B RESIDENTIAL ADDITION

CITY OF STOCKTON

COMMUNITY DEVELOPMENT DEPARTMENT—345 N. EL DORADO STREET—STOCKTON, CA 95202—(209) 937-8561

www.stocktongov.com/CDD/building

NOTE: Check with your homeowners' association and architectural review committee for Conditions, Covenants & Restrictions (CC&R's). The City of Stockton has no regulatory authority to enforce or notify permit applicants of CC&R requirements, nor deny permits for non-compliance.

DESIGN CRITERIA / APPLICABLE CODES

- Seismic Design Category: D
- Basic wind speed: 110 mph, Exposure C
- Climate Zone 12
- Codes: 2013 CRC: California Residential Code
  2013 CPC: California Plumbing Code
  2013 CMC: California Mechanical Code
  2013 CEC: California Electrical Code
  2013 CEC: California Energy Code
  2013 CGBSC: CA Green Building Standards Code
  City of Stockton Municipal Code

DRAWING CRITERIA

- It is preferred that drawings be limited in size to a MINIMUM of 18"x24" and a MAXIMUM of 30"x42"
- Plans must be clear, complete, and legible; illegible or incomplete plans will not be accepted.
- Preferred scale: 1/4 inch per foot for structural and architectural; 1 inch = 20 feet for site plans

WHAT'S INCLUDED IN THIS HANDOUT

SUBMITTAL CHECKLIST

- Incomplete submittals will not be accepted
- Plan check fees are to be paid at the time of submittal
- Due to the complex nature of navigating all the different building code requirements for new construction it is strongly recommended that a design professional (e.g. residential designer, Architect/Engineer) be hired to provide construction plans for permit issuance.
- Final two sets of plans must be wet-signed by preparer on each page. Architect/Engineer must affix their seal and wet-sign. Cover sheet of supporting documents also to be wet- signed. Project address must be on each sheet.

SUBMITTAL DOCUMENTS CHECKLIST

- ☐ COMPLETED BUILDING PERMIT APPLICATION
- ☐ COVER SHEET (3)
- ☐ SITE PLAN (3)
- ☐ FLOOR PLAN (3)
- ☐ ELEVATIONS (3)
- ☐ ARCHITECTURAL & STRUCTURAL SHEETS (3 sets)
- ☐ PLUMBING/MECHANICAL/ELECTRICAL SHEETS (3 sets)
- ☐ STRUCTURAL CALCULATIONS (2 sets)
- ☐ TRUSS CALCULATIONS (2 sets, if applicable)
- ☐ TITLE 24 ENERGY DOCUMENTS (2 sets)
- ☐ GRADING PLAN (2 sets, if applicable)
- ☐ FLOOD ELEVATION CERTIFICATE (if applicable)

THE FOLLOWING ADDITIONAL ITEMS MAY BE REQUIRED BASED ON PROJECT TYPE, SCOPE, AND/OR LOCATION:

- School District certificate of fees paid (additions of 500 sq. ft. and over)
- Special Inspection Agreement
- Soils Report
- Electrical Load Calculations
- Plumbing Calculations

SEPARATE PERMITS AND PLANS ARE REQUIRED FOR THE FOLLOWING TYPES OF WORK:

- Pools and spas
- Accessory structures proposed on the plot plan

INFORMATION REQUIRED ON PLAN SUBMITTALS

COVER SHEET:

- Legal address of project site
- Assessor's Parcel Number (APN)
- Name, address, phone number of owner, contractor and contact person
- Name, address, phone number, title and registration information of project design professional
- Written description of work to be undertaken
- Current applicable codes and edition dates
- Occupancy classification and type of construction
- Zoning
- Gross square footage area by floor
- Index of drawings
- Flood zone identification

SITE PLAN (see sample on pg. 7):

- North arrow
- Lot dimensions & boundaries, showing entire parcel
- Scale used
- Legal address of job site
- Existing and proposed structures, including solid covered patios, porches, sheds, etc., and their areas in square feet and number of stories
- Distances of structures from property lines and other structures
- Utility lines and connection points (water, sewer, electrical, gas, cable, fire hydrants, etc.)
- Adjoining streets
- Driveways and parking areas
- All easements
- Fence bollards, barriers or walls; indicate material of construction and height
- Patios, walkways, existing and proposed sidewalks
- Proposed pad and finished floor elevations
- Signature of preparer (two copies must be wet-stamped)
- Special Flood Hazard Area boundary line (if entire property not within a single flood zone)

FLOOR PLAN (see sample on pg. 8):

- Dimensions and use of all existing and proposed rooms and/or areas inside buildings

ELEVATIONS SHALL SHOW ALL SIDES OF BUILDING, INCLUDING:

- Windows, doors
- Rooftop equipment
- Types of siding and roofing materials
- Dimensions of all elements, including height of structures
- Base Flood Elevation, all floor elevations (if applicable)

TRUSS PLANS & CALCULATIONS (if applicable):

- Truss layout plan with truss member identification corresponding to each truss
- Connection details
- Lateral bracing details
- Project designer approval

ARCHITECTURAL & STRUCTURAL PLANS:

- Foundation and structural floor framing plans; include details of footings, piers, and grade beams
- Architectural floor plan(s), dimensioned, will all openings listed as to size and operation. If it is an addition, show all rooms adjoining the new addition and their window sizes
- Roof plan; show eaves, overhangs, rakes and gables, size of rafters, sheathing material, roofing material, etc.
- A cross-section of each structural system, detailing all structural connections
- Structural second-floor, ceiling-joist, and rafter plans
- Structural systems and materials listing
- Details to include:
  - Fireplace: masonry
  - Post and girder intersections
  - If applicable, stairway rise and run, framing, attachment, and dimensions of members

PLUMBING, MECHANICAL & ELECTRICAL SHEETS:

- Location of all plumbing fixtures
- Location of all mechanical units, ducts, and registers
- Location of all electrical outlets, switches, lights, arc fault and G.F.C.I. outlets, smoke detectors, and ser- vice and sub-panel locations and sizes

TITLE 24 ENERGY DOCUMENTS:

- CF1R-ADD-02 form with required signatures if addition is under 1,000 square feet; OR
- CF1R-ADD-01 form with required signatures if addition is over 1,000 square feet; OR
- CF1R-PRF-01 forms with required signatures if utilizing the performance approach
- Integrate required energy forms into plans
- Heating/cooling calculations and equipment listings (if applicable)

GRADING PLAN (if required):

- Existing and proposed grading plans
- Pad elevations ground slope drainage scheme and topographic plan drawn to 1'-0" contours
- Retaining walls and drainage systems, existing and proposed

SETBACK AND LOT COVERAGE REQUIREMENTS

This overview is provided for your reference only. Prior to building any structure or making an addition or modification to any existing structure, check with the Community Development Department at (209) 937-8561 regarding minimum required distances from property lines and other structures, as well as finding the location of any easements.

LOT COVERAGE:

The maximum area of a lot that may be covered by all primary and accessory structures over 30 inches in height (house, patio, garage, carport, sheds, etc.) is fifty (50) percent for residential zones.

PROPERTY LINE:

Contact the Planning Division for property line setbacks. The back edge of the sidewalk is NOT necessarily the property line. The property line is normally 2 feet in back of the sidewalk.

DRIVEWAYS:

Driveways shall not be located within 20 feet of a right-of-way, measured from the property line and shall not exceed 26 feet in width. Driveways shall be paved with a permanent surface, consisting of concrete, asphalt, or other similar material. Gravel is not considered an acceptable surface.

LOT TYPES:

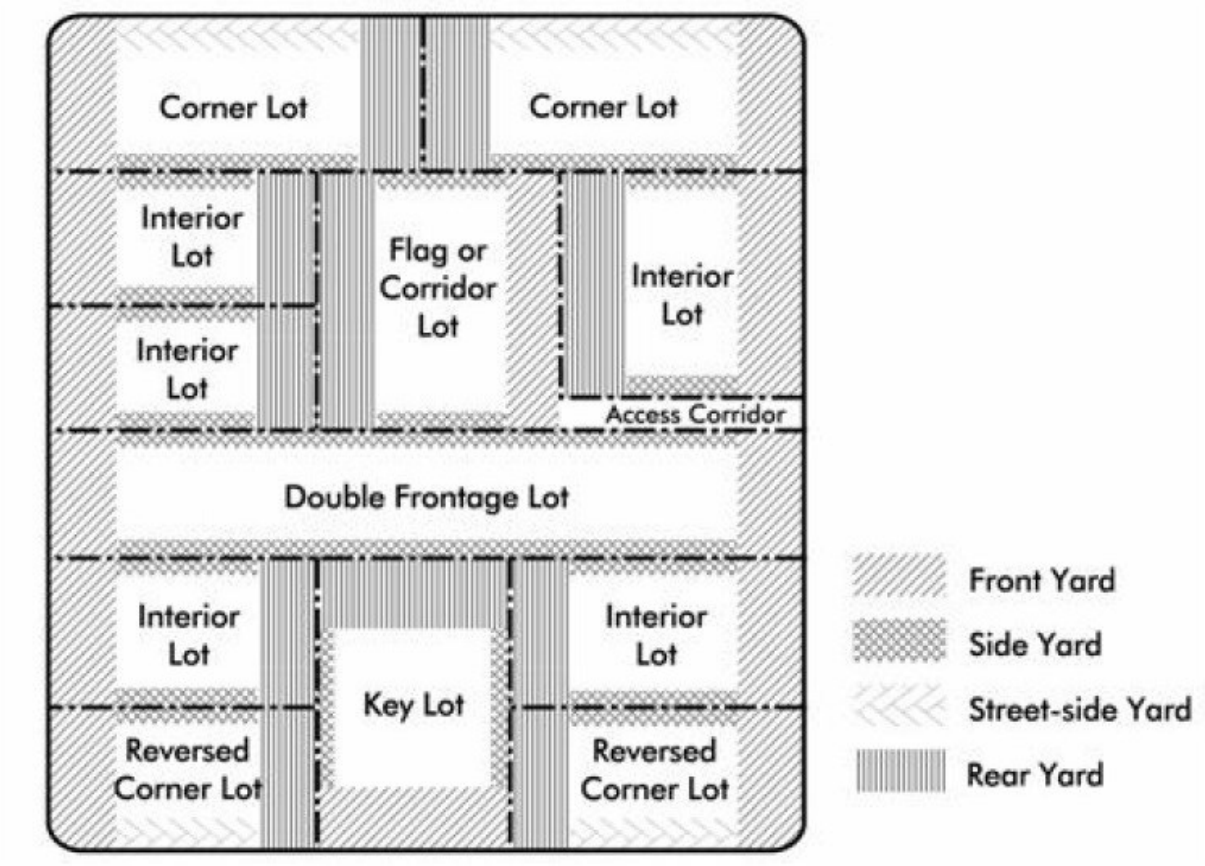
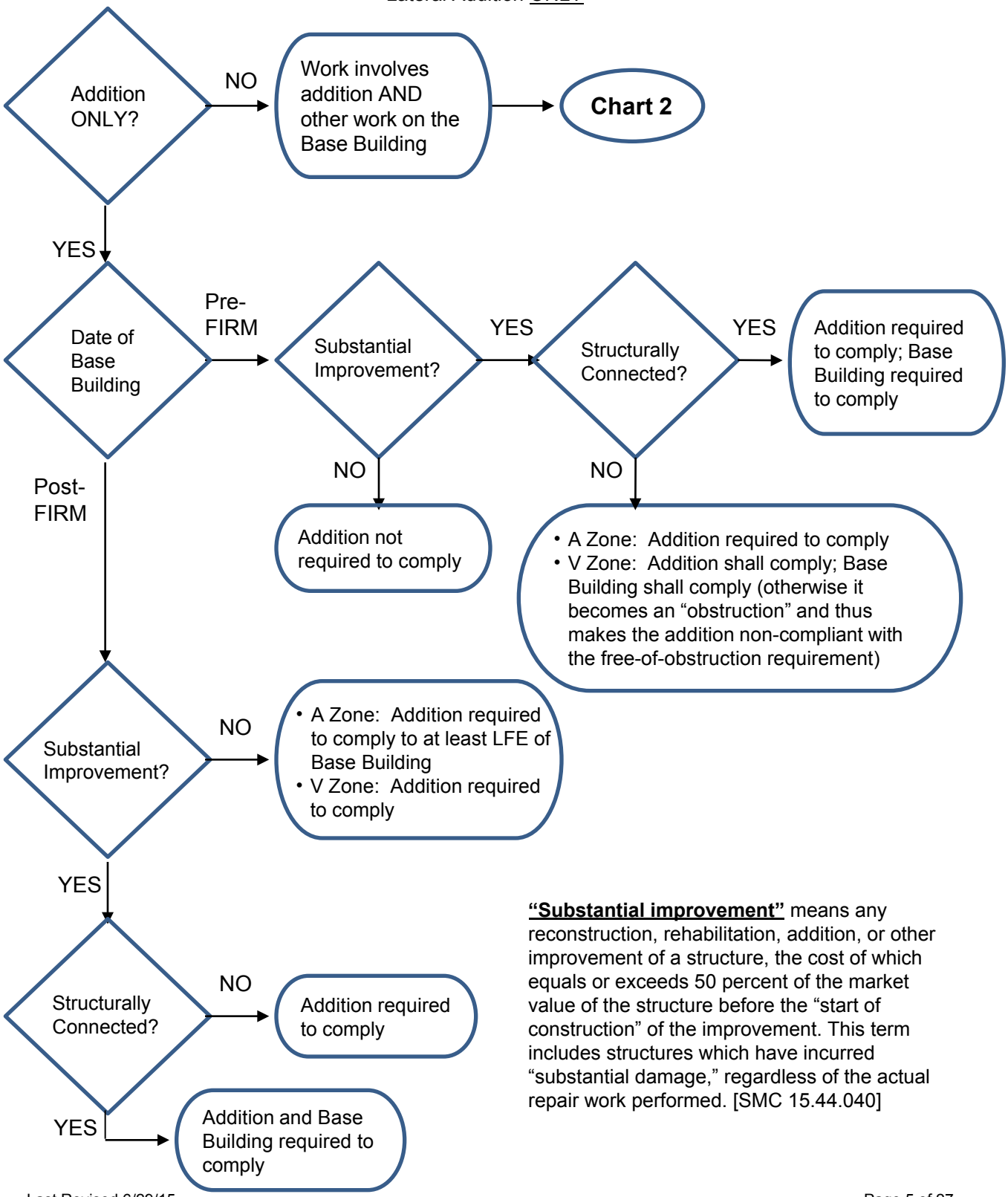


CHART 1 - REQUIREMENTS FOR ADDITIONS IN A SPECIAL FLOOD HAZARD AREA (SFHA)

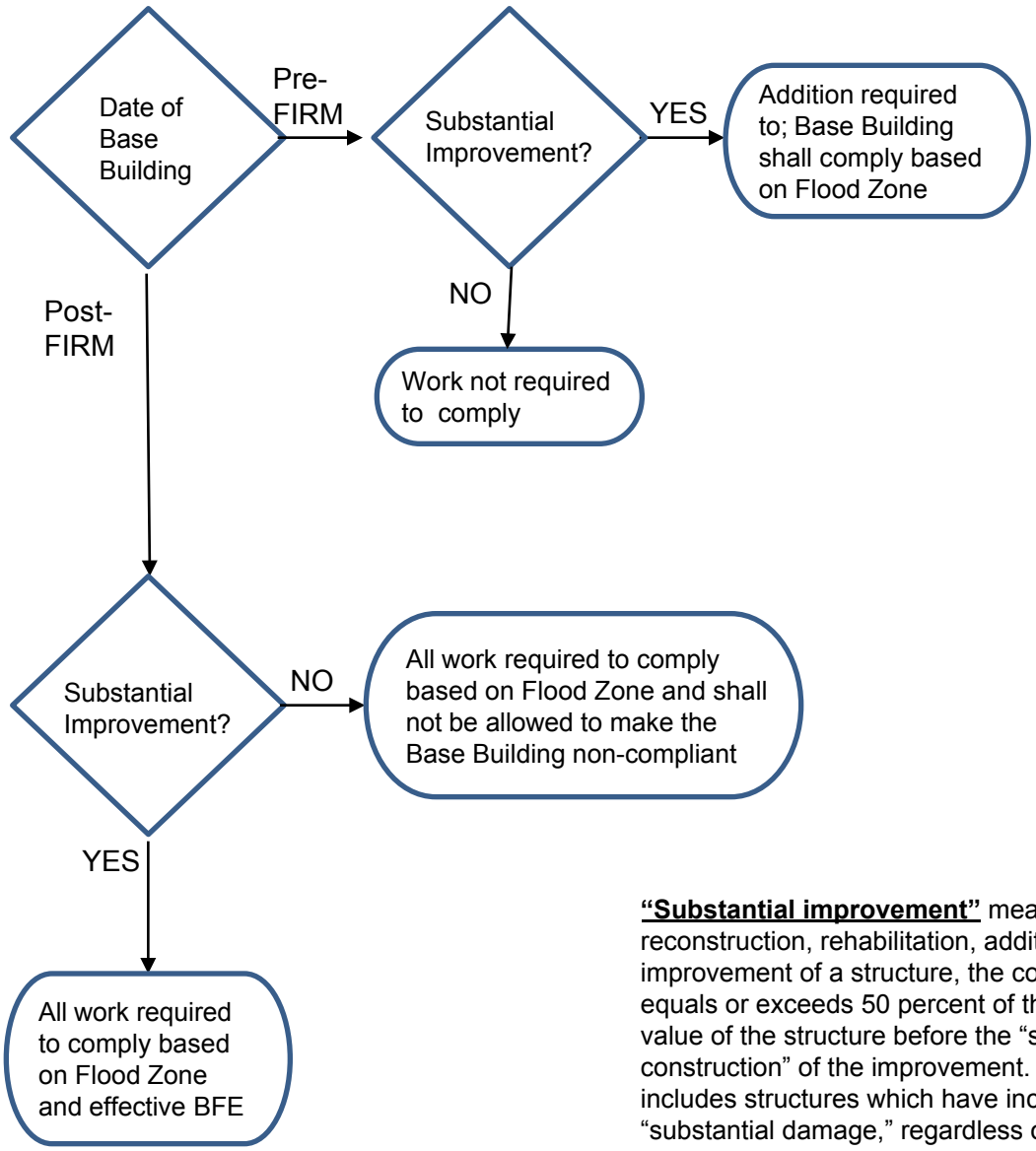
Buildings in all Flood Zones
Lateral Addition ONLY



"Substantial improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. [SMC 15.44.040]

CHART 2 - REQUIREMENTS FOR ADDITIONS IN A SPECIAL FLOOD HAZARD AREA (SFHA)

Buildings in all Flood Zones
Lateral Addition AND Other Improvements in Base Building (e.g., rehab, renovate, remodel)



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EXAMPLES OF ADDITIONS LOCATED IN A SPECIAL FLOOD HAZARD AREA (SFHA)

These figures are from FEMA P-758, *Substantial Improvement / Substantial Damage Desk Reference.*

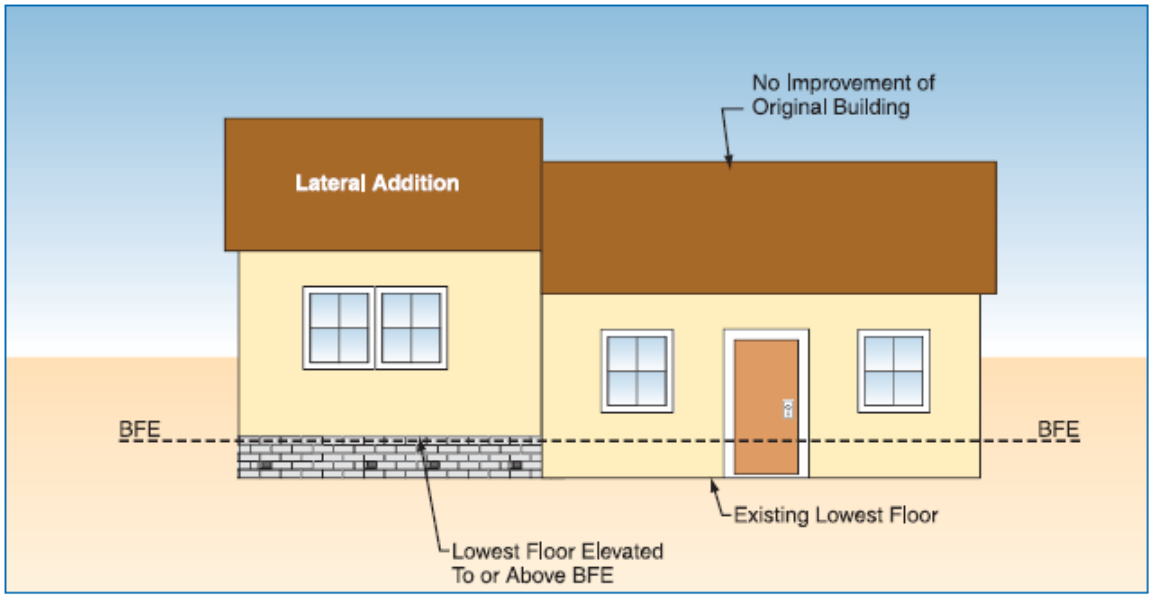


Figure 6-3. Lateral addition to a pre-FIRM building in an A zone – the proposed work is only the addition (no work was performed on the original building and no structural modification was made to the common wall or roof). The addition constitutes a substantial improvement and it complies with all NFIP requirements.

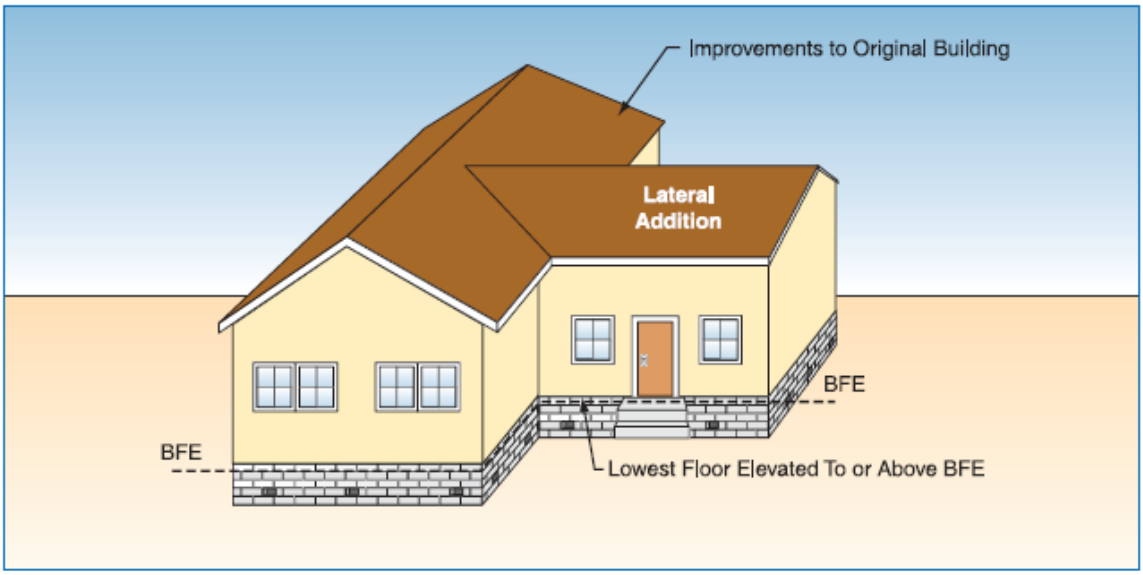


Figure 6-4. Lateral addition to a pre-FIRM building in an A zone – the proposed work includes an addition and work on the original building, including structural modification of the common wall or roof. The proposed work was determined to be a substantial improvement. The addition complies with all requirements and the building is brought into compliance by elevating it on a compliant foundation.

REQUIRED INSPECTIONS

When you are ready for an inspection, call the Building Safety Division's 24-hour inspection recorder at (209) 937-8560. You will be asked to leave your permit number, job site address, type of inspection being requested, date for which you wish to schedule the inspection, and your contact information. Please speak slowly and clearly. Requests left by 4:00 p.m. will be scheduled for the next business day; requests left after 4:00 p.m. will be scheduled for the second following business day.

The approved set of plans, including structural calculations, truss calculations, and/or energy calculations, must be on-site for each inspection. The Inspection Record card must be posted for the inspector's signature.

If the inspector approves the work, the Inspection Record card will be initialed and dated. If the work is not approved, the inspector will leave a correction notice stating which corrections are needed. It is the permit-holder's responsibility to make the required corrections and request a re-inspection of the work.

THE TYPICAL ORDER OF ON-SITE INSPECTIONS IS AS FOLLOWS:

1. UNDER-SLAB PLUMBING:

Drain lines must be plugged and filled with water through a 10' vertical riser. Water lines must be tested with a pressure of 50 psi or City water street pressure for a minimum of 15 minutes. Property lines should be clearly marked.

2. FOUNDATION:

Trenches must be excavated and reinforcing in place. Forms erected and hold-downs held in place. Property lines should be clearly marked.

3. SLAB INSPECTION:

Gravel, compacted sand or soil must be in place. Mesh or reinforcement must be placed over moisture barrier if required. Pipes penetrating slab must be protected from expansion and breakage.

4. UNDERFLOOR INSPECTION:

Prior to installation of floor sheathing, the drain lines must be plugged and filled with water through a 10' vertical riser. Water lines must be tested with a pressure of 50 psi or City water street pressure for a minimum of 15 minutes. Gas lines must be tested to hold a pressure of 10 psi for 15 minutes. The mechanical duct system must be installed and insulated. All floor framing must be in place.

5. DIAPHRAGM & ROOF NAILING:

If the building has shear panels (walls, roof, floor) a nailing inspection is required prior to covering. All metal connectors must be installed. Plans to state exact size and spacing of nails. Trusses should be completed and ready for inspection at the time of the roof nail inspection and truss plans on the job site. All framing should be completed prior to scheduling this inspection.

6. ROUGH FRAME INSPECTION:

All rough plumbing, mechanical and electrical must be complete. Windows, roofing and siding installed (stucco lath installed without stucco). No insulation can be installed.

7. INSULATION INSPECTION:

Only certified or approved insulation may be installed. All gaps around windows and penetrations through plates must be sealed with foam sealant. Underfloor must be accessible to inspector and insulation certificate must be on-site.

8. SHEETROCK NAILING INSPECTION:

Prior to taping and texturing, all sheetrock must be in place and must be inspected and approved. Walls of bathtub/ shower areas must have moisture-resistant sheetrock. Gas lines should be pumped to 15 lbs.

9. LATH INSPECTION:

Sheetrock must be installed prior to lath inspection. All tears and holes in lath must be patched or sealed.

10. FINAL INSPECTION:

Structure must be completely finished and ready for occupancy. Electric service must be energized.

11. ELECTRIC METER TAGGING:

(If upgrading service)

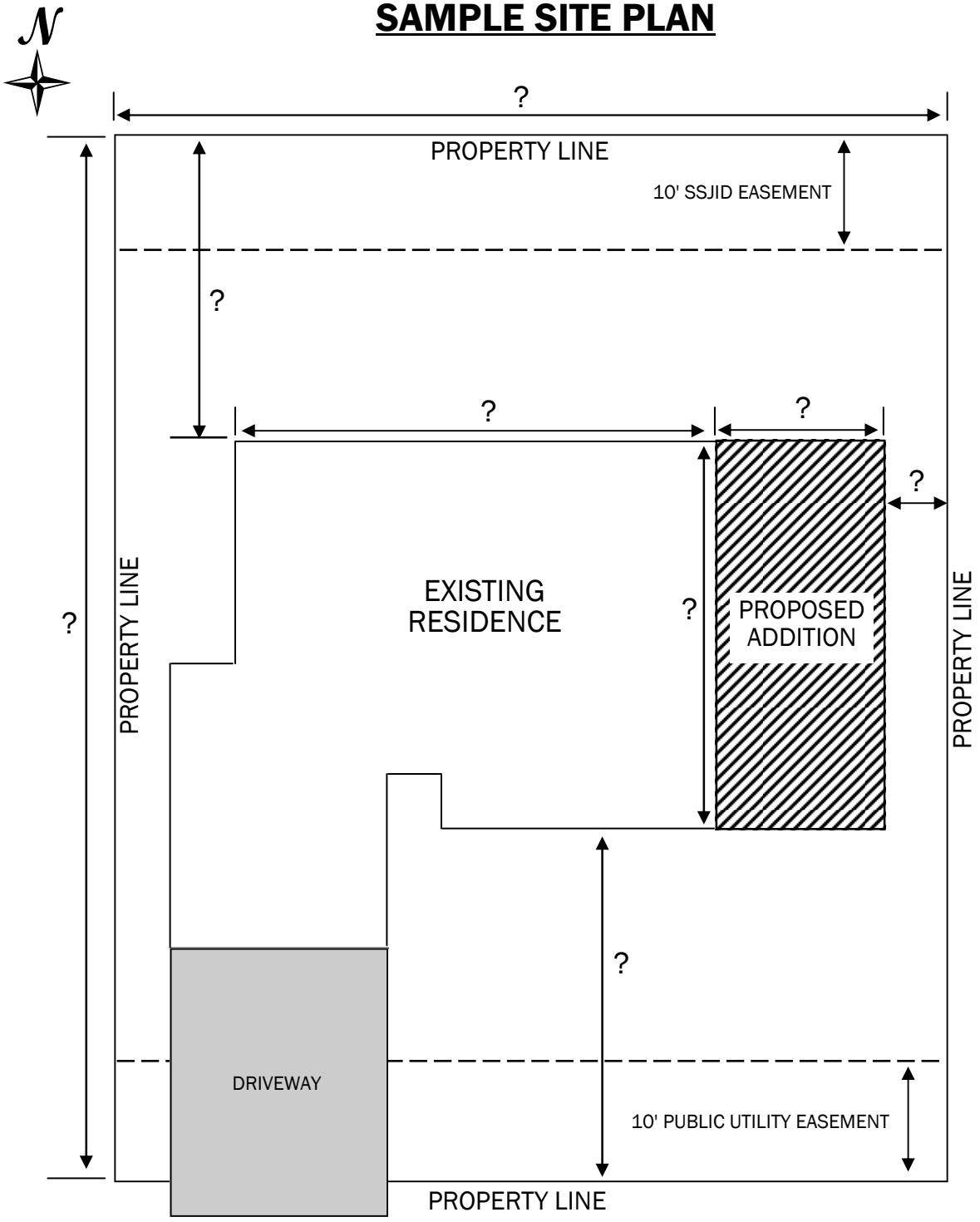
Method of grounding (Ufer) must be visible for inspection. If no Ufer ground available, must install two (2) 5/8" ground rods spaced a minimum of six feet apart. When approved, the inspector will leave a clearance tag on/in the panel box and a card for the applicant to fax to PG&E.*

12. GAS METER TAGGING:

The gas test must be approved prior to requesting a gas tag. At least one appliance must be installed. If approved, the inspector will leave a clearance tag on the gas line at the meter location and will give the applicant a PG&E clearance card. A clearance tag will not be issued unless the building has received a final inspection approval or an application for "Temporary Clearance for Connection of Utilities" has been submitted and approved. The submittal for "Temporary Clearance for Connection of Utilities" must comply with the utility release policy and must be accompanied by a letter stating the reason for the early release of the gas utility.

*Release forms may be faxed to: (800) 700-5722

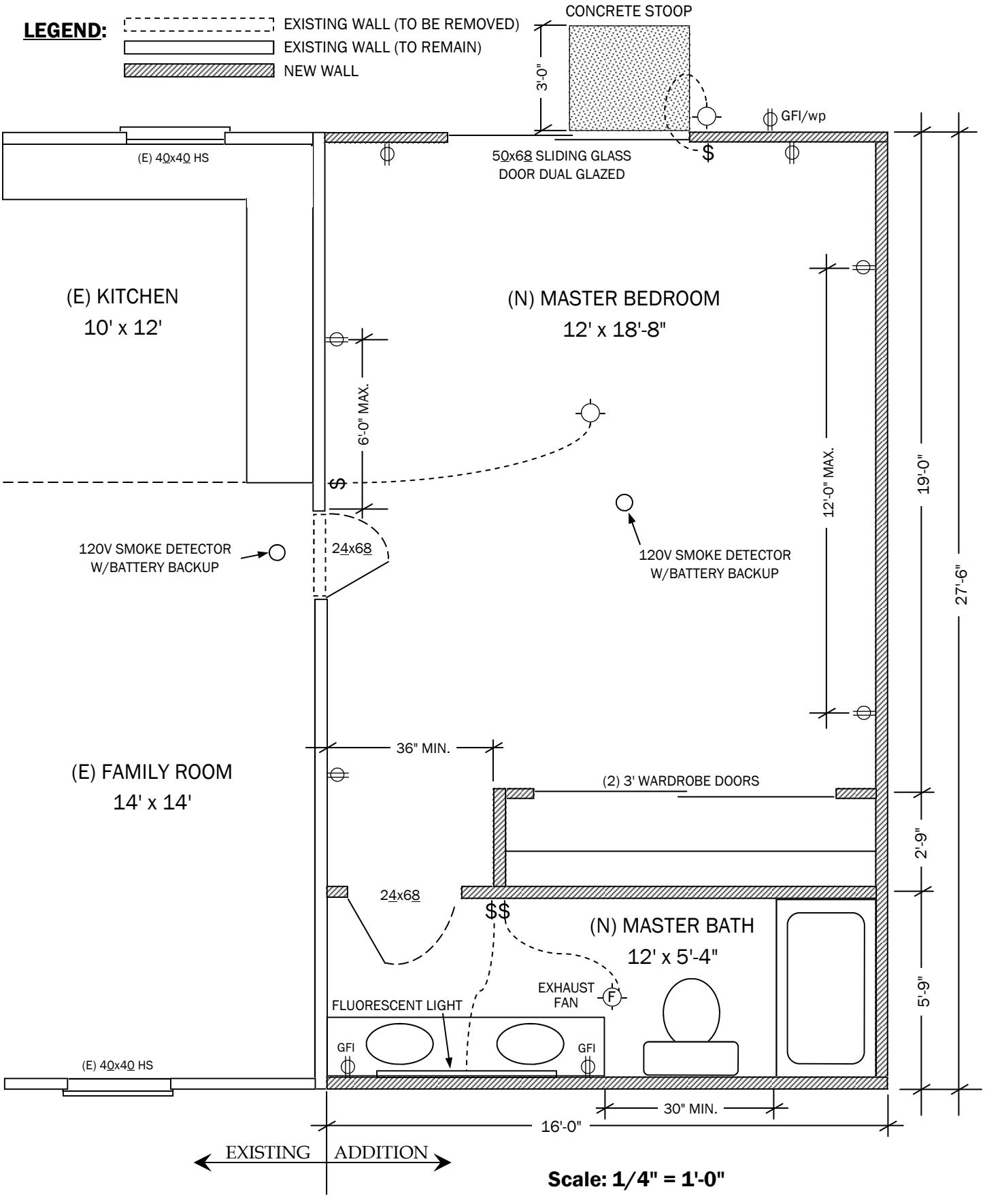
SAMPLE SITE PLAN



HOUSE NUMBER AND STREET NAME

1) Show lot dimensions and total square footage of all covered areas.
2) Check with the Planning Division for building setback requirements.
3) Check with Public Works for location of any utility easements.

SAMPLE FLOOR PLAN



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

NATURAL LIGHT AND VENTILATION REQUIREMENTS
(Windows, Doors and Skylights)

NATURAL LIGHT:

Habitable rooms within a dwelling unit shall be provided with natural light by means of exterior glazed openings with an area not less than 8% of the floor area of such rooms with a minimum of twenty-five (25) square feet. *(2013 CRC R303.1)*

VENTILATION:

Habitable rooms within a dwelling unit shall be provided with natural ventilation by means of openable exterior openings with an area of not less than 4% of the floor area of such rooms with a minimum of twenty-five (25) square feet. *(2013 CRC R303.1)*

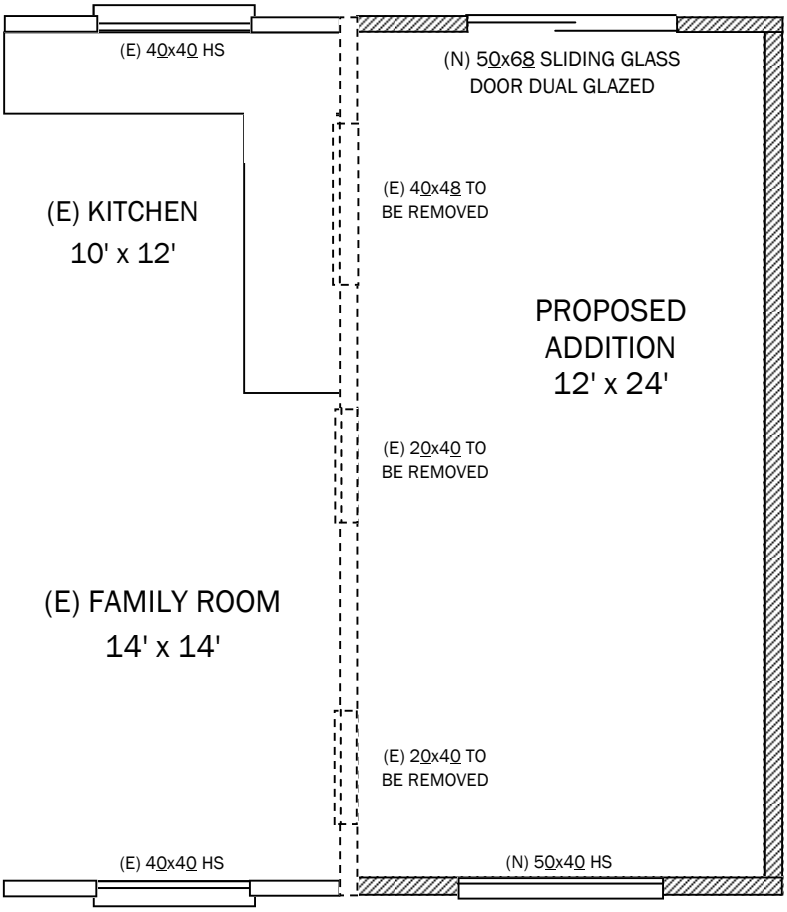
ROOMS ADJOINING PROPOSED ADDITION:

If there are windows and doors that are affected by the addition, rooms adjoining the addition need to be reviewed for lighting and ventilation requirements the same as for new construction.

NOTE: Provide floor plans of rooms adjoining the addition. Indicate any windows and doors (including their sizes and method of opening) which are affected by the addition.

SAMPLE ANALYSIS

LEGEND: EXISTING WALL (TO BE REMOVED)
EXISTING WALL (TO REMAIN)
NEW WALL



PROPOSED ADDITION: 12'x24' = 288 SQ. FT.

LIGHTING REQUIREMENT:
288 SQ. FT. x .08 ..... = 23.04 SQ. FT.
VENTILATION REQUIREMENT:
288 SQ. FT. x .04 ..... = 11.52 SQ. FT.
PROPOSED LIGHTING:
5' x 4' + 5' x 6.67 = 53.35 SQ. FT. ..... > 23.04 SQ. FT. ***OK!***
PROPOSED VENTILATION:
2.5' x 4' + 2.5' x 6.67 = 26.68 SQ. FT. . > 11.52 SQ. FT. ***OK!***

EXISTING KITCHEN: 10'x12' = 120 SQ. FT.

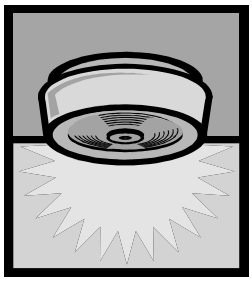
LIGHTING REQUIREMENT:
120 SQ. FT. x .08 ..... = 9.6 SQ. FT.
VENTILATION REQUIREMENT:
120 SQ. FT. x .04 ..... = 4.8 SQ. FT.
(E) WINDOW:
LIGHTING: 4' x 4' = 16 SQ. FT..... > 9.6 SQ. FT. ***OK!***
VENTILATION: 2' x 4' = 8 SQ. FT. ..... > 4.8 SQ. FT. ***OK!***

EXISTING FAMILY RM: 14'x14' = 196 SQ. FT.

LIGHTING REQUIREMENT:
196 SQ. FT. x .08 .....= 15.68 SQ. FT.
VENTILATION REQUIREMENT:
196 SQ. FT. x .04 ..... = 7.84 SQ. FT.
(E) WINDOW:
LIGHTING: 4' x 4' = 16 SQ. FT.....> 15.68 SQ. FT. ***OK!***
VENTILATION: 2' x 4' = 8 SQ. FT. .....>7.84 SQ. FT. ***OK!***

Based on these calculations, no additional windows or enlarging of the existing window is required.

Smoke Detectors and Carbon Monoxide Detectors

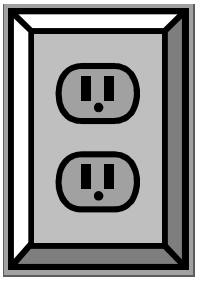


- Smoke detectors shall be installed in every sleeping room, in the hallway outside any sleeping room and on every story including basements and habitable attics.
- Smoke detectors in new bedrooms or hallways must be connected to the house wiring and must also have a battery backup. They shall be interconnected when accessible.
- Carbon Monoxide detectors are required outside sleeping area and on every story. These detectors are also to be interconnected. Multi-purpose alarms are allowed if approved by the State Fire Marshal.
- Show locations of smoke and carbon monoxide detectors on the plans.

ELECTRICAL RECEPTACLES, SWITCHES & FIXTURES

Show locations of all electrical receptacles, switches, and fixtures.

A. Receptacles must be spaced not more than 12 feet apart, with the first outlet not more than six (6) feet from the door, fireplace, or similar opening. Every wall section at least two (2) feet wide or greater requires at least one receptacle.



B. At least one receptacle outlet shall be installed in hallways ten (10) feet or more in length.

C. The following Receptacles shall be GFI-protected:
All receptacles in Bathrooms
All kitchen counter receptacles
All exterior receptacles
All receptacles in garages or accessory buildings that have a floor at or below grade level.
All receptacles in crawl spaces or unfinished basements at or below grade level.
Any other receptacle within 6' of a sink.

D. Receptacles in kitchens and dining areas shall be installed at each counter space so that no point along the wall line is more than 24 inches, measured horizontally from a receptacle outlet in that space. Island and peninsular counter tops 12 inches or wider shall have at least one receptacle.

E. All rooms, halls, and exterior doors must have a switch controlling a light fixture or receptacle.

F. Arc Fault protection is required everywhere not Ground fault protected.

G. All receptacles shall be tamper resistant. CEC 406.11

HIGH-EFFICACY GENERAL LIGHTING

Provide high-efficacy general lighting throughout (see exceptions in the CEC 150(k). High-efficacy lighting shall be at least 30 lumens per watt (see Table 150-C) be switched separately and shall be controlled by the most accessible switch location.

Refer to the information on the following two pages for information on California's Title 24 Residential Lighting Standards.

OVERVIEW of 2013 TITLE 24 LIGHTING STANDARDS

Kitchen	***High-efficacy*** ***OR*** ***Up to 50% of total wattage can be low-efficacy (incandescent)*** ***All high-efficacy and low-efficacy lighting must be switched separately***
Bathroom ***Garage*** ***Laundry Rm*** ***Utility Rm***	***Bathroom—At least one high efficacy luminaire and all low efficacy lighting must be controlled by vacancy sensors.*** ***Garage, Laundry Rm & Utility Rm—All must be high efficacy and must be controlled by vacancy sensors.***
All Other Interior Rooms ***(Living Room, Bedrooms, Dining Room, Hallways) except closets less than 70 sq. ft.***	***High-efficacy*** ***OR*** ***Low-efficacy if controlled by vacancy sensor or by a dimmer.***
Outdoor lighting attached to buildings	***High-efficacy*** ***OR*** ***Low-efficacy if controlled by a motion-sensor and controlled by one of these: Photo control, astronomical time clock or energy management control system (EMCS)***

FOR ALL APPLICATIONS:

- Electronic ballasts for all fluorescent lamps rated 13 watts or greater
- Recessed luminaires in all insulated ceilings approved for zero-clearance insulation cover (IC) and certified airtight ASTM E283

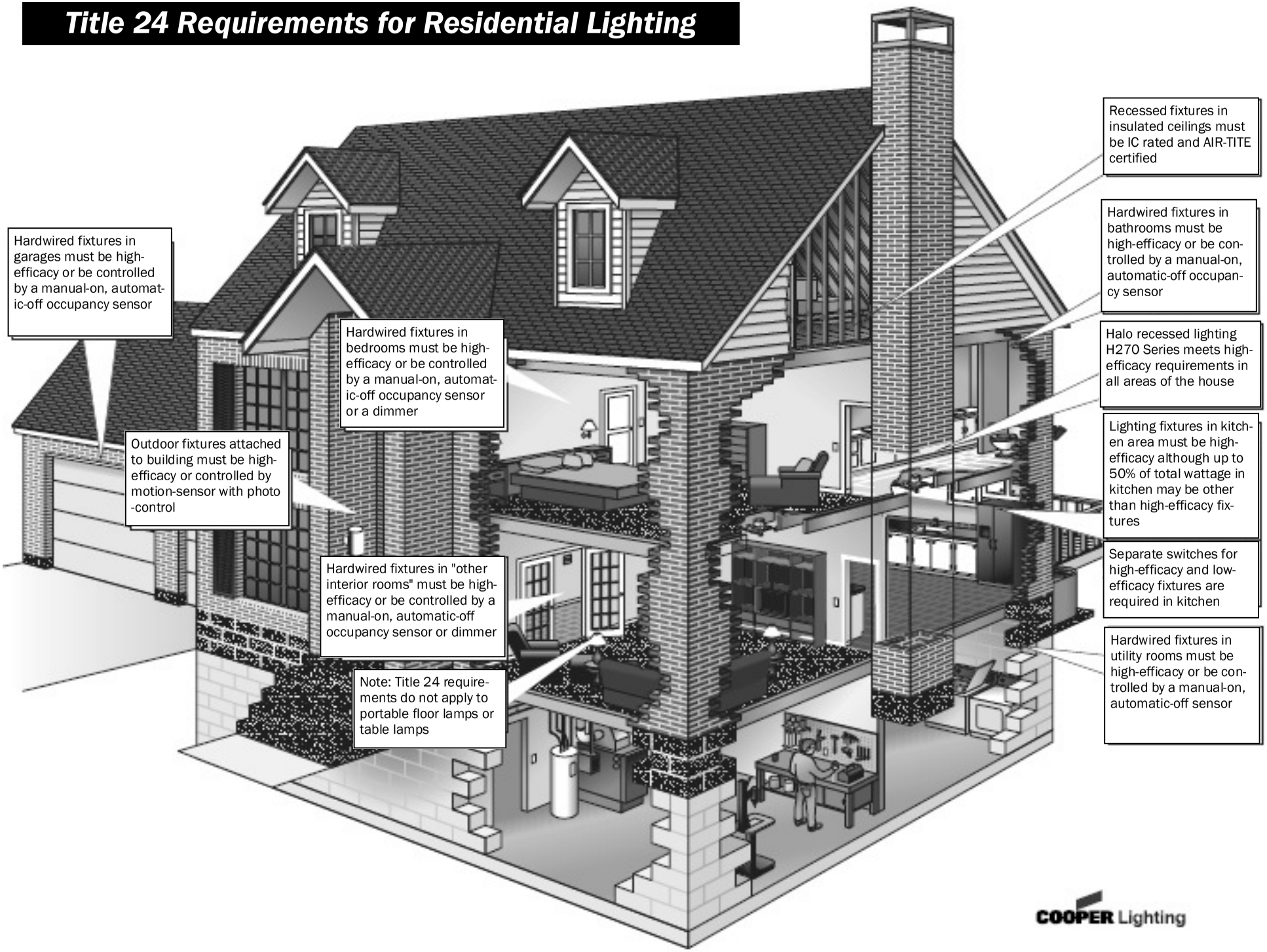
HIGH-EFFICACY FIXTURES

Lamp Power	*Minimum Efficacy Lumens per Watt*	*Compliant Indoor Lamps*	*Compliant Outdoor Lamps*
5 Watts or Less	*30 lm/W*	• *Compact Fluorescent* • *Fluorescent*	• *Metal Halide* • *HPS* • *Compact Fluorescent*
>5 Watts to 15 Watts	*45 lm/W*	• *Compact Fluorescent* • *Fluorescent*	• *Metal Halide* • *HPS* • *Compact Fluorescent*
>15 Watts to 40 watts	*60 lm/W*	• *Compact Fluorescent* • *Fluorescent*	• *Metal Halide* • *HPS* • *Compact Fluorescent*
Over 40 watts	*90 lm/W*	• *Compact Fluorescent* • *Fluorescent*	• *Metal Halide* • *HPS* • *Compact Fluorescent*

Note:

• *High-efficacy luminaires may not contain medium screw-base sockets. Exception: outdoor metal halide or high-pressure sodium (HPS) high-intensity discharge luminaires with electromagnetic ballast may have medium screw-base sockets if minimum efficacy and motion-sensor/ photo-control requirements are met.*

Title 24 Requirements for Residential Lighting



PRESCRIPTIVE ENERGY STANDARDS FOR ROOM ADDITIONS

REQUIREMENTS FOR ADDITIONS OF ≤400 sq. ft.	REQUIREMENTS FOR ADDITIONS OF >400 TO ≤700 sq. ft.	REQUIREMENTS FOR ADDITIONS OF >700 sq.ft.[1]
BUILDING INSULATION Ceiling = R-38 (U=.025) Walls = R-13(2x4)/R-19(2x6) Crawl Space = R-19 (U=.037) Window U = 0.32 (Low E) SHGC = 0.25	**BUILDING INSULATION** Ceiling = R-38 (U=.025) Walls = R-13(2x4)/R-19(2x6) Crawl Space = R-19 (U=.037) Window U = 0.32 (Low E) SHGC = 0.25	**BUILDING INSULATION** Ceiling = R-38 Walls = R-15+R4 or R-13+R5 Crawl Space = R-19 (U=.037) Window U = 0.32 (Low E) SHGC = 0.25
Radiant Barrier Required (Above Attic Spaces)	**Radiant Barrier Required (Above Attic Spaces)**	**Radiant Barrier Required (Above Attic Spaces)**
HEATING & COOLING* AFUE = 80% SEER Rating = 14 SEER EER = 12.2 Duct Sealing = Required**	**HEATING & COOLING*** AFUE = 80% SEER Rating = 14 SEER EER = 12.2 Duct Sealing = Required**	**HEATING & COOLING*** AFUE = 80% SEER Rating = 14 SEER EER = 12.2 Duct Sealing = Required**
***Refrigerant Charge or Charge Indicator Display—Required **	***Refrigerant Charge or Charge Indicator Display—Required**	***Refrigerant Charge or Charge Indicator Display—Required**
MAXIMUM GLAZING **(Dual Glaze)** ≤ 75 sq. ft. or 30% x CFA, whichever is greater **WEST ORIENTATION GLAZING MAXIMUM** 60 sq.ft. CFA—Conditioned Floor Area	**MAXIMUM GLAZING** **(Dual Glaze)** ≤ 120 sq. ft. or 25% x CFA, whichever is greater **WEST ORIENTATION GLAZING MAXIMUM** 60 sq.ft. CFA—Conditioned Floor Area	**MAXIMUM GLAZING** **(Dual Glaze)** ≤ 175 sq. ft. or 20% x CFA, whichever is greater **WEST ORIENTATION GLAZING MAXIMUM** 70 sq.ft. or 50% x CFA, whichever is greater CFA—Conditioned Floor Area

Cool Roof - Steep Sloped (>2:12):
Aged Solar Reflectance = 0.20 ; Thermal Emittance = 0.75 (Exception: Addition <300 sq.ft.)

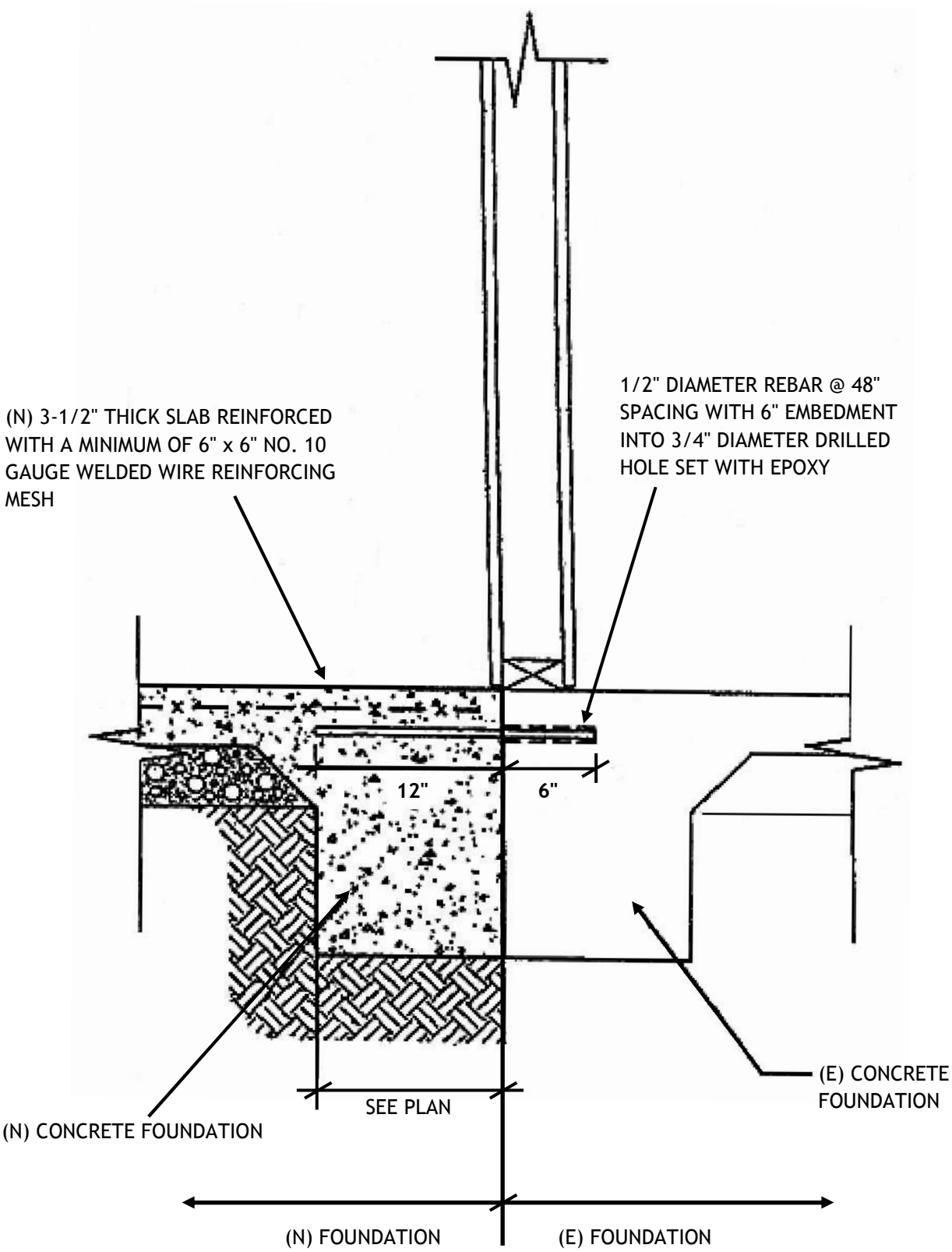
Water Heater—Minimum Energy Factor
Gas Storage ≤ 55 gallons : Currently = 0.67 - (.0019 x storage volume)
(40 gal = 0.594 EF and 50 gal = 0.575 EF)

* If heating and cooling system is left unchanged, compliance with the standards is not required.

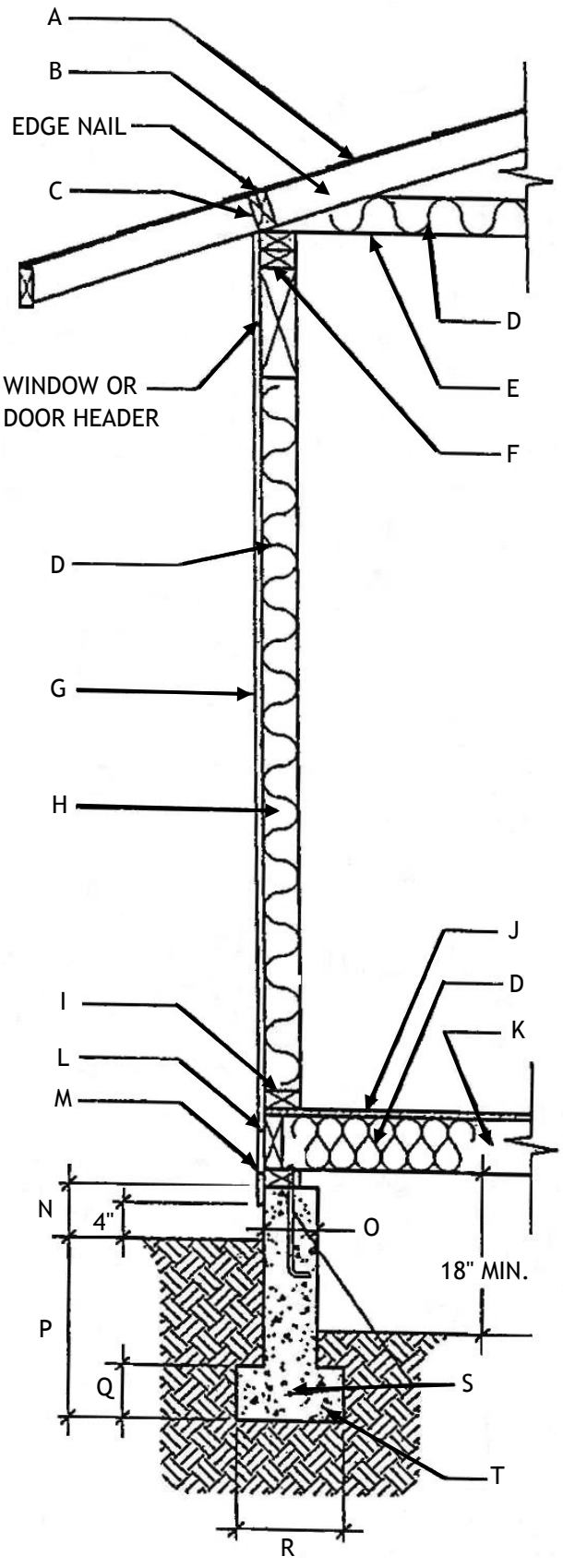
** If more than 40 feet of new or replacement ducts are installed in unconditioned space, duct testing is required.

[1] Additions >1000 sq. ft.: Package A Whole House Fan.

ATTACHMENT OF NEW FOOTING TO EXISTING FOOTING



RAISED-FLOOR CONSTRUCTION SECTION



A. ROOF COVERING ON 15# FELT PAPER ON PLYWOOD OR 1" x 4" SKIP SHEATHING (WOOD SHAKE OR WOOD SHINGLE ONLY). PLYWOOD EDGE NAIL 8d @ 6" O.C.
_____" THICK, _____ SHEATHING

B. MANUFACTURED TRUSSES OR RAFTERS.
IF TRUSSES ARE USED, PROVIDE TRUSS CALCULATIONS.
RAFTERS: 2" x _____" @ _____ O.C.
(REFER TO ALLOWABLE SPAN FOR RAFTERS)

C. BLOCKING OR EAVE VENTS WITH 16d NAILS @ 8" O.C. TO DBL. TOP PLATE (Drill for venting as required)

D. MINIMUM REQUIRED INSULATION OR BETTER.
CEILING: R-_____, WALL: R-_____,
FLOOR: R-_____ (SEE "PRESCRIPTIVE ENERGY STANDARDS" PAGE FOR REQUIRED INSULATION)
(Maintain 1" air space between insulation & roof deck)

E. CEILING JOIST: 2" x _____ @ _____" O.C.
(REFER TO ALLOWABLE SPAN FOR CEILING JOISTS)

F. DOUBLE TOP PLATE (MIN. 48" SPLICE) WITH 12 (16d) NAILS @ EACH SIDE OF SPLICE

G. SIDING MATERIAL: _____

H. STUD WALL WITH 2" x _____" STUDS @ 16" O.C.

I. WALL SILL PLATE WITH 16d NAILS @ 8" O.C. TO RIM JOIST

J. FLOOR SHEATHING: _____" THICK, _____ SHEATHING

K. FLOOR JOISTS OR FLOOR TRUSSES.
JOIST: 2" x _____ @ _____" O.C.
(REFER TO ALLOWABLE SPAN FOR FLOOR JOISTS)

L. 2" x _____" RIM JOIST WITH 16d NAILS @ 8" O.C. TO BOTTOM PLATE

M. BOTTOM PLATE (PRESSURE-TREATED WHEN IN CONTACT WITH CONCRETE) WITH 1/2" x 10" ANCHOR BOLT @ 6' O.C. MAX (MIN. TWO BOLTS PER SILL SECTION)

N. 8" MINIMUM CLEARANCE TO GRADE

O. 7-1/2" MINIMUM

P. 12" FOR ONE-STORY (18" FOR TWO-STORY)

Q. 6" FOR ONE-STORY (7" FOR TWO-STORY)

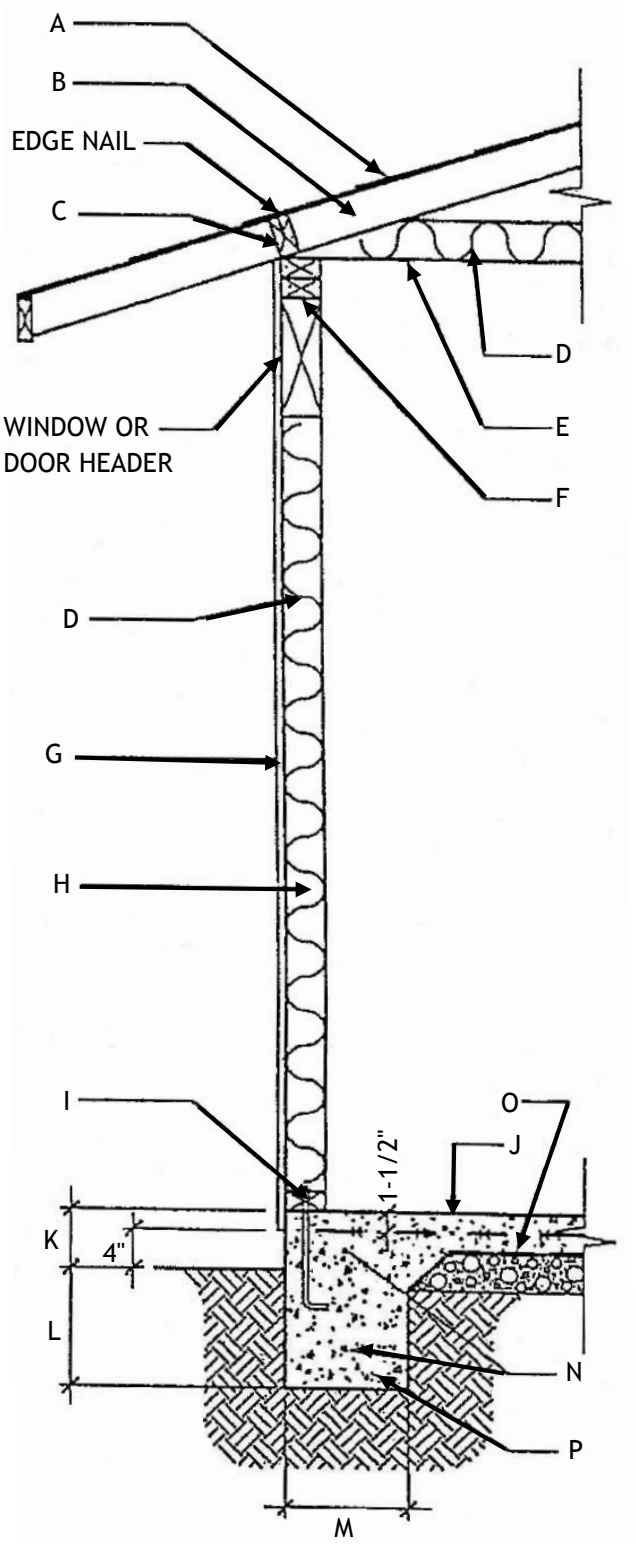
R. 12" FOR ONE-STORY (15" FOR TWO-STORY)

S. (2) #4 REINFORCING BARS (CONTINUOUS)

T. CONCRETE FOUNDATION

Note: Underfloor Ventilation = 1 sqft for each 150 sqft of underfloor area.

SLAB-FLOOR CONSTRUCTION FOOTING



A. ROOF COVERING ON 15# FELT PAPER ON PLYWOOD OR 1" x 4" SKIP SHEATHING (WOOD SHAKE OR WOOD SHINGLE ONLY). PLYWOOD EDGE NAIL 8d @ 6" O.C.
_____" THICK, _____ SHEATHING

B. MANUFACTURED TRUSSES OR RAFTERS.
IF TRUSSES ARE USED, PROVIDE TRUSS CALCULATIONS.
RAFTERS: 2" x _____" @ _____ O.C.
(REFER TO ALLOWABLE SPAN FOR RAFTERS)

C. BLOCKING OR EAVE VENTS WITH 16d NAILS @ 8" O.C. TO DBL. TOP PLATE (Drill for venting as required)

D. MINIMUM REQUIRED INSULATION OR BETTER.
CEILING: R-_____, WALL: R-_____,
(SEE "PRESCRIPTIVE ENERGY STANDARDS" PAGE FOR REQUIRED INSULATION)
Maintain 1" air space between insulation and roof deck

E. CEILING JOIST: 2" x _____ @ _____" O.C.
(REFER TO ALLOWABLE SPAN FOR CEILING JOISTS)

F. DOUBLE TOP PLATE (MIN. 48" SPLICE) WITH 12 (16d) NAILS @ EACH SIDE OF SPLICE

G. SIDING MATERIAL: _____

H. STUD WALL WITH 2" x _____" STUDS @ 16" O.C.

I. BOTTOM PLATE (PRESSURE-TREATED WHEN IN CONTACT WITH CONCRETE) WITH 1/2" x 10" ANCHOR BOLT @ 6' O.C. MAX (MIN. TWO BOLTS PER SILL SECTION)

J. 3-1/2" CONCRETE SLAB 2,500 PSI MINIMUM REINFORCED WITH A MINIMUM OF 6" x 6" #10 GAUGE WELDED WIRE REINFORCING MESH

K. 6" MINIMUM CLEARANCE TO GRADE

L. 12" FOR ONE-STORY. 18" FOR TWO-STORY.

M. 12" FOR ONE-STORY. 15" FOR TWO-STORY.

N. (2) #4 REINFORCING BARS (CONTINUOUS)

O. VAPOR BARRIER

P. CONCRETE FOUNDATION

SPAN TABLES AND ALLOWABLE LOADS

2013 CRC FOR RESIDENTIAL LIGHT-FRAME ONLY

FLOOR JOISTS
Table R502.3.1(2) - LL=40psf/DL=10psf

SIZE & SPACING	GRADE #1	GRADE #2
2 x 6 @ 12" O.C.	10' 11"	10' 9"
@ 16" O.C.	9' 11"	9' 9"
@ 24" O.C.	8' 8"	8' 1"
2 x 8 @ 12" O.C.	14' 5"	14' 2"
@ 16" O.C.	13' 1"	12' 7"
@ 24" O.C.	11' 0"	10' 3"
2 x 10 @ 12" O.C.	18' 5"	17' 9"
@ 16" O.C.	16' 5"	15' 5"
@ 24" O.C.	13' 5"	12' 7"
2 x 12 @ 12" O.C.	22' 0"	20' 7"
@ 16" O.C.	19' 1"	17' 10"
@ 24" O.C.	15' 7"	14' 7"

CEILING JOISTS—No Storage
Table R802.4(1) - LL=10psf/DL=5psf

SIZE & SPACING	GRADE #1	GRADE #2
2 x 4 @ 12" O.C.	12' 8"	12' 5"
@ 16" O.C.	11' 6"	11' 3"
@ 24" O.C.	10' 0"	9' 10"
2 x 6 @ 12" O.C.	19' 1"	19' 6"
@ 16" O.C.	18' 1"	17' 8"
@ 24" O.C.	15' 9"	14' 10"
2 x 8 @ 12" O.C.	Note A	25' 8"
@ 16" O.C.	23' 10"	23' 0"
@ 24" O.C.	20' 1"	18' 9"
2 x 10 @ 12" O.C.	Note A	Note A
@ 16" O.C.	Note A	Note A
@ 24" O.C.	24' 6"	22' 11"

RAFTERS
Table R802.5.1(1) - LL=20 psf/DL=10psf

SIZE & SPACING	GRADE #1	GRADE #2
2 x 4 @ 12" O.C.	11' 1"	10' 10"
@ 16" O.C.	10' 0"	9' 10"
@ 24" O.C.	8' 7"	8' 0"
2 x 6 @ 12" O.C.	17' 4"	16' 7"
@ 16" O.C.	15' 4"	14' 4"
@ 24" O.C.	12' 6"	11' 9"
2 x 8 @ 12" O.C.	22' 5"	21' 0"
@ 16" O.C.	19' 5"	18' 2"
@ 24" O.C.	15' 10"	14' 10"
2 x 10 @ 12" O.C.	Note A	25' 8"
@ 16" O.C.	23' 9"	22' 3"
@ 24" O.C.	19' 5"	18' 2"
2 x 12 @ 12" O.C.	Note A	Note A
@ 16" O.C.	Note A	25' 9"
@ 24" O.C.	22' 6"	21' 0"

Note A: Span exceeds 26 feet in length. Check sources for availability of lumber in lengths greater than 20 feet.

TABLE R502.5(1)
GIRDER SPANS[a] AND HEADER SPANS[a] FOR EXTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf)[c]																	
		30						50						70					
		Building width[c] (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
Roof and ceiling	2-2 × 4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1	2-10	1	2-6	1	2-3	1
	2-2 × 6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2	4-2	1	3-8	2	3-3	2
	2-2 × 8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2	5-4	2	4-7	2	4-1	2
	2-2 × 10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2	6-6	2	5-7	2	5-0	2
	2-2 × 12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2	7-6	2	6-6	2	5-10	3
	3-2 × 8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2	6-8	1	5-9	2	5-2	2
	3-2 × 10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2	8-2	2	7-0	2	6-4	2
	3-2 × 12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2	9-5	2	8-2	2	7-4	2
	4-2 × 8	9-2	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1	7-8	1	6-8	1	5-11	2
	4-2 × 10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2	9-5	2	8-2	2	7-3	2
	4-2 × 12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	10-11	2	9-5	2	8-5	2
Roof, ceiling and one center-bearing floor	2-2 × 4	3-1	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1	2-7	1	2-3	1	2-0	1
	2-2 × 6	4-6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2	3-9	2	3-3	2	2-11	2
	2-2 × 8	5-9	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2	4-9	2	4-2	2	3-9	2
	2-2 × 10	7-0	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2	5-9	2	5-1	2	4-7	3
	2-2 × 12	8-1	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3	6-8	2	5-10	3	5-3	3
	3-2 × 8	7-2	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2	5-11	2	5-2	2	4-8	2
	3-2 × 10	8-9	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2	7-3	2	6-4	2	5-8	2
	3-2 × 12	10-2	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2	8-5	2	7-4	2	6-7	2
	4-2 × 8	8-1	1	7-3	1	6-7	1	7-5	1	6-6	1	5-11	2	6-10	1	6-0	2	5-5	2
	4-2 × 10	10-1	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2	8-4	2	7-4	2	6-7	2
	4-2 × 12	11-9	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2	9-8	2	8-6	2	7-7	2
Roof, ceiling and one clear span floor	2-2 × 4	2-8	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1	2-5	1	2-1	1	1-10	1
	2-2 × 6	3-11	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2	3-6	2	3-1	2	2-9	2
	2-2 × 8	5-0	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2	4-6	2	3-11	2	3-6	2
	2-2 × 10	6-1	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3	5-6	2	4-9	2	4-3	3
	2-2 × 12	7-1	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3	6-4	2	5-6	3	5-0	3
	3-2 × 8	6-3	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2	5-7	2	4-11	2	4-5	2
	3-2 × 10	7-7	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2	6-10	2	6-0	2	5-4	2
	3-2 × 12	8-10	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2	7-11	2	6-11	2	6-3	2
	4-2 × 8	7-2	1	6-3	2	5-7	2	7-0	1	6-1	2	5-5	2	6-6	1	5-8	2	5-1	2
	4-2 × 10	8-9	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2	7-11	2	6-11	2	6-2	2
	4-2 × 12	10-2	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2	9-2	2	8-0	2	7-2	2
Roof, ceiling and two center-bearing floors	2-2 × 4	2-7	1	2-3	1	2-0	1	2-6	1	2-2	1	1-11	1	2-4	1	2-0	1	1-9	1
	2-2 × 6	3-9	2	3-3	2	2-11	2	3-8	2	3-2	2	2-10	2	3-5	2	3-0	2	2-8	2
	2-2 × 8	4-9	2	4-2	2	3-9	2	4-7	2	4-0	2	3-8	2	4-4	2	3-9	2	3-5	2
	2-2 × 10	5-9	2	5-1	2	4-7	3	5-8	2	4-11	2	4-5	3	5-3	2	4-7	3	4-2	3
	2-2 × 12	6-8	2	5-10	3	5-3	3	6-6	2	5-9	3	5-2	3	6-1	3	5-4	3	4-10	3
	3-2 × 8	5-11	2	5-2	2	4-8	2	5-9	2	5-1	2	4-7	2	5-5	2	4-9	2	4-3	2
	3-2 × 10	7-3	2	6-4	2	5-8	2	7-1	2	6-2	2	5-7	2	6-7	2	5-9	2	5-3	2
	3-2 × 12	8-5	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	3	7-8	2	6-9	2	6-1	3
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	4-2 × 10	8-4	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	2	7-7	2	6-8	2	6-0	2
	4-2 × 12	9-8	2	8-6	2	7-8	2	9-5	2	8-3	2	7-5	2	8-10	2	7-9	2	7-0	2
Roof, ceiling, and two clear span floors	2-2 × 4	2-1	1	1-8	1	1-6	2	2-0	1	1-8	1	1-5	2	2-0	1	1-8	1	1-5	2
	2-2 × 6	3-1	2	2-8	2	2-4	2	3-0	2	2-7	2	2-3	2	2-11	2	2-7	2	2-3	2
	2-2 × 8	3-10	2	3-4	2	3-0	3	3-10	2	3-4	2	2-11	3	3-9	2	3-3	2	2-11	3

(continued)

TABLE R502.5(1)—continued
GIRDER SPANS[a] AND HEADER SPANS[a] FOR EXTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf)[e]																	
		30						50						70					
		Building width[c] (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
Roof, ceiling, and two clear span floors	2-2 x 10	4-9	2	4-1	3	3-8	3	4-8	2	4-0	3	3-7	3	4-7	3	4-0	3	3-6	3
	2-2 x 12	5-6	3	4-9	3	4-3	3	5-5	3	4-8	3	4-2	3	5-4	3	4-7	3	4-1	4
	3-2 x 8	4-10	2	4-2	2	3-9	2	4-9	2	4-1	2	3-8	2	4-8	2	4-1	2	3-8	2
	3-2 x 10	5-11	2	5-1	2	4-7	3	5-10	2	5-0	2	4-6	3	5-9	2	4-11	2	4-5	3
	3-2 x 12	6-10	2	5-11	3	5-4	3	6-9	2	5-10	3	5-3	3	6-8	2	5-9	3	5-2	3
	4-2 x 8	5-7	2	4-10	2	4-4	2	5-6	2	4-9	2	4-3	2	5-5	2	4-8	2	4-2	2
	4-2 x 10	6-10	2	5-11	2	5-3	2	6-9	2	5-10	2	5-2	2	6-7	2	5-9	2	5-1	2
	4-2 x 12	7-11	2	6-10	2	6-2	3	7-9	2	6-9	2	6-0	3	7-8	2	6-8	2	5-11	3

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

TABLE R502.5(2)
GIRDER SPANS[a] AND HEADER SPANS[a] FOR INTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir[b] and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING Width[c] (feet)					
		20		28		36	
		Span	NJ[d]	Span	NJ[d]	Span	NJ[d]
One floor only	2-2 x 4	3-1	1	2-8	1	2-5	1
	2-2 x 6	4-6	1	3-11	1	3-6	1
	2-2 x 8	5-9	1	5-0	2	4-5	2
	2-2 x 10	7-0	2	6-1	2	5-5	2
	2-2 x 12	8-1	2	7-0	2	6-3	2
	3-2 x 8	7-2	1	6-3	1	5-7	2
	3-2 x 10	8-9	1	7-7	2	6-9	2
	3-2 x 12	10-2	2	8-10	2	7-10	2
	4-2 x 8	9-0	1	7-8	1	6-9	1
	4-2 x 10	10-1	1	8-9	1	7-10	2
	4-2 x 12	11-9	1	10-2	2	9-1	2
Two floors	2-2 x 4	2-2	1	1-10	1	1-7	1
	2-2 x 6	3-2	2	2-9	2	2-5	2
	2-2 x 8	4-1	2	3-6	2	3-2	2
	2-2 x 10	4-11	2	4-3	2	3-10	3
	2-2 x 12	5-9	2	5-0	3	4-5	3
	3-2 x 8	5-1	2	4-5	2	3-11	2
	3-2 x 10	6-2	2	5-4	2	4-10	2
	3-2 x 12	7-2	2	6-3	2	5-7	3
	4-2 x 8	6-1	1	5-3	2	4-8	2
	4-2 x 10	7-2	2	6-2	2	5-6	2
	4-2 x 12	8-4	2	7-2	2	6-5	2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

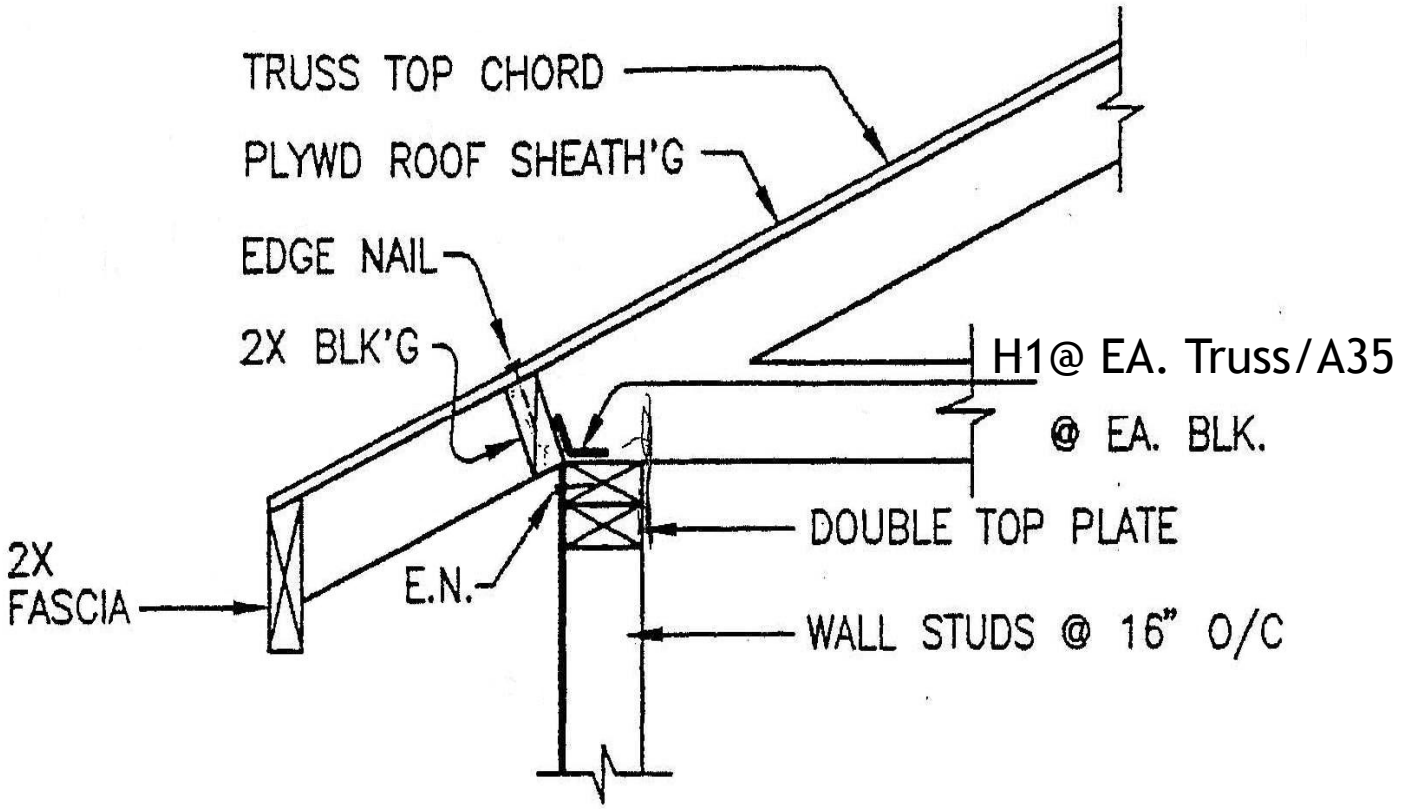
b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

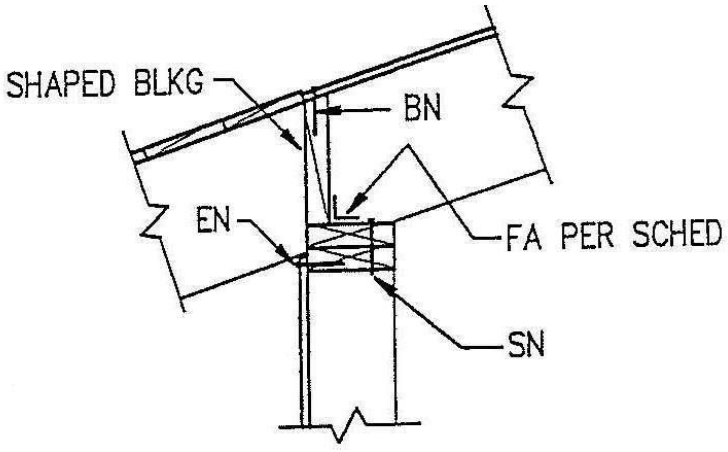
TYPICAL BLOCKING DETAIL

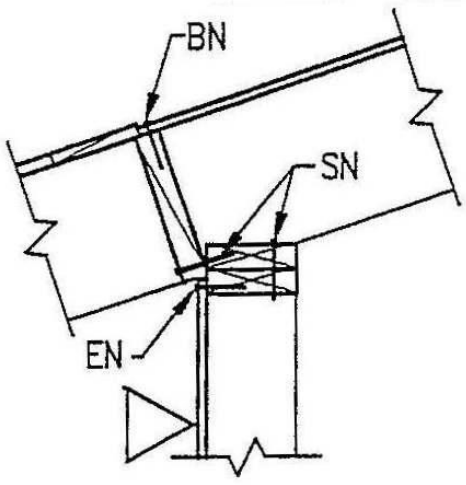
Not to scale



ROOF JOISTS AT PITCHED ROOF

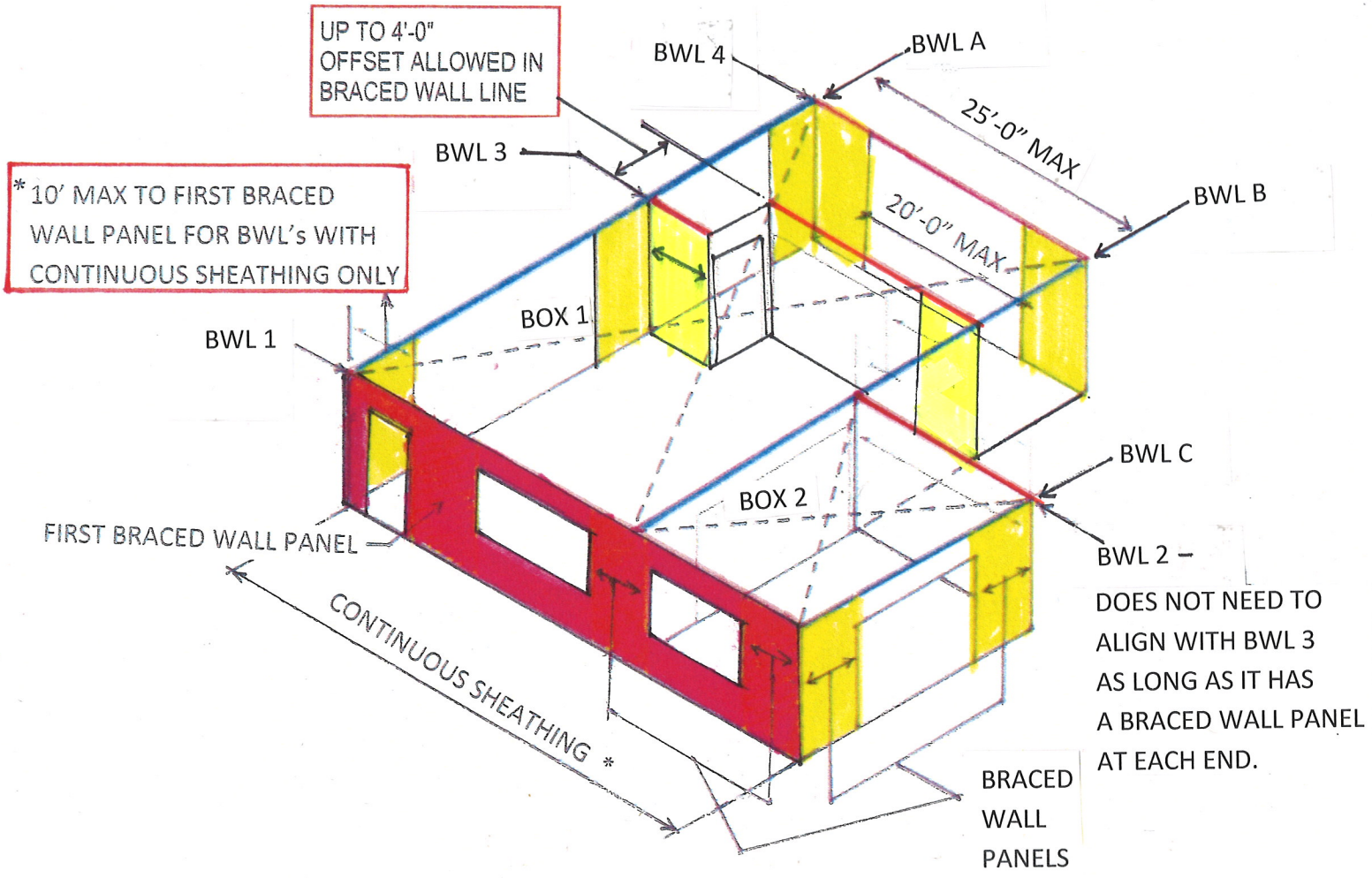
Examples of completed load path

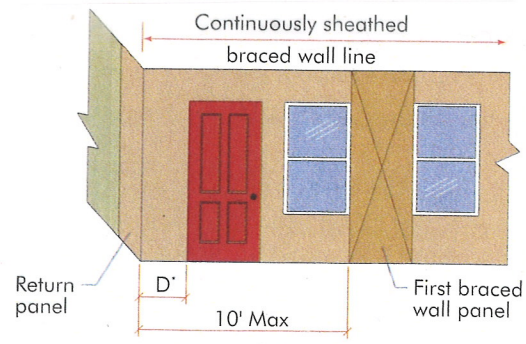




CONVENTIONAL WALL BRACING

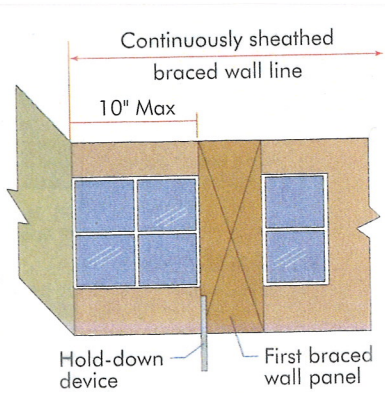
(CRC SECTION R602.10.4)





Return panel: 24" for braced wall lines sheathed with wood structural panels
32" for braced wall lines sheathed with structural fiberboard
Distance D: 24" for braced wall lines sheathed with wood structural panels
32" for braced wall lines sheathed with structural fiberboard

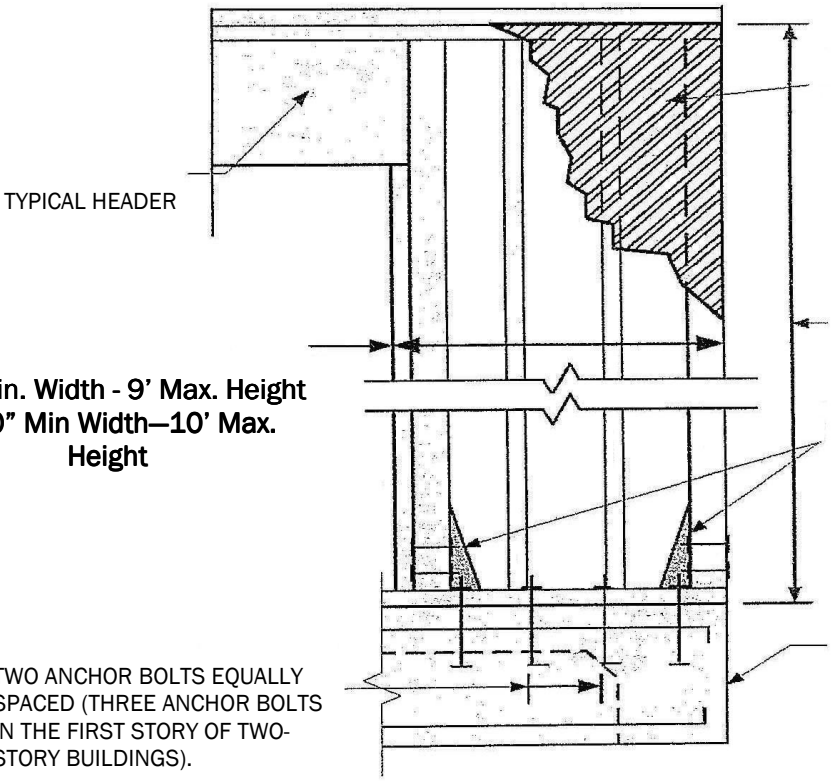
END CONDITION 4



END CONDITION 5

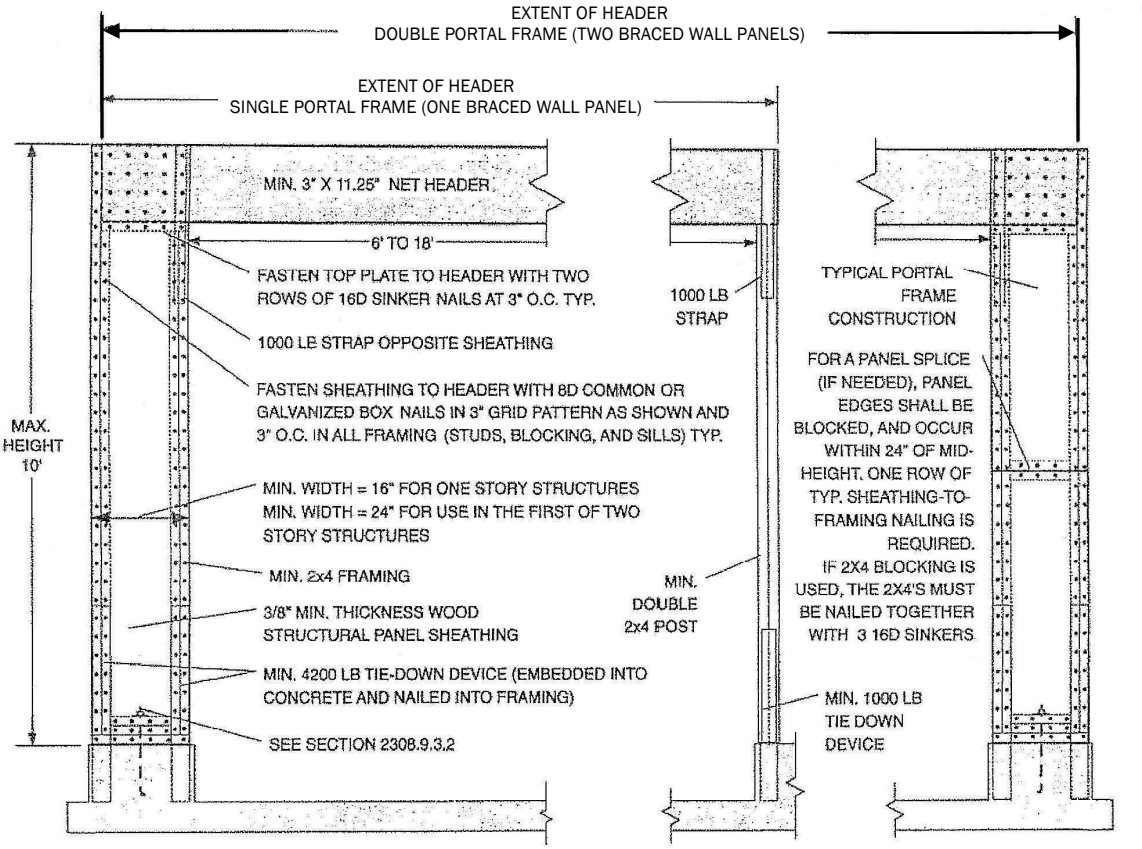
END CONDITIONS FOR BWL's WITH CONTINUOUS SHEATHING

ALTERNATE WALL BRACING (ABW)



2'-8" Min. Width - 9' Max. Height
2'-10" Min Width—10' Max. Height

PORTAL FRAMES WITH HOLDOWNS (PFH)



COMMON WALL BRACING METHODS

METHOD	MATERIAL (THICKNESS/FASTENER/SPACING)	MINIMUM LENGTH/REQUIRED ADJUSTED LENGTH ALONG EACH BWL[1] (WALL HEIGHT)				
		8’	9’	10’	11’	12’
WSP – WOOD STRUCTURAL PANEL (CONTRIBUTING LENGTH = ACTUAL)	3/8” PLY WITH 8d @ 6” EDGE AND 12” FIELD	48” 13’ - 3”	48” 14’- 0”	48” 14’ – 9”	53” 15’ – 6”	58” 16’ – 3”
PCP – PORTLAND CEMENT PLASTER (CONTRIBUTING LENGTH = ACTUAL)	STUCCO WITH 16” O/C STUDS – SEE SECTION R703.6 1-1/2”, 11 GAGE, 7/16” DIA. HEAD NAILS OR 7/8” LONG, 16 GAGE STAPLES @ 6” O/C ON ALL FRAMING MEMBERS	48” 13’ - 3”	48” 14’ - 0”	48” 14’ - 9”	53” 15’ - 6”	58” 16’ - 3”
GB – GYPSUM BOARD (CONTRIBUTING LENGTH = 48”)	½” GYPSUM SHEATHING WITH 1-1/2” GALV. ROOFING NAILS; STAPLE GALV, 1-1/2” LONG; 1-1/4” SCREWS, TYPE W OR S @ 7” EDGE AND 7” FIELD (4” EDGE AND 4” FIELD – REDUCE BY 30%)	96” 48” BS 22’ – 7” (15’ – 10”)	96” 48” BS 23’ – 8” (16’ – 7”)	96” 48” BS 24’ – 11” (17’ – 6”)	106” 53” BS 26’ – 3” (18’ – 5”)	116” 58” BS 27’ – 6” (19’ – 3”)
CS-WSP – CONTINUOUSLY SHEATHED WOOD STRUCTURAL PANEL < 64” ADJ CLEAR OPENING HEIGHT 72” ADJ CLEAR OPENING HEIGHT 80” ADJ CLEAR OPENING HEIGHT 96” ADJ CLEAR OPENING HEIGHT (CONTRIBUTING LENGTH = ACTUAL)	3/8” PLY WITH 8d @ 6” EDGE AND 12” FIELD	24” 27” 32” 48” 11’ – 0”	27” 27” 30” 41” 11’ – 7”	30” 30” 30” 38” 12’ – 3”	33” 33” 33” 36” 12’ – 10”	36” 36” 36” 36” 13’ – 9”
CS-G – CONTINUOUSLY SHEATHED WOOD STRUCTURAL PANEL ADJACENT TO GARAGE OPENINGS (CONTRIBUTING LENGTH = ACTUAL)	3/8” PLY WITH 8d @ 6” EDGE AND 12” FIELD	24” 11’ - 0 “	27” 11’ – 7”	30” 12’ – 3”	33” 12’ -10”	36” 13’ - 9”

[1] 25’ BWL spacing; max. 3 BWL’s; eave-to-ridge height ≤ 15’; with interior gypsum board finish

ABW – ALTERNATE BRACED WALL (CONTRIBUTING LENGTH = 48”)	3/8” PLY WITH 8d @ 6” EDGE AND 12” FIELD	32”	32”	34”	NP	NP
PFH – PORTAL FRAMES WITH HOLDOWNS SUPPORTING ROOF ONLY SUPPORTING ONE STORY AND ROOF (CONTRIBUTING LENGTH = 48”)	3/8” PLY WITH 8d @ 6” EDGE AND 12” FIELD	16” 24”	16” 24”	16” 24”	18”* 27”* *MAX HEIGHT IS	20”* 29”* HEADER 10’

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d ($2^1/_2$" × 0.113")	—
2	Ceiling joists to plate, toe nail	3-8d ($2^1/_2$" × 0.113")	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—
4	Collar tie to rafter, face nail or $1^1/_4$" × 20 gage ridge strap	3-10d (3" × 0.128")	—
5	Rafter or roof truss to plate, toe nail	3-16d box nails ($3^1/_2$" × 0.135") or 3-10d common nails (3" × 0.148")	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss[j]
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	4-16d ($3^1/_2$" × 0.135") 3-16d ($3^1/_2$" × 0.135")	—
	Wall		
7	Built-up studs-face nail	10d (3" × 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12" o.c.
9	Built-up header, two pieces with $^1/_2$" spacer	16d ($3^1/_2$" × 0.135")	16" o.c. along each edge
10	Continued header, two pieces	16d ($3^1/_2$" × 0.135")	16" o.c. along each edge
11	Continuous header to stud, toe nail	4-8d ($2^1/_2$" × 0.113")	—
12	Double studs, face nail	10d (3" × 0.128")	24" o.c.
13	Double top plates, face nail	10d (3" × 0.128")	24" o.c.
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d ($3^1/_2$" × 0.135")	—
15	Sole plate to joist or blocking, face nail	16d ($3^1/_2$" × 0.135")	16" o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d ($3^1/_2$" × 0.135")	16" o.c.
17	Stud to sole plate, toe nail	3-8d ($2^1/_2$" × 0.113") or 2-16d ($3^1/_2$" × 0.135")	— —
18	Top or sole plate to stud, end nail	2-16d ($3^1/_2$" × 0.135")	—
19	Top plates, laps at corners and intersections, face nail	2-10d (3" × 0.128")	—
20	1" brace to each stud and plate, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
21	1" × 6" sheathing to each bearing, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
22	1" × 8" sheathing to each bearing, face nail	2-8d ($2^1/_2$" × 0.113") 3 staples $1^3/_4$"	— —
23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d ($2^1/_2$" × 0.113") 4 staples $1^3/_4$"	— —
	Floor		
24	Joist to sill or girder, toe nail	3-8d ($2^1/_2$" × 0.113")	—
25	Rim joist to top plate, toe nail (roof applications also)	8d ($2^1/_2$" × 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" × 0.113")	6" o.c.
27	1" × 6" subfloor or less to each joist, face nail	2-8d ($2^1/_2$" × 0.113") 2 staples $1^3/_4$"	— —
28	2" subfloor to joist or girder, blind and face nail	2-16d ($3^1/_2$" × 0.135")	—
29	2" planks (plank & beam - floor & roof)	2-16d ($3^1/_2$" × 0.135")	at each bearing
30	Built-up girders and beams, 2-inch lumber layers	10d (3" × 0.128")	Nail each layer as follows: 32" o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d ($3^1/_2$" × 0.135")	At each joist or rafter

(continued)

TABLE R602.3(1)—continued
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c, e]	SPACING OF FASTENERS	
			Edges (inches)[i]	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing				
32	$^3/_8$" - $^1/_2$"	6d common (2" × 0.113") nail (subfloor, wall)[j] 8d common ($2^1/_2$" × 0.131") nail (roof)[f]	6	12[g]
33	$^{19}/_{32}$" - 1"	8d common nail ($2^1/_2$" × 0.131")	6	12[g]
34	$1^1/_8$" - $1^1/_4$"	10d common (3" × 0.148") nail or 8d ($2^1/_2$" × 0.131") deformed nail	6	12
Other wall sheathing[h]				
35	$^1/_2$" structural cellulosic fiberboard sheathing	$1^1/_2$" galvanized roofing nail, $^7/_{16}$" crown or 1" crown staple 16 ga., $1^1/_4$" long	3	6
36	$^{25}/_{32}$" structural cellulosic fiberboard sheathing	$1^3/_4$" galvanized roofing nail, $^7/_{16}$" crown or 1" crown staple 16 ga., $1^1/_2$" long	3	6
37	$^1/_2$" gypsum sheathing[d]	$1^1/_2$" galvanized roofing nail; staple galvanized, $1^1/_2$" long; $1^1/_4$ screws, Type W or S	7	7
38	$^5/_8$" gypsum sheathing[d]	$1^3/_4$" galvanized roofing nail; staple galvanized, $1^5/_8$" long; $1^5/_8$" screws, Type W or S	7	7
	Wood structural panels, combination subfloor underlayment to framing			
39	$^3/_4$" and less	6d deformed (2" × 0.120") nail or 8d common ($2^1/_2$" × 0.131") nail	6	12
40	$^7/_8$" - 1"	8d common ($2^1/_2$" × 0.131") nail or 8d deformed ($2^1/_2$" × 0.120") nail	6	12
41	$1^1/_8$" - $1^1/_4$"	10d common (3" × 0.148") nail or 8d deformed ($2^1/_2$" × 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 Ksi = 6.895 MPa.

a. All nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.

b. Staples are 16 gage wire and have a minimum $^7/_{16}$-inch on diameter crown width.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

d. Four-foot by 8-foot or 4-foot by 9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. For regions having basic wind speed of 110 mph or greater, 8d deformed ($2^1/_2$" × 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.

g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

j. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe nails on one side of the rafter and toe nails from the ceiling joist to top plate in accordance with this schedule. The toe nail on the opposite side of the rafter shall not be required.