATED SPACES SHALL BE INSULATED WITH R-8.

SECTION NOTES:

1. PROVIDE INSULATION BAFFLES AT EAVE VENTS BETWEEN RAFTERS / TRUSSES.

2. RIDGES, VALLEY AND HIP MEMBERS SHALL BE FULL VERTICAL DEPTH OF FRAMING MEMBERS

3. PROVIDE 2X6 COLLAR TIES AT 48" O.C.

4. PROVIDE CONTINUOUS 2X6 PURLINS AT MID-SPAN OF RAFTERS, SPACE AT 8'-6" MAX.

5. PROVIDE 2X4 STRUTS AT 48" O.C. FROM PURLINS TO BEARING WALLS AT 45 MINIMUM ANGLE.

6. HANDRAILS SHALL BE MOUNTED 34" MIN. ABOVE NOSING OF STAIRS. GUARDRAILS SHALL BE MOUNTED AT 36".

PLUMBING NOTES:

1. PLUMBING SHALL MEET ALL LOCAL CODES.

2. IF WATER HEATER IS LOCATED ANYWHERE, EXCEPT GARAGE OR BASEMENT, PROVIDE METAL DRAIN PAN WITH AUXILLARY DRAIN TO EXTERIOR.

3. ALL GAS WATER HEATERS SHALL BE VENTED AT TOPOUT.

4. PROVIDE INSIDE MAIN WATER CUT-OFF.

5. PROVIDE BLOCKING IF WALL PLATES OR JOISTS ARE CUT INTO.

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ROOF PLAN / NOTES

CAD DESIGNED

GENERAL

1. CODES: The Uniform building Code, latest edition, of the international Conference of Building Officials, with possible modifications by local code administration, shall govern where not otherwise qualified in the Specification.
2. Site Work: includes all demolition, site clearing, excavation, filling, grading drainage, and related items necessary to complete the work indicated on Drawings.
3. In the event of conflict between pertinent codes and regulations and referenced standards of these Specifications, the more stringent provisions shall govern.
4. Structural Specifications and Drawings for this work have been prepared in accordance with generally accepted engineering practice to meet minimum requirements of the latest edition of the Southern Building Code.
5. Specifications and Drawings indicate finished structure. Builder shall be responsible for construction methods, procedures, and conditions (including safety), except as specifically indicated otherwise in the contract documents.
6. Construction loads shall not overload structure nor shall they be in excess of design loadings indicated on drawings.
7. Builders shall verify all materials, dimensions, and conditions shown on Structural or noted in Structural Specifications. Any variances within Structural Drawings and Specification, or with conditions encountered at the job site, shall be reported to Owner in writing before commencement of any work effected by such variance.
8. Builder shall rigidly adhere to all laws, codes, and ordinances which apply to this work. We shall notify and receive clarification from owner in writing of any variations between contract documents and governing regulations.
9. All manufactured materials, components, fasteners, assemblies, etc. shall be handled and installed in accordance with manufacturer's instructions and provisions of applicable ICBO Research Recommendations. Where specific manufactured products are called for, generic equals which meet applicable standards and specifications may be used.
10. No variance by a Building Official shall be binding on Designers.
11. Builder shall investigate site during clearing and earthwork operations for filling excavations or buried structures such as cess pools, cisterns, foundations, etc. If any such items are found, Owner shall be notified immediately.
12. Backfill shall not be placed against basement retaining walls until:
   A. Concrete or masonry grout has reached its specified 28 day strength.
   B. And, structural floor framing (including plywood subfloor) required to stabilize walls is complete and fully nailed and anchored.
13. Foundation walls of habitable rooms located below grade shall be waterproofed with membranes extending fron the edge of the footing to the finished grade line. The membrane shall consist of either 2-ply hotmopped felts, 6-mil polyvinyl chloride, 55-pound roll roofing or equivalent material. The laps in the waterprof membrane shall be sealed and firmly affixed to th wall.

FOUNDATIONS

1. General :
   A. Footing thicknesses shown on Drawings are minimum.
   B. Footings may be poured neat against sides of excavations only if approved by owner.
   c. Builder shall be responsible for support of all temporary embankments and excavations.
2. Backfill:
   A. Backfill shall be placed in 6 inch maximum lifts and compacted to minimum density of 90% (under slabs on grade) and 90% (elsewhere) of maximum density of optimum moisture content as determined by AASHTO Standard T99.
   B. Backfill shall consist of non expansive, free draining, predominantly granular material, free of debris and organic material.
3. Footings:
   A. Footings are sized for a minimum total load bearing pressure of 3000 psf. (1-STORY) 3500 psf (2-STORY) except as
   B. Footings shall by placed at a depth to conform to local shown otherwise on Drawings or codes.
   C. Final 3" of excavation shall be removed by hand tool operations in order to assure undisturbed bearing surfaces.
   D. Footings shall be founded on firm, undisturbed, native, free draining soils. Conditions found to be otherwise shall be reported to Owner,
   E. Bottom surface of footings shall not slope more than 1.0 vertical to 10.0 horizontal, except as shown on Drawings.
   F. No excavation shall be made lower and closer to any footings than 1.0 vertical to 3.0 horizontal, except as shown on Drawings.
   G. All ground over which footings and slab on grade are to be placed shall be free of expansive of compressible debris and organic materials.
   H. Footings and slab on grade concrete shall not be placed on muddy or frozen ground. Sub grade for slab where vapor barrier is not required shall be damp at time of concrete placement.

CONCRETE

1. Concrete construction shall conform to " Specifications for Structural Concrete for Buildings"(ACI 301), Recommended Practice for Concrete Formwork"(aci 347), Recommended Practice for Measuring, Mixing, Transporting. and Placing Concrete." (act 304).
   A. Concrete shall have minimum 28 day field cured compressive strength of 3000 psi (f'c = 3000 psi), (1- STORY) unless otherwise specified. 3500 psi (f'c = 3500 psi), (2- STORY) unless otherwise specified.
   B. Use air entraining admixture in all concrete, provided not less than 4% nor more than 8% entrained air for concrete exposed to freezing and thawing, and from 2% to 4% for other concrete.
   C. Admixture containing chloride salts shall not be used.
   D. Materials for Concrete: 1. Portland Cement ASTM C150, Type as required. 2. Aggregates ASTM C 33. 3. Water portable, clean, free of oils, acids, alkali, and organic matter. 4. Air Entraining Admixture ASTM C 260. 5. Water Reducing Admixture ASTM C 494. Type A.
   E. Membrane Forming Curing Compounds: ASTM C 309.
   F. Form Materials:
      1) Exposed concrete Surfaces: Panel type to provide continuous straight, smooth finish. Use largest practical sizes to minimize form joints.
      2) Unexposed Concrete Surfaces: Suitable materials, dressed on at least 2 edges and one side for tight fit.
2. Concrete shall be of : "Ready Mixed Concrete" and shall confirm to ASTM C 94. Mix alternate No. 2.
   A. At time of placement, concrete shall have a slump of 4" maximum (per ASTM C143).
   B. All concrete shall be thoroughly consolidated during placement using a mechanical vibrator.
3. Concrete when placed shall have a temperature between 50 degrees and 70 degrees F. Temperature of concrete during mixing of transportation shall never by lower than 40 degrees F. nor higher than 90 degrees F.
   A. During cold weather (ambient temperatures below 40 degrees F.) Builder shall maintain concrete at a minimum temperature of 50 degrees F. for 3 days and above 32 degrees F. for 14 days following its placement. Follow ACI 306R recommendations for cold weather concreting.
   B. During hot weather (ambient temperature above 80 degrees F.) Builders shall follow recommendations for hot weather concreting as described in ACI 305 R as required to minimize temperature and shrinkage cracking of concrete.
4. Concrete shall be conveyed and deposited in accordance with recommendations of ACI 403.
5. Membranes curing compound shall be provided on all horizontal slab surfaces. Curing compound shall conform to ASTM C309 , and shall be applied in accordance with manufacturer's printed instructions.
6. Except where detailed on Structural Drawings, reinforcement shall not be displaced or cut to provide clearance for penetrations, inserts, or embedments.
7. Design, fabrication, installation, and removal of concrete formwork is solely the responsibility of Builder.
8. Anchor bolts cast in concrete shall conform to ASTM A307.
9. Concrete Placement: Comply with ACI 304, Placing Concrete, and ACI 304.2R Placing Concrete by Pumping Method.

MASONRY

1. Masonry Units:
   A. All hollow concrete units shall be at least 7 5/8"x 7 5/8" x15 5/8" and shall provide minimum unobstructed vertical cores with a least dimension of 3 1/2" when laid up in running bond, unless otherwise specified on Drawings.
   B. Moisture content of hollow concrete units per ASTM C90 at time of laying shall not exceed 30% of total absorption.
2. Mortar:
   A. Mortar shall conform to UBC Type "5" ASTM C476 & ASTM C91.
   B. Mortar shall be retempered as required to keep it plastic, shall be used within 1 hour of initial mixing, and shall not be allowed to stand for longer than 1/2 hour without remixing. Minimum 1800 psi.
3. Grout:
   A. Grout shall be proportioned in conformance with ASTM C476, except as otherwise specified. Maximum size aggregate shall be 3/8".
   B. Grout shall have an average 28 day ultimate compressive strength of 3000 psi.
   C. Grout shall be mixed with sufficient water to be properly placed in cells without segregation.
   D. Mortar shall not be used for, of in, the grout.
   E. No line shall be allowed in grout.
   F. Grout shall be mixed in a mechanical mixer for at least 5 minutes after all water to be used has been added. Ready mixed grout shall conform to all applicable specifications of ASTM C 94. No water shall be added to ready mix grout after its discharge from mixer.
4. Specified 28 day compressive strength as determined by prism tests shall be 1350 psi (f'm=1350 psi).
5. Proper units shall be used to provide for all windows, doors,bond beams, lintels, pilasters, etc.,With a minimum of cutting.
6. All masonry units shall be clean and sound when layed up. Hollow concrete units shall be dry when layed up. Stone and brick units shall be saturated surface dry when layed up.
7. Lay masonry in running bond except as designed otherwise on Drawings. Provide masonry bonds at all corners and intersections.
8. Grout all cells containing reinforcement, bolts, or indicated as grouted on Drawings. Wood, paper, or cardboard shall not be used as grout dams.
   Cells not filled with grout shall be filled with vermiculite poured insulation material. All cells shall receive fill.
9. Masonry shall be layered up and grouted in lifts not exceeding 4' 0". Vertical grout pours shall be stopped 1 1/2" below the top of the top most unit. Each bond beam shall be grouted with lift below.
10. All beams and lintels shall be grouted such that horizontal grout travel is limited to two feet.
11. All grout shall be thoroughly consolidated, and reconsolidated, using a mechanical masonry vibrators.
12. Masonry shall not be layed up or grouted when ambient temperature is below 40 degrees F. of above 90 degrees F. Masonry shall be protected from freezing temperatures for at least 14 days after laying. When ambient temperatures exceed 90 degrees F., units that have previously been layed up shall be given a very fine, light fog spray of water every four hours until 48 hours have elapsed since layed up.

MILD STEEL REINFORCEMENTS FOR CONCRETE AND MASONRY

1. Mild steel reinforcement for concrete and masonry construction shall be manufactured, detailed, fabricated, and placed in accordance with:
   "Building Code Requirements for Reinforced Concrete"(ACI 316R) and "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R, ACI SP 66) and shall be deformed steel bars conforming to ASTM A615, Grade 4C.
   A. Ties, stirrups, and hoops shall conform to ASTM A615, Grade 4C.
   B. Reinforcement shall not be bent in the field unless all of the following provisions are met:
      1) The bars are of size 06 and smaller.
      2) ASTM A615, Grade 40 bars are provided.
2. Welded wire fabric shall conform to ASTM A 185, in as long lengths as practicable.
3. Splices: A. Reinforcement in concrete and masonry shall have
A. Reinforcement in concrete and masonry shall have lap lengths as follows, unless otherwise specified on Drawings.

Bar Size	Length in Concrete	Length in Masonry
#3	1' 6"	2' 0"
#4	2' 0"	2' 6"
#5	2' 6"	3' 3"
#6	3' 4"	3' 9"

   1) Welded wire fabrics shall be lapped one grid width plus 2"
   2) Reinforcement shall be bent cold.
   3) Reinforcement shall not be welded.
4. Placing:
   A. Reinforcement shall be accurately placed and adequately supported by concrete, metal, or other approved chairs, spacers, or ties, and secured against displacement during concrete or grout placement. Tack welding not allowed.
   B. Except where shown otherwise on Structural Drawings, reinforcement in concrete cover as follows:
      1) Concrete deposited against earth..............3"
      2) Formed concrete against earth.................2"
      3) Exterior faces of walls.............................2"
      4) Interior faces of walls..........................3/4"
      5) To top of slabs on grade.......................3/4"

WOOD

1. Materials:
   A. Sawn lumber.
      1) Sawn lumber calculations are based on Douglas Fir Larch, except as shown otherwise on Drawings, graded in accordance with Standard Grading Rules of WWPA or Rule No. 16 of WCLB, as follows:
         A. Light Framing No. 2 and better
         B. Studs No. 2 and better (Light Framing)
         C. Joists and Planks No. 1 and better
         D. Beams and Stringers Dense No. 1 and better
         E. Posts and Timbers Dense No. 1 and better
      2) All 2" lumber shall be seasoned to 19% maximum moisture content.
      3) All wood in contact with concrete, masonry, or soil shall be pressure treated per UBC Standard 25 12.
   B. Glued laminated members shall be Douglas Fir Larch or equal, confirming with the AITC 117 82 and PS 56 73 fabricated with wet use adhesive.
      1) Grade combination "22F" unless otherwise specified on Drawings. C. All plywood shall be identified by grade mark of an approved inspection agency and shall be Standard C D, Flat Interior with ext. glue unless otherwise specified no Drawings.
   D. Light timber decking shall be constructed with 2" tongue and groove plank commercial decking grade marked by an approved inspection agency. Decking shall be laid in accordance with Section 2517 (e.3) UBC (joints in such planking may be randomly spaced, provided the system is applied to not less than three continuous spans, planks are center matched, each plank bears join at least one support and joints are separated by at least 24 inches in adjacent pieces.)
2. Connections:
   A. Nailing. Minimum nailing requirements for standard connections unless specifically shown of noted otherwise. Automatic nailing of stapling devices shall not be used without prior approval of method and fasteners by Owner.

Item	No. or o/c of Nails	Size of Nail Box or Common
Toe nail to plates, sill or girder	3	8d
To parallel alternate joists-	3	16d
At laps overbearing, face nail	3	16d
Studs		
End nail to plates	2	16d
Or toe nail 2 ea. side	4	8d
Top Plates		
Spike together	16" o/c	16d
Laps & intersections, face nail	2	16d
Blocking		
To plate	2	16d
or toe nail	4	8d
To joist each side	2	16d
or toe nail	4	8d
Bridging		
Toe nail to joists, each end	2	8d
Studs		
Corner, angle, or multiply	24"o/c	16d
2"x laminated beams or lintels		
Spike together	16"o/c	16d
Double joists or headers		
Spike together, along ea. edge	16"o/c	16d
Plywood sheathing and sub floor nailing		
At edges of each sheet 3/8" thk.	8d	6"o/c max.
1/2" & 5/8" thk	10d	6"o/c max.

At interior of each sheet space nails 10"o/c for 3/8" and 1/2" thick plywoodh)0*0*0* B. Sheathing shall be nailed as follows, except where shown otherwise:
   1) Roof plywood: 8d common at 6" o/c at all supported edges and at 12" o/c at interior support.
   2) Floor plywood: 8d common at 6" o/c at all supported edges and at 10" o/c at interior supports.
   3) Wall plywood sheathing direct to framing: 10d common at 6" o/c all panel edges and at 10"o/c at all interior studs.
C. Anchor all studs at door openings, ends, and corners of walls which are sheathed with plywood and /or gypsum board to bottom plate with 2 Simpson a 35 framing anchors.
D. All manufactured connection hardware shall be as designated or Drawings and installed and full nailed in coformance to manufactor's instructions and applicable ICBO approval.
E) All steel connection assemblies detailed on Drawings shall be fabricated from ASTN A36 steel in comformance with applicable requirements of AISC "Specification for the Design. Fabrication, and Erection of Structional Steel for Buildings." Welding shall conform to AWS D1.1.
F) Install lag screws in drilled lead holes with a diameter equal to 3/4 of the shank diameter (lag screws shall not be hammered in). Max of soap lag screws. Provide washers under heads bearing on wood. Holes shall be properly aligned.
G) Bolt holes shall be drilled 1/16" larger than bolt diameter. Provide washers under all bolt heads and nuts bearing on wood. Holes shall be properly aligned.
   In no case shall misalignement be allowed which prevents proper bearing or alignment of members. Oversize holes shall not be allowed. Bolts shall be A307 bolts. Nuts shall be tightened snug.
3. Installation:
   A. All stud walls shown on Structural Drawings shall have 2 x4 studs placed at 16"o/c, except where shown otherwise.
   B. Top plates shall be doubled on all stud walls.
   C. Cripples under headers shall be continuous to sole plate.
   D. Block all stud walls as required for sheathing.
   E. Blocking 2" wide of equal depth of the members shall be provided between all joists and rafters at their supports, unless members are nailed to a rim joist.
   F. Beams, girders, and joists supporting bearing walls or other concentrated loads, shall not be notched. Joists, except as above may be notched no deeper than 1/4 the depth, at top edge only provided such notches located within 1/8 to 1/4 of span from face of support. Sawcuts for notches shall not be larger in diameter than 1/10 the depth of member and shall be located within center half of the span. All holes shall be centered within d epth of member . Holes and notches in studs shall not exceed 1" in diameter or depth. Studs on exterior walls shall not be notched.
G. Joists, rafters, and decking shall not be cut and headed or displaced to provide for openings in roofs or floors, except as detailed on Drawings.
H. Install all horizontal members with crown up.
I. All members in bearing shall be accurately cut and aligned so that full bearing is provided without the use of shims. Bearing posts shall have full blocking of support under.
J. All rafters shall be notched for full bearing at all supports.
K. All joists shall have a minimum of 2" bearing at supports. Laping joists shall have 6" laps centered over interior supports.
L. Ledgers and stud wall foundation sill plates shall be bolted to concrete with anchor bolts of size and minimum spacing as shown on Drawings. At least two bolts shall be provided for each piece with one bolt within 12" of each enc.
M. All plywood wall sheathing shall be applied as follows: Center vertical joints over studs and center horizontal joints over 2" blocking or plate. Nail top of panels to double top plate, and nail bottom of panels to anchored sill plate. Apply gypsum board so that end joints of adjacent courses do not occur over the same stud.
   Plywood sub floor and roof sheathing: Install with face grain at right angles to suppports, continuous over two (2) or more spans.
Allow minimum space 1/16 inch between end joists and 1/8 inch at edge joists for expansion and contraction of panels.
N. Underlayment:
   1) Lay underlayment on #6 Rosin sized sheathing paper.
   2) Particleboard floor wnderlayment shall comform to Type 1 m 1 or sanded type 2-m-w of SBC Underlayment shall be not less than 1/4 inch in thickness and shall be identified by grade mark of an approved inspection agency. Underlayment shall be installed in accordance with code and as recomended by manufacturer.
   1/4" to 1/2": 6d common or 1 1/2" ring shank nails 6" o/c @ edge & 8" o/c each way in field.
   5/8" to 3/4": 8d common or 1 1/2" ring shank nails 6" o/c @ edges & 8" o/c each way in field.
O. Building Felt:
   Cover surfaces behind sidings, shingles, and where indicated on Drawings with asphalt saturated, non perforated, felt without wrinkles or buckles. Lap horizontal joints 3", 6" at vertical joints, and carry into openings, up walls 12" and down sides 6" minimum. Locate end laps at least 18" from internal and external corners.

THERMAL AND MOISTURE PROTECTION

1. Apply Standard Dry Wall Products, Inc. "Thoroseal Foundation Coating", foundation waterproofing, on all backfill faces of walls space. Provide "Thoroglaze" dampproofing coating on all exposed surfaces of concrete walls above earth grade and flatwork not covered by finish floor materials, all in strict conformance with manufacturer's printed instructions.
2. Provide under all concrete slab and flatwork, "Moistop" by Sisalkraft. All laps 12 inches minimum and taped tight. Turn up at vertical surfaces 3 inch minimum. Patch all damaged vapor barrier immediately before covering. All concrete slabs and flatwork shall have minimum 4" grave pad unless otherwise spicified on Drawings.

INSULATION

1. Minimum insulation to by as follows:
   Roof and ceiling...R 30
   Exterior walls...R 11
   Floors (wood)...R 19
   Floors (concrete)...R 6
   Exterior foundation walls (basement).......R 11
2. Cold Walls:
   Portions of building between living space and unheated garage, storage room, and portion of wall above ceiling of an adjacent section of a split level dwelling to be insulated same as roof, walls, or floor of dwelling.
3. Vapor Barriers: Either "A", "B", or "C". "D" is mandatory.
   A. All walls and ceilings to be foil backed one side insulation.
   B. Foil backed gypsum board on the inside surface of exterior walls without foil backed insulation.
   C. Polyethylene applied across the inside of studs without foil backed insulation.
   D. In crawl spaces provide 6 mil back polyethylene sheets of "Moistop" over entire ground area and up the exterior foundation walls to the mudsills. Wall insulation (if shown on Drawings) to be applied over the polyethylene vapor barrier. Provide 12" minimum laps between two sections of vapor barrier, and tape tight.
Items 4 5 6 optional, choose one:
4. Blown insulation: thicknesss may vary with manufacturer.

	Fiberglass	Rockwood	Cellulose
R 38	17.5"	12.75"	9.5"
R 30	13.75"	10.25"	7.5"
R 24	11.00"	8.25"	6.0"
R 19	8.75"	6.50"	4.8" h)

5. Batt insulation: Fiberglass or rockwood batts may be used in combinations to obtain higher "R" ratings. Thicknesses shown are for rockwood.
   R 22...6 1/2" thick
   R 19...6 " thick
   R 11...3 1/2" thick
   R 7...2 1/4" thick
   R 5...1 1/2" thick
6. Insulation, rigid type
   A.

	Urethane	Styrofoam (Polystyrene)
1" thick	R 8.33	R 5
1 1/2" thick	R 12.5	R 7.5
2" thick	R 16.66	R 10.0
3" thick	R 25.0	R 15.0

   B. Fire Hazards:
      When plastic foams are used in any interior application a fire barrier must be applied over the unprotected foam surface. Coverings used for protection should be chosen for their fire protection of the foams, ie.,gypsum wallboard.
7. Framing Members:
   It may become necessary to increase depth of framing members to accommodate thicker insulation materials than shown on Drawings.

GYPSUM DRYWALL

Provide gypsum wallboard of type and thickness indicated on Drawings. Gypsum board work and materials shall meet all requirements of ANSI No. A 97 1, for the "Application and Finishing of Wallboard." Joint compound system mixed, applied, and finished it compliance with manufacturer's printed directions; to be invisible after finished, including all metal corner beads and trim.

Gypsum wallboard on stud walls: Cooler nails at 7" o/c all studs, plates, and blockings use 5d nails with 1/2" wallboard and 6d nails with 5/8" unless otherwise shown on Drawings.

CERAMIC TILE

All materials, installation, and workmanship for ceramic tile shall comply with ANSI Specifications: A108.4 and A 108.5 and "Handbook for Ceramic Tile Installation" Published by Tile Council of America and are hereby made part of this specification. All tile shall comply with ANSI Specifications for Ceramic Tile A 137.1.
Junctionh)0*0*0*between dissimilar surfaces to be grouted with G.E. Si licone Rubber
Sealant, or approved equal.

GLAZING

Tempered glass shall comply with Federal Standards 16 CFR 1201 II

NOTICE DUTY OF COOPERATION

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REVISIONS	BY
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GENERAL SPECIFICATIONS
STANDARD BUILDING CODE
International Residential Code (ICC)

DATE
SCALE 1/4" = 1'-0"
BUILDER
JOB
DRAWN BY

CEILING JOIST SPAN DATA

* THE REQUIRED EXTREME FIBER STRESS IN BENDING "F_b", IN POUNDS/IN^2. MODULUS OF ELASTICITY IN 1,000,000 psi. WHERE 1.8 IS EQUAL TO 1,800,000 psi

LIMITED ATTIC STORAGE WHERE DEVELOPMENT OF FUTURE ROOMS IS NOT POSSIBLE
Douglas Fir - Larch - 20lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x4			2x6			2x8			2x10		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	10-3	9-4	8-1	16-1	14-7	12-9	21-2	19-3	16-10	27-1	24-7	21-6
DENSE #1	2050	1.9	10-5	9-6	8-3	16-4	14-11	13-0	21-7	19-7	17-2	27-6	25-0	21-10
DENSE #2	1700	1.7	10-0	9-1	7-7	15-9	14-4	11-11	20-10	18-11	15-9	26-6	24-1	19-10
#2	1450	1.7	9-11	8-8	7-0	15-7	13-6	11-0	20-7	17-10	14-5	26-3	22-8	18-6
#3	850	1.5	7-8	6-7	5-5	11-11	10-7	8-5	15-8	13-8	11-4	20-2	17-5	14-2

LIMITED ATTIC STORAGE WHERE DEVELOPMENT OF FUTURE ROOMS IS NOT POSSIBLE
Southern Yellow pine - 20lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x4			2x6			2x8			2x10		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	10-3	9-4	8-1	16-1	14-7	12-9	21-2	19-3	16-10	27-1	24-7	21-6
#1 DENSE	2150	1.9	10-5	9-6	8-3	16-4	14-11	13-0	21-7	19-7	17-2	27-6	25-0	21-10
#1 DENSE	1750	1.7	10-0	8-1	7-9	15-9	14-4	12-1	20-10	18-11	16-4	26-6	24-1	20-4
#2	1500	1.6	9-10	8-9	7-2	15-6	13-9	11-3	20-5	18-2	14-9	26-0	23-2	18-10
#3	875	1.5	7-9	6-8	5-6	12-0	10-8	8-6	15-9	13-9	11-5	20-3	17-6	14-3
MAXIUM DEFLECTION IS l/240 OF SPAN														

ALLOWABLE RAFTER SPANS

FLAT OR SLOPED RAFTERS (FLAT ROOF OR CATHEDRAL CEILING WITH NO ATTIC SPACE) SUPPORTING DRYWALL CEILING
Douglas Fir - Larch - 20lbs./Ft^2

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	16-1	14-6	12-2	21-2	19-1	16-0	27-0	24-7	20-6	32-10	29-9	24-10
DENSE #1	2050	1.9	16-5	14-10	12-2	21-7	19-7	16-0	27-6	25-0	20-6	33-4	30-5	24-10
DENSE #2	1700	1.7	15-8	13-7	11-1	20-8	17-10	14-7	26-4	22-10	18-7	32-0	27-9	22-8
#2	1450	1.7	14-5	12-6	10-2	19-1	16-6	13-5	24-4	21-0	17-2	29-7	25-7	20-10
#3	850	1.5	11-1	9-7	7-10	14-7	12-7	10-3	18-7	16-2	13-1	22-6	19-7	16-0

FLAT OR SLOPED RAFTERS (FLAT ROOF OR CATHEDRAL CEILING WITH NO ATTIC SPACE) SUPPORTING DRYWALL CEILING
Southern Yellow pine - 20lbs./FT^2

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	16-1	14-6	12-5	21-3	19-2	16-5	27-0	24-5	20-11	32-10	29-9	25-5
#1 DENSE	2150	1.9	16-4	14-10	12-5	21-6	19-7	16-5	27-5	25-0	20-11	33-4	30-5	25-5
#1 DENSE	1750	1.7	15-10	13-9	11-3	20-11	18-1	14-9	26-8	23-1	18-10	31-7	28-1	22-11
#2	1500	1.6	14-8	12-9	10-5	19-5	16-9	13-8	24-9	21-5	17-6	30-1	26-0	21-3
#3	875	1.5	11-3	9-8	7-11	14-9	12-10	10-5	18-10	16-4	13-3	23-0	19-11	16-3

FLAT OR LOW SLOPED RAFTERS (NO ATTIC SPACE) SLOPE 3 IN 12 OR LESS
Douglas Fir - Larch - 20lbs./Ft^2

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	16-2	14-7	12-10	21-3	19-3	16-10	27-1	24-7	21-6	33-0	29-11	26-1
DENSE #1	2050	1.9	16-5	14-10	13-1	21-7	19-7	17-3	27-7	24-10	22-1	33-6	30-4	26-10
DENSE #2	1700	1.7	15-10	14-6	11-11	20-10	19-0	15-9	26-7	24-2	20-1	32-5	29-6	24-5
#2	1450	1.7	15-7	13-6	11-0	20-7	17-10	14-7	26-3	22-9	18-7	31-11	27-8	22-7
#3	850	1.5	11-11	10-4	8-6	15-9	13-6	11-2	20-1	17-5	14-2	24-5	21-1	17-3

FLAT OR LOW SLOPED RAFTERS (NO ATTIC SPACE) SLOPE 3 IN 12 OR LESS
Southern Yellow pine - 20lbs./FT^2

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	16-2	14-7	12-10	21-3	19-3	16-10	27-1	24-7	21-6	33-0	29-11	26-1
#1 DENSE	2150	1.9	16-5	14-10	13-1	21-7	19-7	17-3	27-7	24-10	22-1	33-6	30-4	26-10
#1 DENSE	1750	1.7	15-10	14-6	12-1	20-10	19-0	16-0	26-7	24-2	20-4	32-5	29-6	24-9
#2	1500	1.6	15-7	13-9	11-3	20-9	18-2	14-10	26-6	23-2	18-11	31-5	28-2	23-0
#3	875	1.5	12-0	10-5	8-7	15-10	13-7	11-3	20-2	17-6	14-3	24-6	21-2	17-4

MEDIUM OR HIGH SLOPED RAFTERS (NO ATTIC SPACE) SLOPE 3 IN 12 OR LESS
Douglas Fir - Larch - 20lbs./Ft^2

	"F_b"	"E"*	2x4			2x6			2x8			2x10		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	11-2	10-3	8-10	17-9	16-0	13-10	23-5	21-2	18-2	29-11	27-0	23-4
DENSE #1	2050	1.9	11-6	10-7	8-10	18-0	16-6	13-10	23-10	21-9	18-2	30-5	29-9	23-4
DENSE #2	1700	1.7	11-2	9-10	8-0	17-4	15-5	12-7	22-10	20-4	16-7	29-2	25-3	21-2
#2	1450	1.7	10-5	9-1	7-4	16-5	14-3	11-7	21-8	18-9	15-4	27-8	24-0	19-7
#3	850	1.5	8.0	7-0	5-8	12-7	10-11	8-11	16-7	14-4	11-9	21-2	18-4	15-0

MEDIUM OR HIGH SLOPED RAFTERS (NO ATTIC SPACE) SLOPE 3 IN 12 OR LESS
Southern Yellow pine - 20lbs./FT^2

	"F_b"	"E"*	2x4			2x6			2x8			2x10		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	11-2	10-3	9-0	17-9	16-0	14-2	23-5	21-2	18-6	29-11	27-0	23-8
#1 DENSE	2150	1.9	11-6	10-7	9-0	18-0	16-6	14-2	23-10	21-9	18-8	30-5	29-9	23-10
#1 DENSE	1750	1.7	11-2	9-11	8-1	17-4	15-8	12-9	22-10	20-7	16-10	29-2	25-3	21-6
#2	1500	1.6	10-8	9-3	7-6	16-8	14-6	11-10	22-1	19-1	15-7	28-2	24-5	19-11
#3	875	1.5	8-1	7-1	5-9	12-8	11-0	9-0	16-8	14-5	11-10	21-3	18-5	15-1

TABLE R703.7.3
ALLOWABLE SPANS FOR LINTELS SUPPORTING MASONRY VENEER[a,b,c]

SIZE OF STEEL ANGLE[A,C] (INCHES)	NO STORY ABOVE	ONE STORY ABOVE	TWO STORY ABOVE	NO. OF 1/2 OR EQUIVALENT REINFORCING BARS[C]
3 X 3 X 1/4	6'-0"	3'-6"	3'-0"	1
4 X 3 X 1/4	8'-0"	5'-0"	3'-0"	1
6 X 3-1/2 X 1/4	14'-0"	8'-0"	3'-6"	2
2-6 X 3-1/2 X 1/4	12'-0"	11'-0"	5'-0"	4

For SI: 1 inch=25.4 mm, 1 foot=304.8mm.
a. Long leg of the angle shall be placed in a vertical position.
b. Depth of reinforced lintels shall not be less than 8 inches and all cells of hollow masonry lintels shall be grouted solid. Reinforcing bars shall extend not less than 8 inches into the support.
c. Steel members indicated are adequate typical examples; other steel members meeting structural design requirements may be used.

R703.7.3 Lintels
Masonry veneer shall not support any vertical load other than the dead load of the veneer above.
Veneer above openings shall be supported on lintels of non-combustible materials
and the allowable span shall not exceed the values set fourth in Table R703.7.3.
The lintels shall have a length of bearing of not less than 4 inches (102mm).

FLOOR JOIST SPAN DATA

* MODULUS OF ELASTICITY "E" IN 1,000,000 psi. OR 1.0 IS EQUAL TO 1,000,000 psi

Douglas Fir - Larch - 30lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	12-3	11-2	9-9	16-2	14-8	12-10	20-8	18-9	16-5	25-1	22-10	19-11
DENSE #1	2050	1.9	12-6	11-4	9-11	16-6	15-0	13-1	21-0	19-1	16-8	25-7	23-3	20-3
DENSE #2	1700	1.7	12-0	10-11	9-7	15-10	14-5	12-7	20-3	18-5	16-1	24-8	22-5	19-7
#2	1450	1.7	12-0	10-11	9-7	15-10	14-5	12-7	20-3	18-5	16-1	24-8	22-5	19-7
#3	850	1.5	10-4	9-0	7-2	13-8	11-10	9-8	17-5	15-1	12-3	21-3	18-3	15-0

Douglas Fir - Larch - 40lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2050	1.8	11-2	10-2	8-10	14-8	13-4	11-8	18-9	17-0	14-11	22-10	20-9	18-1
DENSE #1	2050	1.9	11-4	10-4	9-0	15-0	13-7	11-11	19-1	17-4	15-2	23-3	21-1	18-5
DENSE #2	1700	1.7	10-11	9-11	8-8	14-5	13-1	11-5	18-5	16-9	14-7	22-5	20-4	17-9
#2	1450	1.7	10-11	9-11	8-6	14-5	13-1	11-4	18-5	16-9	14-5	22-5	20-4	17-6
#3	850	1.5	9-2	7-11	6-7	12-3	10-7	8-8	15-7	13-6	11-0	18-11	16-4	13-5

Southern Yellow Pine - 30lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	12-3	11-2	9-9	16-2	14-8	12-10	20-8	18-9	16-5	25-1	22-10	19-11
#1 DENSE	2150	1.9	12-6	11-4	9-11	16-6	15-0	13-1	21-0	19-1	16-8	25-7	23-3	20-3
#2 DENSE	1750	1.7	12-0	10-11	9-7	15-10	14-5	12-7	20-3	18-5	16-1	24-8	22-5	19-7
#2	1500	1.6	11-10	10-9	9-4	15-7	14-2	12-4	19-10	18-0	15-9	24-2	21-11	19-2
#3	875	1.5	10-6	9-0	7-4	14-0	11-11	9-9	17-7	15-3	12-5	21-9	18-7	15-1

Southern Yellow Pine - 40lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
SELECT STRUCTURAL	2150	1.8	11-2	10-2	8-10	14-8	13-4	11-8	18-9	17-0	14-11	22-10	20-9	18-1
#1 DENSE	2150	1.9	11-4	10-4	9-0	15-0	13-7	11-11	19-1	17-4	15-2	23-3	21-1	18-5
#2 DENSE	1750	1.7	10-11	9-11	8-8	14-5	13-1	11-5	18-5	16-9	14-7	22-5	20-4	17-9
#2	1500	1.6	10-9	9-9	8-6	14-2	12-10	11-3	18-0	16-5	14-4	21-11	19-11	17-5
#3	875	1.5	9-4	7-11	6-8	12-4	10-10	8-9	15-9	13-9	11-0	19-3	16-7	13-8

California Redwood - 30lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
CL.HEART STRUCT.	2650	1.4	11-3	10-3	8-11	14-11	13-6	11-10	19-0	17-3	15-1	23-1	21-0	18-4
SELECT STRUCTURAL	2000	1.4	11-3	10-3	8-11	14-11	13-6	11-10	19-0	17-3	15-1	23-1	21-0	18-4
#1	1700	1.4	11-3	10-3	8-11	14-11	13-6	11-10	19-0	17-3	15-1	23-1	21-0	18-4
#2	1400	1.25	10-10	9-10	8-7	14-4	13-0	11-4	18-3	16-7	14-6	22-2	19-2	17-8
#3	800	1.1	10-0	8-8	7-1	13-3	11-6	9-4	16-11	14-9	11-11	20-7	17-8	14-7

California Redwood - 40lbs./Ft^2 - Live Load

	"F_b"	"E"*	2x6			2x8			2x10			2x12		
			12"	16"	24"	12"	16"	24"	12"	16"	24"	12"	16"	24"
CL.HEART STRUCT.	2650	1.4	10-3	9-4	8-2	13-6	12-3	10-9	17-3	15-8	13-8	21-0	19-1	16-8
SELECT STRUCTURAL	2000	1.4	10-3	9-4	8-2	13-6	12-3	10-9	17-3	15-8	13-8	21-0	19-1	16-8
#1	1700	1.4	10-3	9-4	8-2	13-6	12-3	10-9	17.3	15-8	13-8	21-0	19-1	16-8
#2	1400	1.25	9-10	8-11	7-10	13-0	11-10	10-4	16-7	15-1	13-2	20-2	18-4	16-0
#3	800	1.1	9-0	7-10	6-5	11-9	10-3	8-5	15-0	13-1	10-8	18-2	15-10	13-2

GLUED LAMINATED FLOOR AND ROOF BEAMS - SPAN DATA

SPAN DATA FOR GLUED LAMINATED ROOF BEAMS *
MAXIUM DEFLECTION l/240TH OF THE SPAN

BEAM SIZE (ACTUAL)	WGT. OF BEAM PER LIN. FT. IN POUNDS	SPAN IN FEET											
		10	12	14	16	18	20	22	24	26	28	30	32
		POUNDS PER LIN. FT. LOAD BEARING CAPACITY											
3 X 5 1/4	3.7	151	85										
3 X 7 1/4	4.9	362	206	128	84								
3 X 9 1/4	6.7	566	448	300	199	137	99						
3 X 11 1/4	8.0	680	566	483	363	252	182	135	102				
4 1/2 X 9 1/4	9.8	850	673	451	299	207	148	109					
4 1/2 X 11 1/4	12.0	1,036	860	731	544	378	273	202	153				
3 1/4 X 13 1/2	10.4	1,100	916	784	685	479	347	258	197	152	120		
3 1/4 X 15	11.5	1,145	1,015	870	759	650	473	352	267	206	163	128	104
5 1/4 X 13 1/2	16.7	1,778	1,478	1,266	1,105	773	559	415	316	245	193	154	124
5 1/4 X 15	18.6	1,976	1,647	1,406	1,229	1,064	771	574	438	342	269	215	174
5 1/4 X 16 1/2	20.5	2,180	1,810	1,550	1,352	1,155	933	768	586	457	362	290	236
5 1/4 X 18	22.3	2,378	1,978	1,688	1,478	1,308	1,113	918	766	598	478	382	311

EXAMPLE: CLEAR SPAN = 20'-0"
BEAM SPACING = 10'-0"
DEAD LOAD 8 LBS./SQ.FT. (ROOFING AND DECKING)
LIVE LOAD 20 LBS./SQ/FT (SNOW)
TOTAL LOAD LIVE LOAD + DEAD LOAD X BEAM SPACING
= (20 + 8) X 10 + 280 LBS./LIN.FT.
THE BEAM SIZE REQUIRED IS 3 1/4 X 13 1/2 WHICH SUPPORT 347 LBS./LIN/ FT. OVER A SPAN OF 20'-0".

*** BEAMS MAY BE DOUGLAS FIR, LARCH OR SOUTHERN YELLOW PINE.**

GLUED LAMINATED FLOOR AND ROOF BEAMS - SPAN DATA

SPAN DATA FOR GLUED LAMINATED FLOOR BEAMS *
MAXIUM DEFLECTION l/360TH OF THE SPAN

BEAM SIZE (ACTUAL)	WGT. OF BEAM PER LIN. FT. IN POUNDS	SPAN IN FEET											
		10	12	14	16	18	20	22	24	26	28	30	32
		POUNDS PER LIN. FT. LOAD BEARING CAPACITY											
3 X 5 1/4	3.7	114	64										
3 X 7 1/4	4.9	275	156	84	55								
3 X 9 1/4	6.7	492	319	198	130	89							
3 X 11 1/4	8.0	590	491	361	239	165	119						
4 1/2 X 9 1/4	9.8	738	479	298	196	134	96						
4 1/2 X 11 1/4	12.0	900	748	541	359	248	178	131	92				
3 1/4 X 13 1/2	10.4	956	795	683	454	316	228	169	128	98			
3 1/4 X 15	11.5	997	884	756	626	436	315	234	178	137	108		
5 1/4 X 13 1/2	16.7	1,541	1,283	1,095	732	509	367	271	205	158	123	96	
5 1/4 X 15	18.6	1,713	1,423	1,219	1,009	703	508	376	286	221	173	137	109
5 1/4 X 16 1/2	20.5	1,885	1,568	1,340	1,170	939	678	505	384	298	235	187	151
5 1/4 X 18	22.3	2,058	1,710	1,464	1,278	1,133	886	660	503	391	309	247	200

EXAMPLE: CLEAR SPAN = 20'-0"
BEAM SPACING = 10'-0"
DEAD LOAD 7 LBS./SQ.FT. (DECKING AND CARPET)
LIVE LOAD 40 LBS./SQ/FT (FURNITURE AND OCCUPANTS)
TOTAL LOAD LIVE LOAD + DEAD LOAD X BEAM SPACING
= (40 + 7) X 10 + 470 LBS./LIN.FT.
THE BEAM SIZE REQUIRED IS 5 1/4 X 15 WHICH SUPPORT 508 LBS./LIN/ FT. OVER A SPAN OF 20'-0".

*** BEAMS MAY BE DOUGLAS FIR, LARCH OR SOUTHERN YELLOW PINE.**

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
F	EXHAUST FAN
	CEILING FAN
	CEILING FAN W/ LIGHT
FL	EXHAUST FAN W/ LIGHT
HLV	HEAT, LIGHT AND VENT
	LIGHT
	4' FLORESCENT LIGHT
	2' X 4' FLORESCENT LIGHT
	RECESSED CAN LIGHT
	FLOOD LIGHT
	WALL MOUNTED LIGHT
	ELECTRICAL OUTLET
	220V ELECTRICAL OUTLET
	CEILING MOUNTED OUTLET
	FLOOR MOUNTED OUTLET
	HIDDEN OUTLET
	SWITCHED OUTLET
	BREAKER BOX
	PHONE
SD	SMOKE DETECTOR
$	SWITCH
	STACKED SWITCHES
3	THREE WAY
4	FOUR WAY
GFI	GROUND FAULT INTERRUPTER
W.P.	WATERPROOF
	ELECTRICAL WIRE
C	CABLE TV
	TRACK LIGHTING

GENERAL NOTES:

In case of conflict between the General Notes below and the specifications the more rigid requirement shall govern unless amended in writing by the Engineer.

DESIGN DATA

1. Design Codes - (All latest editions unless noted)
   -American Concrete Institute (ACI)
   -American Institute of Steel Construction (AISC)
   -American Welding Society (AWS)
   -Southern Standard Building Code (SSBC)
   -American National Standards Institute, Inc. (ANSI A58.1-1982)
   Minimum Design Loads for Buildings and Other Structures
2. Material Specifications and Design Stresses
   -Anchor Bolts and Embedded Steel.............Fy = 36,000 psi (ASTM A36)
   -Structural Steel UNO..................................Fy = 36,000 psi (ASTM A36)
   -Cast-in-place Concrete
   -Footings...F'c = 3,000 psi at 28-days.
   -Interior slabs-on-grade.............................f'c = 3,000 psi at 28-days.
   -Ext. exposed concrete)air entrained)......F'c = 4,000 psi at 28-days.
   -Reinforcing Steel
   -#2 and #3 bar3 only..................................Fy = 40,000 psi (ASTM A615, Grade 40)
   -#4 and larger bars....................................Fy = 60,000 psi (ASTM A615, Grade 60)
3. Design Soil Bearing Pressures
   -Reference Soil and Foundation Investigation by Grubbs, Garner, & Hoskyn, Inc. Consulting Engineers, Little Rock, AR.
   -Footings on natural soils are designed for a maximum soil bearing pressure of 2,000 psf.
   -Footings on compacted engineered fill are designed for maximum soil bearing pressure of 2,000 psf.
   -If the soil at the footing bearing elevations shown is of questionable bearing value, the Engineer or Architect shall be notified immediately.
   -After footing excavations are completed and before placing concrete, the excavated area shall be inspected and approved by the Owner selected independent testing laboratory as specified.

GENERAL INFORMATION

1. All columns shall be centered on grid lines unless noted otherwise.
2. All column footings shall be centered on columns unless noted otherwise.
3. All wall footings shall be centered on walls unless noted otherwise.
4. For concrete reinforcing at corners, see typical corner bar detail.
5. For slab-on-grade construction joint detail, see typical slab-on-grade detail.
6. All fill material under structure shall be sandy clay or clayey sand exhibiting a liquid limit less than 35. Fill material shall be placed in loose lifts not to exceed 8" and compacted to a density of not less than 95% of Modified Proctor Maximum Dry Density (ASTM D-1557) at or slightly wet of optimum moisture content. In place moisture and density of each lift shall be determined by in-situ field tests prior to placing additional fill.
7. Where noted C.J. on plan, provide Keyed Joint in floor slab.
8. A 6-mil polyethylene film vapor barrier shall be placed below all interior slabs-on-grade.
9. Provide a 4-inch clean medium to coarse sand or gravel compacted drainage fill below all interior slabs-on-grade.

CAST-IN-PLACE CONCRETE

1. Arrangement and bending of reinforcing steel shall be in accordance with ACI detailing manual, latest edition.
2. Reinforcing steel shall be new and all bars over #2 shall be deformed.
3. Where reinforcing bars are shown continuous, lap bars 36-bar diameters or 24-bar diameters at tension or compression splices respectively (12" minimum).
4. Provide suitable wire spacers, chairs, ties, etc., for supporting reinforcing steel in the proper position while placing concrete.
5. Concrete protective covering for reinforcement at surfaces not exposed directly to the ground shall be 3/4" for slabs, joists, and walls and 1-1/2" for beam stirrups and column ties or spirals.
6. Concrete protective covering for reinforcement at surfaces which will be exposed to the weather or be in contact with the ground shall be 2" for bars larger than #5 and 1-1/2" for #5 bars or smaller. Provide 3" cover below and at ends of footing bars.
7. Location and sizes of openings, sleeve, etc., required for other trades must be verified by these trades before placing concrete.

CONCRETE MASONRY UNITS

1. Place vertical reinforcing bars at corners, jambs of openings, below beam bearing, and in walls as indicated on the drawings.
2. Dowell vertical reinforcing bars out of the structure below with bars of the same size and spacing above.
3. Lap splice bars in masonry 40 bar diameters.
4. Place horizontal bars in 8" deep bond beam units at top of wall.
5. Continue bond beam units and reinforcing uninterrupted around corners and across wall intersections.
6. Metal masonry-course reinforcing shall be truss type conforming to ASTM A82, not less than 9 gauge, galvanized at exterior walls. Furnish material with prefabricated corners and tees. Reinforcing shall be used in all partitions, spaced 16" o.c., vertically, joints lapped 6". Place reinforcing in first bed joint above and below all concrete slabs and wall openings.
7. Load bearing concrete masonry units shall conform to ASTM C90, Grade N, Type I, with minimum average compressive strength on net area of 1,100 psi and minimum net area compressive strength of individual units shall be 1,500 psi.
8. Non-loan bearing concrete masonry units shall conform to ASTM C129, Type I.
9. Mortar shall be Type N conforming to property or protection requirements of ASTM C476.
10. All masonry fill concrete shall have a minimim strength at 28-days f'c = 3,000 psi, maximum aggregate shall be 3/8" and shall be placed in maximum lifts of 4'-0".
11. All grout shall conform to ASTM C476, Fine Grout.

ARCHITECTURAL ABBREVIATIONS LEGEND

ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
ARCH.	architectural	PAN.	pantry
B.F.	bi-fold doors	P.D.	pocket door
BRD.	board	PR.	pair
C.D.X.	C & D grade exterior plywood	P.T.	pressure treated
COL.	column	PW.	plywood
CLO. or CLOS.	closet	RG.	range
CLNG.	ceiling	RD.	rod or round
C.O.	cased opening	REF.	refrigator
C.M.U.	concrete masonry unit (concrete block)	RFG.	roofing
COMP.	composition	RND	round
C.T.	cook-top	SH.	shelf
D.	dryer	SHLV.	shelves
DIA.	diameter	SHT.	sheet
DWG.	drawing	SQ.	square
DW.	dishwasher	S4S	surfaced four sides (rectangular wood trim)
DN.	down	S.F. or SQ.FT.	square foot
EXT.	exterior	SEC. or SECT.	section
FTG.	footing	SHWR.	shower
FT.	foot	SKL.	skylight
FZR.	freezer	SL.	sliding
GALV.	galvanized	T.C.	trash compactor
GYP. BD.	gypsum wallboard	TRM.	trm
HVAC	heating, ventilation and air conditioning	TRT'D	treated
H.B.	hose bibb	THK	thick
H.D.	heavy duty	T&G	tongue and groove
H.W.	hot water	W.	washer
I.B.	ironing board	W.H.	water heater
I.M.	ice maker	WHP.	whirlpool
INSUL.	insulation	WP.	waterproof
M.C.	medicine cabinet	W/	with
M.U.	make-up		
MW.	microwave		
N.I.C.	not in contract		
N.T.S.	not to scale		
O.C.	on center		

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REVISIONS	BY
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LEGENDS / GENERAL NOTES

DATE
SCALE
1/4" = 1'-0"
BUILDER
JOB
DRAWN BY

1/2

2015 International Residential Code® Construction Specifications and Methodologies

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2. BEFORE EXCAVATION, THE CONTRACTOR SHALL EXAMINE ALL DRAWINGS, MAPS, AND BUILDING SITE OF EXITING FACILITY TO DETERMINE THE ROUTES OF ALL UNDERGROUND UTILITIES. BEFORE DIGGING COMMENCES IT IS ADVISED THAT THE OWNER AND OR CONTRACTOR CALL THEIR STATES UTILITY LOCATOR FACILITATOR.
3. IT IS RECOMMENDED THAT THE SITES SOIL BE TESTED FOR COMPRESSION RATING TO DETERMINE FOUNDATION AND FOOTING DESIGN. CONCRETE FOUNDATIONS AND FOOTING DESIGN SHALL BE IN ACCORDANCE TO CHAPTER 4 OF THE I.R.C. CODE. SEE FOUNDATION SECTION ON THIS PAGE FOR MORE DETAIL.
4. CONSULT A LOCAL CIVIL ENGINEER FOR SITE PLANS AND SURVEYS OF EXISTING PROPERTY. A LANDSCAPE ARCHITECT SHOULD BE CONSULTED FOR MORE EXTENSIVE LANDSCAPE DESIGNS.

CHAPTER 3 :: BUILDING PLANNING

SECTION R304 MINIMUM ROOM AREAS

R304.1 MINIMUM AREA.
HABITABLE ROOMS SHALL HAVE A FLOOR AREA OF NOT LESS THAN 70 SQUARE FEET (6.5 M2).
EXCEPTION: KITCHENS.

R304.2 MINIMUM DIMENSIONS.
HABITABLE ROOMS SHALL BE NOT LESS THAN 7 FEET (2134 MM) IN ANY HORIZONTAL DIMENSION.

EXCEPTION: KITCHENS.

R304.3 HEIGHT EFFECT ON ROOM AREA.
PORTIONS OF A ROOM WITH A SLOPING CEILING MEASURING LESS THAN 5 FEET (1524 MM) OR A FURRED CEILING MEASURING LESS THAN 7 FEET (2134 MM) FROM THE FINISHED FLOOR TO THE FINISHED CEILING SHALL NOT BE CONSIDERED AS CONTRIBUTING TO THE MINIMUM REQUIRED HABITABLE AREA FOR THAT ROOM.

SECTION R305 CEILING HEIGHT

R305.1 MINIMUM HEIGHT.
HABITABLE SPACE, HALLWAYS AND PORTIONS OF BASEMENTS CONTAINING THESE SPACES SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 7 FEET (2134 MM). BATHROOMS, TOILET ROOMS AND LAUNDRY ROOMS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 6 FEET 8 INCHES (2032 MM).

NOTE: SEE SECTION R305.1 FOR EXCEPTIONS

R305.1.1 BASEMENTS.
PORTIONS OF BASEMENTS THAT DO NOT CONTAIN HABITABLE SPACE OR HALLWAYS SHALL HAVE A CEILING HEIGHT OF NOT LESS THAN 6 FEET 8 INCHES (2032 MM).

EXCEPTION: AT BEAMS, GIRDERS, DUCTS OR OTHER OBSTRUCTIONS, THE CEILING HEIGHT SHALL BE NOT LESS THAN 6 FEET 4 INCHES (1931 MM) FROM THE FINISHED FLOOR.

SECTION R306 SANITATION

R306.1 TOILET FACILITIES.
EVERY DWELLING UNIT SHALL BE PROVIDED WITH A WATER CLOSET, LAVATORY, AND A BATHTUB OR SHOWER.

R306.2 KITCHEN.
EACH DWELLING UNIT SHALL BE PROVIDED WITH A KITCHEN AREA AND EVERY KITCHEN AREA SHALL BE PROVIDED WITH A SINK.

R306.3 SEWAGE DISPOSAL.
PLUMBING FIXTURES SHALL BE CONNECTED TO A SANITARY SEWER OR TO AN APPROVED PRIVATE SEWAGE DISPOSAL SYSTEM.

R306.4 WATER SUPPLY TO FIXTURES.
PLUMBING FIXTURES SHALL BE CONNECTED TO AN APPROVED WATER SUPPLY. KITCHEN SINKS, LAVATORIES, BATHTUBS, SHOWERS, BIDETS, LAUNDRY TUBS AND WASHING MACHINE OUTLETS SHALL BE PROVIDED WITH HOT AND COLD WATER.

SECTION R307 TOILET, BATH, AND SHOWER SPACES

R307.1 SPACE REQUIRED. FIXTURES SHALL BE SPACED IN ACCORDANCE WITH FIGURE R307.1, AND IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION P2705.1.

R307.2 BATHTUB AND SHOWER SPACES. BATHTUB AND SHOWER FLOORS AND WALLS ABOVE BATHTUBS WITH INSTALLED SHOWER HEADS AND IN SHOWER COMPARTMENTS SHALL BE FINISHED WITH A NONABSORBENT SURFACE. SUCH WALL SURFACES SHALL EXTEND TO A HEIGHT OF NOT LESS THAN 6 FEET (1829 MM) ABOVE THE FLOOR.

1. THERE SHALL BE A MINIMUM 21" CLEARANCE FROM NOSE OR TIP OF TOILET TO ANY ADJACENT WALL OR FIXTURE.

2.THERE SHALL BE A MINIMUM OF 15" FROM THE CENTER OF TOILET TO ANY ADJACENT WALL OR FIXTURE.

3. SHOWER STALLS SHALL BE NO LESS THAN 30"x30" IN SIZE

4. THERE SHALL BE A MINIMUM CLEARANCE IN FRONT OF ANY OPENING WITHIN A WATER CLOSET.

SECTION R308 GLAZING

R308.4 HAZARDOUS LOCATIONS.
THE LOCATIONS SPECIFIED IN SECTIONS R308.4.1 THROUGH R308.4.7 SHALL BE CONSIDERED TO BE SPECIFIC HAZARDOUS LOCATIONS FOR THE PURPOSES OF GLAZING.

R308.4.1 GLAZING IN DOORS.
GLAZING IN FIXED AND OPERABLE PANELS OF SWINGING, SLIDING AND BI-FOLD DOORS SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION.

NOTE: SEE SECTION 308.4.1 FOR EXCEPTIONS

GLAZING ADJACENT TO DOORS. GLAZING IN AN INDIVIDUAL FIXED OR OPERABLE PANEL ADJACENT TO A DOOR SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 60 INCHES (1524 mm) ABOVE THE FLOOR OR WALKING SURFACE AND IT MEETS EITHER OF THE FOLLOWING CONDITIONS:

1. WHERE THE GLAZING IS WITHIN 24 INCHES (610 MM) OF EITHER SIDE OF THE DOOR IN THE PLANE OF THE DOOR IN A CLOSED POSITION.
2. WHERE THE GLAZING IS ON A WALL PERPENDICULAR TO THE PLANE OF THE DOOR IN A CLOSED POSITION AND WITHIN 24 SURFACE. THE RAIL SHALL BE CAPABLE OF WITHSTANDING A HORIZONTAL LOAD OF 50 POUNDS PER LINEAR FOOT (730 N/M) WITHOUT CONTACTING THE GLASS AND HAVE ACROSS-SECTIONAL HEIGHT OF NOT LESS THAN 11/2 INCHES (38 MM).
3. OUTBOARD PANES IN INSULATING GLASS UNITS AND OTHER MULTIPLE GLAZED PANELS WHERE THE BOTTOM EDGE OF THE GLASS IS 25 FEET (7620mm) OR MORE ABOVE GRADE, A ROOF, WALKING SURFACES OR OTHER HORIZONTAL [WITHIN 45 DEGREES (0.79 RAD) OF HORIZONTAL] SURFACE ADJACENT TO THE GLASS EXTERIOR.

R308.4.3 GLAZING IN WINDOWS.
GLAZING IN AN INDIVIDUAL FIXED OR OPERABLE PANEL THAT MEETS ALL OF THE FOLLOWING CONDITIONS SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION:
1. THE EXPOSED AREA OF AN INDIVIDUAL PANE IS LARGER THAN 9 SQUARE FEET (0.836 M2),
2. THE BOTTOM EDGE OF THE GLAZING IS LESS THAN 18 INCHES (457 MM) ABOVE THE FLOOR,
3. THE TOP EDGE OF THE GLAZING IS MORE THAN 36 INCHES (914 MM) ABOVE THE FLOOR; AND
4. ONE OR MORE WALKING SURFACES ARE WITHIN 36 INCHES
5. (914 MM), MEASURED HORIZONTALLY

NOTE: SEE SECTION R308.4.3. FOR EXCEPTIONS

R308.4.4 GLAZING IN GUARDS AND RAILINGS.
GLAZING IN GUARDS AND RAILINGS, INCLUDING STRUCTURAL BALUSTER PANELS AND NONSTRUCTURAL IN-FILL PANELS, REGARDLESS OF AREA OR HEIGHT ABOVE A WALKING SURFACE SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION.

R308.4.5 GLAZING AND WET SURFACES.
GLAZING IN WALLS, ENCLOSURES OR FENCES CONTAINING OR FACING HOT TUBS, SPAS, WHIRLPOOLS, SAUNAS, STEAM ROOMS, BATHTUBS, SHOWERS AND INDOOR OR OUTDOOR SWIMMING POOLS WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 60 INCHES (1524 MM) MEASURED VERTICALLY ABOVE ANY STANDING OR WALKING SURFACE SHALL BE CONSIDERED A HAZARDOUS LOCATION. THIS SHALL APPLY TO SINGLE GLAZING AND ALL PANES IN MULTIPLE GLAZING.

NOTE: SEE SECTION 308.4.5 FOR EXCEPTION

R308.4.6 GLAZING ADJACENT TO STAIRS AND RAMPS.
GLAZING WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 36 INCHES (914 MM) ABOVE THE PLANE OF THE ADJACENT WALKING SURFACE OF STAIRWAYS, LANDINGS BETWEEN FLIGHTS OF STAIRS AND RAMPS SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION.

NOTE: SEE SECTION 308.4.6 FOR EXCEPTIONS

R308.4.7 GLAZING ADJACENT TO THE BOTTOM STAIR LANDING.
GLAZING ADJACENT TO THE LANDING AT THE BOTTOM OF A STAIRWAY WHERE THE GLAZING IS LESS THAN 36 INCHES (914 MM) ABOVE THE LANDING AND WITHIN A 60-INCH (1524 MM) HORIZONTAL ARC LESS THAN 180 DEGREES FROM THE BOTTOM TREAD NOSING SHALL BE CONSIDERED TO BE A HAZARDOUS LOCATION.

SEE SECTION 308.4.7 FOR EXCEPTION

R308.5 SITE-BUILT WINDOWS.
SITE-BUILT WINDOWS SHALL COMPLY WITH SECTION 2404 OF THE INTERNATIONAL BUILDING CODE.

R308.6 SKYLIGHTS AND SLOPED GLAZING.
SKYLIGHTS AND SLOPED GLAZING SHALL COMPLY WITH THE FOLLOWING SECTIONS.

R308.6.1 DEFINITIONS. THE FOLLOWING TERMS ARE DEFINED IN CHAPTER 2:
-SKYLIGHT, UNIT.
-SKYLIGHTS AND SLOPED GLAZING.
-TUBULAR DAYLIGHTING DEVICE (TDD).

SECTION R309 GARAGES AND CARPORTS

R309.1 FLOOR SURFACE.
GARAGE FLOOR SURFACES SHALL BE OF APPROVED NONCOMBUSTIBLE MATERIAL. THE AREA OF FLOOR USED FOR PARKING OF AUTOMOBILES OR OTHER VEHICLES SHALL BE SLOPED TO FACILITATE THE MOVEMENT OF LIQUIDS TO A DRAIN OR TOWARD THE MAIN VEHICLE ENTRY DOORWAY.

R309.2 CARPORTS.
CARPORTS SHALL BE OPEN ON NOT LESS THAN TWO SIDES. CARPORT FLOOR SURFACES SHALL BE OF APPROVED NONCOMBUSTIBLE MATERIAL. CARPORTS NOT OPEN ON TWO OR MORE SIDES SHALL BE CONSIDERED TO BE A GARAGE AND SHALL COMPLY WITH THE PROVISIONS OF THIS SECTION FOR GARAGES.

NOTE: SEE SECTION 310.2.3.2 FOR EXCEPTION

R309.4 AUTOMATIC GARAGE DOOR OPENERS.
AUTOMATIC GARAGE DOOR OPENERS, IF PROVIDED, SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 325.

R309.5 FIRE SPRINKLERS.
PRIVATE GARAGES SHALL BE PROTECTED BY FIRE SPRINKLERS WHERE THE GARAGE WALL HAS BEEN DESIGNED BASED ON TABLE R302.1(2), FOOTNOTE A. SPRINKLERS IN GARAGES SHALL BE CONNECTED TO AN AUTOMATIC SPRINKLER SYSTEM THAT COMPLIES WITH SECTION P2904. GARAGE SPRINKLERS SHALL BE RESIDENTIAL SPRINKLERS OR QUICK-RESPONSE SPRINKLERS, DESIGNED TO PROVIDE A DENSITY OF 0.05 GPM/FT2. GARAGE DOORS SHALL NOT BE CONSIDERED OBSTRUCTIONS WITH RESPECT TO SPRINKLER PLACEMENT.

SECTION R310 EMERGENCY ESCAPE AND RESCUE OPENINGS

R310.1 EMERGENCY ESCAPE AND RESCUE OPENING REQUIRED. BASEMENTS, HABITABLE ATTICS AND EVERY SLEEPING ROOM SHALL HAVE NOT LESS THAN ONE OPERABLE EMERGENCY ESCAPE AND RESCUE OPENING. WHERE BASEMENTS CONTAIN ONE OR MORE SLEEPING ROOMS, AN EMERGENCY ESCAPE AND RESCUE OPENING SHALL BE REQUIRED IN EACH SLEEPING ROOM. EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL OPEN DIRECTLY INTO A PUBLIC WAY, OR TO A YARD OR COURT THAT OPENS TO A PUBLIC WAY.

EXCEPTION: STORM SHELTERS AND BASEMENTS USED ONLY TO HOUSE MECHANICAL EQUIPMENT NOT EXCEEDING A TOTAL FLOOR AREA OF 200 SQUARE FEET (18.58 M2).

R310.1.1 OPERATIONAL CONSTRAINTS AND OPENING CONTROL DEVICES.
EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL BE OPERATIONAL FROM THE INSIDE OF THE ROOM WITHOUT THE USE OF KEYS, TOOLS OR SPECIAL KNOWLEDGE. WINDOW OPENING CONTROL DEVICES COMPLYING WITH ASTM F 2090 SHALL BE PERMITTED FOR USE ON WINDOWS SERVING AS A REQUIRED EMERGENCY ESCAPE AND RESCUE OPENING.

R310.2 EMERGENCY ESCAPE AND RESCUE OPENINGS.
EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL HAVE MINIMUM DIMENSIONS AS SPECIFIED IN THIS SECTION.

R310.2.1 MINIMUM OPENING AREA.
EMERGENCY AND ESCAPE RESCUE OPENINGS SHALL HAVE A NET CLEAR OPENING OF NOT LESS THAN 5.7 SQUARE FEET (0.530 M2). THE NET CLEAR
OPENING DIMENSIONS REQUIRED BY THIS SECTION SHALL BE OBTAINED BY THE NORMAL OPERATION OF THE EMERGENCY ESCAPE AND RESCUE OPENING FROM THE INSIDE. THE NET CLEAR HEIGHT OPENING SHALL BE NOT LESS THAN 24 INCHES (610 MM) AND THE NET CLEAR WIDTH SHALL BE NOT LESS THAN 20 INCHES (508 MM).

EXCEPTION: GRADE FLOOR OR BELOW GRADE OPENINGS SHALL HAVE A NET CLEAR OPENING OF NOT LESS THAN 5 SQUARE FEET (0.465 M2).

R310.2.2 WINDOW SILL HEIGHT.
WHERE A WINDOW IS PROVIDED AS THE EMERGENCY ESCAPE AND RESCUE OPENING, IT SHALL HAVE A SILL HEIGHT OF NOT MORE THAN 44 INCHES (1118 MM) ABOVE THE FLOOR; WHERE THE SILL HEIGHT IS BELOW GRADE, IT SHALL BE PROVIDED WITH A WINDOW WELL IN ACCORDANCE WITH SECTION R310.2.3.

R310.2.3 WINDOW WELLS.
THE HORIZONTAL AREA OF THE WINDOW WELL SHALL BE NOT LESS THAN 9 SQUARE FEET (0.9 M2), WITH A HORIZONTAL PROJECTION AND WIDTH OF NOT LESS THAN 36 INCHES (914 MM). THE AREA OF THE WINDOW WELL SHALL ALLOW THE EMERGENCY ESCAPE AND RESCUE OPENING TO BE FULLY OPENED.

NOTE: SEE SECTION 310.2.3 FOR EXCEPTION

R310.2.3.1 LADDER AND STEPS.
WINDOW WELLS WITH A VERTICAL DEPTH GREATER THAN 44 INCHES (1118 MM) SHALL BE EQUIPPED WITH A PERMANENTLY AFFIXED LADDER OR STEPS USABLE WITH THE WINDOW IN THE FULLY OPEN POSITION. LADDERS OR STEPS REQUIRED BY THIS SECTION SHALL NOT BE REQUIRED TO COMPLY WITH SECTIONS R311.7 AND R311.8. LADDERS OR RUNGS SHALL HAVE AN INSIDE WIDTH OF NOT LESS THAN 12 INCHES (305 MM), SHALL PROJECT NOT LESS THAN 3 INCHES (76 MM) FROM THE WALL AND SHALL BE SPACED NOT MORE THAN 18 INCHES (457 MM) ON CENTER VERTICALLY FOR THE FULL HEIGHT OF THE WINDOW WELL.

R310.2.3.2 DRAINAGE.
WINDOW WELLS SHALL BE DESIGNED FOR PROPER DRAINAGE BY CONNECTING TO THE BUILDING-S FOUNDATION DRAINAGE SYSTEM REQUIRED BY SECTION R405.1 OR BY AN APPROVED ALTERNATIVE METHOD.

NOTE: SEE SECTION 310.2.3.2 FOR EXCEPTION

R310.2.4 EMERGENCY ESCAPE AND RESCUE OPENINGS UNDER DECKS AND PORCHES.
EMERGENCY ESCAPE AND RESCUE OPENINGS SHALL BE PERMITTED TO BE INSTALLED UNDER DECKS AND PORCHES PROVIDED THAT THE LOCATION OF THE DECK ALLOWS THE EMERGENCY ESCAPE AND RESCUE OPENINGS TO BE FULLY OPENED AND PROVIDES A PATH NOT LESS THAN 36 INCHES (914 MM) IN HEIGHT TO A YARD OR COURT.

R310.2.5 REPLACEMENT WINDOWS.
REPLACEMENT WINDOWS INSTALLED IN BUILDINGS MEETING THE SCOPE OF THIS CODE SHALL BE EXEMPT FROM THE MAXIMUM SILL HEIGHT REQUIREMENTS OF SECTIONS R310.1 AND SECTIONS R310.2.1 AND R310.2.2, PROVIDED THE REPLACEMENT WINDOW MEETS THE FOLLOWING CONDITIONS:

1. THE REPLACEMENT WINDOW IS THE MANUFACTURER'S LARGEST STANDARD SIZE WINDOW THAT WILL FIT WITHIN THE EXISTING FRAME OR EXISTING ROUGH OPENING. THE REPLACEMENT WINDOW IS OF THE SAME OPERATING STYLE AS THE EXISTING WINDOW OR A STYLE THAT PROVIDES FOR AN EQUAL OR GREATER WINDOW OPENING AREA THAN THE EXISTING WINDOW.
2. THE REPLACEMENT WINDOW IS NOT PART OF A CHANGE OF OCCUPANCY.

R310.3 EMERGENCY ESCAPE AND RESCUE DOORS.
WHERE A DOOR IS PROVIDED AS THE REQUIRED EMERGENCY ESCAPE AND RESCUE OPENING, IT SHALL BE PERMITTED TO BE A SIDE-HINGED DOOR OR A SLIDER WHERE THE OPENING IS BELOW THE ADJACENT GROUND ELEVATION, IT SHALL BE PROVIDED WITH A BULKHEAD ENCLOSURE.

R310.3.1 MINIMUM DOOR OPENING SIZE.
THE MINIMUM NET CLEAR HEIGHT OPENING FOR ANY DOOR THAT SERVES AS AN EMERGENCY AND ESCAPE RESCUE OPENING SHALL BE IN ACCORDANCE WITH SECTION R310.2.1.

R310.3.2 BULKHEAD ENCLOSURES.
BULKHEAD ENCLOSURES SHALL PROVIDE DIRECT ACCESS FROM THE BASEMENT. THE BULKHEAD ENCLOSURE SHALL PROVIDE THE MINIMUM NET CLEAR OPENING EQUAL TO THE DOOR IN THE FULLY OPEN POSITION.

R310.3.2.1 DRAINAGE.
BULKHEAD ENCLOSURES SHALL BE DESIGNED FOR PROPER DRAINAGE BY CONNECTING TO THE BUILDING-S FOUNDATION DRAINAGE SYSTEM REQUIRED BY SECTION R405.1 OR BY AN APPROVED ALTERNATIVE METHOD.

NOTE: SEE SECTION 310.3.2.1 FOR EXCEPTION

R310.4 BARS, GRILLES, COVERS AND SCREENS.
BARS, GRILLES, COVERS, SCREENS OR SIMILAR DEVICES ARE PERMITTED TO BE PLACED OVER EMERGENCY ESCAPE AND RESCUE OPENINGS, BULKHEAD ENCLOSURES, OR WINDOW WELLS THAT SERVE SUCH OPENINGS, PROVIDED THAT THE MINIMUM NET CLEAR OPENING SIZE COMPLIES WITH SECTIONS R310.1.1 TO R310.2.3, AND SUCH DEVICES SHALL BE RELEASABLE OR REMOVABLE FROM THE INSIDE WITHOUT THE USE OF A KEY, TOOL, SPECIAL KNOWLEDGE OR FORCE GREATER THAN THAT REQUIRED FOR THE NORMAL OPERATION OF THE ESCAPE AND RESCUE OPENING.

R310.5 DWELLING ADDITIONS.
WHERE DWELLING ADDITIONS OCCUR THAT CONTAIN SLEEPING ROOMS, AN EMERGENCY ESCAPE AND RESCUE OPENING SHALL BE PROVIDED IN EACH NEW SLEEPING ROOM. WHERE DWELLING ADDITIONS OCCUR THAT HAVE BASEMENTS, AN EMERGENCY ESCAPE AND RESCUE OPENING SHALL BE PROVIDED IN THE NEW BASEMENT.

NOTE: SEE SECTION 310.5 FOR EXCEPTIONS

R310.6 ALTERATIONS OR REPAIRS OF EXISTING BASEMENTS.
AN EMERGENCY ESCAPE AND RESCUE OPENING IS NOT REQUIRED WHERE EXISTING BASEMENTS UNDERGO ALTERATIONS OR REPAIRS.

NOTE: SEE SECTION 310.6 FOR EXCEPTION

SECTION R311 MEANS OF EGRESS

R311.1 MEANS OF EGRESS.
DWELLINGS SHALL BE PROVIDED WITH A MEANS OF EGRESS IN ACCORDANCE WITH THIS SECTION. THE MEANS OF EGRESS SHALL PROVIDE A CONTINUOUS AND UNOBSTRUCTED PATH OFVERTICAL AND HORIZONTAL EGRESS TRAVEL FROM ALL PORTIONS OF THEDWELLING TO THE REQUIRED EGRESS DOOR WITHOUT REQUIRING TRAVEL THROUGH A GARAGE. THE REQUIRED EGRESS DOOR SHALL OPEN DIRECTLY INTO A PUBLIC WAY OR TO A YARD OR COURT THAT OPENS TO A PUBLIC WAY.

R311.2 EGRESS DOOR.
NOT LESS THAN ONE EGRESS DOOR SHALL BE PROVIDED FOR EACH DWELLING UNIT. THE EGRESS DOOR SHALL BE SIDE-HINGED, AND SHALL PROVIDE A CLEAR WIDTH OF NOT LESS THAN 32 INCHES (813 MM) WHERE MEASURED BETWEEN THE FACE OF THE DOOR AND THE STOP, WITH THE DOOR OPEN 90 DEGREES (1.57 RAD). THE CLEAR HEIGHT OF THE DOOR OPENING SHALL BE NOT LESS THAN 78 INCHES (1981 MM) IN HEIGHT MEASURED FROM THE TOP OF THE THRESHOLD TO THE BOTTOM OF THE STOP. OTHER DOORS SHALL NOT BE REQUIRED TO COMPLY WITH THESE MINIMUM DIMENSIONS. EGRESS DOORS SHALL BE READILY OPEN-ABLE FROM INSIDE THE DWELLING WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.

R311.3 FLOORS AND LANDINGS AT EXTERIOR DOORS.
THERE SHALL BE A LANDING OR FLOOR ON EACH SIDE OF EACH EXTERIOR DOOR. THE WIDTH OF EACH LANDING SHALL BE NOT LESS THAN THE DOOR SERVED.
EVERY LANDING SHALL HAVE A DIMENSION OF NOT LESS THAN 36 INCHES (914 MM) MEASURED IN THE DIRECTION OF TRAVEL. THE SLOPE AT EXTERIOR LANDINGS SHALL NOT EXCEED 1/4 UNIT VERTICAL IN 12 UNITS HORIZONTAL (2 PERCENT).

NOTE: SEE SECTION 311.3. FOR EXCEPTION

R311.3.1 FLOOR ELEVATIONS AT THE REQUIRED EGRESS DOORS.
LANDINGS OR FINISHED FLOORS AT THE REQUIRED EGRESS DOOR SHALL BE NOT MORE THAN 11/2 INCHES (38 MM) LOWER THAN THE TOP OF THE THRESHOLD.

NOTE: SEE SECTION 311.3.1 FOR EXCEPTION

R311.3.2 FLOOR ELEVATIONS FOR OTHER EXTERIOR DOORS.
DOORS OTHER THAN THE REQUIRED EGRESS DOOR SHALL BE PROVIDED WITH LANDINGS OR FLOORS NOT MORE THAN 73/4 INCHES (196 MM) BELOW THE TOP OF THE THRESHOLD.

NOTE: SEE SECTION 311.3.2. FOR EXCEPTION

R311.3.3 STORM AND SCREEN DOORS.
STORM AND SCREEN DOORS SHALL BE PERMITTED TO SWING OVER EXTERIOR STAIRS AND LANDINGS.

R311.4 VERTICAL EGRESS.
EGRESS FROM HABITABLE LEVELS INCLUDING HABITABLE ATTIC AND BASEMENTS NOT PROVIDED WITH AN EGRESS DOOR IN ACCORDANCE WITH SECTION R311.2 SHALL BE BY A RAMP IN ACCORDANCE WITH SECTION R311.8 OR A STAIRWAY IN ACCORDANCE WITH SECTION R311.7.

R311.5 CONSTRUCTION.

R311.5.1 ATTACHMENT.
EXTERIOR LANDINGS, DECKS, BALCONIES, STAIRS AND SIMILAR FACILITIES SHALL BE POSITIVELY ANCHORED TO THE PRIMARY STRUCTURE TO RESIST BOTH VERTICAL AND LATERAL FORCES OR SHALL BE DESIGNED TO BE SELF-SUPPORTING. ATTACHMENT SHALL NOT BE ACCOMPLISHED BY USE OF TOENAILS OR NAILS SUBJECT TO WITHDRAWAL.

R311.6 HALLWAYS.
THE WIDTH OF A HALLWAY SHALL BE NOT LESS THAN 3 FEET (914 MM).

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R311.7 STAIRWAYS.

R311.7.1 WIDTH.
STAIRWAYS SHALL BE NOT LESS THAN 36 INCHES (914 MM) IN CLEAR WIDTH AT ALL POINTS ABOVE THE PERMITTED HANDRAIL HEIGHT AND BELOW THE REQUIRED HEADROOM HEIGHT. HANDRAILS SHALL NOT PROJECT MORE THAN 4 1/2 INCHES (114 MM) ON EITHER SIDE OF THE STAIRWAY AND THE CLEAR WIDTH OF THE STAIRWAY AT AND BELOW THE HANDRAIL HEIGHT, INCLUDING TREADS AND LANDINGS, SHALL BE NOT LESS THAN 31 1/2 INCHES (787 MM) WHERE A HANDRAIL IS INSTALLED ON ONE SIDE AND 27 INCHES (698 MM) WHERE HANDRAILS ARE PROVIDED ON BOTH SIDES.

NOTE: SEE SECTION 311.7. FOR EXCEPTION

R311.7.2 HEADROOM.
THE HEADROOM IN STAIRWAYS SHALL BE NOT LESS THAN 6 FEET 8 INCHES (2032 MM) MEASURED VERTICALLY FROM THE SLOPED LINE ADJOINING THE TREAD NOSING OR FROM THE FLOOR SURFACE OF THE LANDING OR PLATFORM ON THAT PORTION OF THE STAIRWAY.

NOTE: SEE SECTION 311.7.2 FOR EXCEPTION S

R311.7.3 VERTICAL RISE.
A FLIGHT OF STAIRS SHALL NOT HAVE A VERTICAL RISE LARGER THAN 147 INCHES (3734 MM) BETWEEN FLOOR LEVELS OR LANDINGS

R311.7.4 WALK-LINE.
THE WALK-LINE ACROSS WINDER TREADS SHALL BE CONCENTRIC TO THE CURVED DIRECTION OF TRAVEL THROUGH THE TURN AND LOCATED 12 INCHES (305 MM) FROM THE SIDE WHERE THE WINDERS ARE NARROWER. THE 12-INCH (305mm) DIMENSION SHALL BE MEASURED FROM THE WIDEST POINT OF THE CLEAR STAIR WIDTH AT THE WALKING SURFACE OF THE WINDER.
IF WINDERS ARE ADJACENT WITHIN THE FLIGHT, THE POINT OF THE WIDEST CLEAR STAIR WIDTH OF THE ADJACENT WINDERS SHALL BE USED.

R311.7.5 STAIR TREADS AND RISERS.
STAIR TREADS AND RISERS SHALL MEET THE REQUIREMENTS OF THIS SECTION. FOR THE PURPOSES OF THIS SECTION, DIMENSIONS AND DIMENSIONED SURFACES SHALL BE EXCLUSIVE OF CARPETS, RUGS OR RUNNERS.

R311.7.5.1 RISERS.
THE RISER HEIGHT SHALL BE NOT MORE THAN 73/4 INCHES (196 MM). THE RISER SHALL BE MEASURED VERTICALLY BETWEEN LEADING EDGES OF THE ADJACENT TREADS. THE GREATEST RISER HEIGHT WITHIN ANY FLIGHT OF STAIRS SHALL NOT EXCEED THE SMALLEST BY MORE THAN 3/8 INCH (9.5 MM). RISERS SHALL BE VERTICAL OR SLOPED FROM THE UNDERSIDE OF THE NOSING OF THE TREAD ABOVE AT AN ANGLE NOT MORE THAN 30 DEGREES (0.51 RAD) FROM THE VERTICAL. OPEN RISERS ARE PERMITTED PROVIDED THAT THE OPENINGS LOCATED MORE THAN 30 INCHES (762 MM), AS MEASURED VERTICALLY, TO THE FLOOR OR GRADE BELOW DO NOT PERMIT THE PASSAGE OF 4-INCH-DIA (102 MM) SPHERE.

NOTE: SEE SECTION 311.5.1 FOR EXCEPTION S

R311.7.5.2 TREADS.
THE TREAD DEPTH SHALL BE NOT LESS THAN 10 INCHES (254 MM). THE TREAD DEPTH SHALL BE MEASURED HORIZONTALLY BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AND AT A RIGHT ANGLE TO THE TREAD'S LEADING EDGE. THE GREATEST TREAD DEPTH WITHIN ANY FLIGHT OF STAIRS SHALL NOT EXCEED THE SMALLEST BY MORE THAN 3/8 INCH (9.5 MM).

R311.7.5.2.1 WINDER TREADS.
WINDER TREADS SHALL HAVE A TREAD DEPTH OF NOT LESS THAN 10 INCHES (254MM) MEASURED BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AT THE INTERSECTIONS WITH THE WALK-LINE. WINDER TREADS SHALL HAVE A TREAD DEPTH OF NOT LESS THAN 6 INCHES (152 MM) AT ANY POINT WITHIN THE CLEAR WIDTH OF THE STAIR. WITHIN ANY FLIGHT OF STAIRS, THE LARGEST WINDER TREAD DEPTH AT THE WALK-LINE SHALL NOT EXCEED THE SMALLEST WINDER TREAD BY MORE THAN 3/8 INCH (9.5 MM). CONSISTENTLY SHAPED WINDERS AT THE WALK-LINE SHALL BE ALLOWED WITHIN THE SAME FLIGHT OF STAIRS AS RECTANGULAR TREADS AND DO NOT HAVE TO BE WITHIN 3/8 INCH (9.5 MM) OF THE RECTANGULAR TREAD DEPTH.

NOTE: SEE SECTION 311.7.5 .2.1 FOR EXCEPTION

R311.7.5.3 NOSINGS.
THE RADIUS OF CURVATURE AT THE NOSING SHALL BE NOT GREATER THAN 9/16 INCH (14 MM). A NOSING PROJECTION NOT LESS THAN 3/4 INCH (19 MM) AND NOT MORE THAN 11/4 INCHES (32 MM) SHALL BE PROVIDED ON STAIRWAYS WITH SOLID RISERS. THE GREATEST NOSING PROJECTION SHALL NOT EXCEED THE SMALLEST NOSING PROJECTION BY MORE THAN 3/8 INCH (9.5 MM) BETWEEN TWO STORIES, INCLUDING THE NOSING AT THE LEVEL OF FLOORS AND LANDINGS. BEVELING OF NOSINGS SHALL NOT EXCEED 1/2 INCH (12.7 MM).

NOTE: SEE SECTION 311.7.5.3 FOR EXCEPTION

R311.7.5.4 EXTERIOR PLASTIC COMPOSITE STAIR TREADS.
PLASTIC COMPOSITE EXTERIOR STAIR TREADS SHALL COMPLY WITH THE PROVISIONS OF THIS SECTION AND SECTION R507.3

R311.7.6 LANDINGS FOR STAIRWAYS.
THERE SHALL BE A FLOOR OR LANDING AT THE TOP AND BOTTOM OF EACH STAIRWAY. THE WIDTH PERPENDICULAR TO THE DIRECTION OF TRAVEL SHALL BE NOT LESS THAN THE WIDTH OF THE FLIGHT SERVED. LANDINGS OF SHAPES OTHER THAN SQUARE OR RECTANGULAR SHALL BE PERMITTED PROVIDED THAT THE DEPTH AT THE WALK LINE AND THE TOTAL AREA IS NOT LESS THAN THAT OF A QUARTER CIRCLE WITH A RADIUS EQUAL TO THE REQUIRED LANDING WIDTH. WHERE THE STAIRWAY HAS A STRAIGHT RUN, THE DEPTH IN THE DIRECTION OF TRAVEL SHALL BE NOT LESS THAN 36 INCHES (914 MM).

NOTE: SEE SECTION 311.7.6 FOR EXCEPTION

R311.7.7 STAIRWAY WALKING SURFACE.
THE WALKING SURFACE OF TREADS AND LANDINGS OF STAIRWAYS SHALL BE SLOPED NOT STEEPER THAN ONE UNIT VERTICAL IN 48 INCHES HORIZONTAL (2-PERCENT SLOPE).

R311.7.8 HANDRAILS.
HANDRAILS SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF EACH CONTINUOUS RUN OF TREADS OR FLIGHT WITH FOUR OR MORE RISERS.

R311.7.8.1 HEIGHT.
HANDRAIL HEIGHT, MEASURED VERTICALLY FROM THE SLOPED PLANE ADJOINING THE TREAD NOSING, OR FINISH SURFACE OF RAMP SLOPE, SHALL BE NOT LESS THAN 34 INCHES (864 MM) AND NOT MORE THAN 38 INCHES (965 MM).

NOTE: SEE SECTION 311.7.8.1 FOR EXCEPTIONS

R311.7.8.2 CONTINUITY.
HANDRAILS FOR STAIRWAYS SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE FLIGHT, FROM A POINT DIRECTLY ABOVE THE TOP RISER OF THE FLIGHT TO A POINT DIRECTLY ABOVE THE LOWEST RISER OF THE FLIGHT. HANDRAIL ENDS SHALL BE RETURNED OR SHALL TERMINATE IN NEWEL POSTS OR SAFETY TERMINALS. HANDRAILS ADJACENT TO A WALL SHALL HAVE A SPACE OF NOT LESS THAN 11/2 INCHES (38 MM) BETWEEN THE WALL AND THE HANDRAILS.

NOTE: SEE SECTION 311.7.8.2 FOR EXCEPTIONS

R311.7.8.3 GRIP-SIZE.
REQUIRED HANDRAILS SHALL BE OF ONE OF THE FOLLOWING TYPES OR PROVIDE EQUIVALENT GRASP-ABILITY.

NOTE: SEE R3117.8.3 FOR TYPE I AND TYPE II HANDRAILS.

R311.7.8.4 EXTERIOR PLASTIC COMPOSITE HANDRAILS.
PLASTIC COMPOSITE EXTERIOR HANDRAILS SHALL COMPLY WITH THE REQUIREMENTS OF SECTION R507.3.

R311.7.9 ILLUMINATION.
STAIRWAYS SHALL BE PROVIDED WITH ILLUMINATION IN ACCORDANCE WITH SECTION R303.7.

R311.7.10 SPECIAL STAIRWAYS.
SPIRAL STAIRWAYS AND BULKHEAD ENCLOSURE STAIRWAYS SHALL COMPLY WITH THE REQUIREMENTS OF SECTION R311.7 EXCEPT AS SPECIFIED IN SECTIONS R311.7.10.1 AND R311.7.10.2.

R311.7.10.1 SPIRAL STAIRWAYS.
SPIRAL STAIRWAYS ARE PERMITTED, PROVIDED THAT THE CLEAR WIDTH AT AND BELOW THE HANDRAIL IS NOT LESS THAN 26 INCHES (660 MM) AND THE WALK-LINE RADIUS IS NOT GREATER THAN 24 1/2 INCHES (622 MM). EACH TREAD SHALL HAVE A DEPTH OF NOT LESS THAN 6 3/4 INCHES (171 MM) AT THE WALK-LINE. ALL TREADS SHALL BE IDENTICAL, AND THE RISE SHALL BE NOT MORE THAN 9 1/2 INCHES (241 MM). HEADROOM SHALL BE NOT LESS THAN 6 FEET 6 INCHES (1982 MM).

R311.7.10.2 BULKHEAD ENCLOSURE STAIRWAYS.
STAIRWAYS SERVING BULKHEAD ENCLOSURES, NOT PART OF THE REQUIRED BUILDING EGRESS, PROVIDING ACCESS FROM THE OUTSIDE GRADE LEVEL TO THE BASEMENT SHALL BE EXEMPT FROM THE REQUIREMENTS OF SECTIONS R311.3 AND R311.7 WHERE THE HEIGHT FROM THE BASEMENT FINISHED FLOOR LEVEL TO GRADE ADJACENT TO THE STAIRWAY IS NOT MORE THAN 8 FEET (2438 MM) AND THE GRADE LEVEL OPENING TO THE STAIRWAY IS COVERED BY A BULKHEAD ENCLOSURE WITH HINGED DOORS OR OTHER APPROVED MEANS.

NOTE: SEE SECTION R311.7.11 THROUGH R311.7.12.2 FOR ALTERNATING TREAD DEVICES AND SHIPS LADDERS.

R311.8 RAMPS

R311.8.1 MAXIMUM SLOPE.
RAMPS SERVING THE EGRESS DOOR REQUIRED BY SECTION R311.2 SHALL HAVE A SLOPE OF NOT MORE THAN 1 UNIT VERTICAL IN 12 UNITS HORIZONTAL (8.3-PERCENT SLOPE). ALL OTHER RAMPS SHALL HAVE A MAXIMUM SLOPE OF 1 UNIT VERTICAL IN 8 UNITS HORIZONTAL (12.5 PERCENT).

EXCEPTION: WHERE IT IS TECHNICALLY INFEASIBLE TO COMPLY BECAUSE OF SITE CONSTRAINTS, RAMPS SHALL HAVE A SLOPE OF NOT MORE THAN 1 UNIT VERTICAL IN 8 UNITS HORIZONTAL (12.5 PERCENT).

R311.8.2 LANDINGS REQUIRED.
THERE SHALL BE A FLOOR OR LANDING AT THE TOP AND BOTTOM OF EACH RAMP. WHERE DOORS OPEN ONTO RAMPS, AND WHERE RAMPS CHANGE DIRECTIONS. THE WIDTH OF THE LANDING PERPENDICULAR TO THE RAMP SLOPE SHALL BE NOT LESS THAN 36 INCHES (914 MM).

R311.8.3 HANDRAILS REQUIRED.
HANDRAILS SHALL BE PROVIDED ON NOT LESS THAN ONE SIDE OF RAMPS EXCEEDING A SLOPE OF ONE UNIT VERTICAL IN 12 UNITS HORIZONTAL (8.33-PERCENT SLOPE).

R311.8.3.1 HEIGHT.
HANDRAIL HEIGHT, MEASURED ABOVE THE FINISHED SURFACE OF THE RAMP SLOPE, SHALL BE NOT LESS THAN 34 INCHES (864 MM)AND NOT MORE THAN 38 INCHES (965 MM).

R311.8.3.2 GRIP SIZE.
HANDRAILS ON RAMPS SHALL COMPLY WITH SECTION R311.7.8.3.

R311.8.3.3 CONTINUITY.
HANDRAILS WHERE REQUIRED ON RAMPS SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE RAMP. HANDRAIL ENDS SHALL BE RETURNED OR SHALL TERMINATE IN NEWEL POSTS OR SAFETY TERMINALS. HANDRAILS ADJACENT TO A WALL SHALL HAVE A SPACE OF NOT LESS THAN 11/2 INCHES (38 MM) BETWEEN THE WALL AND THE HANDRAILS.

SECTION R312
GUARDS AND WINDOW FALL PROTECTION

R312.1 GUARDS.
GUARDS SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS R312.1.1 THROUGH R312.1.4.

R312.1.1 WHERE REQUIRED.
GUARDS SHALL BE LOCATED ALONG OPEN-SIDED WALKING SURFACES, INCLUDING STAIRS, RAMPS AND LANDINGS, THAT ARE LOCATED MORE THAN 30 INCHES (762 MM) MEASURED VERTICALLY TO THE FLOOR OR GRADE BELOW AT ANY POINT WITHIN 36 INCHES (914 MM) HORIZONTALLY TO THE EDGE OF THE OPEN SIDE. INSECT SCREENING SHALL NOT BE CONSIDERED AS A GUARD.

R312.1.2 HEIGHT.
REQUIRED GUARDS AT OPEN-SIDED WALKING SURFACES, INCLUDING STAIRS, PORCHES, BALCONIES OR LANDINGS, SHALL BE NOT LESS THAN 36 INCHES (914 MM) IN HEIGHT AS MEASURED VERTICALLY ABOVE THE ADJACENT WALKING SURFACE OR THE LINE CONNECTING THE LEADING EDGES OF THE TREADS.

NOTE: SEE SECTION 312.1.2 FOR EXCEPTION S

R312.1.3 OPENING LIMITATIONS.
REQUIRED GUARDS SHALL NOT HAVE OPENINGS FROM THE WALKING SURFACE TO THE REQUIRED GUARD HEIGHT THAT ALLOW PASSAGE OF A SPHERE 4 INCHES (102 mm) IN DIAMETER.

NOTE: SEE SECTION 312.1.3 FOR EXCEPTION S

R312.1.4 EXTERIOR PLASTIC COMPOSITE GUARDS.
PLASTIC COMPOSITE EXTERIOR GUARDS SHALL COMPLY WITH THE REQUIREMENTS OF SECTION R317.4.

R312.2 WINDOW FALL PROTECTION.
WINDOW FALL PROTECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS R312.2.1 AND R312.2.2.

R312.2.1 WINDOW SILLS.
IN DWELLING UNITS, WHERE THE TOP OF THE SILL OF AN OPERABLE WINDOW OPENING IS LOCATED LESS THAN 24 INCHES (610 MM) ABOVE THE FINISHED FLOOR AND GREATER THAN 72 INCHES (1829 MM) ABOVE THE FINISHED GRADE OR OTHER SURFACE BELOW ON THE EXTERIOR OF THE BUILDING, THE OPERABLE WINDOW SHALL COMPLY WITH ONE OF THE FOLLOWING:

1. OPERABLE WINDOWS WITH OPENINGS THAT WILL NOT ALLOW A 4-INCH-DIAMETER (102 MM) SPHERE TO PASS THROUGH THE OPENING WHERE THE OPENING IS IN ITS LARGEST OPENED POSITION.
2. OPERABLE WINDOWS THAT ARE PROVIDED WITH WINDOW FALL PREVENTION DEVICES THAT COMPLY WITH ASTM F 2090.
3. OPERABLE WINDOWS THAT ARE PROVIDED WITH WINDOW
4. OPENING CONTROL DEVICES THAT COMPLY WITH SECTION R312.2.2.

R312.2.2 WINDOW OPENING CONTROL DEVICES.
WINDOW OPENING CONTROL DEVICES SHALL COMPLY WITH ASTM F 2090. THE WINDOW OPENING CONTROL DEVICE, AFTER OPERATION TO RELEASE THE CONTROL DEVICE ALLOWING THE WINDOW TO FULLY OPEN, SHALL NOT REDUCE THE NET CLEAR OPENING AREA OF THE WINDOW UNIT TO LESS THAN THE AREA REQUIRED BY SECTION R310.2.1.

SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

313.1 TOWNHOUSE AUTOMATIC FIRE SPRINKLER SYSTEMS.
AN AUTOMATIC RESIDENTIAL FIRE SPRINKLER SYSTEM SHALL BE INSTALLED IN TOWNHOUSES.

NOTE: SEE SECTION 313.1 FOR EXCEPTION

R313.1.1 DESIGN AND INSTALLATION.
AUTOMATIC RESIDENTIAL FIRE SPRINKLER SYSTEMS FOR TOWNHOUSES SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH SECTION P2904 OR NFPA 13D.

R313.2 ONE- AND TWO-FAMILY DWELLINGS AUTOMATIC FIRE SYSTEMS.
AN AUTOMATIC RESIDENTIAL FIRE SPRINKLER SYSTEM SHALL BE INSTALLED IN ONE- AND TWO-FAMILY DWELLINGS.

NOTE: SEE SECTION 313.2 FOR EXCEPTION

R313.2.1 DESIGN AND INSTALLATION.
AUTOMATIC RESIDENTIAL FIRE SPRINKLER SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH SECTION P2904 OR NFPA 13D.

SECTION R314 SMOKE ALARMS

R314.1 GENERAL.
SMOKE ALARMS SHALL COMPLY WITH NFPA 72 AND SECTION R314.

R314.1.1 LISTINGS.
SMOKE ALARMS SHALL BE LISTED IN ACCORDANCE WITH UL 217. COMBINATION SMOKE AND CARBON MONOXIDE ALARMS SHALL BE LISTED IN ACCORDANCE WITH UL 217 AND UL 2034.

R314.2 WHERE REQUIRED.
SMOKE ALARMS SHALL BE PROVIDED IN ACCORDANCE WITH THIS SECTION.

R314.2.1 NEW CONSTRUCTION.
SMOKE ALARMS SHALL BE PROVIDED IN DWELLING UNITS.

R314.2.2 ALTERATIONS, REPAIRS AND ADDITIONS.
WHERE ALTERATIONS, REPAIRS OR ADDITIONS REQUIRING A PERMIT OCCUR, OR WHERE ONE OR MORE SLEEPING ROOMS ARE ADDED OR CREATED IN EXISTING DWELLINGS, THE INDIVIDUAL DWELLING UNIT SHALL BE EQUIPPED WITH SMOKE ALARMS LOCATED AS REQUIRED FOR NEW DWELLINGS.

NOTE: SEE SECTION 314.2.2 FOR EXCEPTION S

R314.3 LOCATION.
SMOKE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS:
1. IN EACH SLEEPING ROOM.
2. OUTSIDE EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS.
3. ON EACH ADDITIONAL STORY OF THE DWELLING, INCLUDING BASEMENTS AND HABITABLE ATTICS AND NOT INCLUDING CRAWL SPACES AND UNINHABITABLE ATTICS. IN DWELLINGS OR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, A SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL PROVIDED THAT THE LOWER LEVEL IS LESS THAN ONE FULL STORY BELOW THE UPPER LEVEL.
4. SMOKE ALARMS SHALL BE INSTALLED NOT LESS THAN 3 FEET (914 MM) HORIZONTALLY FROM THE DOOR OR OPENING OF A BATHROOM THAT CONTAINS A BATHTUB OR SHOWER UNLESS THIS WOULD PREVENT PLACEMENT OF A SMOKE ALARM REQUIRED BY SECTION R314.3.

R314.3.1 INSTALLATION NEAR COOKING APPLIANCES.
SMOKE ALARMS SHALL NOT BE INSTALLED IN THE FOLLOWING LOCATIONS UNLESS THIS WOULD PREVENT PLACEMENT OF A SMOKE ALARM IN A LOCATION REQUIRED BY SECTION R314.3.

1. IONIZATION SMOKE ALARMS SHALL NOT BE INSTALLED LESS THAN 20 FEET (6096 MM) HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE.
2. IONIZATION SMOKE ALARMS WITH AN ALARM-SILENCING SWITCH SHALL NOT BE INSTALLED LESS THAN 10 FEET (3048 mm) HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE.
3. PHOTOELECTRIC SMOKE ALARMS SHALL NOT BE INSTALLED LESS THAN 6 FEET (1828 MM) HORIZONTALLY FROM A PERMANENTLY INSTALLED COOKING APPLIANCE.

R314.4 INTERCONNECTION.
WHERE MORE THAN ONE SMOKE ALARM IS REQUIRED TO BE INSTALLED WITHIN AN INDIVIDUAL DWELLING UNIT IN ACCORDANCE WITH SECTION R314.3, THE ALARM DEVICES SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL DWELLING UNIT. PHYSICAL INTERCONNECTION OF SMOKE ALARMS SHALL NOT BE REQUIRED WHERE LISTED WIRELESS ALARMS ARE INSTALLED AND ALL ALARMS SOUND UPON ACTIVATION OF ONE ALARM.

NOTE: SEE SECTION 314.4 FOR EXCEPTION

R314.5 COMBINATION ALARMS.
COMBINATION SMOKE AND CARBON MONOXIDE ALARMS SHALL BE PERMITTED TO BE USED IN LIEU OF SMOKE ALARMS.

R314.6 POWER SOURCE.
SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM THE BUILDING WIRING WHERE SUCH WIRING IS SERVED FROM A COMMERCIAL SOURCE AND, WHERE PRIMARY POWER IS INTERRUPTED, SHALL RECEIVE POWER FROM A BATTERY. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN THOSE REQUIRED FOR OVERCURRENT PROTECTION.

NOTE: SEE SECTION 314.6 FOR EXCEPTIONS

R314.7 FIRE ALARM SYSTEMS
FIRE ALARM SYSTEMS SHALL BE PERMITTED TO BE USED IN LIEU OF SMOKE ALARMS AND SHALL COMPLY WITH SECTIONS R314.7.1 THROUGH R314.7.4.

SECTION R315 CARBON MONOXIDE ALARMS

R315.1 GENERAL.
CARBON MONOXIDE ALARMS SHALL COMPLY WITH SECTION R315.

R315.1.1 LISTINGS.
CARBON MONOXIDE ALARMS SHALL BE LISTED IN ACCORDANCE WITH UL 2034. COMBINATION CARBON MONOXIDE AND SMOKE ALARMS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 217.

R315.2 WHERE REQUIRED.
CARBON MONOXIDE ALARMS SHALL BE PROVIDED IN ACCORDANCE WITH SECTIONS R315.2.1 AND R315.2.2.

R315.2.1 NEW CONSTRUCTION.
FOR NEW CONSTRUCTION, CARBON MONOXIDE ALARMS SHALL BE PROVIDED IN DWELLING UNITS WHERE EITHER OR BOTH OF THE FOLLOWING CONDITIONS EXIST.

1. THE DWELLING UNIT CONTAINS A FUEL-FIRED APPLIANCE.
2. THE DWELLING UNIT HAS AN ATTACHED GARAGE WITH AN OPENING THAT COMMUNICATES WITH THE DWELLING UNIT.

R315.2.2 ALTERATIONS, REPAIRS AND ADDITIONS.
WHERE ALTERATIONS, REPAIRS OR ADDITIONS REQUIRING A PERMIT OCCUR, OR WHERE ONE OR MORE SLEEPING ROOMS ARE ADDED OR CREATED IN EXISTING DWELLINGS, THE INDIVIDUAL DWELLING UNIT SHALL BE EQUIPPED WITH CARBON MONOXIDE ALARMS LOCATED AS REQUIRED FOR NEW DWELLINGS.
EXCEPTIONS:

NOTE: SEE SECTION 315.2.2 FOR EXCEPTION S

R315.3 LOCATION.
CARBON MONOXIDE ALARMS IN DWELLING UNITS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS. WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM OR ITS ATTACHED BATHROOM, A CARBON MONOXIDE ALARM SHALL BE INSTALLED WITHIN THE BEDROOM.

R315.4 COMBINATION ALARMS.
COMBINATION CARBON MONOXIDE AND SMOKE ALARMS SHALL BE PERMITTED TO BE USED IN LIEU OF CARBON MONOXIDE ALARMS.

R315.5 POWER SOURCE.
CARBON MONOXIDE ALARMS SHALL RECEIVE THEIR PRIMARY POWER FROM THE BUILDING WIRING WHERE SUCH WIRING IS SERVED FROM A COMMERCIAL SOURCE AND, WHERE PRIMARY POWER IS INTERRUPTED, SHALL RECEIVE POWER FROM A BATTERY. WIRING SHALL BE PERMANENT AND WITHOUT A DISCONNECTING SWITCH OTHER THAN THOSE REQUIRED FOR OVER-CURRENT PROTECTION.

NOTE: SEE SECTION 315.5 FOR EXCEPTION S

R315.6 CARBON MONOXIDE DETECTION SYSTEMS.
CARBON MONOXIDE DETECTION SYSTEMS SHALL BE PERMITTED TO BE USED IN LIEU OF CARBON MONOXIDE ALARMS AND SHALL COMPLY WITH SECTIONS R315.6.1 THROUGH R315.6.4.

SECTION R321
ELEVATORS AND PLATFORM LIFTS

R321.1 ELEVATORS.
WHERE PROVIDED, PASSENGER ELEVATORS, LIMITED- USE AND LIMITED-APPLICATION ELEVATORS OR PRIVATE RESIDENCE ELEVATORS SHALL COMPLY WITH ASME A17.1/CSA B44.

SECTION R322
FLOOD-RESISTANT CONSTRUCTION

R322.1 GENERAL.
BUILDINGS AND STRUCTURES CONSTRUCTED IN WHOLE OR IN PART IN FLOOD HAZARD AREAS, INCLUDING A OR V ZONES AND COASTAL A ZONES, AS ESTABLISHED IN TABLE R301.2(1), AND SUBSTANTIAL IMPROVEMENT AND RESTORATION OF SUBSTANTIAL DAMAGE OF BUILDINGS AND STRUCTURES IN FLOOD HAZARD AREAS, SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS CONTAINED IN THIS SECTION. BUILDINGS AND STRUCTURES THAT ARE LOCATED IN MORE THAN ONE FLOOD HAZARD AREA SHALL COMPLY WITH THE PROVISIONS ASSOCIATED WITH THE MOST RESTRICTIVE FLOOD HAZARD AREA. BUILDINGS AND STRUCTURES LOCATED IN WHOLE OR IN PART IN IDENTIFIED FLOODWAYS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ASCE 24.

R322.1.2 STRUCTURAL SYSTEMS.
STRUCTURAL SYSTEMS OF BUILDINGS AND STRUCTURES SHALL BE DESIGNED, CONNECTED AND ANCHORED TO RESIST FLOTATION, COLLAPSE OR PERMANENT LATERAL MOVEMENT DUE TO STRUCTURAL LOADS AND STRESSES FROM FLOODING EQUAL TO THE DESIGN FLOOD ELEVATION.

R322.1.3 FLOOD-RESISTANT CONSTRUCTION.
BUILDINGS AND STRUCTURES ERECTED IN AREAS PRONE TO FLOODING SHALL BE CONSTRUCTED BY METHODS AND PRACTICES THAT MINIMIZE FLOOD DAMAGE.

R322.1.4 ESTABLISHING THE DESIGN FLOOD ELEVATION.
THE DESIGN FLOOD ELEVATION SHALL BE USED TO DEFINE FLOOD HAZARD AREAS. AT A MINIMUM, THE DESIGN FLOOD ELEVATION SHALL BE THE HIGHER OF THE FOLLOWING:

1. THE BASE FLOOD ELEVATION AT THE DEPTH OF PEAK ELEVATION OF FLOODING, INCLUDING WAVE HEIGHT, THAT HAS A 1 PERCENT (100-YEAR FLOOD) OR GREATER CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR; OR
2. THE ELEVATION OF THE DESIGN FLOOD ASSOCIATED WITH THE AREA DESIGNATED ON A FLOOD HAZARD MAP ADOPTED BY THE COMMUNITY, OR OTHERWISE LEGALLY DESIGNATED.

FOR DETERMINING DESIGN FLOOD ELEVATIONS AND IMPACTS REFER TO SECTIONS R322.1.4.1 AND R322.1.4.2

R322.1.5 LOWEST FLOOR.
THE LOWEST FLOOR SHALL BE THE LOWEST FLOOR OF THE LOWEST ENCLOSED AREA, INCLUDING BASEMENT, AND EXCLUDING ANY UNFINISHED FLOOD-RESISTANT ENCLOSURE THAT IS USEABLE SOLELY FOR VEHICLE PARKING, BUILDING ACCESS OR LIMITED STORAGE PROVIDED THAT SUCH ENCLOSURE IS NOT BUILT SO AS TO RENDER THE BUILDING OR STRUCTURE IN VIOLATION OF THIS SECTION.

R322.1.6 PROTECTION OF MECHANICAL, PLUMBING AND ELECTRICAL SYSTEMS.
ELECTRICAL SYSTEMS, EQUIPMENT AND COMPONENTS; HEATING, VENTILATING, AIR CONDITIONING; PLUMBING APPLIANCES AND PLUMBING FIXTURES; DUCT SYSTEMS; AND OTHER SERVICE EQUIPMENT SHALL BE LOCATED AT OR ABOVE THE ELEVATION REQUIRED IN SECTION R322.2 OR R322.3. IF REPLACED AS PART OF A SUBSTANTIAL IMPROVEMENT, ELECTRICAL SYSTEMS, EQUIPMENT AND COMPONENTS; HEATING, VENTILATING, AIR CONDITIONING AND PLUMBING APPLIANCES AND PLUMBING FIXTURES; DUCT SYSTEMS; AND OTHER SERVICE EQUIPMENT SHALL MEET THE REQUIREMENTS OF THIS SECTION. SYSTEMS, FIXTURES, AND EQUIPMENT AND COMPONENTS SHALL NOT BE MOUNTED ON OR PENETRATE THROUGH WALLS INTENDED TO BREAK AWAY UNDER FLOOD LOADS.

NOTE SEE SECTION 322.1.6 FOR EXCEPTION

R322.1.7 PROTECTION OF WATER SUPPLY AND SANITARY SEWAGE SYSTEMS.
NEW AND REPLACEMENT WATER SUPPLY SYSTEMS SHALL BE DESIGNED TO MINIMIZE OR ELIMINATE INFILTRATION OF FLOOD WATERS INTO THE SYSTEMS IN ACCORDANCE WITH THE PLUMBING PROVISIONS OF THIS CODE. NEW AND REPLACEMENT SANITARY SEWAGE SYSTEMS SHALL BE DESIGNED TO MINIMIZE OR ELIMINATE INFILTRATION OF FLOODWATERS INTO SYSTEMS AND DISCHARGES FROM SYSTEMS INTO FLOODWATERS IN ACCORDANCE WITH THE PLUMBING PROVISIONS OF THIS CODE AND CHAPTER 3 OF THE INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE.

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R322.1.8 FLOOD-RESISTANT MATERIALS.
BUILDING MATERIALS AND INSTALLATION METHODS USED FOR FLOORING AND INTERIOR AND EXTERIOR WALLS AND WALL COVERINGS BELOW THE ELEVATION REQUIRED IN SECTION R322.2 OR R322.3 SHALL BE FLOOD DAMAGE- RESISTANT MATERIALS THAT CONFORM TO THE PROVISIONS OF FEMA TB-2.

SEE SECTION R322.2 FOR FLOOD HAZARD AREAS (INCLUDING A ZONES).

R322.2.2 ENCLOSED AREA BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS, INCLUDING CRAWL SPACES, THAT ARE BELOW THE DESIGN FLOOD ELEVATION SHALL:
1. BE USED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.
2. BE PROVIDED WITH FLOOD OPENINGS THAT MEET THE FOLLOWING CRITERIA AND ARE INSTALLED IN ACCORDANCE WITH SECTION R322.2.2.1 SECTIONS 2.1 THROUGH 2.3,
AS WELL AS, SECTIONS:

-R322.2.2.1 FOR INSTALLATION OF OPENINGS.
-R322.2.3 FOUNDATION DESIGN AND CONSTRUCTION.
-R322.2.4 TANKS.

REFER TO SECTION R322.3 FOR COASTAL HIGH-HAZARD AREAS (INCLUDING V ZONES AND COASTAL A ZONES, WHERE DESIGNATED). INCLUDING:

R322.3.1 LOCATION AND SITE PREPARATION
R322.3.2 ELEVATION REQUIREMENTS
R322.3.3 FOUNDATIONS
R322.3.4 WALLS BELOW DESIGN FLOOD ELEVATION
R322.3.5 ENCLOSED AREAS BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS BELOW THE DESIGN FLOOD ELEVATION SHALL BEUSED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.

R322.1.8 FLOOD-RESISTANT MATERIALS.
BUILDING MATERIALS AND INSTALLATION METHODS USED FOR FLOORING AND INTERIOR AND EXTERIOR WALLS AND WALL COVERINGS BELOW THE ELEVATION REQUIRED IN SECTION R322.2 OR R322.3 SHALL BE FLOOD DAMAGE- RESISTANT MATERIALS THAT CONFORM TO THE PROVISIONS OF FEMA TB-2.

SEE SECTION R322.2 FOR FLOOD HAZARD AREAS (INCLUDING A ZONES).

R322.2.2 ENCLOSED AREA BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS, INCLUDING CRAWL SPACES, THAT ARE BELOW THE DESIGN FLOOD ELEVATION SHALL:
1. BE USED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.
2. BE PROVIDED WITH FLOOD OPENINGS THAT MEET THE FOLLOWING CRITERIA AND ARE INSTALLED IN ACCORDANCE WITH SECTION R322.2.2.1 SECTIONS 2.1 THROUGH 2.3,
AS WELL AS, SECTIONS:

-R322.2.2.1 FOR INSTALLATION OF OPENINGS.
-R322.2.3 FOUNDATION DESIGN AND CONSTRUCTION.
-R322.2.4 TANKS.

REFER TO SECTION R322.3 FOR COASTAL HIGH-HAZARD AREAS (INCLUDING V ZONES AND COASTAL A ZONES, WHERE DESIGNATED). INCLUDING:

R322.3.1 LOCATION AND SITE PREPARATION
R322.3.2 ELEVATION REQUIREMENTS
R322.3.3 FOUNDATIONS
R322.3.4 WALLS BELOW DESIGN FLOOD ELEVATION
R322.3.5 ENCLOSED AREAS BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS BELOW THE DESIGN FLOOD ELEVATION SHALL BEUSED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.

R322.1.8 FLOOD-RESISTANT MATERIALS.
BUILDING MATERIALS AND INSTALLATION METHODS USED FOR FLOORING AND INTERIOR AND EXTERIOR WALLS AND WALL COVERINGS BELOW THE ELEVATION REQUIRED IN SECTION R322.2 OR R322.3 SHALL BE FLOOD DAMAGE- RESISTANT MATERIALS THAT CONFORM TO THE PROVISIONS OF FEMA TB-2.

SEE SECTION R322.2 FOR FLOOD HAZARD AREAS (INCLUDING A ZONES).

R322.2.2 ENCLOSED AREA BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS, INCLUDING CRAWL SPACES, THAT ARE BELOW THE DESIGN FLOOD ELEVATION SHALL:
1. BE USED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.
2. BE PROVIDED WITH FLOOD OPENINGS THAT MEET THE FOLLOWING CRITERIA AND ARE INSTALLED IN ACCORDANCE WITH SECTION R322.2.2.1 SECTIONS 2.1 THROUGH 2.3,
AS WELL AS, SECTIONS:

-R322.2.2.1 FOR INSTALLATION OF OPENINGS.
-R322.2.3 FOUNDATION DESIGN AND CONSTRUCTION.
-R322.2.4 TANKS.

REFER TO SECTION R322.3 FOR COASTAL HIGH-HAZARD AREAS (INCLUDING V ZONES AND COASTAL A ZONES, WHERE DESIGNATED). INCLUDING:

R322.3.1 LOCATION AND SITE PREPARATION
R322.3.2 ELEVATION REQUIREMENTS
R322.3.3 FOUNDATIONS
R322.3.4 WALLS BELOW DESIGN FLOOD ELEVATION
R322.3.5 ENCLOSED AREAS BELOW DESIGN FLOOD ELEVATION.
ENCLOSED AREAS BELOW THE DESIGN FLOOD ELEVATION SHALL BEUSED SOLELY FOR PARKING OF VEHICLES, BUILDING ACCESS OR STORAGE.

SECTION R323 STORM SHELTERS

R323.1 GENERAL.
THIS SECTION APPLIES TO STORM SHELTERS WHERE CONSTRUCTED AS SEPARATE DETACHED BUILDINGS OR WHERE CONSTRUCTED AS SAFE ROOMS WITHIN BUILDINGS FOR THE PURPOSE OF PROVIDING REFUGE FROM STORMS THAT PRODUCE HIGH WINDS, SUCH AS TORNADOS AND HURRICANES. IN ADDITION TO OTHER APPLICABLE REQUIREMENTS IN THIS CODE, STORM SHELTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ICC/NSSA-500.

SECTION R326
SWIMMING POOLS, SPAS AND HOT TUBS

R326.1 GENERAL.
THE DESIGN AND CONSTRUCTION OF POOLS AND SPAS SHALL COMPLY

CHAPTER 4 :: FOUNDATIONS

SECTION R401 GENERAL

R401.2 REQUIREMENTS.
FOUNDATION CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS IN ACCORDANCE WITH SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING SOIL. FILL SOILS THAT SUPPORT FOOTINGS AND FOUNDATIONS SHALL BE DESIGNED, INSTALLED AND TESTED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE. GRAVEL FILL USED AS FOOTINGS FOR WOOD AND PRECAST CONCRETE FOUNDATIONS SHALL COMPLY WITH SECTION R403.

R401.3 DRAINAGE.
SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE OR OTHER APPROVED POINT OF COLLECTION THAT DOES NOT CREATE A HAZARD. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES (152 MM) WITHIN THE FIRST 10 FEET (3048 MM).

NOTE: SEE SECTION 312.1.3 FOR EXCEPTION S

R401.4 SOIL TESTS.
WHERE QUANTIFIABLE DATA CREATED BY ACCEPTED SOIL SCIENCE METHODOLOGIES INDICATE EXPANSIVE, COMPRESSIBLE, SHIFTING OR OTHER QUESTIONABLE SOIL CHARACTERISTICS ARE LIKELY TO BE PRESENT, THE BUILDING OFFICIAL SHALL DETERMINE WHETHER TO REQUIRE A SOIL TEST TO DETERMINE THE SOIL'S CHARACTERISTICS AT A PARTICULAR LOCATION. THIS TEST SHALL BE DONE BY AN APPROVED AGENCY USING AN APPROVED METHOD.

SECTION R402 MATERIALS

R402.1 WOOD FOUNDATIONS.
WOOD FOUNDATION SYSTEMS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF THIS CODE.
R402.1.1 FASTENERS. FASTENERS USED BELOW GRADE TO ATTACH PLYWOOD TO THE EXTERIOR SIDE OF EXTERIOR BASEMENT OR CRAWLSPACE WALL STUDS, OR FASTENERS USED IN KNEE WALL CONSTRUCTION, SHALL BE OF TYPE 304 OR 316 STAINLESS STEEL. FASTENERS USED ABOVE GRADE TO ATTACH PLYWOOD AND ALL LUMBER-TOLUMBER FASTENERS EXCEPT THOSE USED IN KNEE WALL CONSTRUCTION SHALL BE OF TYPE 304 OR 316 STAINLESS STEEL, SILICON BRONZE, COPPER, HOT-DIPPED GALVANIZED (ZINC COATED) STEEL NAILS, OR HOT-TUMBLED GALVANIZED (ZINC COATED) STEEL NAILS. ELECTRO-GALVANIZED STEEL NAILS AND GALVANIZED (ZINC COATED) STEEL STAPLES SHALL NOT BE PERMITTED.

R402.1.2 WOOD TREATMENT.
ALL LUMBER AND PLYWOOD SHALL
BE PRESSURE-PRESERVATIVE TREATED AND DRIED AFTER TREATMENT IN ACCORDANCE WITH AWPA U1 (COMMODITY SPECIFICATION A, USE CATEGORY 4B AND SECTION 5.2), AND SHALL BEAR THE LABEL OF AN ACCREDITED AGENCY. WHERE LUMBER AND/OR PLYWOOD IS CUT OR DRILLED AFTER TREATMENT, THE TREATED SURFACE SHALL BE FIELD TREATED WITH COPPER NAPHTHENATE, THE CONCENTRATION OF WHICH SHALL CONTAIN A MINIMUM OF 2-PERCENTCOPPER METAL, BY REPEATED BRUSHING, DIPPING OR SOAKING UNTIL THE WOOD ABSORBS NO MORE PRESERVATIVE.

R402.2 CONCRETE.
CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF F c SC, AS SHOWN IN TABLE R402.2. CONCRETE SUBJECT TO MODERATE OR SEVERE WEATHERING AS INDICATED IN TABLE R301.2(1) SHALL BE AIR ENTRAINED AS SPECIFIED IN TABLE R402.2. THE MAXIMUM WEIGHT OF FLY ASH, OTHER POZZOLANS, SILICA FUME, SLAG OR BLENDED CEMENTS THAT IS INCLUDED IN CONCRETE MIXTURES FOR GARAGE FLOOR SLABS AND FOR EXTERIOR PORCHES, CARPORT SLABS AND STEPS THAT WILL BE EXPOSED TO DEICING CHEMICALS SHALL NOT EXCEED THE PERCENTAGES OF THE TOTAL WEIGHT OF CEMENTITIOUS MATERIALS SPECIFIED IN SECTION 19.3.3.4 OF ACI MATERIALS USED TO PRODUCE CONCRETE AND TESTING THEREOF SHALL COMPLY WITH THE APPLICABLE STANDARDS LISTED IN CHAPTERS 19 AND 20 OF ACI 318 OR ACI 332. R402.2.1

SECTION 403 FOOTINGS

R403.1 GENERAL.
ALL EXTERIOR WALLS SHALL BE SUPPORTED ON CONTINUOUS SOLID OR FULLY GROUTED MASONRY OR CONCRETE FOOTINGS, CRUSHED STONE FOOTINGS, WOOD FOUNDATIONS, OR OTHER APPROVED STRUCTURAL SYSTEMS WHICH SHALL BE OF SUFFICIENT DESIGN TO ACCOMMODATE ALL LOADS ACCORDING TO SECTION R301 AND TO TRANSMIT THE RESULTING LOADS TO THE SOIL WITHIN THE LIMITATIONS AS DETERMINED FROM THE CHARACTER OF THE SOIL. FOOTINGS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL. CONCRETE FOOTINGS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF SECTION R403 OR IN ACCORDANCE WITH ACI 332.

R403.1.1 MINIMUM SIZE.
THE MINIMUM WIDTH, W, AND THICKNESS, T, FOR CONCRETE FOOTINGS SHALL BE IN ACCORDANCE WITH TABLES R403.1(1) THROUGH R403.1(3) AND FIGURE R403.1(1) OR R403.1.3, AS APPLICABLE. THE FOOTING WIDTH SHALL BE BASED ON THE LOAD-BEARING VALUE OF THE SOIL IN ACCORDANCE WITH TABLE R401.4.1. FOOTING PROJECTIONS, P, SHALL BE NOT LESS THAN 2 INCHES (51 MM) AND SHALL NOT EXCEED THE THICKNESS OF THE FOOTING. FOOTING THICKNESS AND PROJECTION FOR FIREPLACES SHALL BE IN ACCORDANCE WITH SECTION R1001.2. THE SIZE OF FOOTINGS SUPPORTING PIERS AND COLUMNS SHALL BE BASED ON THE TRIBUTARY LOAD AND ALLOWABLE SOIL PRESSURE IN ACCORDANCE WITH TABLE R401.4.1. FOOTINGS FOR WOOD FOUNDATIONS SHALL BE IN ACCORDANCE WITH THE DETAILS SET FORTH IN SECTION R403.2, AND FIGURES R403.1(2) AND R403.1(3).

REFER TO THESE SECTIONS FOR THE FOLLOWING TOPICS:
-R403.1.2 CONTINUOUS FOOTING IN SEISMIC DESIGN CATEGORIES D0, D1 AND D2.
-R403.1.3 FOOTING AND STEM WALL REINFORCING IN SEISMIC DESIGN CATEGORIES D0, D1, AND D2.
-R403.1.3.4 INTERIOR BEARING AND BRACED WALL PANEL FOOTINGS IN SEISMIC DESIGN CATEGORIES D0, D1 AND D2.
-R403.1.3.5 REINFORCEMENT.

R403.1.4 MINIMUM DEPTH.
EXTERIOR FOOTINGS SHALL BE PLACED NOT LESS THAN 12 INCHES (305 MM) BELOW THE UNDISTURBED GROUND SURFACE. WHERE APPLICABLE, THE DEPTH OF FOOTINGS
SHALL ALSO CONFORM TO SECTIONS R403.1.4.1 THROUGH R403.1.4.2.

R403.1.4.1 FROST PROTECTION.
EXCEPT WHERE OTHERWISE PROTECTED FROM FROST, FOUNDATION WALLS, PIERS AND OTHER PERMANENT SUPPORTS OF BUILDINGS AND STRUCTURES SHALL BE PROTECTED FROM FROST BY ONE OR MORE OF THE FOLLOWING METHODS LISTED IN THE IRC CODE.

R403.1.5 SLOPE.
THE TOP SURFACE OF FOOTINGS SHALL BE LEVEL. THE BOTTOM SURFACE OF FOOTINGS SHALL NOT HAVE A SLOPE EXCEEDING ONE UNIT VERTICAL IN 10 UNITS HORIZONTAL (10-PERCENT SLOPE). FOOTINGS SHALL BE STEPPED WHERE IT IS NECESSARY TO CHANGE THE ELEVATION OF THE TOP SURFACE OF THE FOOTINGS OR WHERE THE SLOPE OF THE BOTTOM SURFACE OF THE FOOTINGS WILL EXCEED ONE UNIT VERTICAL IN 10 UNITS HORIZONTAL (10-PERCENT SLOPE).

R403.1.6 FOUNDATION ANCHORAGE.
WOOD SILL PLATES AND WOOD WALLS SUPPORTED DIRECTLY ON CONTINUOUS FOUNDATIONS SHALL BE ANCHORED TO THE FOUNDATION IN ACCORDANCE WITH THIS SECTION.

COLD-FORMED STEEL FRAMING SHALL BE ANCHORED DIRECTLY TO THE FOUNDATION OR FASTENED TO WOOD SILL PLATES ANCHORED TO THE FOUNDATION. ANCHORAGE OF COLD-FORMED STEEL FRAMING AND SILL PLATES SUPPORTING COLD-FORMED STEEL FRAMING SHALL BE IN ACCORDANCE WITH THIS SECTION AND SECTION R505.3.1 OR R603.3.1.

WOOD SOLE PLATES AT ALL EXTERIOR WALLS ON MONOLITHIC SLABS, WOOD SOLE PLATES OF BRACED WALL PANELS AT BUILDING INTERIORS ON MONOLITHIC SLABS AND ALL WOOD SILL PLATES SHALL BE ANCHORED TO THE FOUNDATION WITH MINIMUM 1/2-INCHDIAMETER (12.7 MM) ANCHOR BOLTS SPACED A MAXIMUM OF 6 FEET (1829 MM) ON CENTER OR APPROVED ANCHORS OR ANCHOR STRAPS SPACED AS REQUIRED TO PROVIDE EQUIVALENT ANCHORAGE TO 1/2-INCH-DIAMETER (12.7 MM) ANCHOR BOLTS. BOLTS SHALL EXTEND A MINIMUM OF 7 INCHES (178 MM) INTO CONCRETE OR GROUTED CELLS OF CONCRETE MASONRY UNITS. THE BOLTS SHALL BE LOCATED IN THE MIDDLE THIRD OF THE WIDTH OF THE PLATE. A NUT AND WASHER SHALL BE TIGHTENED ON EACH ANCHOR BOLT. THERE SHALL BE A MINIMUM OF TWO BOLTS PER PLATE SECTION WITH ONE BOLT LOCATED NOT MORE THAN 12 INCHES (305 MM) OR LESS THAN SEVEN BOLT DIAMETERS FROM EACH END OF THE PLATE SECTION. INTERIOR BEARING WALL SOLE PLATES ON MONOLITHIC SLAB FOUNDATION THAT ARE NOT PART OF A BRACED WALL PANEL SHALL BE POSITIVELY ANCHORED WITH APPROVED FASTENERS. SILL PLATES AND SOLE PLATES SHALL BE PROTECTED AGAINST DECAY AND TERMITES WHERE REQUIRED BY SECTIONS R317 AND R318.

NOTE: SEE SECTION 403.1.6 FOR EXCEPTION S

R403.1.6.1 FOUNDATION ANCHORAGE IN SEISMIC DESIGN CATEGORIES C, D0, D1 AND D2.
IN ADDITION TO THE REQUIREMENTS OF SECTION R403.1.6, THE FOLLOWING REQUIREMENTS SHALL APPLY TO WOOD LIGHT-FRAME STRUCTURES IN SEISMIC DESIGN CATEGORIES D0, D1 AND D2 AND WOOD LIGHT-FRAME TOWNHOUSES IN SEISMIC DESIGN CAT. C.

NOTE: SEE SECTION 403.1.6.1 FOR REQUIREMENTS

R403.1.7 FOOTINGS ON OR ADJACENT TO SLOPES.
THE PLACEMENT OF BUILDINGS AND STRUCTURES ON OR ADJACENT TO SLOPES STEEPER THAN ONE UNIT VERTICAL IN THREE UNITS HORIZONTAL (33.3-PERCENT SLOPE) SHALL CONFORM TO SECTIONS R403.1.7.1 THROUGH R403.1.7.4

R403.1.8 FOUNDATIONS ON EXPANSIVE SOILS.
FOUNDATION AND FLOOR SLABS FOR BUILDINGS LOCATED ON EXPANSIVE SOILS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 1808.6 OF THE INTERNATIONAL BUILDING CODE.

NOTE: SEE SECTION 403.1.8 FOR EXCEPTION AND EXPANSIVE SOILS CLASSIFICATIONS.

R403.2 FOOTINGS FOR WOOD FOUNDATIONS.
FOOTINGS FOR WOOD FOUNDATIONS SHALL BE IN ACCORDANCE WITH FIGURES R403.1(2) AND R403.1(3). GRAVEL SHALL BE WASHED AND WELL GRADED. THE MAXIMUM SIZE STONE SHALL NOT EXCEED 3/4 INCH (19.1 MM). GRAVEL SHALL BE FREE FROM ORGANIC, CLAYEY OR SILTY SOILS. SAND SHALL BE COARSE, NOT SMALLER THAN 1/16-INCH (1.6 MM) GRAINS AND SHALL BE FREE FROM ORGANIC, CLAYEY OR SILTY SOILS. CRUSHED STONE SHALL HAVE A MAXIMUM SIZE OF 1/2 INCH (12.7 MM).

R403.3 FROST-PROTECTED SHALLOW FOUNDATIONS.
FOR BUILDINGS WHERE THE MONTHLY MEAN TEMPERATURE OF THE BUILDING IS MAINTAINED AT A MINIMUM OF 64°F (18°C), FOOTINGS ARE NOT REQUIRED TO EXTEND BELOW THE FROST LINE WHEN PROTECTED FROM FROST BY INSULATION IN ACCORDANCE WITH FIGURE R403.3(1) AND TABLE R403.3(1). FOUNDATIONS PROTECTED FROM FROST IN ACCORDANCE WITH FIGURE R403.3(1) AND TABLE R403.3(1) SHALL NOT BE USED FOR UNHEATED SPACES SUCH AS PORCHES, UTILITY ROOMS, GARAGES AND CARPORTS, AND SHALL NOT BE ATTACHED TO BASEMENTS OR CRAWL SPACES THAT ARE NOT MAINTAINED AT A MINIMUM MONTHLY MEAN TEMPERATURE OF 64°F (18°C).

REFER TO SECTION 403 FOR THE FOLLOWING AREAS:

-R403.3.1 FOUNDATIONS ADJOINING FROST-PROTECTED SHALLOW FOUNDATIONS
-R403.3.2 PROTECTION OF HORIZONTAL INSULATION BELOW GROUND.
-R403.3.3 DRAINAGE.
-R403.3.4 TERMITE PROTECTION.

R403.4 FOOTINGS FOR PRECAST CONCRETE FOUNDATIONS.
FOOTINGS FOR PRECAST CONCRETE FOUNDATIONS SHALL COMPLY WITH SECTION R403.4.

SECTION 404
FOUNDATION AND RETAINING WALLS

R404.1 CONCRETE AND MASONRY FOUNDATION WALLS.
REFER TO SECTION 404.1 FOR FURTHER SPECIFICATIONS, NOTES AND DESIGN CRITERIA FOR CONCRETE AND MASONRY FOUNDATION WALLS.

R404.2 WOOD FOUNDATION WALLS.
REFER TO SECTION 404.2 FOR FURTHER SPECIFICATIONS, NOTES AND DESIGN CRITERIA FOR WOOD FOUNDATION WALLS.

R404.3 WOOD SILL PLATES. WOOD SILL PLATES SHALL BE A MINIMUM OF 2-INCH BY 4-INCH (51 MM BY 102 MM) NOMINAL LUMBER. SILL PLATE ANCHORAGE SHALL BE IN ACCORDANCE WITH SECTIONS R403.1.6 AND R602.11.

R404.4 RETAINING WALLS. RETAINING WALLS THAT ARE NOT LATERALLY SUPPORTED AT THE TOP AND THAT RETAIN IN EXCESS OF 48 INCHES (1219 MM) OF UNBALANCED FILL, OR RETAINING WALLS EXCEEDING 24 INCHES (610 MM) IN HEIGHT THAT RESIST LATERAL LOADS IN ADDITION TO SOIL, SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE TO ENSURE STABILITY AGAINST OVERTURNING, SLIDING, EXCESSIVE FOUNDATION PRESSURE AND WATER UPLIFT. RETAINING WALLS SHALL BE DESIGNED FOR A SAFETY FACTOR OF 1.5 AGAINST LATERAL SLIDING AND OVERTURNING. THIS SECTION SHALL NOT APPLY TO FOUNDATION WALLS SUPPORTING BUILDINGS.

R404.5 PRECAST CONCRETE FOUNDATION WALLS.
REFER TO SECTION 404.5 FOR FURTHER SPECIFICATIONS, NOTES AND DESIGN CRITERIA FOR PRECAST CONCRETE FOUNDATION WALLS.

SECTION R405 FOUNDATION DRAINAGE

R405.1 CONCRETE OR MASONRY FOUNDATIONS.
DRAINS SHALL BE PROVIDED AROUND CONCRETE OR MASONRY FOUNDATIONS THAT RETAIN EARTH AND ENCLOSE HABITABLE OR USABLE SPACES LOCATED BELOW GRADE. DRAINAGE TILES, GRAVEL OR CRUSHED STONE DRAINS, PERFORATED PIPE OR OTHER APPROVED SYSTEMS OR MATERIALS SHALL BE INSTALLED AT OR BELOW THE AREA TO BE PROTECTED AND SHALL DISCHARGE BY GRAVITY OR MECHANICAL MEANS INTO AN APPROVED DRAINAGE SYSTEM. GRAVEL OR CRUSHED STONE DRAINS SHALL EXTEND NOT LESS THAN 1 FOOT (305 MM) BEYOND THE OUTSIDE EDGE OF THE FOOTING AND 6 INCHES (152 MM) ABOVE THE TOP OF THE FOOTING AND BE COVERED WITH AN APPROVED FILTER MEMBRANE MATERIAL. THE TOP OF OPEN JOINTS OF DRAIN TILES SHALL BE PROTECTED WITH STRIPS OF BUILDING PAPER. EXCEPT WHERE OTHERWISE RECOMMENDED BY THE DRAIN MANUFACTURER, PERFORATED DRAINS SHALL BE SURROUNDED WITH AN APPROVED FILTER MEMBRANE OR THE FILTER MEMBRANE SHALL COVER THE WASHED GRAVEL OR CRUSHED ROCK COVERING THE DRAIN. DRAINAGE TILES OR PERFORATED PIPE SHALL BE PLACED ON A MINIMUM OF 2 INCHES (51 MM) OF WASHED GRAVEL OR CRUSHED ROCK NOT LESS THAN ONE SIEVE SIZE LARGER THAN THE TILE JOINT OPENING OR PERFORATION AND COVERED WITH NOT LESS THAN 6 INCHES (152 MM) OF THE SAME MATERIAL.

REFER TO SECTION 405 FOR FURTHER SPECIFICATIONS, NOTES AND DESIGN CRITERIA FOR PRECAST CONCRETE FOUNDATION WALLS.

SECTION R406
FOUNDATION WATER-PROOFING AND DAMP-PROOFING

REFER TO SECTION 405 FOR FURTHER SPECIFICATIONS. NOTES AND DESIGN CRITERIA FOR WATER-PROOFING AND DAMP-PROOFING FOUNDATIONS INCLUDING THE FOLLOWING AREAS:

-R406.1 CONCRETE AND MASONRY FOUNDATION DAMPPROOFING.
-R406.2 CONCRETE AND MASONRY FOUNDATION WATERPROOFING.
-R406.3 DAMPPROOFING FOR WOOD FOUNDATIONS.
-R406.4 PRECAST CONCRETE FOUNDATION SYSTEM DAMPPROOFING.

SECTION R407 COLUMNS

REFER TO SECTION 407 FOR FURTHER SPECIFICATIONS. NOTES AND DESIGN CRITERIA FOR COLUMNS INCLUDING THE FOLLOWING AREAS:

-R407.1 WOOD COLUMN PROTECTION.
-R407.2 STEEL COLUMN PROTECTION.
-R407.3 STRUCTURAL REQUIREMENTS.

SECTION R408 UNDER-FLOOR SPACE

REFER TO SECTION 408 FOR FURTHER SPECIFICATIONS. NOTES AND DESIGN CRITERIA FOR UNDER-FLOOR SPACE INCLUDING THE FOLLOWING AREA:

-R408.1 VENTILATION.
-R408.2 OPENINGS FOR UNDER-FLOOR VENTILATION.
-R408.3 UN-VENTED CRAWL SPACE.
-R408.4 ACCESS.
-R408.5 REMOVAL OF DEBRIS.
-R408.6 FINISHED GRADE.
-R408.7 FLOOD RESISTANCE.

CHAPTER 5 :: FLOORS

SECTION R501 GENERAL

R501.1 APPLICATION.
THE PROVISIONS OF THIS CHAPTER SHALL CONTROL THE DESIGN AND CONSTRUCTION OF THE FLOORS FOR BUILDINGS, INCLUDING THE FLOORS OF ATTIC SPACES USED TO HOUSE MECHANICAL OR PLUMBING FIXTURES AND EQUIPMENT.

R501.2 REQUIREMENTS.
FLOOR CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS IN ACCORDANCE WITH SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING STRUCTURAL ELEMENTS.

SECTION R502 WOOD FLOOR FRAMING

R502.1 GENERAL.
WOOD AND WOOD-BASED PRODUCTS USED FOR LOAD-SUPPORTING PURPOSES SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THIS SECTION. SEE SECTIONS 502.1.1 THROUGH 502.1.7 FOR FURTHER SPECIFICATIONS.

R502.2 DESIGN AND CONSTRUCTION.
FLOORS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THIS CHAPTER, FIGURE R502.2 AND SECTIONS R317 AND R318 OR IN ACCORDANCE WITH ANSI AWC NDS. SEE SECTIONS 502.2.1 THROUGH 502.2.2 FOR FURTHER SPECIFICATIONS.

R502.3 ALLOWABLE JOIST SPANS.
SPANS FOR FLOOR JOISTS SHALL BE IN ACCORDANCE WITH TABLES R502.3.1(1) AND R502.3.1(2). FOR OTHER GRADES AND SPECIES AND FOR OTHER LOADING CONDITIONS, REFER TO THE AWC STJR. SEE SECTIONS 502.3.1 THROUGH 502.3.3 FOR FURTHER SPECIFICATIONS.

R502.4 JOISTS UNDER BEARING PARTITIONS.
JOISTS UNDER PARALLEL BEARING PARTITIONS SHALL BE OF ADEQUATE SIZE TO SUPPORT THE LOAD.DOUBLE JOISTS, SIZED TO ADEQUATELY SUPPORT THE LOAD, THAT ARE SEPARATED TO PERMIT THE INSTALLATION OF PIPING OR VENTS SHALL BE FULL DEPTH SOLID BLOCKED WITH LUMBER NOT LESS THAN 2 INCHES (51 MM) IN NOMINAL THICKNESS SPACED NOT MORE THAN 4 FEET (1219 MM) ON CENTER. BEARING PARTITIONS PERPENDICULAR TO JOISTS SHALL NOT BE OFFSET FROM SUPPORTING GIRDERS, WALLS OR PARTITIONS MORE THAN THE JOIST DEPTH UNLESS SUCH JOISTS ARE OF SUFFICIENT SIZE TO CARRY THE ADDITIONAL LOAD.

R502.5 ALLOWABLE GIRDER AND HEADER SPANS.
THE ALLOWABLE SPANS OF GIRDERS AND HEADERS FABRICATED OF DIMENSION LUMBER SHALL NOT EXCEED THE VALUES SET FORTH IN TABLES R602.7(1), R602.7(2) AND R602.7(3).

R502.6 BEARING.
THE ENDS OF EACH JOIST, BEAM OR GIRDER SHALL HAVE NOT LESS THAN 1 1 2 INCHES (38 MM) OF BEARING ON WOOD OR METAL AND NOT LESS THAN 3 INCHES (76 MM) ON MASONRY OR CONCRETE EXCEPT WHERE SUPPORTED ON A 1-INCH BY 4-INCH (25 MM BY 102 MM) RIBBON STRIP AND NAILED TO THE ADJACENT STUD OR BY THE USE OF APPROVED JOIST HANGERS. THE BEARING ON MASONRY OR CONCRETE SHALL BE DIRECT, OR A SILL PLATE OF 2-INCH-MINIMUM (51 mm) NOMINAL THICKNESS SHALL BE PROVIDED UNDER THE JOIST, BEAM OR GIRDER. THE SILL PLATE SHALL PROVIDE A MINIMUM NOMINAL BEARING AREA OF 48 SQUARE INCHES (30 865 SQUARE MM). SEE SECTIONS 502.6.1 THROUGH 502.6.2 FOR FURTHER SPECIFICATIONS.

REFER TO THE IRC FOR FURTHER INFORMATION ON THE FOLLOWING AREAS:

-R502.7 LATERAL RESTRAINT AT SUPPORTS.
-R502.8 CUTTING, DRILLING AND NOTCHING.
-R502.9 FASTENING.
-R502.10 FRAMING OF OPENINGS.
-R502.11 WOOD TRUSSES.
-R502.12 DRAFTSTOPPING REQUIRED.
-R502.13 FIREBLOCKING REQUIRED.

REFER TO THE IRC FOR THE FOLLOWING SECTIONS:

SECTION 503 FLOOR SHEATHING
SECTION 504 PRESSURE PRESERVATIVE TREATED WOOD FLOORS
SECTION 505 COLD-FORMED STEEL FLOOR FRAMING

SECTION 506 CONCRETE FLOORS (ON GROUND)

R506.1 GENERAL.
CONCRETE SLAB-ON-GROUND FLOORS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION OR ACI 332. FLOORS SHALL BE A MINIMUM 3 1/2 INCHES (89 MM) THICK (FOR EXPANSIVE SOILS, SEE SECTION R403.1.8). THE SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE SHALL BE AS SET FORTH IN SECTION R402.2.

R506.2 SITE PREPARATION.
THE AREA WITHIN THE FOUNDATION WALLS SHALL HAVE ALL VEGETATION, TOP SOIL AND FOREIGN MATERIAL REMOVED.

R506.2.1 FILL.
FILL MATERIAL SHALL BE FREE OF VEGETATION AND FOREIGN MATERIAL. THE FILL SHALL BE COMPACTED TO ENSURE UNIFORM SUPPORT OF THE SLAB, AND EXCEPT WHERE APPROVED, THE FILL DEPTHS SHALL NOT EXCEED 24 INCHES (610 MM) FOR CLEAN SAND OR GRAVEL AND 8 INCHES (203 MM) FOR EARTH.

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MEN DESIGNS
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DATE	10-1-16
SCALE	1/4" = 1'-0"
BUILDER	
JOB	
DRAWN BY	

3
4

R506.2.2 BASE.
A 4-INCH-THICK (102 MM) BASE COURSE CONSISTING OF CLEAN GRADED SAND, GRAVEL, CRUSHED STONE, CRUSHED CONCRETE OR CRUSHED BLAST-FURNACE SLAG PASSING A 2- INCH (51 MM) SIEVE SHALL BE PLACED ON THE PREPARED SUBGRADE WHERE THE SLAB IS BELOW GRADE.

NOTE: SEE SECTION 506.2.2 FOR EXCEPTION

R506.2.3 VAPOR RETARDER.
A 6-MIL (0.006 INCH; 152 αM) POLYETHYLENE OR APPROVED VAPOR RETARDER WITH JOINTS LAPPED NOT LESS THAN 6 INCHES (152 MM) SHALL BE PLACED BETWEEN THE CONCRETE FLOOR SLAB AND THE BASE COURSE OR THE PREPARED SUBGRADE WHERE NO BASE COURSE EXISTS.

R506.2.4 REINFORCEMENT SUPPORT.
WHERE PROVIDED IN SLABS-ON-GROUND, REINFORCEMENT SHALL BE SUPPORTED TO REMAIN IN PLACE FROM THE CENTER TO UPPER ONE-THIRD OF THE SLAB FOR THE DURATION OF THE CONCRETE PLACEMENT.

SECTION R507 DECKS

R507.1 DECKS.
WOOD-FRAMED DECKS SHALL BE IN ACCORDANCE WITH THIS SECTION OR SECTION R301 FOR MATERIALS AND CONDITIONS NOT PRESCRIBED HEREIN. WHERE SUPPORTED BY ATTACHMENT TO AN EXTERIOR WALL, DECKS SHALL BE POSITIVELY ANCHORED TO THE PRIMARY STRUCTURE AND DESIGNED FOR BOTH VERTICAL AND LATERAL LOADS. SUCH ATTACHMENT SHALL NOT BE ACCOMPLISHED BY THE USE OF TOENAILS OR NAILS SUBJECT TO WITHDRAWAL. WHERE POSITIVE CONNECTION TO THE PRIMARY BUILDING STRUCTURE CANNOT BE VERIFIED DURING INSPECTION, DECKS SHALL BE SELF-SUPPORTING. FOR DECKS WITH CANTILEVERED FRAMING MEMBERS CONNECTIONS TO EXTERIOR WALLS OR OTHER FRAMING MEMBERS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST UPLIFT RESULTING FROM THE FULL LIVE LOAD SPECIFIED IN TABLE R301.5 ACTING ON THE CANTILEVERED PORTION OF THE DECK.

R507.2 DECK LEDGER CONNECTION TO BAND JOIST.
DECK LEDGER CONNECTIONS TO BAND JOISTS SHALL BE IN ACCORDANCE WITH THIS SECTION, TABLES R507.2 AND R507.2.1, AND FIGURES R507.2.1(1) AND R507.2.1(2). FOR OTHER GRADES, SPECIES, CONNECTION DETAILS AND LOADING CONDITIONS, DECK LEDGER CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION R301. SEE SECTIONS 507.2.1 THROUGH 502.3.4 FOR FURTHER SPECIFICATIONS.

R507.3 PLASTIC COMPOSITE DECK BOARDS, STAIR TREADS, GUARDS, OR HANDRAILS.
PLASTIC COMPOSITE EXTERIOR DECK BOARDS, STAIR TREADS, GUARDS AND HANDRAILS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM D 7032 AND THE REQUIREMENTS OF SECTION 507.3. SEE SECTIONS 507.3.1 THROUGH 502.3.5 FOR FURTHER SPECIFICATIONS.

R507.4 DECKING.
MAXIMUM ALLOWABLE SPACING FOR JOISTS SUPPORTING DECKING SHALL BE IN ACCORDANCE WITH TABLE R507.4. WOOD DECKING SHALL BE ATTACHED TO EACH SUPPORTING MEMBER WITH NOT LESS THAN (2) 8D THREADED NAILS OR (2) NO. 8 WOOD SCREWS.

R507.5 DECK JOISTS.
MAXIMUM ALLOWABLE SPANS FOR WOOD DECK JOISTS, AS SHOWN IN FIGURE R507.5, SHALL BE IN ACCORDANCE WITH TABLE R507.5. DECK JOISTS SHALL BE PERMITTED TO CANTILEVER NOT GREATER THAN ONE-FOURTH OF THE ACTUAL, ADJACENT JOIST SPAN.

R507.5.1 LATERAL RESTRAINT AT SUPPORTS.
JOIST ENDS AND BEARING LOCATIONS SHALL BE PROVIDED WITH LATERAL RESTRAINT TO PREVENT ROTATION. WHERE LATERAL RESTRAINT IS PROVIDED BY JOIST HANGERS OR BLOCKING BETWEEN JOISTS, THEIR DEPTH SHALL EQUAL NOT LESS THAN 60 PERCENT OF THE JOIST DEPTH. WHERE LATERAL RESTRAINT IS PROVIDED BY RIM JOISTS, THEY SHALL BE SECURED TO THE END OF EACH JOIST WITH NOT LESS THAN (3) 10D (3-INCH E 0.128-INCH) NAILS OR (3) NO. 10 X 3-INCH (76 MM) LONG WOOD SCREWS.

R507.6 DECK BEAMS.
MAXIMUM ALLOWABLE SPANS FOR WOOD DECK BEAMS, AS SHOWN IN FIGURE R507.6, SHALL BE IN ACCORDANCE WITH TABLE R507.6. BEAM PLIES SHALL BE FASTENED WITH TWO ROWS OF 10D (3-INCH X 0.128-INCH) NAILS MINIMUM AT 16 INCHES (406 MM) ON CENTER ALONG EACH EDGE. BEAMS SHALL BE PERMITTED TO CANTILEVER AT EACH END UP TO ONE-FOURTH OF THE ACTUAL BEAM SPAN. SPLICES OF MULTI-SPAN BEAMS SHALL BE LOCATED AT INTERIOR POST LOCATIONS.

R507.7 DECK JOIST AND DECK BEAM BEARING.
THE ENDS OF EACH JOIST AND BEAM SHALL HAVE NOT LESS THAN 1 1/2 INCHES (38mm)OF BEARING ON WOOD OR METAL AND NOT LESS THAN 3 INCHES (76 MM) ON CONCRETE OR MASONRY FOR THE ENTIRE WIDTH OF THE BEAM. JOIST FRAMING INTO THE SIDE OF A LEDGER BOARD OR BEAM SHALL BE SUPPORTED BY APPROVED JOIST HANGERS. JOISTS BEARING ON A BEAM SHALL BE CONNECTED TO THE BEAM TO RESIST LATERAL DISPLACEMENT.

R507.7.1 DECK POST TO DECK BEAM.
DECK BEAMS SHALL BE ATTACHED TO DECK POSTS IN ACCORDANCE WITH FIGURE R507.7.1 OR BY OTHER EQUIVALENT MEANS CAPABLE TO RESIST LATERAL DISPLACEMENT. MANUFACTURED POST-TO-BEAM CONNECTORS SHALL BE SIZED FOR THE POST AND BEAM SIZES. ALL BOLTS SHALL HAVE WASHERS UNDER THE HEAD AND NUT.

NOTE: SEE SECTION 507.7.1 FOR EXCEPTION

R507.8 DECK POSTS. FOR SINGLE-LEVEL WOOD-FRAMED DECKS WITH BEAMS SIZED IN ACCORDANCE WITH TABLE R507.6, DECK POST SIZE SHALL BE IN ACCORDANCE WITH TABLE R507.8.

R507.8.1 DECK POST TO DECK FOOTING.
POSTS SHALL BEAR ON FOOTINGS IN ACCORDANCE WITH SECTION R403 AND FIGURE R507.8.1. POSTS SHALL BE RESTRAINED TO PREVENT LATERAL DISPLACEMENT AT THE BOTTOM SUPPORT. SUCH LATERAL RESTRAINT SHALL BE PROVIDED BY MANUFACTURED CONNECTORS INSTALLED IN ACCORDANCE WITH SECTION R507 AND THE MANUFACTURERS' INSTRUCTIONS OR A MINIMUM POST EMBEDMENT OF 12 INCHES (305 MM) IN SURROUNDING SOILS OR CONCRETE PIERS.

CHAPTER 6 :: WALL CONSTRUCTION

SECTION R601 GENERAL

R601.1 APPLICATION.
THE PROVISIONS OF THIS CHAPTER SHALL CONTROL THE DESIGN AND CONSTRUCTION OF WALLS AND PARTITIONS FOR BUILDINGS.

R601.2 REQUIREMENTS.
WALL CONSTRUCTION SHALL BE CAPABLE OF ACCOMMODATING ALL LOADS IMPOSED IN ACCORDANCE WITH SECTION R301 AND OF TRANSMITTING THE RESULTING LOADS TO THE SUPPORTING STRUCTURAL ELEMENTS.

SECTION R602 WOOD WALL FRAMING

R602.1 GENERAL.
WOOD AND WOOD-BASED PRODUCTS USED FOR LOAD SUPPORTING PURPOSES SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THIS SECTION. SEE SECTIONS 602.6.1 THROUGH 502.6.10 FOR FURTHER SPECIFICATIONS.

R602.2 GRADE. STUDS SHALL BE A MINIMUM NO. 3, STANDARD OR STUD GRADE LUMBER.

NOTE: SEE SECTION 506.2.2 FOR EXCEPTION

R602.3 DESIGN AND CONSTRUCTION.
EXTERIOR WALLS OF WOODFRAME CONSTRUCTION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THIS CHAPTER AND FIGURES R602.3(1) AND R602.3(2), OR IN ACCORDANCE WITH AWC NDS. COMPONENTS OF EXTERIOR WALLS SHALL BE FASTENED IN ACCORDANCE WITH TABLES R602.3(1) THROUGH R602.3(4). WALL SHEATHING SHALL BE FASTENED DIRECTLY TO FRAMING MEMBERS AND, WHERE PLACED ON THE EXTERIOR SIDE OF AN EXTERIOR WALL, SHALL BE CAPABLE OF RESISTING THE WIND PRESSURES LISTED IN TABLE R301.2(2) ADJUSTED FOR HEIGHT AND EXPOSURE USING TABLE R301.2(3) AND SHALL CONFORM TO THE REQUIREMENTS OF TABLE R602.3(3). WALL SHEATHING USED ONLY FOR EXTERIOR WALL COVERING PURPOSES SHALL COMPLY WITH SECTION R703. STUDS SHALL BE CONTINUOUS FROM SUPPORT AT THE SOLE PLATE TO A SUPPORT AT THE TOP PLATE TO RESIST LOADS PERPENDICULAR TO THE WALL. THE SUPPORT SHALL BE FOUNDATION OR FLOOR, CEILING OR ROOF DIAPHRAGM OR SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

NOTE: SEE SECTION 506.2.3 FOR EXCEPTION

SEE SECTIONS 602.3.1 THROUGH 603.3.5 FOR FURTHER SPECIFICATIONS.

REFER TO THE IRC FOR FURTHER INFORMATION ON THE FOLLOWING AREAS:

R602.4 INTERIOR LOAD-BEARING WALLS.
R602.5 INTERIOR NONBEARING WALLS.
R602.6 DRILLING AND NOTCHING OF STUDS.
R602.7 HEADERS.
R602.8 FIREBLOCKING REQUIRED.
R602.9 CRIPPLE WALLS.

R602.10 WALL BRACING.
BUILDINGS SHALL BE BRACED IN ACCORDANCE WITH THIS SECTION OR, WHEN APPLICABLE, SECTION R602.12. WHERE A BUILDING, OR PORTION THEREOF, DOES NOT COMPLY WITH ONE OR MORE OF THE BRACING REQUIREMENTS IN THIS SECTION, THOSE PORTIONS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION R301.1.

REFER TO SECTIONS 602.10.1 THROUGH 602.10.12 FOR BRACED WALL PANELS, DESIGN AND CRITERIA.

REFER TO THE IRC FOR THE FOLLOWING SECTIONS:

SECTION 603 COLD-FORMED STEEL WALL FRAMING
SECTION 604 WOOD STRUCTURAL PANELS
SECTION 605 PARTICLEBOARD
SECTION 606 GENERAL MASONRY CONSTRUCTION
SECTION 607 GLASS UNIT MASONRY
SECTION 608 EXTERIOR CONC. WALL CONSTRUCTION
SECTION 609 (SEE BELOW)
SECTION R610 STRUCTURAL INSULATED PANEL WALL CONSTRUCTION

SECTION 609 EXTERIOR WINDOWS AND DOORS.

R609.1 GENERAL.
THIS SECTION PRESCRIBES PERFORMANCE AND CONSTRUCTION REQUIREMENTS FOR EXTERIOR WINDOWS AND DOORS INSTALLED IN WALLS. WINDOWS AND DOORS SHALL BE INSTALLED AND FLASHED IN ACCORDANCE WITH THE FENESTRATION MANUFACTURER'S WRITTEN INSTRUCTIONS. WINDOW AND DOOR OPENINGS SHALL BE FLASHED IN ACCORDANCE WITH SECTION R703.4. WRITTEN INSTALLATION INSTRUCTIONS SHALL BE PROVIDED BY THE FENESTRATION MANUFACTURER FOR EACH WINDOW OR DOOR.

R609.2 PERFORMANCE. EXTERIOR WINDOWS AND DOORS SHALL BE DESIGNED TO RESIST THE DESIGN WIND LOADS SPECIFIED IN TABLE R301.2(2) ADJUSTED FOR HEIGHT AND EXPOSURE IN ACCORDANCE WITH TABLE R301.2(3) OR DETERMINED IN ACCORDANCE WITH ASCE 7 USING THE ALLOWABLE STRESS DESIGN LOAD COMBINATIONS OF ASCE 7. DESIGN WIND LOADS FOR EXTERIOR GLAZING NOT PART OF A LABELED ASSEMBLY SHALL BE PERMITTED TO BE DETERMINED IN ACCORDANCE WITH CHAPTER 24 OF THE INTERNATIONAL BUILDING CODE.

R609.4 GARAGE DOORS.
GARAGE DOORS SHALL BE TESTED IN ACCORDANCE WITH EITHER ASTM E 330 OR ANSI/DASMA 108, AND SHALL MEET THE ACCEPTANCE CRITERIA OF ANSI/DASMA 108.

CHAPTER 7 :: INTERIOR COVERING

R702.1 GENERAL.
INTERIOR COVERINGS OR WALL FINISHES SHALL BE INSTALLED IN ACCORDANCE WITH THIS CHAPTER AND TABLE R702.1(1), TABLE R702.1(2), TABLE R702.1(3) AND TABLE R702.3.5. INTERIOR MASONRY VENEER SHALL COMPLY WITH THE REQUIREMENTS OF SECTION R703.7.1 FOR SUPPORT AND SECTION R703.7.4 FOR ANCHORAGE, EXCEPT AN AIRSPACE IS NOT REQUIRED. INTERIOR FINISHES AND MATERIALS SHALL CONFORM TO THE FLAME SPREAD AND SMOKE DEVELOPMENT REQUIREMENTS OF SECTION R302.9.
SEE SECTIONS 702.2 THROUGH 502.7 FOR FURTHER SPECIFICATIONS.

SECTION R703 EXTERIOR COVERING

R703.1 GENERAL.
EXTERIOR WALLS SHALL PROVIDE THE BUILDING WITH A WEATHER-RESISTANT EXTERIOR WALL ENVELOPE. THE EXTERIOR WALL ENVELOPE SHALL INCLUDE FLASHING AS DESCRIBED IN SECTION R703.4.

R703.2 WATER-RESISTIVE BARRIER.
ONE LAYER OF NO. 15 ASPHALT FELT, FREE FROM HOLES AND BREAKS, COMPLYING WITH ASTM D 226 FOR TYPE 1 FELT OR OTHER APPROVED WATER-RESISTIVE BARRIER SHALL BE APPLIED OVER STUDS OR SHEATHING OF ALL EXTERIOR WALLS. SUCH FELT OR MATERIAL SHALL BE APPLIED HORIZONTALLY, WITH THE UPPER LAYER LAPPED OVER THE LOWER LAYER NOT LESS THAN 2 INCHES (51 MM). WHERE JOINTS OCCUR, FELT SHALL BE LAPPED NOT LESS THAN 6 INCHES (152 MM). THE FELT OR OTHER APPROVED MATERIAL SHALL BE CONTINUOUS TO THE TOP OF WALLS AND TERMINATED AT PENETRATIONS AND BUILDING APPENDAGES IN A MANNER TO MEET THE REQUIREMENTS OF THE EXTERIOR WALL ENVELOPE AS DESCRIBED IN SECTION R703.1. THE WATER-RESISTIVE BARRIER IS NOT REQUIRED FOR DETACHED ACCESSORY BUILDINGS.

R703.3.2 FASTENERS.
EXTERIOR WALL COVERINGS SHALL BE SECURELY FASTENED WITH ALUMINUM, GALVANIZED, STAINLESS STEEL OR RUST-PREVENTATIVE COATED NAILS OR STAPLES IN ACCORDANCE WITH TABLE R703.3(1) OR WITH OTHER APPROVED CORROSION-RESISTANT FASTENERS IN ACCORDANCE WITH THE WALL COVERING MANUFACTURER'S INSTALLATION INSTRUCTIONS. NAILS AND STAPLES SHALL COMPLY WITH ASTM F 1667. NAILS SHALL BE T-HEAD, MODIFIED ROUND HEAD, OR ROUND HEAD WITH SMOOTH OR DEFORMED SHANKS. STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16 INCH (11.1 MM) OUTSIDE DIAMETER AND BE MANUFACTURED OF MINIMUM 16-GAGE WIRE. WHERE FIBERBOARD, GYPSUM, OR FOAM PLASTIC SHEATHING BACKING IS USED, NAILS OR STAPLES SHALL BE DRIVEN INTO THE STUDS. WHERE WOOD OR WOOD STRUCTURAL PANEL SHEATHING IS USED, FASTENERS SHALL BE DRIVEN INTO STUDS UNLESS OTHERWISE PERMITTED TO BE DRIVEN INTO SHEATHING IN ACCORDANCE WITH EITHER THE SIDING MANUFACTURER'S INSTALLATION INSTRUCTIONS OR TABLE R703.3.2.

R703.4 FLASHING.
APPROVED CORROSION-RESISTANT FLASHING SHALL BE APPLIED SHINGLE-FASHION IN A MANNER TO PREVENT ENTRY OF WATER INTO THE WALL CAVITY OR PENETRATION OF WATER TO THE BUILDING STRUCTURAL FRAMING COMPONENTS. SELF-ADHERED MEMBRANES USED AS FLASHING SHALL COMPLY WITH AAMA 711. FLUID-APPLIED MEMBRANES USED AS FLASHING IN EXTERIOR WALLS SHALL COMPLY WITH AAMA 714. THE FLASHING SHALL EXTEND TO THE SURFACE OF THE EXTERIOR WALL FINISH. APPROVED CORROSION-RESISTANT FLASHINGS SHALL BE INSTALLED AT THE FOLLOWING LOCATIONS:

1. EXTERIOR WINDOW AND DOOR OPENINGS. FLASHING AT EXTERIOR WINDOW AND DOOR OPENINGS SHALL EXTEND TO THE SURFACE OF THE EXTERIOR WALL FINISH OR TO THE WATER-RESISTIVE BARRIER COMPLYING WITH SECTION 703.2 FOR SUBSEQUENT DRAINAGE. MECHANICALLY ATTACHED FLEXIBLE FLASHINGS SHALL COMPLY WITH AAMA 712. FLASHING AT EXTERIOR WINDOW AND DOOR OPENINGS SHALL BE INSTALLED IN ACCORDANCE WITH ONE OR MORE OF THE FOLLOWING:

REFER TO SECTION 1.1 THROUGH 1.3 FOR FURTHER SPECIFICATIONS.

REFER TO THE IRC FOR FURTHER INFORMATION ON THE FOLLOWING AREAS:

-R703.5 WOOD, HARDBOARD AND WOOD STRUCTURAL PANEL SIDING.
-R703.6 WOOD SHAKES AND SHINGLES.
-R703.7 EXTERIOR PLASTER.
-R703.8 ANCHORED STONE AND MASONRY VENEER, GENERAL.
-R703.9 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)/EIFS WITH DRAINAGE.
-R703.10 FIBER CEMENT SIDING.
-R703.11 VINYL SIDING.
-R703.12 ADHERED MASONRY VENEER INSTALLATION.
-R703.13 INSULATED VINYL SIDING.
-R703.14 POLYPROPYLENE SIDING.
-R703.15 CLADDING ATTACHMENT OVER FOAM SHEATHING TO WOOD FRAMING.
-R703.16 CLADDING ATTACHMENT OVER FOAM SHEATHING TO COLD-FORMED STEEL FRAMING.
-R703.17 CLADDING ATTACHMENT OVER FOAM SHEATHING TO MASONRY OR CONCRETE WALL CONSTRUCTION.

CHAPTER 8 :: WOOD ROOF FRAMING

R802.1 GENERAL.
WOOD AND WOOD-BASED PRODUCTS USED FOR LOAD SUPPORTING PURPOSES SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THIS SECTION.

SEE SECTIONS 802.1.1 THROUGH 802.1.7 FOR FURTHER SPECIFICATIONS.

R802.2 DESIGN AND CONSTRUCTION.
THE FRAMING DETAILS REQUIRED IN SECTION R802 APPLY TO ROOFS HAVING A MINIMUM SLOPE OF THREE UNITS VERTICAL IN 12 UNITS HORIZONTAL (25-PERCENT SLOPE) OR GREATER. ROOF-CEILINGS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THIS CHAPTER AND FIGURES R606.11(1), R606.11(2) AND R606.11(3) OR IN ACCORDANCE WITH AWC NDS. COMPONENTS OF ROOF-CEILINGS SHALL BE FASTENED IN ACCORDANCE WITH TABLE R602.3(1).

R802.3 FRAMING DETAILS.
RAFTERS SHALL BE FRAMED NOT MORE THAN 1 1/2-INCHES (38 MM) OFFSET FROM EACH OTHER TO RIDGE BOARD OR DIRECTLY OPPOSITE FROM EACH OTHER WITH A GUSSET PLATE AS A TIE. RIDGE BOARD SHALL BE NOT LESS THAN 1-INCH (25 MM) NOMINAL THICKNESS AND NOT LESS IN DEPTH THAN THE CUT END OF THE RAFTER. AT VALLEYS AND HIPS THERE SHALL BE A VALLEY OR HIP RAFTERNOT LESS THAN 2-INCH (51 MM) NOMINAL THICKNESS AND NOT LESS IN DEPTH THAN THE CUT END OF THE RAFTER. HIP AND VALLEY RAFTERS SHALL BE SUPPORTED AT THE RIDGE BY A BRACE TO A BEARING PARTITION OR BE DESIGNED TO CARRY AND DISTRIBUTE THE SPECIFIC LOAD AT THAT POINT. WHERE THE ROOF PITCH IS LESS THAN THREE UNITS VERTICAL IN 12 UNITS HORIZONTAL (25-PERCENT SLOPE), STRUCTURAL MEMBERS THAT SUPPORT RAFTERS AND CEILING JOISTS, SUCH AS RIDGE BEAMS, HIPS AND VALLEYS, SHALL BE DESIGNED AS BEAMS.

REFER TO THE IRC FOR FURTHER INFORMATION ON THE FOLLOWING AREAS:

R802.4 ALLOWABLE CEILING JOIST SPANS.
R802.5 ALLOWABLE RAFTER SPANS.
R802.6 BEARING.
R802.7 CUTTING, DRILLING AND NOTCHING.
R802.8 LATERAL SUPPORT.
R802.9 FRAMING OF OPENINGS.

R802.10 WOOD TRUSSES.

R802.10.1 TRUSS DESIGN DRAWINGS. TRUSS DESIGN DRAWINGS, PREPARED IN CONFORMANCE TO SECTION R802.10.1, SHALL BE PROVIDED TO THE BUILDING OFFICIAL AND APPROVED PRIOR TO INSTALLATION. TRUSS DESIGN DRAWINGS SHALL BE PROVIDED WITH THE SHIPMENT OF TRUSSES DELIVERED TO THE JOB SITE. TRUSS DESIGN DRAWINGS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING INFORMATION:

REFER TO SECTION 802 10.1 (1-12 FOR MINIMUM INFORMATION)

R802.10.2 DESIGN.
WOOD TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE. THE DESIGN AND MANUFACTURE OF METAL-PLATE-CONNECTED WOOD TRUSSES SHALL COMPLY WITH ANSI/TPI 1. THE TRUSS DESIGN DRAWINGS SHALL BE PREPARED BY A REGISTERED PROFESSIONAL WHERE REQUIRED BY THE STATUTES OF THE JURISDICTION IN WHICH THE PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH SECTION R106.1.

R802.10.3 BRACING.
TRUSSES SHALL BE BRACED TO PREVENT ROTATION AND PROVIDE LATERAL STABILITY IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE CONSTRUCTION DOCUMENTS FOR THE BUILDING AND ON THE INDIVIDUAL TRUSS DESIGN DRAWINGS. IN THE ABSENCE OF SPECIFIC BRACING REQUIREMENTS, TRUSSES SHALL BE BRACED IN ACCORDANCE WITH ACCEPTED INDUSTRY PRACTICE SUCH AS THE SBCA BUILDING COMPONENT SAFETY INFORMATION (BDSI) GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING & BRACING OF METAL PLATE CONNECTED WOOD TRUSSES.

R802.10.4 ALTERATIONS TO TRUSSES.
TRUSS MEMBERS SHALL NOT BE CUT, NOTCHED, DRILLED, SPLICED OR OTHERWISE ALTERED IN ANY WAY WITHOUT THE APPROVAL OF A REGISTERED DESIGN PROFESSIONAL. ALTERATIONS RESULTING IN THE ADDITION OF LOAD SUCH AS HVAC EQUIPMENT WATER HEATER THAT EXCEEDS THE DESIGN LOAD FOR THE TRUSS SHALL NOT BE PERMITTED WITHOUT VERIFICATION THAT THE TRUSS IS CAPABLE OF SUPPORTING SUCH ADDITIONAL LOADING.

R802.11 ROOF TIE-DOWN.

R802.11.1 UPLIFT RESISTANCE. ROOF ASSEMBLIES SHALL HAVE UPLIFT RESISTANCE IN ACCORDANCE WITH SECTIONS R802.11.1.1 AND R802.11.1.2. WHERE THE UPLIFT FORCE DOES NOT EXCEED 200 POUNDS (90.8 KG), RAFTERS AND TRUSSES SPACED NOT MORE THAN 24 INCHES (610 MM) ON CENTER SHALL BE PERMITTED TO BE ATTACHED TO THEIR SUPPORTING WALL ASSEMBLIES IN ACCORDANCE WITH TABLE R602.3(1). WHERE THE BASIC WIND SPEED DOES NOT EXCEED 115 MPH, THE WIND EXPOSURE CATEGORY IS B, THE ROOF PITCH IS 5:12 OR GREATER, AND THE ROOF SPAN IS 32 FEET (9754 MM) OR LESS, RAFTERS AND TRUSSES SPACED NOT MORE THAN 24 INCHES (610 MM) ON CENTER SHALL BE PERMITTED TO BE ATTACHED TO THEIR SUPPORTING WALL ASSEMBLIES IN ACCORDANCE WITH TABLE R602.3(1).

R802.11.1.1 TRUSS UPLIFT RESISTANCE.
TRUSSES SHALL BE ATTACHED TO SUPPORTING WALL ASSEMBLIES BY CONNECTIONS CAPABLE OF RESISTING UPLIFT FORCES AS SPECIFIED ON THE TRUSS DESIGN DRAWINGS FOR THE ULTIMATE DESIGN WIND SPEED AS DETERMINED BY FIGURE R301.2(4)A AND LISTED IN TABLE R301.2(1) OR AS SHOWN ON THE CONSTRUCTION DOCUMENTS. UPLIFT FORCES SHALL BE PERMITTED TO BE DETERMINED AS SPECIFIED BY TABLE R802.11, IF APPLICABLE, OR AS DETERMINED BY ACCEPTED ENGINEERING PRACTICE.
R802.11.1.2 RAFTER UPLIFT RESISTANCE.
INDIVIDUAL RAFTERS SHALL BE ATTACHED TO SUPPORTING WALL ASSEMBLIES BY CONNECTIONS CAPABLE OF RESISTING UPLIFT FORCES AS DETERMINED BY TABLE R802.11 OR AS DETERMINED BY ACCEPTED ENGINEERING PRACTICE. CONNECTIONS FOR BEAMS USED IN A ROOF SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

REFER TO THE IRC FOR THE FOLLOWING SECTIONS:

SECTION 803 ROOF SHEATHING
SECTION 804 COLD-FORMED STEEL ROOF FRAMING

SECTION 805 CEILING FINISHES

R805.1 CEILING INSTALLATION.
CEILINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS FOR INTERIOR WALL FINISHES AS PROVIDED IN SECTION R702.

SECTION R806

ROOF VENTILATION
R806.1 VENTILATION REQUIRED. ENCLOSED ATTICS AND ENCLOSED RAFTER SPACES FORMED WHERE CEILINGS ARE APPLIED DIRECTLY TO THE UNDERSIDE OF ROOF RAFTERS SHALL HAVE CROSS VENTILATION FOR EACH SEPARATE SPACE BY VENTILATING OPENINGS PROTECTED AGAINST THE ENTRANCE OF RAIN OR SNOW. VENTILATION OPENINGS SHALL HAVE A LEAST DIMENSION OF 1/16 INCH (1.6 MM) MINIMUM AND 1/4 INCH (6.4 MM) MAXIMUM. VENTILATION OPENINGS HAVING A LEAST DIMENSION LARGER THAN 1/4 INCH (6.4 MM) SHALL BE PROVIDED WITH CORROSION-RESISTANT WIRE CLOTH SCREENING, HARDWARE CLOTH OR SIMILAR MATERIAL WITH OPENINGS HAVING A LEAST DIMENSION OF 1/16 INCH (1.6 MM) MINIMUM AND 1/4 INCH (6.4 MM) MAXIMUM. OPENINGS IN ROOF FRAMING MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF SECTION R802.7. REQUIRED VENTILATION OPENINGS SHALL OPEN DIRECTLY TO THE OUTSIDE AIR.

R806.2 MINIMUM VENT AREA.
THE MINIMUM NET FREE VENTILATING AREA SHALL BE 1/150 OF THE AREA OF THE VENTED SPACE.

NOTE: SEE SECTION 806.2 FOR EXCEPTION

R806.3 VENT AND INSULATION CLEARANCE.
WHERE EAVE OR CORNICE VENTS ARE INSTALLED, INSULATION SHALL NOT BLOCK THE FREE FLOW OF AIR. NOT LESS THAN A 1-INCH (25 MM) SPACE SHALL BE PROVIDED BETWEEN THE INSULATION AND THE ROOF SHEATHING AND AT THE LOCATION OF THE VENT.

R806.4 INSTALLATION AND WEATHER PROTECTION.
VENTILATORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALLATION OF VENTILATORS IN ROOF SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION R903. INSTALLATION OF VENTILATORS IN WALL SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION R703.1.

R806.5 UNVENTED ATTIC AND UNVENTED ENCLOSED RAFTER ASSEMBLIES.
UNVENTED ATTICS AND UNVENTED ENCLOSED ROOF FRAMING ASSEMBLIES CREATED BY CEILINGS THAT ARE APPLIED DIRECTLY TO THE UNDERSIDE OF THE ROOF FRAMING MEMBERS AND STRUCTURAL ROOF SHEATHING APPLIED DIRECTLY TO THE TOP OF THE ROOF FRAMING MEMBERS/RAFTERS, SHALL BE PERMITTED WHERE ALL THE FOLLOWING CONDITIONS ARE MET:

SEE CONDITIONS 806.5 (1 THROUGH 5)

SECTION R807 ATTIC ACCESS

R807.1 ATTIC ACCESS.
BUILDINGS WITH COMBUSTIBLE CEILING OR ROOF CONSTRUCTION SHALL HAVE AN ATTIC ACCESS OPENING TO ATTIC AREAS THAT HAVE A VERTICAL HEIGHT OF 30 INCHES (762 MM) OR GREATER OVER AN AREA OF NOT LESS THAN 30 SQUARE FEET (2.8 M2). THE VERTICAL HEIGHT SHALL BE MEASURED FROM THE TOP OF THE CEILING FRAMING MEMBERS TO THE UNDERSIDE OF THE ROOF FRAMING MEMBERS.

THE ROUGH-FRAMED OPENING SHALL BE NOT LESS THAN 22 INCHES BY 30 INCHES (559 MM BY 762 MM) AND SHALL BE LOCATED IN A HALLWAY OR OTHER READILY ACCESSIBLE LOCATION. WHERE LOCATED IN A WALL, THE OPENING SHALL BE NOT LESS THAN 22 INCHES WIDE BY 30 INCHES HIGH (559 MM WIDE BY 762 MM HIGH). WHERE THE ACCESS IS LOCATED IN A CEILING, MINIMUM UNOBSTRUCTED HEADROOM IN THE ATTIC SPACE SHALL BE 30 INCHES (762 MM) AT SOME POINT ABOVE THE ACCESS MEASURED VERTICALLY FROM THE BOTTOM OF CEILING FRAMING MEMBERS. SEE SECTION M1305.1.3 FOR ACCESS REQUIREMENTS WHERE MECHANICAL EQUIPMENT IS LOCATED IN ATTICS.

CHAPTER 9 :: ROOF ASSEMBLIES

SECTION R901 GENERAL

R901.1 SCOPE. THE PROVISIONS OF THIS CHAPTER SHALL GOVERN THE DESIGN, MATERIALS, CONSTRUCTION AND QUALITY OF ROOF ASSEMBLIES.

CHAPTER 10 :: CHIMNEYS & FIREPLACES

R1001.1 GENERAL.
MASONRY FIREPLACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION AND THE APPLICABLE PROVISIONS OF CHAPTERS 3 AND 4.

MEN DESIGNS

REVISIONS	BY
	24x36

2015 IRC

By Michael E. Nelson
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DATE	10-1-16
SCALE	1/4" = 1'-0"
BUILDER	
JOB	
DRAWN BY	

4/4

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