CONSTRUCTION SPECIFICATIONS

FOUNDATIONS

FOOTERS

TYPE	WIDTH	DEPTH
STEMWALL	20”	10”
MONOLITHIC	12”	20”
FIREPLACE	12” deep with a matt of #5 rebar	

FOOTER REINFORCEMENT: footers require a minimum of 2 - #5 rebar run 3” above the bottom of the footer. The rebar must be bent around all corners and lapped a minimum of 25”. Footer rebar must be cold bent (not heated).

FOOTER GROUNDING: a #4 solid copper wire must be clamped to a full 20 rebar and stubbed out of the footer to go to the ground rod and meter base.

ANCHOR BOLTS:

SIZE:	5/8”
WASHER SIZE:	3”
SPACING:	Maximum 32” on center
EMBEDMENT:	Minimum 7” into concrete
TREATMENT:	Hot dipped galvanized (except for borate treated sill plates)

SLABS

THICKNESS:	Minimum 3 – 1/2”
VAPOR BARRIER:	Minimum 6-mil
TREATMENT:	Termite soil treatment required

Note: do not walk on soil after termite treatment (walk on vapor barrier).

WELDED WIRE REINFORCEMENT: slabs are required to have 6 X 6 welded wire reinforcement located in the middle to upper third of the slab and supported at maximum 3-foot increments.

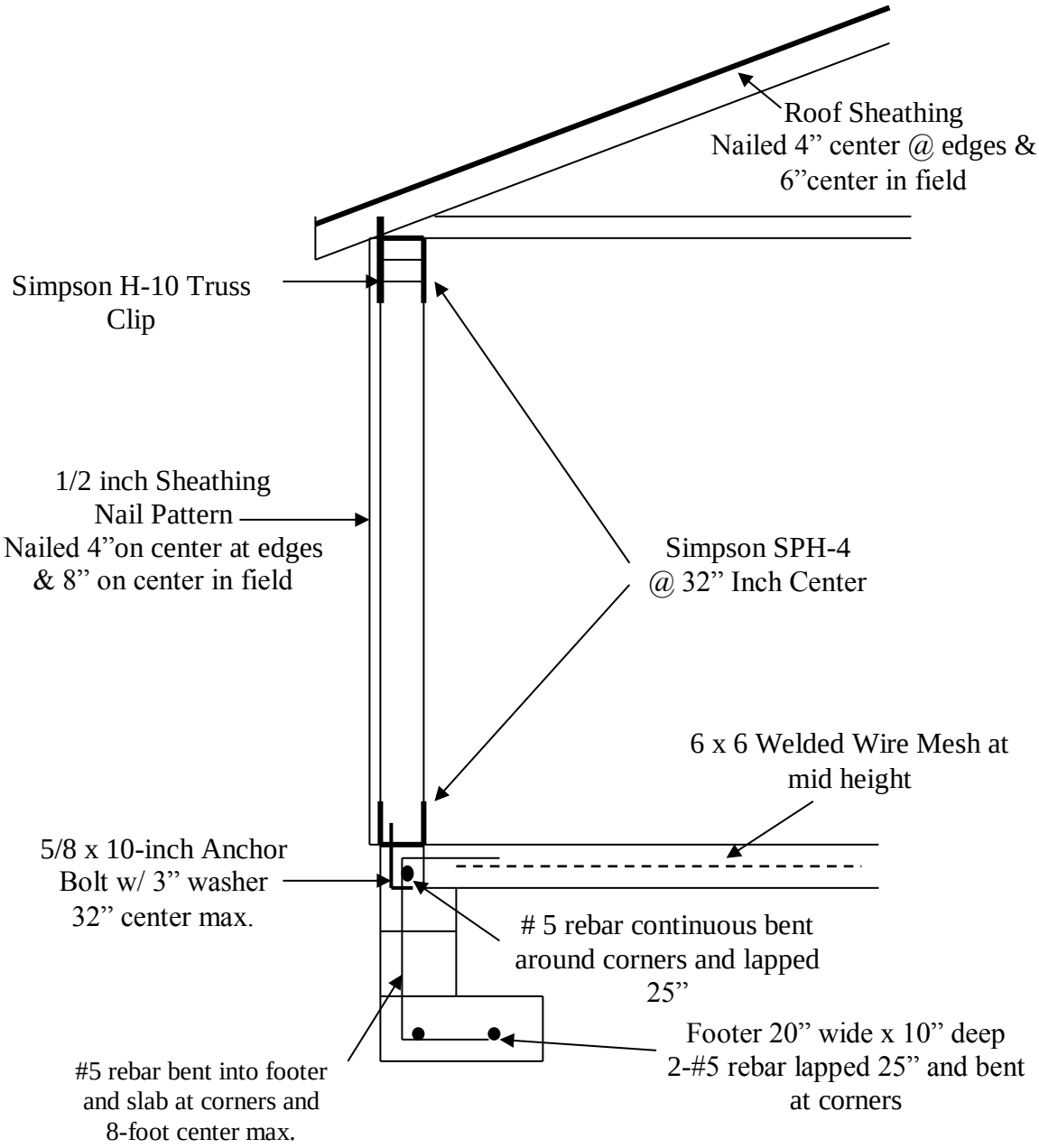
PIER FOUNDATIONS

WHEN ALLOWED: pier foundations are allowed only for relocated structures and detached non-habitable structures.

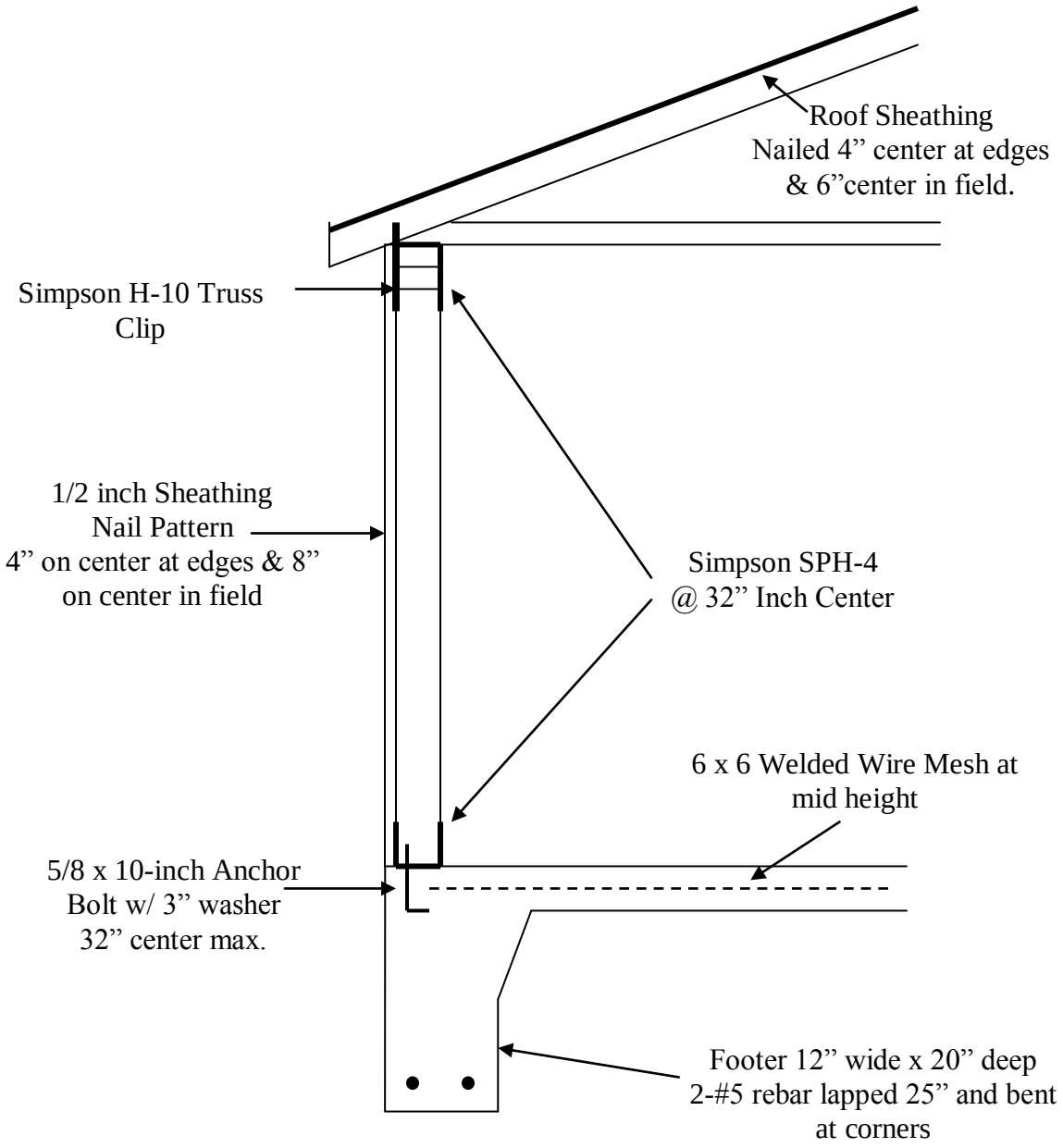
MAXIMUM HEIGHT: piers over 36” high must be designed by a design professional (engineer or architect).

SPACING: maximum spacing for piers is 6-foot on center, unless otherwise approved by the department.

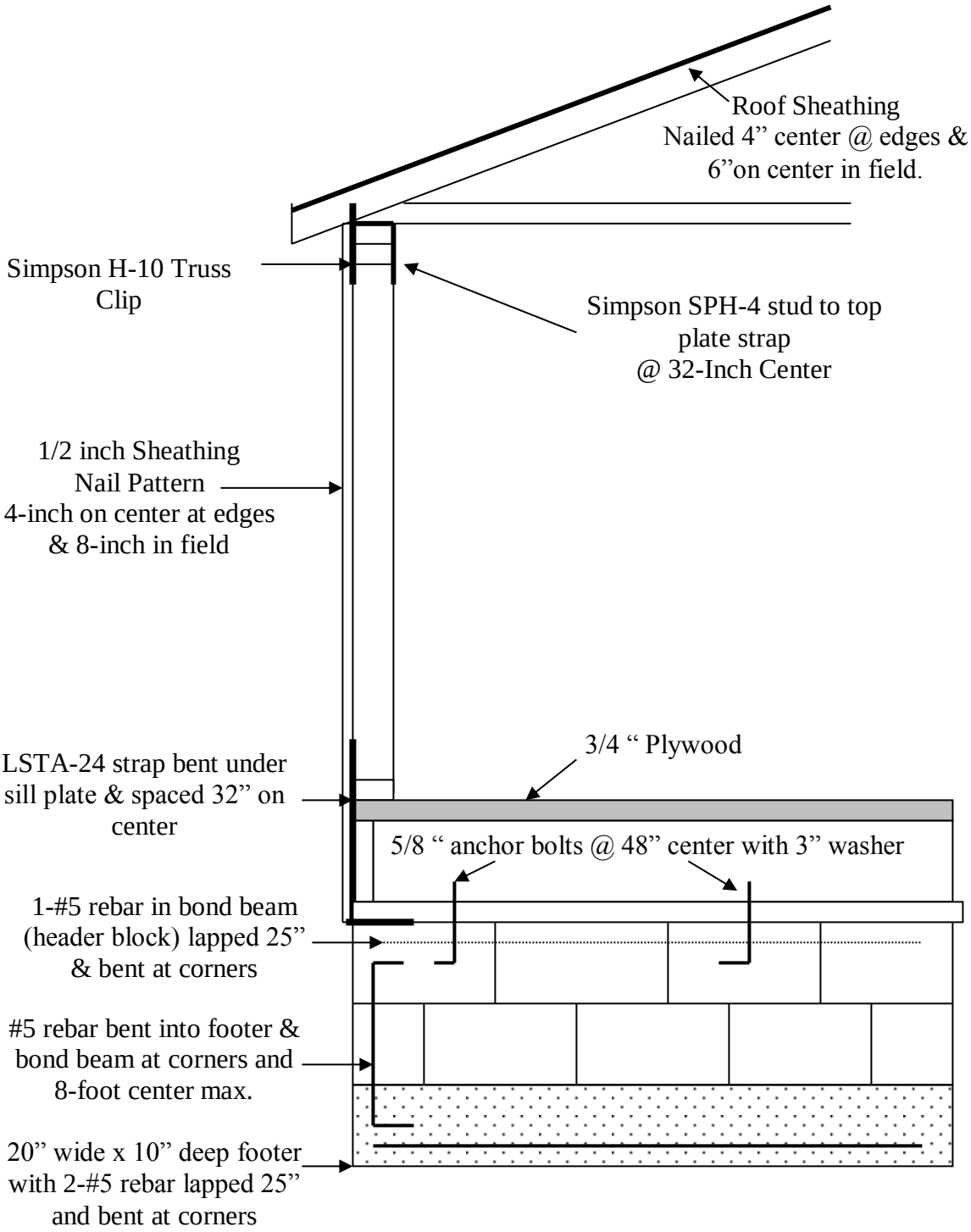
STEM WALL SLAB ON GRADE DETAIL



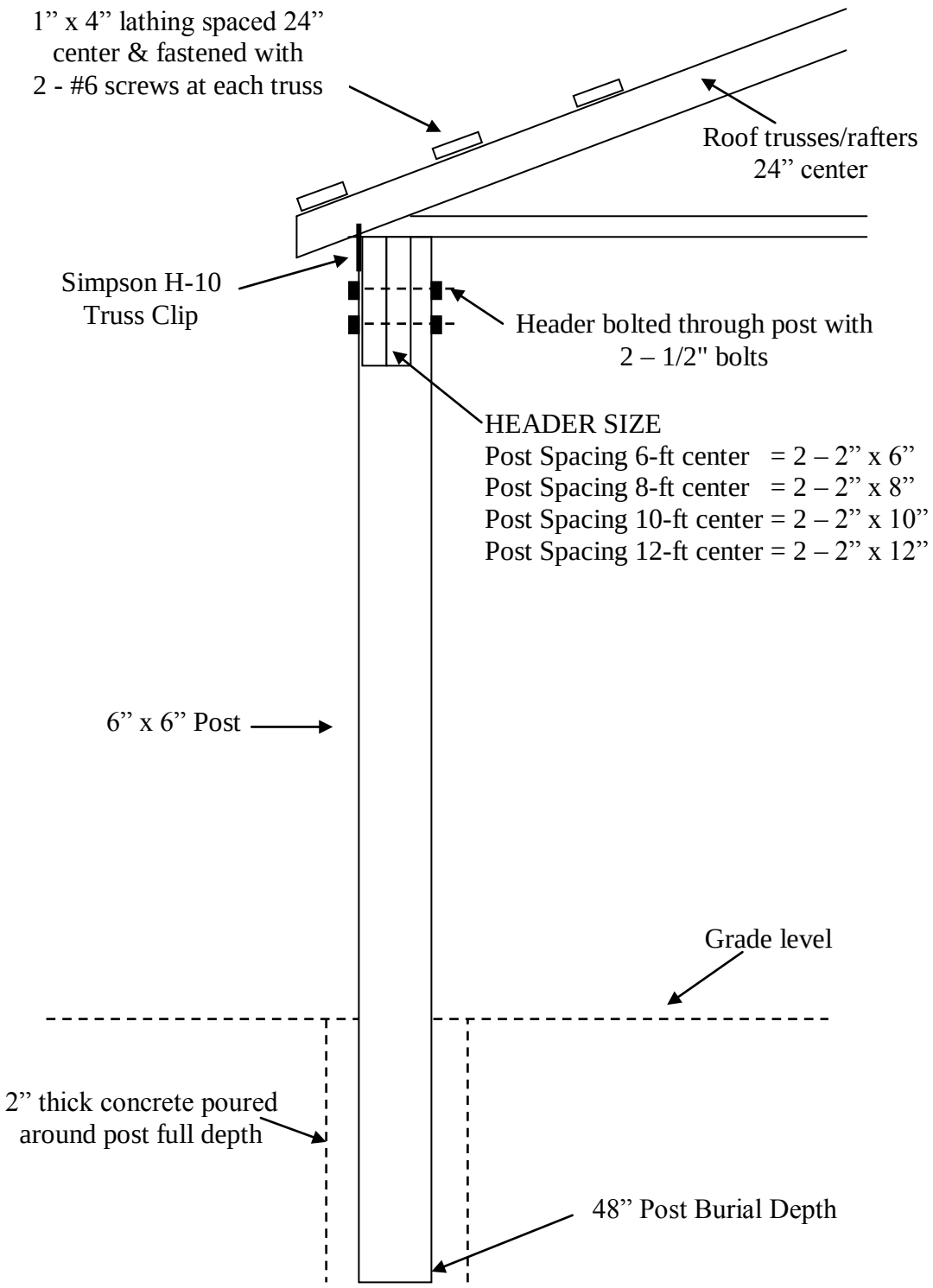
MONOLITHIC SLAB ON GRADE DETAIL



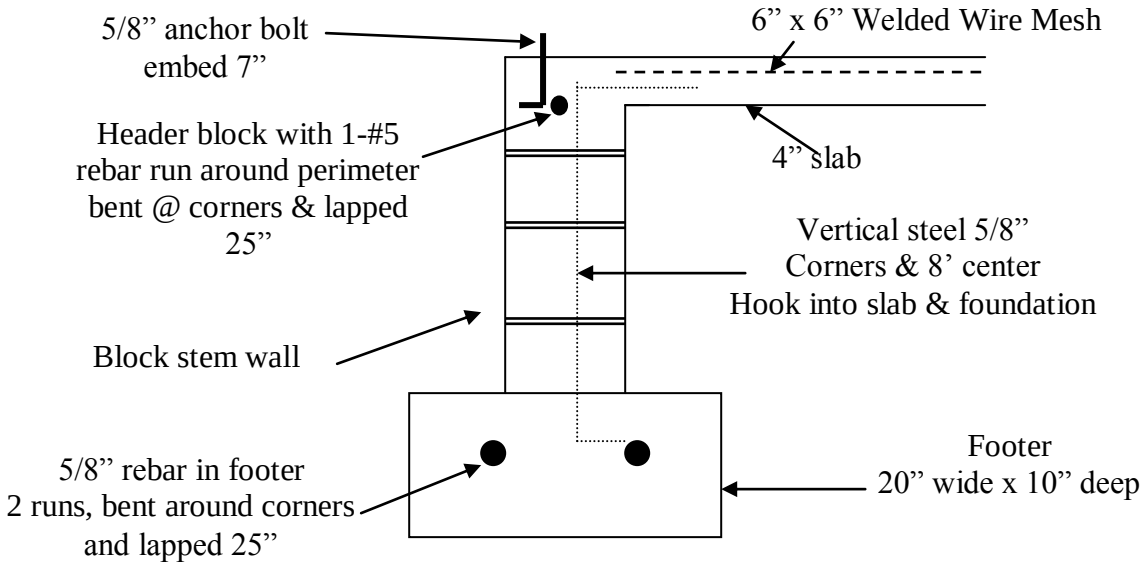
WOOD FLOOR WALL DETAIL



POLE BARN DETAIL



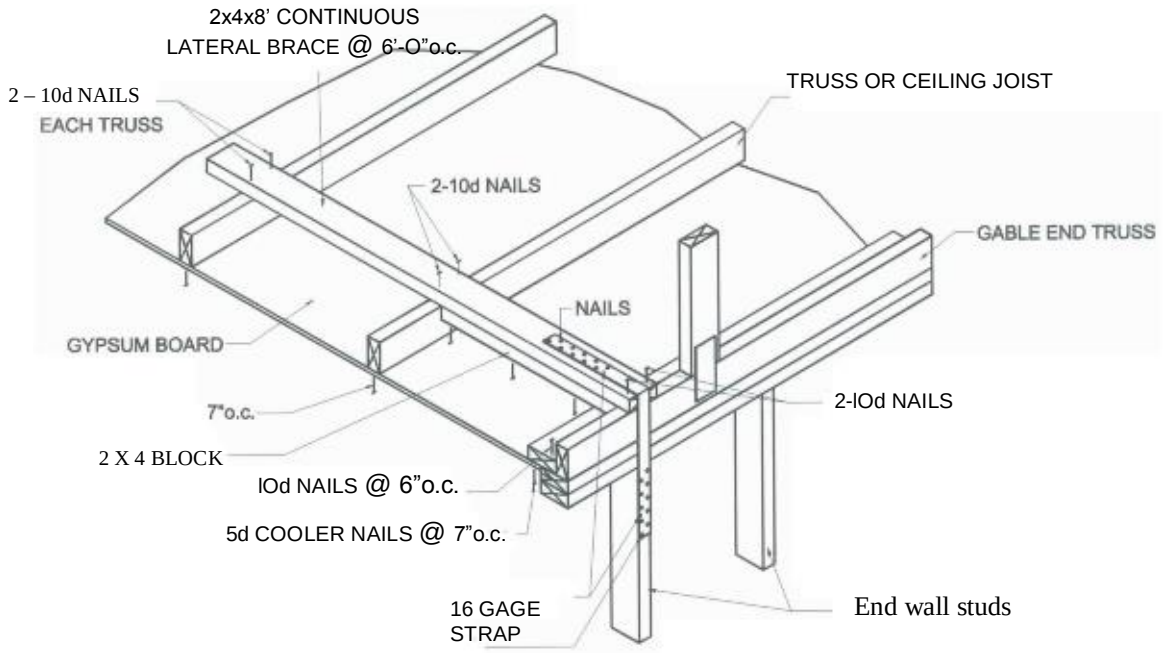
STEMWALL FOOTER DETAIL



NOTES

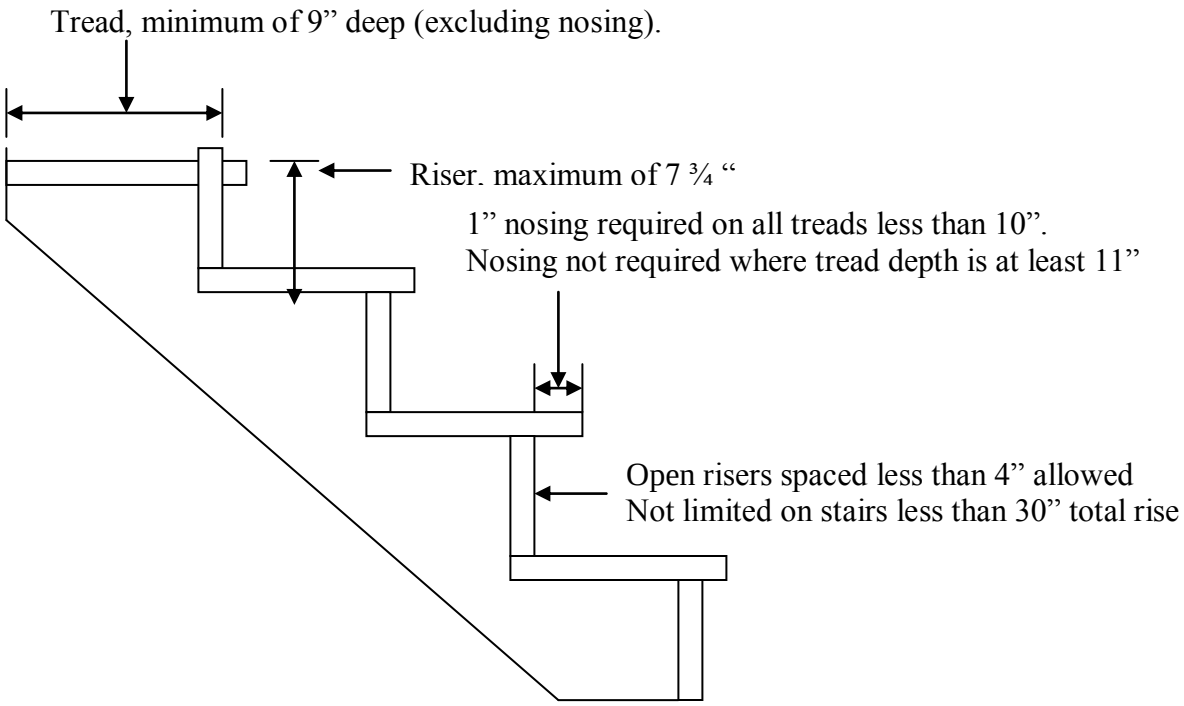
1. Bottom of footer must be at least 12" below finished grade.
2. 5/8" rebar in footer must be cold bent (not heated) around each corner and splices must lap a minimum of 25 inches.
3. Bend vertical steel into footer a minimum of 10 inches.
4. Bend vertical steel into slab a minimum distance of 16 inches.
5. Anchor bolts must be a minimum size of 5/8" and embed at least 7" in concrete.
6. Maximum spacing of anchor bolts 32 inches on center.
7. 3-inch washer required for anchor bolts.
8. Bond beam provided with 1-#5 rebar, lapped 25" & bent around corners.
9. Cells with vertical steel must be poured solid.
10. 6" x 6" Welded Wire Mesh must be installed in slab & supported at max 3-ft increments.

GABLE END WALL TRUSS STRAPPING



Notes:
1. Angle bracing for trusses is required.
2. Maximum spacing for lateral bracing of 6-foot center.
3. Cathedral/sloped ceilings require balloon framing.

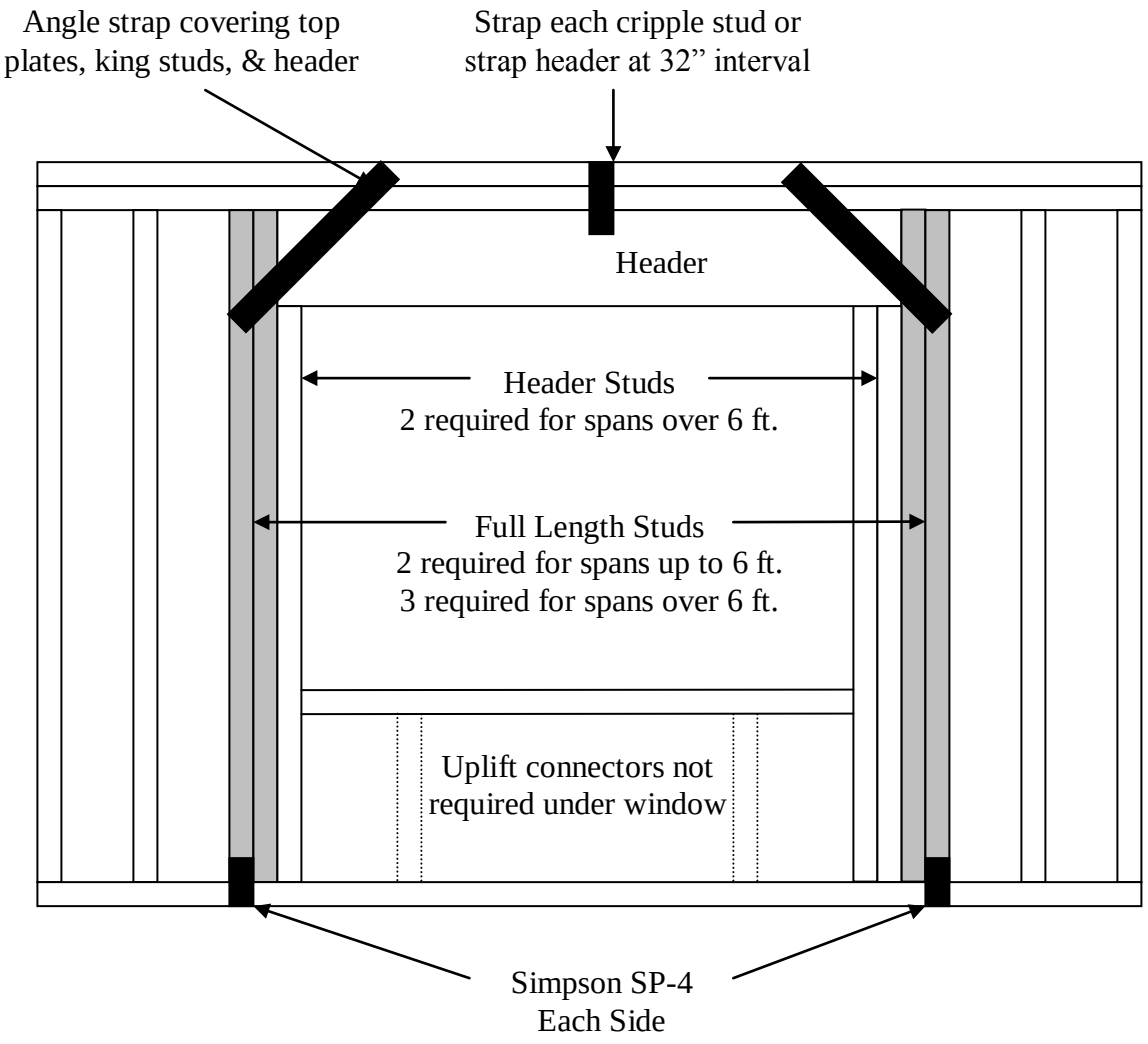
RESIDENTIAL STAIRWAY REQUIREMENTS



Notes

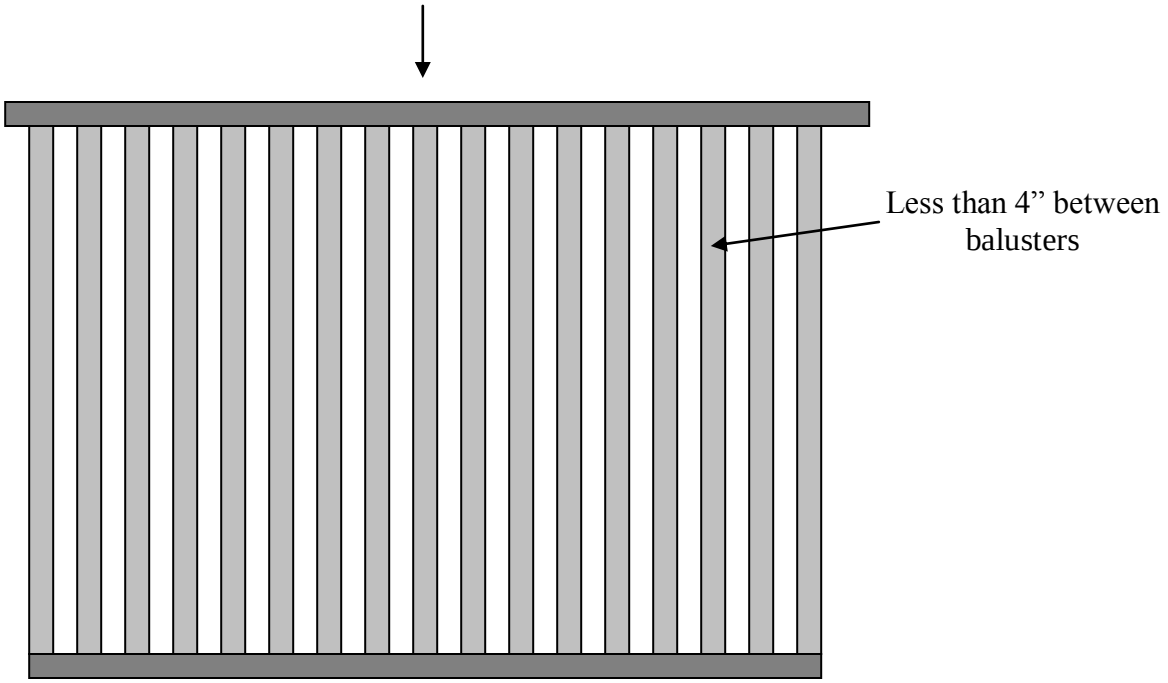
1. 2 risers + 1 tread (excluding nosing) must total between 24” & 25”.
2. Minimum stairway width of 36” (excluding handrail projections).
3. Minimum 36” wide landing required at top and bottom of stairway.
4. Not more than 12’ allowed between landings.
5. Handrail required if 4 or more risers or more than 30” total rise.
6. Handrail height between 34” & 38” above leading edge of tread.
7. Handrails may project a maximum of 4-1/2” into stairway.

WINDOW FRAMING REQUIREMENTS



GUARDRAIL REQUIREMENTS

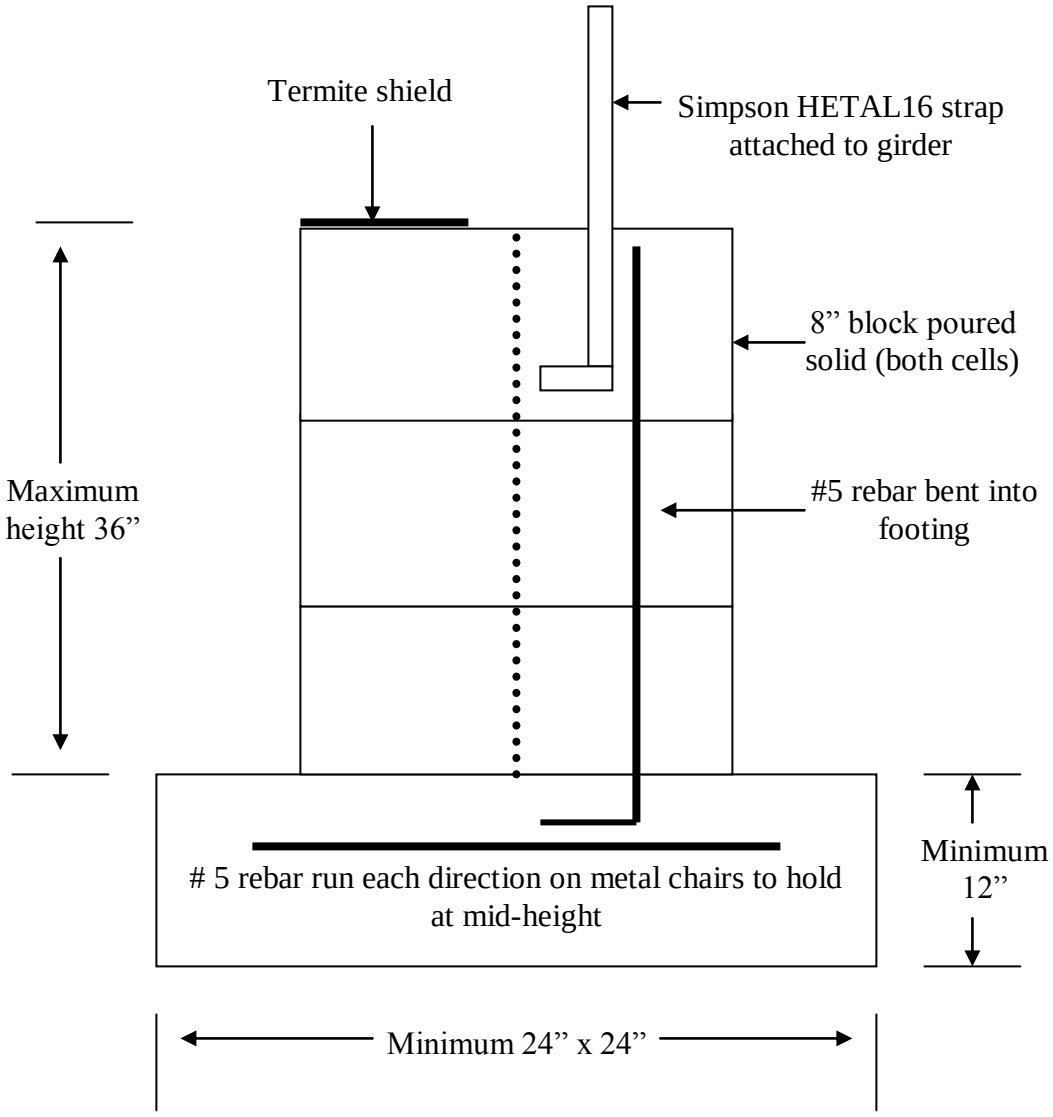
36” high for 1-family dwelling
42” high for all other uses



NOTE

1. Guardrails not required for walking surfaces 30” or less above grade.
2. Guardrails are required on screen porches & decks.
3. Space from floor to intermediate rails must be less than 4”
4. Top rail designed to resist a 200 lb concentrated load in any direction.
5. Intermediate rails must be designed to resist a 50 pound per square ft load.

PIER DETAIL



***Note: pier foundations can only be used with special permission by the Building Department.**

SPAN TABLES

RAFTER SPANS (#2 Southern Pine)											
2 x 6			2 x 8			2 x 10			2 x 12		
Spacing			Spacing			Spacing			Spacing		
12”	16”	24”	12”	16”	24”	12”	16”	24”	12”	16”	24”
15-6	13-11	11-5	20-5	18-0	14-8	24-10	21-6	17-6	29-1	25-2	20-7

FLOOR JOIST SPANS (40 LB Live Load)											
2 x 6			2 x 8			2 x 10			2 x 12		
Spacing			Spacing			Spacing			Spacing		
12”	16”	24”	12”	16”	24”	12”	16”	24”	12”	16”	24”
10-9	9-9	8-6	14-2	12-10	11-0	18-0	16-1	13-2	21-9	18-10	15-4

CEILING JOIST SPANS (Drywall)											
2 x 6			2 x 8			2 x 10			2 x 12		
Spacing			Spacing			Spacing			Spacing		
12”	16”	24”	12”	16”	24”	12”	16”	24”	12”	16”	24”
15-6	13-6	11-0	20-1	17-5	14-2	24-0	20-9	17-0	28-1	24-4	19-10

HEADER TABLE						
Header Size						
Header Span	**Structure Width**					
	12	**16**	**20**	**24**	**28**	**32**
4-feet	2 – 2 x 4	2 – 2 x 4	2 – 2 x 6	2 – 2 x 6	2 – 2 x 6	2 – 2 x 6
6-feet	2 – 2 x 6	2 – 2 x 6	2 – 2 x 6	2 – 2 x 6	2 – 2 x 8	2 – 2 x 8
8-feet	2 – 2 x 8	2 – 2 x 8	2 – 2 x 8	2 – 2 x 8	2 –2 x 10	2 –2 x 10
10-feet	2 – 2 x 8	2 –2 x 10	2 –2 x 10	2 – 2 x 12	2 – 2 x 12	3 – 2 x 10
12-feet	2 – 2 x 10	2 – 2 x 12	2 – 2 x 12	3 – 2 x 10	3 – 2 x 12	3 – 2 x 12
14-feet	2 – 2 x 12	3 – 2 x 10	3 – 2 x 12	3 – 2 x 12	-	-
16-feet	3 – 2 x 10	3 – 2 x 12	3 – 2 x 12	-	-	-
18-feet	3 – 2 x 12	-	-	-	-	-
20-feet	3 – 2 x 12	-	-	-	-	-

GIRDER SIZING TABLE

	SIDEWALL GIRDER SIZE									
	House Width									
	24		26		28		30		32	
Pier Spacing	Girder Spacing		Girder Spacing		Girder Spacing		Girder Spacing		Girder Spacing	
	8-ft	12-ft	8-ft	12-ft	9-ft	14-ft	10-ft	15-ft	10-ft	16-ft
	#2 Southern Yellow Pine									
10-ft center	3-2x10	3-2x12	3-2x10	3-2x12	3-2x10	3-2x12	3-2x12	3-2x12	3-2x12	3-2x12
8-ft center	2-2x10	2-2x10	2-2x10	2-2x12	2-2x10	2-2x12	2-2x12	2-2x12	2-2x12	2-2x12
6-ft center	2-2x6	2-2x8	2-2x6	2-2x8	2-2x6	2-2x8	2-2x8	2-2x8	2-2x8	2-2x8
	Spruce Pine Fir									
10-ft center	3-2x12	NP	NP	NP	NP	NP	NP	NP	NP	NP
8-ft center	3-2x10	3-2x12	3-2x10	3-2x12	3-2x10	3-2x12	3-2x12	3-2x12	3-2x12	3-2x12
6-ft center	2-2x10	2-2x10	2-2x10	2-2x12	2-2x10	2-2x12	2-2x12	2-2x12	2-2x12	2-2x12

	INTERIOR GIRDER SIZE									
	House Width									
	24		26		28		30		32	
Pier Spacing	Girder Spacing		Girder Spacing		Girder Spacing		Girder Spacing		Girder Spacing	
	8-ft	12-ft	8-ft	12-ft	9-ft	14-ft	10-ft	15-ft	10-ft	16-ft
	#2 Southern Yellow Pine									
10-ft center	2-2x10	2-2x12	2-2x10	2-2x12	2-2x10	3-2x10	2-2x12	3-2x10	2-2x12	3-2x12
8-ft center	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x12
6-ft center	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x8
	Spruce Pine Fir									
10-ft center	3-2x10	3-2x12	3-2x10	3-2x12	3-2x10	NP	3-2x12	NP	3-2x12	NP
8-ft center	2-2x10	2-2x12	2-2x10	2-2x12	2-2x10	3-2x10	2-2x12	3-2x10	2-2x12	3-2x12
6-ft center	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x10	2-2x8	2-2x12

NP = Not Permitted

Note: 3 - 2" x 8" may be substituted for 2 - 2" x 12" or 2 - 2" x 10"

DOORS / LANDINGS / STAIRWAYS

DOORS

WIDTH:	36-inches minimum for main exterior exit door.
LOCATION:	Main exit cannot pass through a garage.
TYPE:	Main exit door must be side hinged.
HEIGHT:	Main exit door cannot exceed 6-foot 8-inches in height.
LOCKS:	Egress doors must be un-lockable from inside without key or tools.

LANDINGS

MAIN EXIT DOOR:	Landing required at top and bottom of main exit door.
SECONDARY EXIT:	Landing at top & bottom required where more than 2 stair risers.
INTERIOR DOORS:	Landing not required at top of stair where door swings away from stair.
LANDING HEIGHT:	Landing cannot be more than 1 ½ inches below threshold of door.
STAIR HEIGHT:	Stairs cannot exceed 12-feet vertical rise between landings.
WIDTH:	Landing width cannot be less than the stairway width.
DEPTH:	Minimum of 36-inches deep in the direction of travel.

RESIDENTIAL STAIRWAYS

WIDTH	
ABOVE HANDRAIL:	Not less than 36-inches wide above the handrail height.
HANDRAIL ONE SIDE:	Minimum width of 31 ½ inches.
HANDRAIL BOTH SIDES:	Minimum width of 27-inches

GENERAL REQUIREMENTS	
HEADROOM:	Minimum headroom of 6-foot 8-inches at nosing.
RISER HEIGHT:	Maximum riser height of 7 ¾ inches.
TREAD DEPTH:	The minimum tread depth is 10-inches.
OPEN RISERS:	Open riser's not allowing passage of a 4-inch sphere are allowed.

NOSING	
WHEN REQUIRED:	Nosing is required where tread depth is less than 11-inches.
DIMENSIONS:	Not less than ¾ inch and not more than 1 ½ inch.

WINDOWS / WINDOW FRAMING

BEDROOM WINDOWS	
SILL HEIGHT:	Maximum sill height of **44"** above floor
1st FLOOR OPEN AREA:	Minimum net clear opening of **5** square feet
2ND FLOOR OPEN AREA:	Minimum net clear opening of **5.7** square feet
OPENING HEIGHT:	Minimum net clear opening height of **24"**
OPENING WIDTH:	Minimum net clear opening width of **20"**

MINIMUM SIZE NEEDED	
BATHROOMS:	3 square feet (1/2 openable). Unless 50 CFM ventilation provided.
LIVING ROOM:	8% of floor area (room square feet x .08)
DINING ROOM:	8% of floor area (room square feet x .08)
KITCHEN:	8% of floor area (room square feet x .08)
DEN:	8% of floor area (room square feet x .08)
BEDROOM:	8% of floor area (room square feet x .08)

HEADER SIZE 1-STORY BUILDING			
HEADER SIZE	**BUILDING WIDTH**		
	20 FEET	**28 FEET**	**36 FEET**
2 – 2" X 6"	5' – 5"	4' – 8"	4' – 2"
2 – 2" X 8"	6' – 10"	5' – 11"	5' – 4"
2 – 2" X 10"	8' – 5"	7' – 3"	6' – 6"
2 – 2" X 12"	9' – 9"	8' – 5"	7' – 6"
2-STORY BUILDING			
HEADER SIZE	**BUILDING WIDTH**		
	20 FEET	**28 FEET**	**36 FEET**
2 – 2" X 6"	4' – 6"	4' – 0"	3' – 7"
2 – 2" X 8"	5' – 9"	5' – 0"	4' – 6"
2 – 2" X 10"	7' – 0"	6' – 2"	5' – 6"
2 – 2" X 12"	8' – 1"	7' – 1"	6' – 5"

FLASHING REQUIREMENTS	
WINDOWS:	At top of all exterior windows (unless self flashing).
DOORS:	Over all exterior doors.
CHIMNEYS:	At intersection of chimney with roof, or frame / stucco wall.
PORCH / DECK:	Where porch, deck, or stairs attach to wall or floor assembly.
ROOF / WALL:	At all wall and roof intersections.
BRICK WALL:	In all brick walls (see brick section)

ATTICS / CRAWLSPACES

ATTICS	
ACCESS SIZE:	Minimum attic access opening of **22" x 30"**
HEADROOM:	Minimum **30"** headroom where access opens into attic
VENTILATION:	Minimum **1**-square foot opening per **150**-square feet of attic space
OPENINGS:	Must be corrosion resistant mesh with openings between **1/8"** & **1/4"**
EAVES VENT:	Minimum of **1"** clearance between insulation & roof sheathing
HVAC:	Trusses must be engineered to support HVAC
EAVE SIZE:	Maximum overhang of **12"** at gable truss, **48**" at eave
CRAWLSPACES	
ACCESS SIZE:	Minimum of one access not less than **18"** x **24"**
VENTILATION:	Minimum **1**-square ft opening per **150**-square ft of under floor space
LOCATION:	**1** vent must be located within **3**-feet of each corner of the building

SMOKE DETECTORS

WHERE REQUIRED:	1. In each sleeping room. 2. Outside each sleeping area (in immediate vicinity). 3. Each story of the dwelling unit.
POWER:	Smoke detectors must be hardwired **and** have battery backup
WIRING:	Smoke detectors must be interconnected to activate all detectors at once

GARAGE / CARPORT

DOORS OPENING INTO HOME	
TYPE:	1. Solid wood not less than 1-3/8" thick 2. Solid or honeycomb metal door not less than 1-3/8" thick 3. 20-minute fire door
BEDROOMS:	Doors between garage and residence cannot open into bedrooms.

CEILING / WALL FINISH	
CEILING:	Minimum 1/2" sheetrock between garage ceiling and attic
WALL:	Minimum 1/2" sheetrock between garage and residence
UPPER FLOOR:	Minimum 5/8" type X fire rated sheetrock on garage ceiling
RECEPTACLES:	All garage receptacles must be G.F.C.I. protected

BRICK	
AIR SPACE:	Minimum 1-inch clearance between sheathing and brick.
TIES:	Maximum spacing **24"** horizontal and **24"** vertical, (max **2.67 sq ft** wall area)
FELT/WRAP:	Weather resistant membrane (house wrap, etc.) required over sheathing.
FLASHING:	1. Beneath first course of masonry above grade above foundation. 2. At window shelf angles. 3. At lintels.
WEEPHOLES:	1. Located immediately above flashing. 2. Maximum spacing 33-inches on center. 3. Minimum diameter of 3/16 inch.

BORED / DRILLED HOLES

STUDS				
EXTERIOR WALL STUDS				
STUD SIZE:	**2" X 4"**	**2" X 6"**		
MAXIMUM NOTCH 25%:	3/8"	1 – 3/8"		
MAX HOLE 40% (single stud):	5/8"	2 – 3/16"		
MAX HOLE 60% (double stud):	7/8"	3 – 5/16"		
EDGE:	Holes at least 5/8" from the edge of the stud			
LOCATION:	Notches and holes not in the same section of the stud			
INTERIOR NON-BEARING WALL STUDS				
STUD SIZE:	**2" X 4"**	**2" X 6"**		
MAXIMUM NOTCH 40%:	5/8"	2 – 3/16"		
MAX HOLE 60% (single stud):	7/8"	3 – 5/16"		
MAX HOLE 60% (double stud):	7/8"	3 – 5/16"		
EDGE:	Holes at least 5/8" from the edge of the stud			
LOCATION:	Notches and holes not in the same section of the stud			
TOP PLATE (cut or drilled over 50% of width)				
16 gauge x 1–1/2" metal strap across opening with 8-16d nails each side				
RAFTERS, FLOOR JOISTS AND CEILING JOISTS				
SIZE	**2" X 6"**	**2" X 8"**	**2" X 10"**	**2" X 12"**
MAXIMUM NOTCH DEPTH:	7/8"	1-3/16"	1-1/2"	1-7/8"
MAXIMUM NOTCH LENGTH:	1-7/8"	2-3/8"	3"	3-3/4"
MAXIMUM HOLE SIZE:	1-1/2"	2-3/8"	3"	3-3/4"
HOLES PROHIBITED:	1. Within 2" of edge of joist or rafter. 2. Within 2" of other holes. 3. Within 2" of any notch			
NOTCH PROHIBITED:	Notches prohibited in middle 1/3rd of span			
TRUSSES				
Trusses can **not** be cut, notched, or spliced without approval of an engineer.				

RESIDENTIAL GUARDRAILS

WHERE REQUIRED	
DECKS:	More than 30" above grade
PORCHES:	
BALCONIES:	
STEPS / STAIRS:	
MINIMUM HEIGHT	
DECKS:	Minimum 36" high
PORCHES:	Minimum 36" high
BALCONIES:	Minimum 36" high
STEPS / STAIRS:	Between 34" and 38" high
BALUSTERS / VERTICAL RAILS	
SPACING GENERAL:	Less than 4-inches apart
STAIRWAYS:	Less than 6-inches apart

ROOFS

SHINGLE INSTALLATION	
MINIMUM SLOPE:	2” : 12”
NAIL LENGTH:	Minimum 3/4” embedment into sheathing
NAIL SPACING:	Per manufacturers specification

UNDERLAYMENT	
2:12 – 4:12	19”strip applied parallel to eave, then 36” strips lapped 19”
> 4:12	36” strip applied to eave and lapped 2” thereafter
NAILS	Maximum of 36” apart along overlap

DECKING	
SHEATHING:	Minimum 1/2” sheathing (OSB/Plywood) required on all roof assemblies
NAIL SPACING:	4” center at gable truss, 6” center for remainder of roof

DRIP EDGE	
REQUIRED:	All eaves and gables of shingle roofs
OVERLAP:	Minimum overlap of 2”
NAIL SPACING:	Maximum of 12” on center
EAVES:	Where installed over felt, 2” strip of roofing cement required on drip edge

METAL ROOFING	
SHEATHING:	Min 1/2” sheathing (OSB/Plywood) required on all roof assemblies
UNDERLAYMENT:	Roofing felt is required per manufacturers guidelines
STRIPPING:	#6 screws @ 12” center or 8d screw shank nails at 4” center
MINIMUM SLOPE:	3”:12” without lap sealant and lap screws
FASTENERS:	All metal roofing must be screw attached

TRUSSES	
CONSTRUCTION:	Trusses can **not** be built by an owner contractor (must be engineered)
SPACING:	The maximum spacing for trusses is 24” on center
BRACING:	Angle bracing is required at each gable truss
NOTCHING:	Trusses **cannot** be cut, notched, or spliced without approval of engineer
HVAC:	HVAC equipment **cannot** be located on truss unless engineered for it.

REROOFING REQUIREMENTS FOR SINGLE-FAMILY DWELLINGS

PLYWOOD SHEATHING NAILING FOR EXISTING ROOFS

SUPPLEMENTAL NAILS
8d ring shank w/round head
0.113-inch minimum shank diameter
16 – 20 rings per inch
0.280 minimum round head diameter
Ring shank extends minimum 1 ½” from tip of nail

NAIL SPACING AT PLYWOOD EDGES AND INTERMEDIATE FRAMING

Existing Nails	Existing Spacing	Supplemental Nails
Staples or 6d nails	Any	Install 8d ring shank round head nails @ 6” o.c.
8d clipped head, round head, smooth or ring shank	6” o.c. or less	None Required
8d clipped head, round head, smooth or ring shank	> 6” o.c	Add 8d ring shank round head nails to achieve a maximum 6” o.c. spacing (including existing nails)

SAWN LUMBER OR WOOD PLANK SHEATHING

Existing Nails	Supplemental Nails
2 - 8d nails at each truss / rafter	None Required
Any other condition	Install 2 - 8d nails at each truss / rafter

UNDERLAYMENT INSTALLATION FOR SHINGLE ROOF

Roof Slope	Underlayment Installation
2:12 to 4:12	ASTM D 226 Type I or Type II underlayment
	Apply 19-inch strip parallel with and starting with the eaves
	Starting at eave apply 36-inch sheet overlapping successive sheets 19-inches
	Offset end laps by 6-feet
	Install 1- inch round plastic or metal cap nails in a 12-inch grid pattern between overlaps
	Install 1- inch round plastic or metal cap nails 6-inch o.c. spacing at the overlaps

4:12 or more	ASTM D 226 Type I or Type II underlayment
	Begin at eave lapping successive sheets 2-inches
	Offset end laps by 6-feet
	Install 1- inch round plastic or metal cap nails in a 12-inch grid pattern between overlaps
	Install 1- inch round plastic or metal cap nails 6-inch o.c. spacing at the overlaps

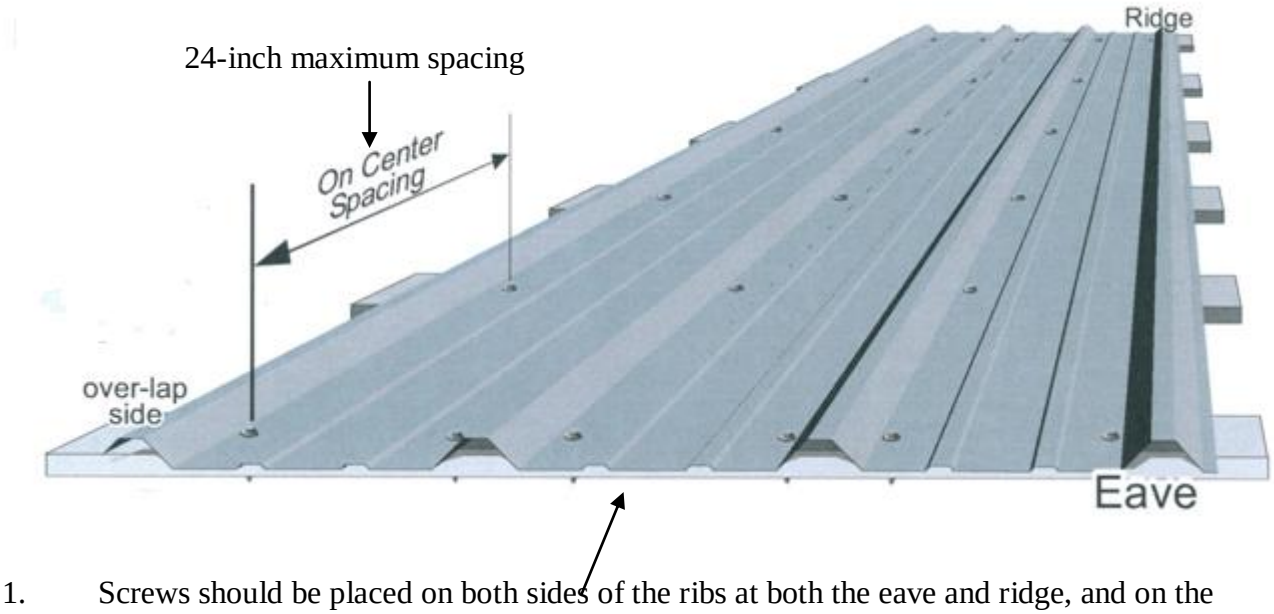
OR

Roof deck covered with approved self-adhering polymer modified bitumen sheet (ASTM D 1970)

OR

Roof deck covered with approved self-adhering synthetic underlayment installed to manufacturers spec’s.

METAL ROOFING



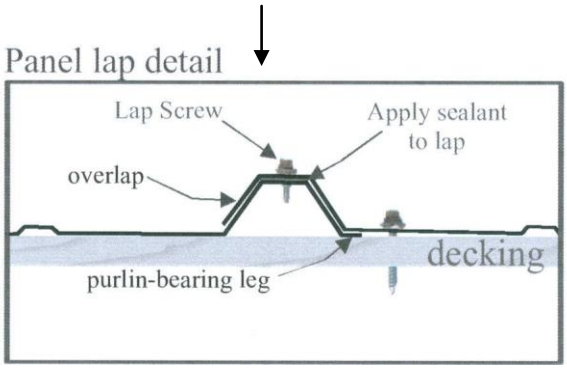
1. Screws should be placed on both sides of the ribs at both the eave and ridge, and on the overlap side of the panel lap (2 1/2" screws recommended).

2. Stripping must be a minimum of 1" x 4" pine (not pressure treated) spaced on a maximum 24-inch center.

3. Stripping must be fastened by one of the following methods:

   a. #6 screws at 12-inch on center
   b. 2 - 8d screw shank nails spaced 8-inch on center
   c. 1 - 8d screw shank nail spaced 4-inch on center.

4. On roofs with less than 3/12 pitch, lap screws and butyl tape must be applied at the panel lap to keep water from overflowing the lap.



MASONRY WALL CONSTRUCTION

FOOTERS

STEM WALL

WIDTH:	Minimum **16**-inches wide for 1-story & **20**-inches wide for 2-story
DEPTH:	Minimum **8**-inches deep for 1-story & **10**-inches deep for 2-story
REBAR:	Minimum 2 - #5 run continuous and bent around corners with 25-inch lap

MONOLITHIC

WIDTH:	Minimum **12**-inches wide for 1-story & **16**-inches wide for 2-story
DEPTH:	Minimum 16-inches deep
REBAR:	Minimum 2 - #5 run continuous and bent around corners with 25-inch lap

REBAR

SIZE:	Minimum size #5 (5/8 inch diameter)
COVER:	3-inches in footers & where concrete is in direct contact with earth
BENDING:	Rebar must be cold bent (cannot be heated)

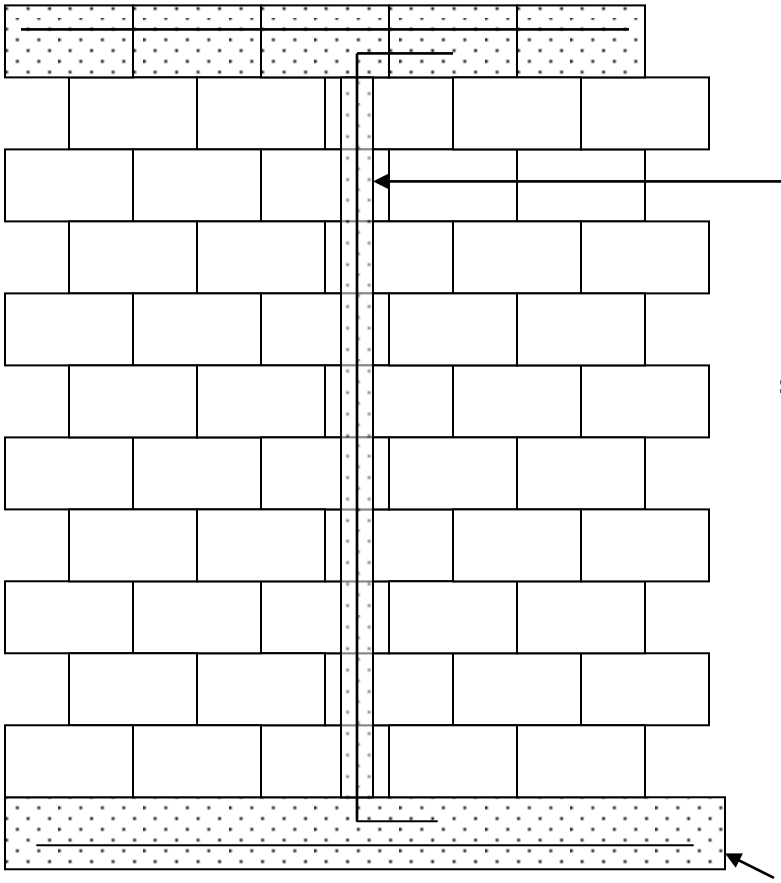
WALL CONSTRUCTION

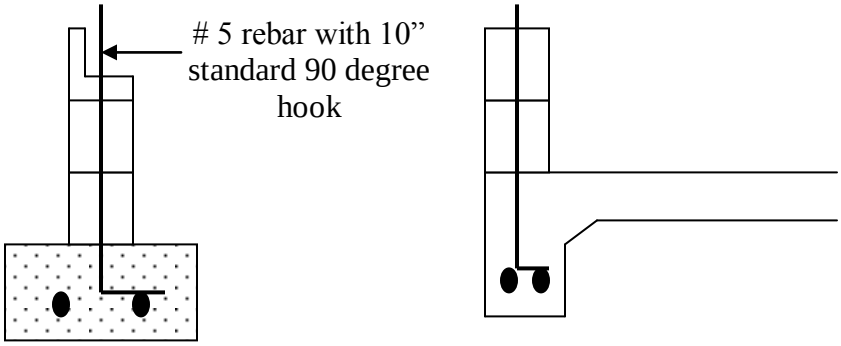
VERTICAL STEEL:	Required at corners, maximum 8-foot apart, and each side of openings > 6-foot
BOND BEAM:	1 - #5 run continuous around perimeter and bent around corners
CONNECTIONS:	Bent & connected to bond beam and footer with standard 10-inch 90 degree hook
HORIZONTAL:	Minimum 9-gauge joint reinforcement at 16-inch center
BED JOINT:	Minimum 1/4-inch and maximum 3/4-inch thick
TOP PLATE:	Wood top plate must be 2-inch x 8-inch pressure treated
ANCHORS:	Wood top plate anchors minimum size 1/2-inch, maximum spacing 24-inch center

TRUSS CONNECTIONS

TRUSS SPACING:	Maximum spacing of 24-inches on center
WOOD TOP PLATE:	All nails must be used for truss strap (may be bent under top plate)
TO BOND BEAM:	META or HETA strap must be embedded in bond beam & wrapped over truss
SEPARATION:	Trusses must be separated from bond beam by metal plate

ONE STORY BLOCK WALL DETAIL

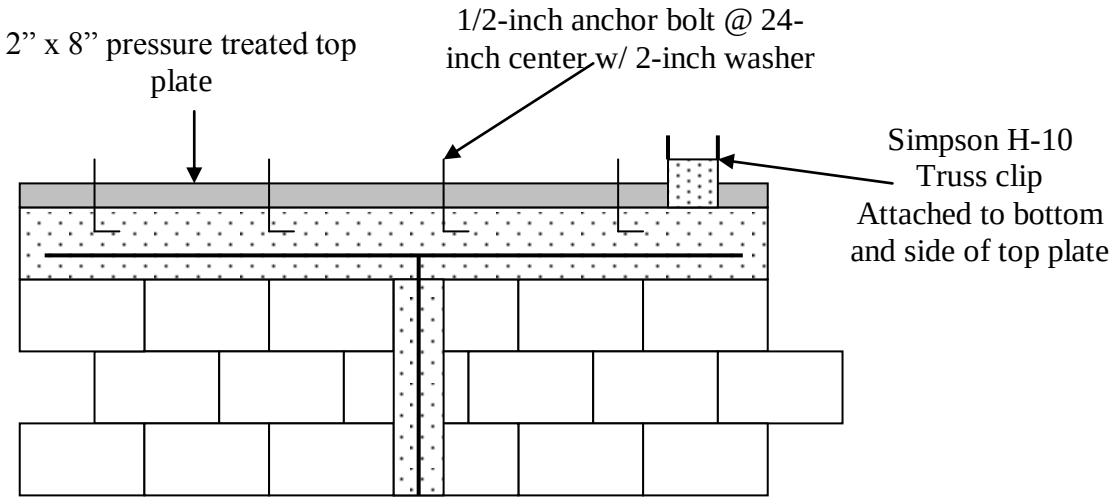


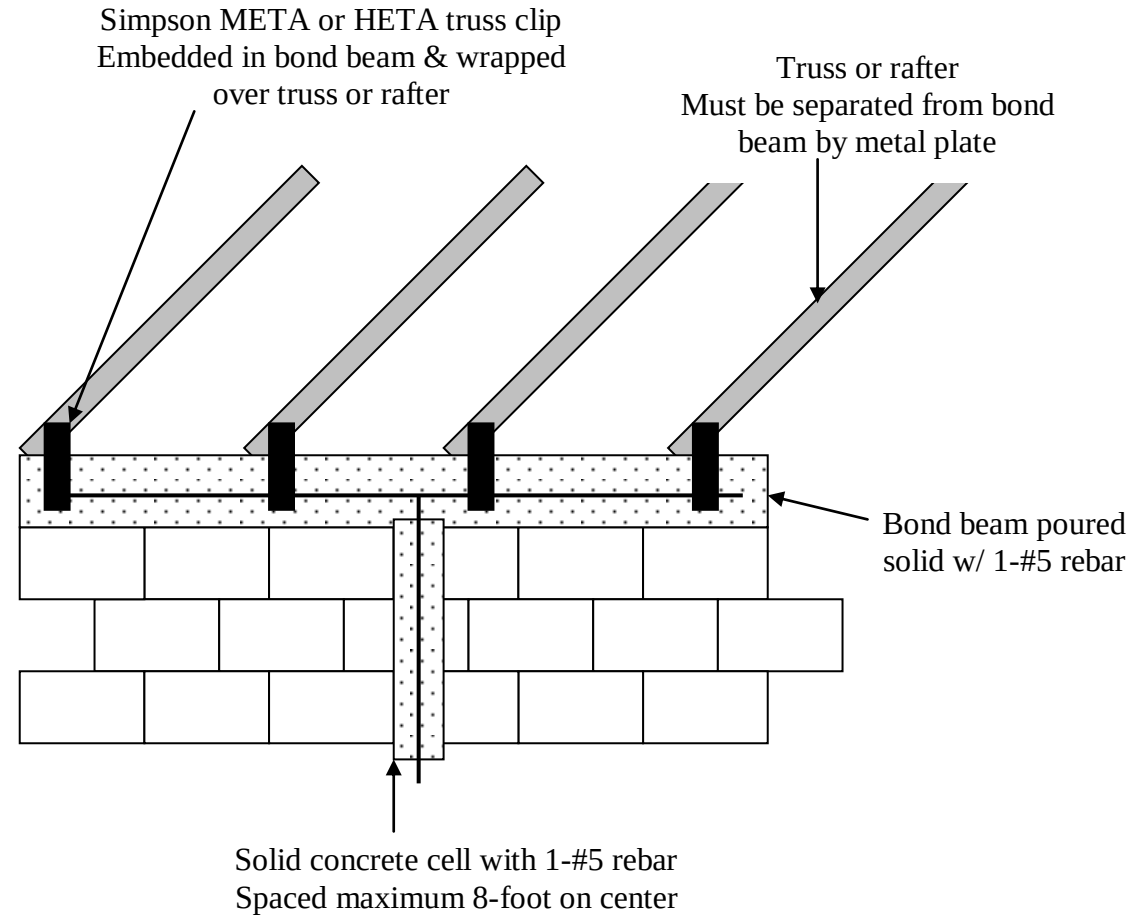


1-story = 8" deep x 16" wide
2-story = 10" deep x 20" wide

1-story = 16" deep x 12" wide
2-story = 16" deep x 16" wide

BLOCK WALL TOP PLATE & TRUSS CONNECTION





GENERAL ELECTRICAL REQUIREMENTS

TAMPER-RESISTANT RECEPTACLES	
GENERAL:	All 120 Volt receptacles installed in dwelling units must be listed as tamper-resistant.

RECEPTACLE SPACING	
HABITABLE ROOMS:	Within **6-feet** of the edge of any door
	Not more than **12-feet** apart along wall
	At all wall spaces **24"** or more wide
KITCHEN:	Within **24"** of edge of sink, range, refrigerator, and end of counter
	Not more than **4-feet** apart along counter top
	At all counter spaces **12"** or more wide
	At all kitchen island counter spaces
	At all kitchen peninsula countertops
	Not more than **20"** above countertops
BATHROOM:	Within **3-feet** of each basin
GARAGE:	A minimum of **1** receptacle required in garage
HALLWAY:	**1** receptacle required for hallways **10**-feet or more in length
OUTDOOR:	**1** receptacle required at the front and back of dwelling, located less than **6-1/2** feet above grade
H. V. A. C.	**1** receptacle within 25-feet on air conditioning unit.

G. F. C. I. RECEPTACLES	
KITCHEN:	All kitchen countertop receptacles must be GFCI protected
OUTDOOR:	All outdoor receptacles must be GFCI protected
GARAGE:	All general purpose garage receptacle must be GFCI protected
BATHROOM:	All bathroom receptacles must GFCI protected
WET BAR SINK:	Receptacles within 6-feet of sink must be GFCI protected
WORKSHOP:	Receptacles in grade level workshop/storage buildings must be GFCI protected

A. F. C. I. (ARC-FAULT) OUTLETS	
GENERAL:	All 120 Volt branch circuits that supply outlets in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways or similar areas shall be protected by a listed AFCI device.

BATHROOM CIRCUIT	
AMPERAGE:	Minimum of 1 – 20 amp circuit
DEDICATED:	Circuit supplying more than one bathroom **cannot** supply any fan, light, or receptacle, other than the bathroom receptacle(s)

WASHING MACHINE CIRCUIT	
SIZE:	**20-amp** circuit
DEDICATED:	Circuit **cannot** supply any light, receptacle, etc. other than washing machine receptacle

KITCHEN CIRCUITS	
SIZE:	20-amp rating for all kitchen receptacle circuits.
# OF CIRCUITS:	Minimum of 2 – 20 amp circuits to supply kitchen

WIRE AND BREAKER SIZES		
RECEPTACLES / APPLIANCES		
CIRCUIT TYPE	**WIRE SIZE**	**BREAKER SIZE**
General Purpose Outlets	12-2 with ground romex	20-amp 1-pole
	14-2 with ground romex	15-amp 1-pole
Kitchen Outlets	12-2 with ground romex	20-amp 1-pole
Washing Machine	12-2 with ground romex	20-amp 1-pole
Water Heater (4500 Watt)	10-2 with ground romex	30-amp 2-pole
Water Heater (< 4500 Watt)	12-2 with ground romex	20-amp 1-pole
Range	6-3 with ground romex	50-amp 2-pole
Dryer	10-3 with ground romex	30-amp 2 pole

HEAT / AIR CONDITIONING			
TYPE	RATING	WIRE SIZE	BREAKER SIZE
AIR HANDLER	7.5 KW	6-2 with ground romex	50-amp 2-pole
AIR HANDLER	10 KW	6-2 with ground romex	60-amp 2-pole
AIR HANDLER	15 KW	6-2 with ground romex	60-amp 2-pole
		10-2 with ground romex	30-amp 2-pole
AIR COND	3-TON	10-2 with ground romex	30-amp 2-pole
AIR COND	3-1/2 TON	8-2 with ground romex	40-amp 2-pole
AIR COND	4-TON	6-2 with ground romex	40-amp 2 pole
AIR COND	5-TON	6-2 with ground romex	50-amp 2 pole

WATER PUMP (COPPER WIRE)				
H. P.	VOLTS	WIRE LENGTH	WIRE SIZE	BREAKER
1/2 H. P.	120 VOLT	< 100 feet	10-2 with ground UF	20-amp
	120 VOLT	100 to 200 feet	8-2 with ground UF	20-amp
	120 VOLT	200 to 300 feet	6-2 with ground UF	20-amp
	240 VOLT	< 100 feet	12-2 with ground UF	15-amp
	240 VOLT	100 to 200 feet	12-2 with ground UF	15-amp
	240 VOLT	200 to 300 feet	10-2 with ground UF	15-amp
3/4 H. P.	120 VOLT	< 100 feet	10-2 with ground UF	30-amp
	120 VOLT	100 to 200 feet	6-2 with ground UF	30-amp
	120 VOLT	200 to 300 feet	#4 copper	30-amp
	240 VOLT	< 100 feet	12-2 with ground UF	20-amp
	240 VOLT	100 to 200 feet	10-2 with ground UF	20-amp
	240 VOLT	200 to 300 feet	8-2 with ground UF	20-amp
1 H. P.	120 VOLT	< 100 feet	8-2 with ground UF	30-amp
	120 VOLT	100 to 200 feet	6-2 with ground UF	30-amp
	120 VOLT	200 to 300 feet	#4 copper	30-amp
	240 VOLT	< 100 feet	12-2 with ground UF	20-amp
	240 VOLT	100 to 200 feet	10-2 with ground UF	20-amp
	240 VOLT	200 to 300 feet	8-2 with ground UF	20-amp

NAIL PLATES	
HOLES:	Required where edge of hole is less than **1-1/4 inch** from face of stud.
NOTCHES:	Nail plates required over all notches for wiring.
P. V. C.	Required where PVC piping is less than **1-1/4 inch** from face of stud.
STAPLES	
ATTICS	
SCUTTLE HOLE:	Wiring stapled to sides of rafters/ joists within **6-ft** of the attic entrance.
SPACING:	Attic wiring must be stapled not more than **4-1/2** feet apart.
BOXES:	Wiring must be stapled within **12-inches** of each box.
WALLS	
PLASTIC BOXES:	Wiring must be stapled within **8-inches** of plastic wall boxes.
METAL BOXES:	Wiring must be stapled within **12-inches** of metal wall boxes.
STUDS:	Wiring must be stapled **1-1/4 inch** from the face of the stud.
SPACING:	Wiring must be stapled not more than **4-1/2** feet apart along studs.

EXPOSED WIRING	
WALLS:	Exposed wires in wall must be protected with PVC or EMT up to **8-ft** above floor
ATTIC:	Protection required within **6-feet** of scuttle hole (unless run on side of joist).
OUTSIDE:	Exterior wiring must be protected up to **8-feet** above grade.

UNDERGROUND WIRING	
UNDER SLAB:	Must be in conduit (PVC) until outside of building.
BELOW GRADE:	Must be protected by conduit to a depth of **18-inches** minimum.
ABOVE GRADE:	Must be protected by conduit up to **8-feet** above grade.
BURIAL DEPTH	
SERVICE CABLE:	**24-inches** deep to top of cable
U. F. ROMEX	**24-inches** deep to top of romex
P. V. C.	**18-inches** deep to top of conduit
RIGID CONDUIT:	**6-inches** deep to top of conduit
DRIVEWAYS:	All wiring under driveways must be **24-inches** deep minimum.

ALUMINUM WIRING	
CORROSION:	All aluminum wires must have oxidation inhibitor at terminations.
SPLICES:	Copper & aluminum can only be spliced with split bolt connectors rated for that use.

SMOKE DETECTORS	
WHERE REQUIRED:	1. In each sleeping room. 2. Outside each sleeping area (in immediate vicinity). 3. Each story of the dwelling unit.
POWER:	Smoke detectors must be hardwired **and** have battery backup
WIRING:	Smoke detectors must be interconnected to activate all detectors at once

P. V. C.	
COLOR:	All electrical PVC must be gray in color and UL listed for electrical use.

FOOTER GROUND	
REBAR:	#4 ground wire must be connected to 20-foot length of rebar in footer and extended to the outside for connection to the ground rod.

LIGHTING	
CLOTHES CLOSETS	
OPEN BULB:	Open bulb incandescent fixtures are **not allowed** in clothes closets.
INCANDESCENT:	Enclosed incandescent fixtures must be at least **12"** from storage areas.
RECESSED:	Recessed fixtures must be at least **6"** from storage areas.
FLUORESCENT:	Fluorescent fixtures must be at least **6"** from storage areas (shelves).
ATTICS:	
LIGHTS:	A switched light must be installed in all attics used for storage.
HVAC:	A receptacle and light is required in all attics containing HVAC equipment.
REQUIRED LIGHTING	
BATROOMS:	Wall switched light fixture required.
KITCHENS:	Wall switched light fixture required.
STAIRWAYS:	Light fixture required switched at top and bottom of stairs.
HALLWAYS:	Wall switched light fixture required.
GARAGES:	Wall switched light fixture required.
DOORWAYS:	Light fixture required at each exterior doorway.
OTHER:	Bedroom, living rooms, etc. may have switched receptacle instead of light.

4-WIRE CIRCUITS	
RANGE:	Ranges require a 4-wire circuit, 4-wire receptacle, and 4-wire cord.
DRYER:	Ranges require a 4-wire circuit, 4-wire receptacle, and 4-wire cord
SUB PANEL:	Sub panels require a 4-wire supply with a separate ground buss at sub panel.

GROUND ROD	
LENGTH:	8-feet long minimum.
GALVANIZED:	Galvanized ground rods must be 5/8" minimum diameter.
COPPER:	Copper ground rods must be 1/2" minimum diameter.
PIPE:	Galvanized pipe ground rods must be 3/4" minimum diameter.
CLAMP:	Ground clamps at, or below grade, must rated for below ground use.
DEPTH:	Ground rods must be driven full depth into earth.

120 VOLT COPPER VOLTAGE DROP TABLE						
Maximum Wire Length (Feet)						
Current Draw	**Wire Size**					
	14	**12**	**10**	**8**	**6**	**4**
5-amp	115	182	290	461	732	1165
10-amp	57	91	145	230	366	582
12-amp	48	76	121	192	305	485
15-amp	38	61	97	154	244	388
17-amp	-	54	85	136	215	343
20-amp	-	46	72	115	183	291
25-amp	-	-	58	92	146	233
30-amp	-	-	48	77	122	194
40-amp	-	-	-	58	92	146
50-amp	-	-	-	46	73	116

240 VOLT COPPER VOLTAGE DROP TABLE						
Maximum Wire Length (Feet)						
Current Draw	**Wire Size**					
	14	**12**	**10**	**8**	**6**	**4**
5-amp	229	364	579	921	1465	2330
10-amp	115	182	290	461	732	1165
12-amp	96	152	241	384	610	971
15-amp	76	121	193	307	488	777
17-amp	-	107	170	271	431	685
20-amp	-	91	145	230	366	582
25-amp	-	-	116	184	293	466
30-amp	-	-	97	154	244	388
40-amp	-	-	-	115	183	291
50-amp	-	-	-	92	146	233

SERVICES			
RESIDENTIAL SERVICE WIRE SIZE			
COPPER			
	100 AMP	**150 AMP**	**200 AMP**
HOT	#4	#1	2 / 0
NEUTRAL	#6	#2	1 / 0
4^{TH} WIRE (sub-panel & MH)	#8	#6	#6
ALUMINUM			
	100 AMP	**150 AMP**	**200 AMP**
HOT	#2	2 / 0	4 / 0
NEUTRAL	#4	1 / 0	2 / 0
4^{TH} WIRE (sub-panel & MH)	#6	#4	#4

SERVICE PANEL	
GENERAL	
LABELING:	All circuits must be labeled on the panel cover.
OPENINGS:	Unused openings in panels must be covered with hole plugs or panel blanks (tape is unacceptable).
WORKING SPACE	
HEIGHT:	Minimum of 6-1/2 feet clear space from floor.
DEPTH:	Minimum of 36-inches clear space in front of panel.
WIDTH:	Minimum of 30-inches clear width in front of panel.
APPLICANCES:	Washers, dryers, etc are **not** allowed in front of service panel.
LOCATION	
CLOSET:	Service panel are **not allowed** in clothes closets.
BATHROOM:	Service panels are **not allowed** in bathroom.
DISTANCE FROM METER CAN	
OUTSIDE DISCONNECT:	Service panels not located back-to-back or adjacent to meter can must have a disconnect installed outside adjacent to meter can.

METER CAN LOCATION / WORKING SPACE	
LOCATION:	Front of home unless, approved otherwise by power company.
CENTER:	Minimum 4-feet, maximum 5-1/2 feet, from grade to center of meter can
HEIGHT:	Minimum of 6-1/2 feet clear space from grade.
DEPTH:	Minimum of 36-inches clear space in front of meter can (18" each side).
WIDTH:	Minimum of 48-inches clear width in front of meter can.

SERVICE RISER	
SIZE:	Risers that extend through the roof must be 2-inch rigid metal pipe.
GUY WIRES:	Rises that extend more than 3-feet above roof must have guy wire support.
ATTACHMENT HEIGHT	
PEDESTRIAN TRAFFIC:	12-feet from grade
RESIDENTIAL DRIVEWAY:	14-feet from grade
COMMERCIAL DRIVEWAY:	18-feet from grade

PLUMBING

FOUNDATIONS	
SLEEVES:	Pipes run through or under foundation must be in a sleeve **2 sizes** larger than pipe.

UNDERGROUND	
DEPTH:	Plumbing pipe must be buried a minimum of 12-inches underground.

NAIL PLATES	
STUD/JOIST:	Nail plates are required where pipe is within 1 1/2" of the face of the stud/joist

TESTS	
P. V. C.:	Plastic piping must be tested by water pressure (air test is not allowed).
DRAIN LINE:	Entire system must be filled to 5-foot head of water for inspection.
SUPPLY:	Plastic water piping must be tested by water at the working system pressure.
COPPER:	Metal supply piping may be tested at minimum 50 PSI air pressure.

WATER HEATER PAN	
REQUIRED:	Pans are required when water heaters are located in the home or attic.
DRAIN SIZE:	The minimum size drain line is 3/4".
TERMINATION:	Drain must terminate outside the building between 6” & 24” above ground.
RELIEF VALVE:	The relief valve pipe may terminate at the drain pan.
DEPTH:	Water heater pan must be a minimum 1 1/2" deep.
MATERIAL:	Gas water heaters must have metal drain pans.

WATER SUPPLY & DISTRIBUTION PIPING	
P. V. C.:	Exterior piping may be PVC, interior piping must be CPVC.
SIZE:	The minimum size water supply piping is 3/4-inch.
GLUE / SOLVENT CEMENT	
C. P. V. C.:	Must be glued using an approved primer & orange color glue Or Glue yellow in color may be used for CPVC pipe up to 2” diameter.
P. V. C.:	Must be glued using a purple primer & glue of another color.
SHUT OFF VALVES	
REQUIRED:	Shut-off valves are required for all plumbing fixtures.
EXEMPT:	Residential tubs & showers do not require shut-off valves.
ACCESS:	All shut-off valves must be accessible.
BACKFLOW PREVENTION	
GENERAL:	Backflow prevention is required for all plumbing outlets by 1 of the following: 1. Air gap 2. Reduced pressure principle backflow preventer 3. Backflow preventer with intermediate atmospheric vent 4. Vacuum breaker
HOSE:	Hose connections must be protected by atmospheric vent or vacuum breaker.

WELL PUMP SIZING					
# BATHROOMS:	1	1 - 1 1/2	2 - 2 1/2	3 - 4	5 - 6
PUMP GALLONS PER MINUTE:	7	10	14	17	21

DRAINAGE	
DRAIN PIPE MINIMUM SLOPE	
SIZE	**MINIMUM SLOPE**
2-1/2” or less	1/4-inch per foot
3” to 6”	1/8-inch per foot
8” or larger	1/16-inch per foot
GLUE / SOLVENT CEMENT	
P. V. C.:	Purple primer must be used with glue of another color.
PIPE FITTINGS	
SANITARY TEE:	A sanitary tee can only be used for horizontal to vertical drainage, such as a lavatory.
CLEANOUTS	
DRAINS:	Cleanouts are required on all building drains.
SEWER:	Cleanouts are required on all sewer lines.
BENDS:	Cleanouts required at all building drain direction changes over 45 degrees.
EXTERIOR:	A cleanout is required outside where the building drain and sewer connect.
SIZE:	Cleanouts must be the same size as the pipe they serve.
TRAP SIZES	
FIXTURE TYPE	**MINIMUM TRAP SIZE**
Clothes Washer	2-inch
Bathtub	1 1/2-inch
Dishwasher	1 1/2-inch
Drinking fountain	1 1/4-inch
Floor drain	2-inch
Kitchen sink	1 1/2-inch
Lavatory	1 1/4-inch
Shower	1 1/2-inch
Urinal	Same as fixture outlet
Toilet	Same as fixture outlet

VENTS		
VENT STACK		
REQUIRED:	All homes must have at least 1 vent stack from drain through roof .	
HEIGHT:	Vents must extend at least 6-inches above roof.	
MAXIMUM DISTANCE FROM TRAP TO VENT		
TRAP SIZE	**SLOPE**	**MAXIMUM DISTANCE**
1 - 1/4”	1/4-inch	3 1/2 – feet
1 - 1/2"	1/4-inch	5 – feet
2-inch	1/4-inch	6 – feet
3-inch	1/8-inch	10 – feet
4-inch	1/8-inch	12 – feet
AIR ADMITTANCE VALVES		
PERMITTED:	Air admittance valves can be used on individual, branch, and circuit vents.	
LOCATION:	Minimum of 6-inches above insulation & 4-inches above fixture drain. Air admittance valves cannot be located within walls.	
ACCESS:	All air admittance valves must be accessible & in ventilated area.	

H. V. A. C.	
AIR HANDLER IN ATTIC	
ATTIC ACCESS:	Must be large enough to allow removal of air handler (Minimum **22"x30**")
DISTANCE:	Air handler must be within **6-feet** of attic access opening.
WALKWAY:	Minimum **24-inches** wide and 30-inches high
WORKSPACE:	Minimum **30-inches x 30-inches** at service side of air handler.
LIGHTING:	Light fixture required with switch located at attic access.
RECEPTACLE:	Receptacle required in attic near service area of air handler.
DISCONNECT:	Must be located within **6-feet** of the attic access.
ALARM:	Air handler must have a device to alarm owner, or shut down unit, in case of condensate drain problems.

NOTICE REQUIRED

A notice must be placed on the electrical service panel stating the following:

A PART OF YOUR AIR-CONDITIONING SYSTEM, THE AIR HANDLER, IS LOCATED IN THE ATTIC. FOR PROPER, EFFICIENT, AND ECONOMIC OPERATION OF THE AIR-CONDITIONING SYSTEM, YOU MUST ENSURE THAT REGULAR MAINTENANCE IS PERFORMED. YOUR AIR-CONDITIONING SYSTEM IS EQUIPPED WITH ONE OR BOTH OF THE FOLLOWING:

1. A DEVICE THAT WILL ALERT YOU WHEN THE CONDENSATION DRAIN IS NOT WORKING PROPERLY

OR

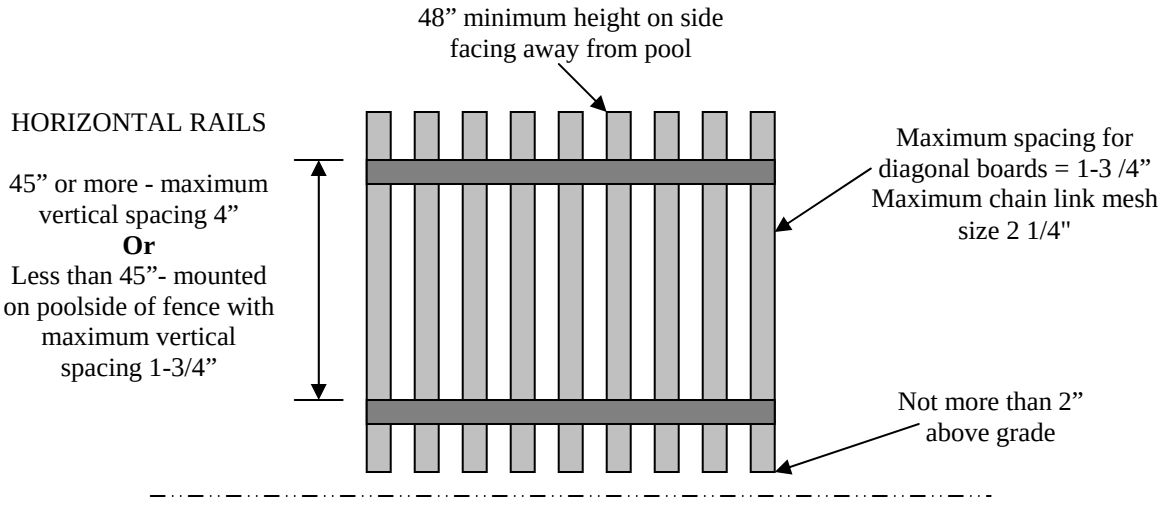
2. A DEVICE THAT WILL SHUT THE SYSTEM DOWN WHEN THE CONDENSATION DRAIN IS NOT WORKING. TO LIMIT POTENTIAL DAMAGE TO YOUR HOME, AND TO AVOID DISRUPTION OF SERVICE, IT IS RECOMMENDED THAT YOU ENSURE PROPER WORKING ORDER OF THESE DEVICES BEFORE EACH SEASON OF PEAK OPERATION.

CONDENSATE DISPOSAL	
SLOPE:	Minimum slope of 1/8" in 12".
SIZE:	Minimum size of 3/4" internal diameter pipe.
PIPE TYPE:	PVC, CPVC, ABS, copper, galvanized, PE, cast iron
TRAPS:	Condensate lines must be trapped.
INSULATION:	Condensate lines in un-conditioned spaces must be insulated.

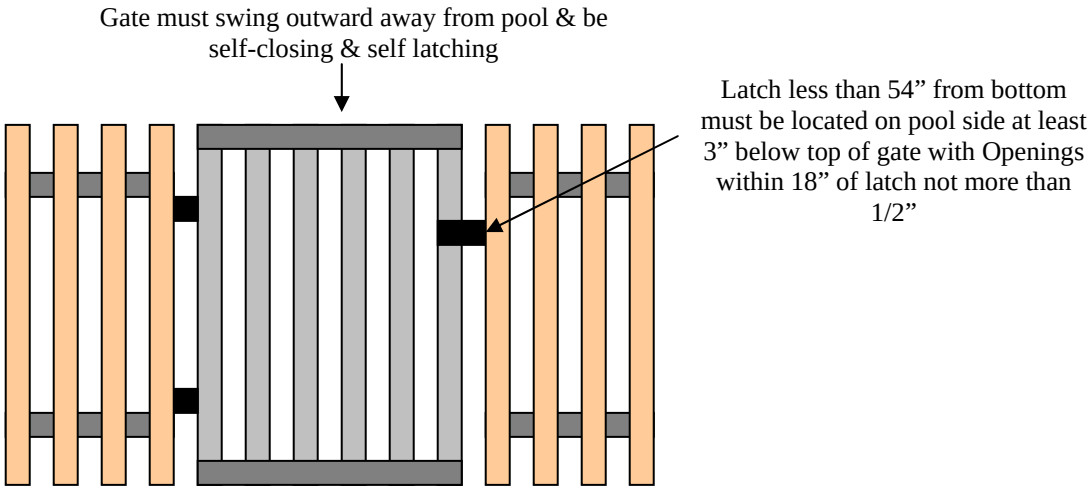
SECONDARY DRAIN PAN	
Require in attics and where building damage may occur	
OPTION #1:	Auxiliary pan 3" larger than unit with drain line to conspicuous place.
OPTION #2:	Auxiliary pan 3" larger than unit, with float switch shut-off protection.
OPTION #3:	Secondary drain line from unit to conspicuous place.

SWIMMING POOL BARRIER REQUIREMENTS

Required for all outdoor pools

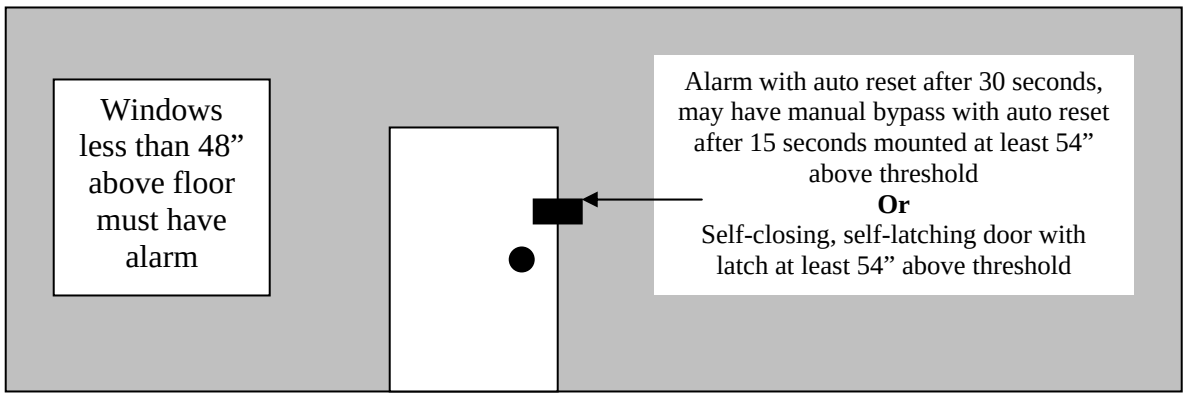


GATES



DOORS

Providing access to pool



RESIDENTIAL SWIMMING POOL REQUIREMENTS

BARRIER / FENCE	
REQUIRED:	All outdoor pool must be surrounded by a barrier (fence).
HEIGHT:	Pool barriers must be a minimum of **48-inches** high on side away from pool.
BOTTOM:	Bottom of barrier cannot exceed **2-inches** above grade on side away from pool.
OPENINGS / VERTICAL SPACING	
HORIZONTAL RAILS SPACED LESS THAN 45-INCHES APART (top to top) Maximum vertical member spacing of **1 3/4-inches** with horizontal rails on pool side.	
HORIZONTAL RAILS SPACED 45-INCHES OR MORE (top to top) Maximum vertical rail spacing less than **4-inches** apart.	
CHAIN LINK:	The maximum mesh size for chain link fencing is **2 1/4-inch**.
DIAGONAL:	The maximum spacing for barriers with diagonal members is **1 3/4-inches**

GATES	
DIRECTION:	Gates must swing outward away from the pool.
LATCH:	Gates must be self-closing & self-latching.
LATCH LESS THAN 54-INCHES FROM GRADE	
Latch must be located on pool side Latch must be at least **3-inches** below top of gate No opening greater than **1/2-inch** within **18-inches** of latch	

DWELLING WALL PART OF BARRIER	
ALARM	
ALARM:	Must sound **30-seconds** minimum and automatically reset.
BYPASS:	Single opening Bypass is required at least **54-inches** above floor. Bypass must reset within **15-seconds**.
HEIGHT:	Alarm deactivation switch must be at least **54-inches** above floor.
WINDOWS:	Sill heights less than **48-inches** must be equipped with alarm.
DOORS:	All doors providing access require an alarm. **Or** Must be self-closing & self-latching with latch at least **54-inches** above floor.