

12-13-18

# **NAVAJO COUNTY**

## **ADDENDA & ADDITIONS**

### **TO THE INTERNATIONAL BUILDING CODES**



## **Public Works/Planning & Zoning**

### **Building & Safety**

AMENDED (12/11/18)

**NAVAJO COUNTY GOVERNMENTAL COMPLEX**  
**P.O. BOX 668**  
**HOLBROOK, ARIZONA 86025**

7-11-18 20400  
Page 1 of 3  
2018-12-11 10:09 AM BOARD OF SUPERVISORS  
Navajo County Recorder Dept. Clerk  
11-11-2018 03:44 PM Record as Filed



**RESOLUTION 31-18**

**A RESOLUTION OF THE NAVAJO COUNTY BOARD OF SUPERVISORS,  
AMENDING THE NAVAJO COUNTY ADDENDA AND ADDITIONS TO THE 2015  
INTERNATIONAL BUILDING CODE AND THE 2015 INTERNATIONAL  
RESIDENTIAL CODE**

WHEREAS, Navajo County recognizes the primary objectives of proper building code enforcement are to protect the public; to reduce loss of life; to minimize the risk of property loss; and to reduce economic and social disruption that result from natural catastrophes; and

WHEREAS, Navajo County Public Works staff held public meetings with licensed contractors on November 28, 2017 at the Public Works facility in Heber, and December 12, 2017 at the Public Works facility in Show Low, and solicited comments from building industry professionals via email between November 21, 2018 and December 3, 2018, to obtain feedback and consider certain proposed amendments to the Navajo County Addenda and Additions to the International Building Codes to bring them more in line with current construction practices; and

WHEREAS, after giving notice pursuant to ARS 11-251, the Navajo County Board of Supervisors held a public hearing on December 11, 2018 and determined that the recommended amendments to the Navajo County Addenda and Additions to the International Building Codes would be appropriate and in the interests of the public health, safety and general welfare of the community;

NOW, THEREFORE, BE IT RESOLVED, by the Board of Supervisors that the amendments to Navajo County Addenda and Additions to the 2015 International Building Code and the 2015 International Residential Code are APPROVED and the attached document shall be used in conjunction with construction in the unincorporated portions of Navajo County. See attached document. This Resolution shall become effective at 12:01 a.m. on June 11, 2019, or if the effectiveness of this Resolution is prohibited by Arizona law at such time, then this Resolution shall become effective at the earliest such later time as authorized by Arizona law.

PASSED, ADOPTED AND APPROVED by the Navajo County Board of Supervisors on this 11th day of December 2018.

NAVAJO COUNTY BOARD OF SUPERVISORS

By Steve Williams  
Steve Williams, Chairman of the Board

Melissa W. Buckley  
Melissa W. Buckley, Clerk of the Board

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*Public Works/Planning & Zoning*  
**Area Offices**

[www.navajocountyaz.gov](http://www.navajocountyaz.gov)

**Holbrook Area**

Holbrook  
Woodruff  
Joseph City  
Sun Valley  
Adamana  
Winslow

Navajo County  
Planning & Zoning  
P.O. Box 668  
100 West Public Works Dr.  
Holbrook, AZ 86025  
928 524-4100  
928 524-4399 (FAX)

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**Show Low Area**

Show Low  
Pinetop  
Lakeside  
Linden  
Pinedale  
Concho  
Taylor  
Snowflake

Navajo County  
Building & Safety  
P.O. Box 789  
1100 E Thornton  
Show Low, AZ 85901  
928-532-6040  
928-532-6044 (FAX)

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**Heber/Overgaard Area**

Clay Springs  
Aripine  
Chevelon Retreat  
928-535-7110  
928-535-7114 (FAX)

Navajo County  
Building & Safety  
P.O. Box 1212  
2188 W. Country Club Dr.  
Overgaard, AZ 85933

# ***GENERAL NOTES***

## **Information on construction documents**

Design/construction documents shall be drawn upon suitable material with sufficient clarity to indicate the nature, location and extent of the work performed and show in detail that it will conform to the provisions of this code, relevant laws, ordinances, rules and regulations as determined by the building official.

All submitted documentation (plans, etc.) must meet a minimum standard as stated in Chapter 1 -Scope and Administration- of International Residential Code (IRC) and International Building Code (IBC). Documents must consist of applicable drawings and details, in order to perform a reasonable and timely review.

## **Adopted Codes**

- All 2015 IRC & IBC, Electric, Plumbing, and Mechanical Codes, Except the following: *Chapter 11 Energy Efficiency; appendix E of Manufactured Housing as Dwellings from IRC; E3902 from IRC; And IRC appendices A, D, J, K, L, M, O, T and I.*
- 2014 National Electric Code.

## **Conflicts**

If there is a conflict between code(s) as adopted by either Navajo County or the State of Arizona and this Addenda and Additions, the more restrictive shall prevail. The Navajo County Technical Advisory Board shall act as the Board of Appeals in such matters.

## **Certificate of Occupancy**

No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the Building Official has issued a Certificate of Occupancy.

*Exception: Navajo County does not prohibit the occupancy of a single-family non-commercial dwelling by the owners of said property during the finishing phases of construction, providing the building meets all safety requirements and has an **approved and completed** septic or sewer system.*

## **Issuance of Permit**

No building, manufactured home, or meter loop (electrical hook-up) permit will be issued unless hook-up to an **approved** sanitary system is available. Documentation of the system will be required.

## **Flood hazard area**

All permits issued must first pass a flood hazard evaluation and permission granted to build on the property for which application is being made.

# *Design Criteria*

## **Engineering**

Any Structure built for commercial use as well as any steel, log or post/pole and beam type construction, shall be approved and stamped by an architect or engineer registered in the State of Arizona. This policy is at the discretion of the Technical Advisory Board and the Board of Supervisors.

## DESIGN

### LOADS

| Area             | Wind/Exposure | Seismic | Roof Pitch      | Snow Load PSF |
|------------------|---------------|---------|-----------------|---------------|
| Heber/Overgaard  | 80 mph / B    | B       | 0:12 up to 4:12 | 45 PSF        |
| Pinetop/Lakeside | 80 mph / B    |         | 4:12 or greater | 40 PSF        |
| Show Low         | 80 mph / B    |         |                 |               |
| Clay Springs     | 80 mph / C    | B       | 0:12 up to 4:12 | 35 PSF        |
| Pinedale         | 80 mph / B    |         | 4:12 or greater | 30 PSF        |
| Snowflake/Taylor | 80 mph / C    |         |                 |               |
| Shumway          | 80 mph / B    |         |                 |               |
| Holbrook         | 80 mph / C    | B       | 0:12 up to 4:12 | 25 PSF        |
| Joseph City      | 80 mph / C    |         | 4:12 or greater | 20 PSF        |
| Winslow          | 80 mph / C    |         |                 |               |
| Woodruff         | 80 mph / C    |         |                 |               |

Note: All Signs, Cell Towers, and similar structures and any changes to existing Cell Towers to be designed for a load of 115mph, 3 second gust or current State Building Code.\* All Greenhouses designed for 100 PSF live load.

\* Adopted by BOS Resolution 37-17

| Area             | Ground Snow Load | Seismic | Roof Pitch      | Snow Load PSF |
|------------------|------------------|---------|-----------------|---------------|
| Heber/Overgaard  | 64 PSF           | B       | 0:12 up to 4:12 | 45 PSF        |
| Pinetop/Lakeside | 57 PSF           |         | 4:12 or greater | 40 PSF        |
| Show Low         |                  |         |                 |               |
| White Mnt Lake   | 50 PSF           | B       | 0:12 up to 4:12 | 35 PSF        |
| Clay Springs     | 43 PSF           |         | 4:12 or greater | 30 PSF        |
| Pinedale         |                  |         |                 |               |
| Snowflake/Taylor | 43 PSF           |         | 0:12 up to 4:12 | 30 PSF        |
| Shumway          | 36 PSF           |         | 4:12 or greater | 25 PSF        |
| Holbrook         | 36 PSF           | B       | 0:12 up to 4:12 | 25 PSF        |
| Joseph City      | 29 PSF           |         | 4:12 or greater | 20 PSF        |
| Winslow          |                  |         |                 |               |
| Woodruff         |                  |         |                 |               |

Note: All Snow Loads are .7 of the ground snow load i.e. 45 PSF roof snow / .7 = 65 PSF Ground

## **Permits Required IRC 105.1**

Any owner or authorized agent who intends to construct, alter, move, enlarge or change the occupancy of a building or structure if structure is greater than 200 square feet shall first make application and obtain the required permit.

## **Work Exempt From Permit IRC-105.2**

1. One story detached(a) accessory structures, provided the floor area does not exceed 200 square feet.
2. Fences not over 7 feet high.
3. Retaining walls not over 4 feet in height measured from the bottom of the footing to the top of the wall unless supporting a surcharge.
4. Flat work, sidewalks and driveways if not more than 30 inches above adjacent grade and not above any basement or story below.
5. Replacement of roof coverings or exterior siding.
6. Decks not exceeding 200 square feet in area, not more than 30 inches above grade at any point, are not attached to a dwelling and do not serve the exit door required by R311. Structure must maintain 10 feet of separation from any component of the septic system.
7. Interior remodeling not exceeding \$1000.00 in materials & labor  
(a) Detached generally means a required 15 ft separation between structure, see the specific zoning requirements for you project.
8. Water tanks less than 5000 gallons supported directly upon grade with a ratio of height to diameter or width less than or equal to 2:1
9. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work
10. Prefabricated swimming pools less than 24" deep
11. Window awnings supported by an exterior wall and does not project greater than 54 inches from the exterior wall and does not require additional support
12. For gas, electrical, mechanical, plumbing and emergency repairs see IRC 2015 R105.2, R1052.1 and R1052.2 or consult with the building official.

## **Required Inspections**

1. Septic systems.
2. Foundation piers or trenches or basement area excavated and any required erected forms
3. Rough plumbing, mechanical, gas and electrical systems prior to covering
4. Floodplain -any permitted construction located within the floodplain must adhere to all requirements stipulated by the flood plain district
5. Fire Resistance where required
6. Footing steel, foundation piers
7. Stem steel
8. Under-slab copper, sewer, electrical.
9. Under-floor framing...BEFORE FLOOR SHEETING.
10. Roof sheathing & Shear panel nail-off.
11. Rough-in Framing, Electrical, Plumbing, Venting and Heating.  
(House must be weather-sealed prior to rough-in inspections)
12. Drywall nailing.
13. Final Inspection.
14. Additional inspections may be required for specialized projects.

*All inspections must be performed, and work approved before issuance of a Certificate of Occupancy.*

## **Connection of service utilities**

Connection shall not be made from a utility, source of energy, fuel or power regulated by International Residential Code for which a permit is required, until approval by the building official. The building official has authority to authorize temporary connection of the building or system to the utility, source of energy, fuel or power.

## Foundations, Piers and Stem Walls

1. Footing rebar is required to be placed 6 inches below the surface of the poured concrete, and 3 inches minimum from all soil.

### Load bearing values of foundation materials

| Class of Material  | Load-Bearing Pressure<br>(pounds per square foot) |
|--|---|
| Crystalline Bedrock  | 12,000  |
| Sedimentary and foliated rock  | 4,000   |
| Sandy Gravel or Gravel (GW and GP)   | 3,000   |
| Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM, and GC) | 2,000   |
| Clay, sandy, silty clay, clayey silt, silt and sandy silt clay (CL, ML, MH and CH)         | 1,500*  |

\* If building official determines soil less than 1,500 PSF is likely to be at the site then bearing capacity is to be determined by soil investigation

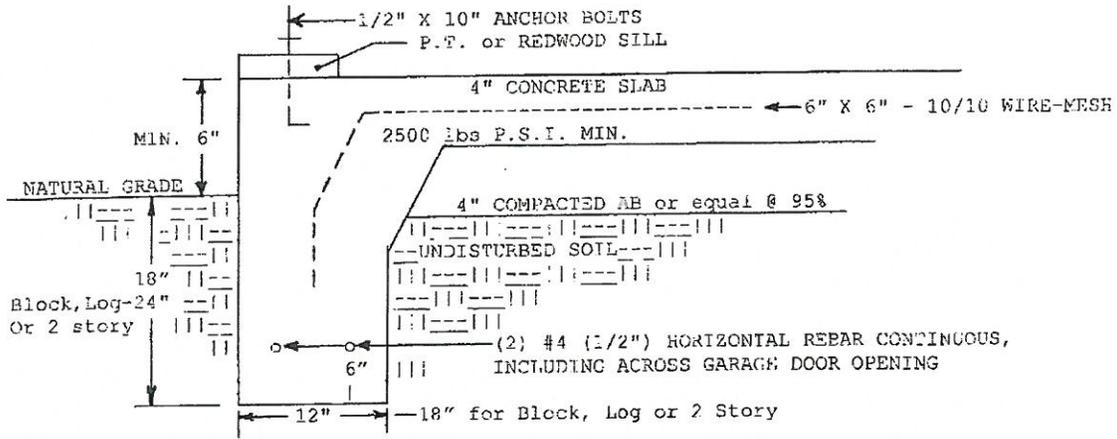
2. Due to most ground conditions in Navajo County, it is recommended that a UFER wire be installed in the footing before pouring. (Minimum 20' into footing) With an additional 10' free or outside and beyond the footer making a total of 30'
3. All CMU stem walls shall have bond beams in the top course.
4. Any CMU stem wall under 60 inches in height shall be a minimum of 8 inches in width with ½ inch diameter (#4), reinforcing steel at 48 inches on center and 1 ft. min. from each corner. The vertical steel shall be embedded at a minimum of 6 inches into the concrete footing. Garages may use 6-inch width stem but limited to 3 courses (2 feet high).
5. Any basement or stem wall 60 inches or more in height shall be a minimum of 8 inches in width and have 5/8-inch diameter rebar at 24 inches on center in both the horizontal and vertical direction.
6. Dur-o-wall may be used in lieu of rebar for the non-bond beam horizontal reinforcement, if desired.
7. All CMU cells containing reinforcing steel shall be grouted solid.
8. All steel laps shall be a minimum of 40 diameters and tied.
9. In walls over 8 feet in height, the steel bond beam and footing requirements may be changed at the discretion of the building official if site conditions so dictate.
10. Fiber mesh concrete (3000 psi) may be substituted for 6"x 6"-10/10 wire in slabs.

11. All pier footings shall be 24"x 24"x 24" with 12" thick concrete.
12. For porches or decks with piers on top of the footing that go up to 24 inches in height shall be a minimum of 8"x8"x16" CMU grouted solid or 12" diameter tubular concrete.
13. Concrete piers over 24 inches in height shall be a minimum of 16"x16" CMU grouted solid or 18-inch diameter tubular concrete.
14. Single story stem wall footings shall be 18" wide & 18" deep with 10" of concrete. Footings for block, log, and/or two stories shall be 24" X 24" with 12" of concrete.
15. Single story piers shall have two (2) ½" vertical rebars. Piers for block, log, and/or two stories shall have four (4) ½" vertical rebars.
16. Compaction testing is required for fill in excess of 12" deep.
17. Area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to drain towards the main vehicle entry.

FOUNDATIONS Continued

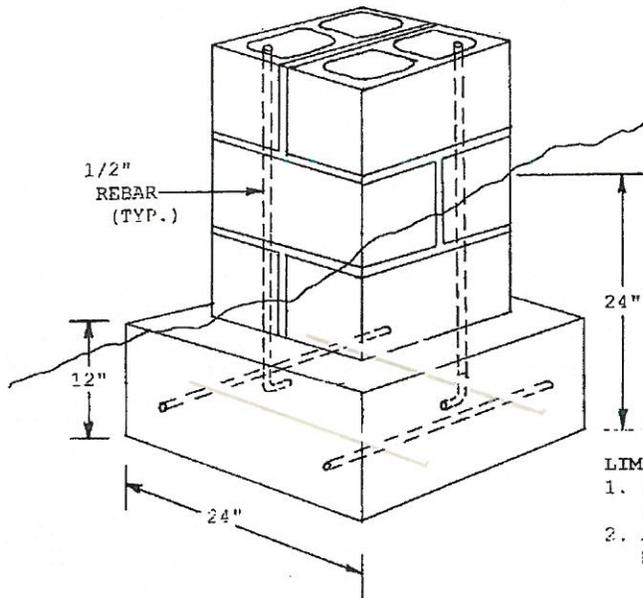
All foundation requirements are included as addenda & additions to Current IRC

MONOLITHIC POURED SLABS

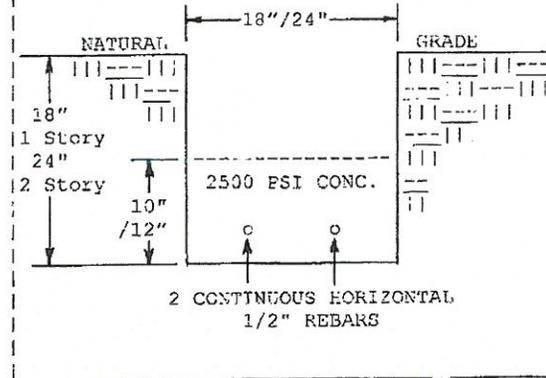


NOTE: FIBERMESH CONCRETE @ 3000 PSI MAY BE SUBSTITUTED FOR 6" X 6" - 10/10 WIRE-MESH

PIERS & PIER FOOTINGS



STEM WALL FOOTING DITCH



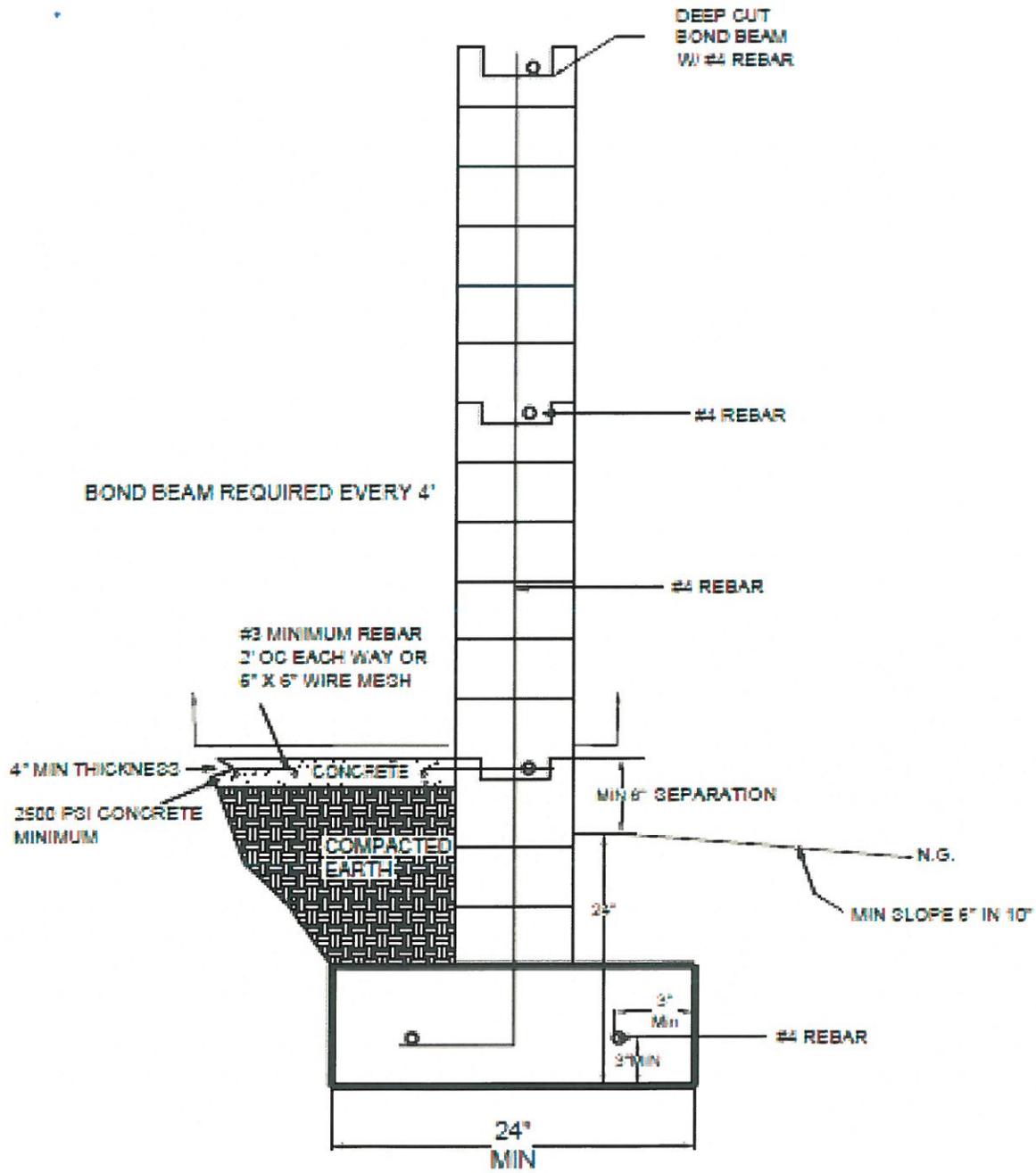
- LIMITATIONS OF PIERS POURED INTO TUBE FORMS:
1. 12" & 16" TUBES: UP TO 24" IN HEIGHT (Porches & Sheds ONLY)
  2. ANY PIER MORE THAN 24" ABOVE GRADE REQUIRES A MINIMUM TUBE DIAMETER OF 18".







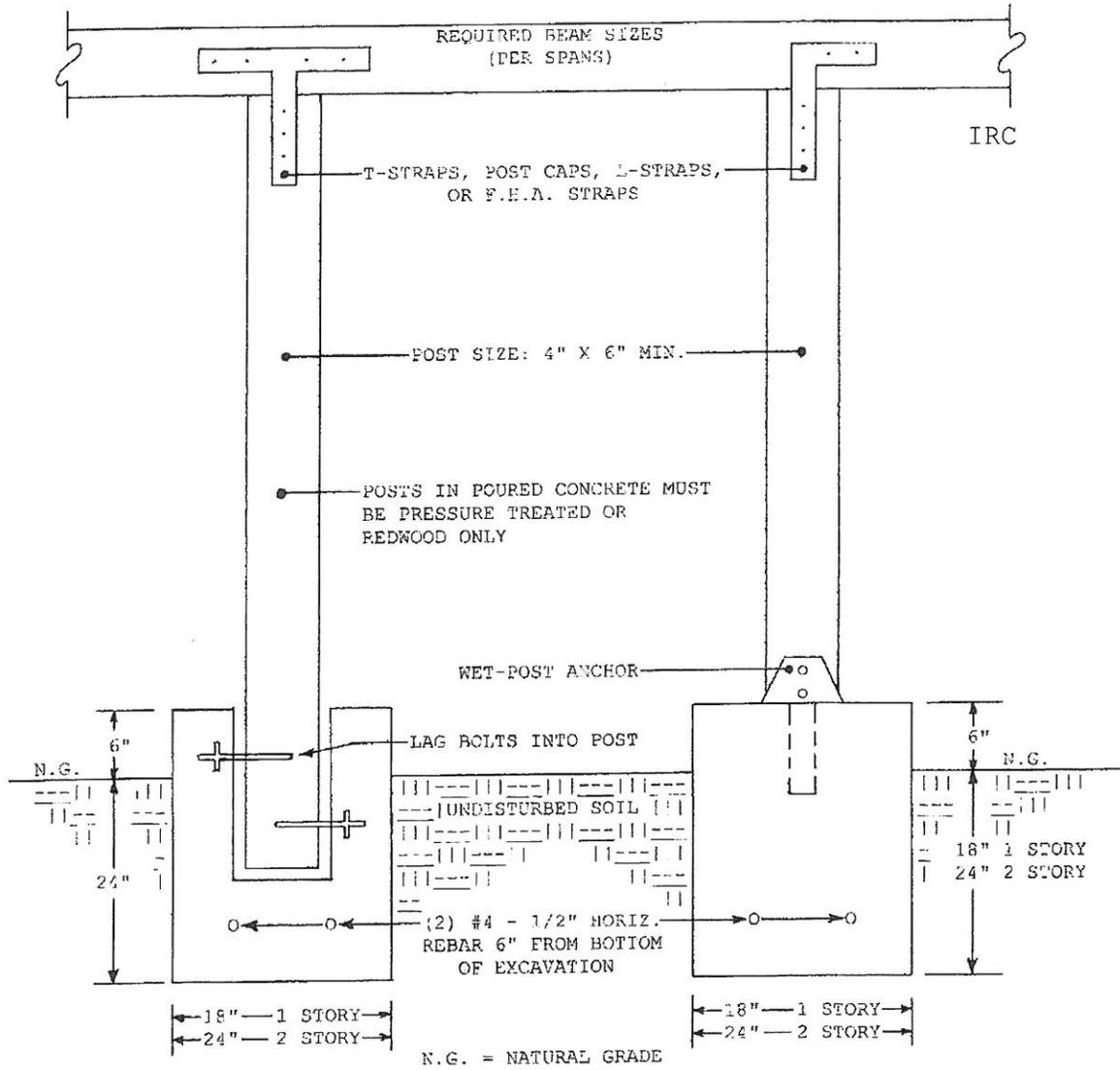
# FOUNDATION & WALL DETAIL



FOUNDATIONS Continued

All foundation requirements are included as addenda & additions to Current

POST & BEAM CONSTRUCTION WITH FOOTINGS



## Floors

1. All under-slab plumbing, electrical and mechanical shall be inspected and approved before placement of concrete.
2. Wood floor framing shall be inspected and approved before placement of sheathing. (Minimum ¾" T. & G.)
3. All bearing points of girders must be strapped by approved means.

## Roofs

1. Roof sheathing nail spacing (6" on edges & 12 " in fields) shall be inspected and approved before placement of roofing material.
2. Trusses shall be engineered and manufactured for all imposed loads including any mechanical equipment or concrete roofing etc..
3. Roof sheathing face grain shall be at right angles to rafters with the following ratios:  
5/8" sheathing : rafters at 24" O.C. 3/4" sheathing : rafters at 32" O.C. 1/2" sheathing may be used only on unattached accessory buildings with rafters at 16" O.C.

## Framing

1. All headers to be box or double 2x material on edge. Flat or "California" type headers are **not** allowed.
2. All walls shall have double top plates (48" Minimum Overlap).
3. Metal hurricane straps (e.g. H2.5s) must be secured at each end of each rafter to the double top plates of walls.
4. All 2x4 framed walls, 16 inches on center maximum.
5. End wall ladder backing is not allowed.
6. Ceiling height in livable areas shall be a minimum of 7 ft 6 inches with the exception of bathrooms, kitchens and hallways which may be reduced to 7 feet.
7. All walls shall be braced for shear.
8. Engineering calculations and design data may be required for any unusual design, at

the discretion of the building official, prior to issuance of a building permit.

9. Attic access openings must be 30 " x 22 " minimum.
10. Hall ways must be greater than or equal to 3ft

### **Electrical**

1. Inspections based on 2003 I.E.C. and referenced with 1996 National Electric Code.
2. All receptacle wiring shall be 12 AWG minimum on 20 Amp circuit.
3. Separate lighting circuits may use 14 AWG with 15 Amp breakers.
4. Bathrooms must be on their own separate circuit.
5. Ground Fault Circuit Interrupters are required for:
  - a. All receptacles in bathrooms
  - b. All receptacles within 6 feet of water
  - c. All countertop receptacles
  - d. All exterior receptacles (Must have weather-proof cover)
  - e. All receptacles in garages and unfinished basements
  - f. All temporary receptacles.
  - g. All circuits providing power to spas or hot tubs and any convenience outlet within 10 feet of unit.

### **Plumbing**

1. Inspections based on 2003 I.P.C. and referenced with 1994 Uniform Plumbing Code.
2. All venting through the roof shall be a minimum of 2" in diameter.
3. LPG service, facilities, supply, or storage shall **not** be installed in a basement, pit, or crawlspace.
4. All fireplaces supplied with gas log lighters shall have a key type gas valve installed outside the hearth and within three feet of the device.
5. No atmospheric valve type venting (e.g. Studor brand vents) will be allowed without prior approval from the Building Official. (Attic placement prohibited)

### **Drywall**

1. Water-resistant gypsum backing board shall not be used where there will be direct exposure to water, or in areas subject to continuous high humidity.

#### R702.4.2 Backer Boards

Materials used as backers for wall tile in tub and shower areas and wall panels in shower areas shall be of materials listed in Table R702.4.2 and installed in accordance with the manufacturer's recommendations.

**TABLE R702.4.2  
BACKER BOARD MATERIAL**

| <b>MATERIAL</b>  | <b>STANDARD</b>                     |
|--|-------------------------------------|
| Glass mat gypsum backing panel                                 | ASTM C 1178                         |
| Fiber-reinforced gypsum panels                                 | ASTM C 1278                         |
| Non-asbestos fiber-cement backer board                         | ASTM C 1288 or ISO 8336, Category C |
| Non-asbestos fiber mat reinforced<br>Cementitious backer units | ASTM C 1325                         |

2. Sheetrock shall not be installed on the exterior of any structure.
3. ATTACHED GARAGES: All ceilings and walls common with a dwelling, shall be 1/2" sheetrock minimum. (Solid core doors with self closing hinges are required at the dwelling access. If there is a habitable room above the garage, then 5/8" Type X gypsum board is required.)
4. See drywall fastener schedule below

| THICKNESS OF GYPSUM BOARD OR GYPSUM PANEL PRODUCTS (inches) | APPLICATION | ORIENTATION OF GYPSUM BOARD OR GYPSUM PANEL PRODUCTS TO FRAMING | MAXIMUM SPACING OF FRAMING MEMBERS (inches o.c.) | MAXIMUM SPACING OF FASTENERS (inches) |                     | SIZE OF NAILS FOR APPLICATION TO WOOD FRAMING <sup>c</sup> |
|---|-------------|---|--|---------------------------------------|---------------------|--|
|   |             |   |  | Nails <sup>a</sup>                    | Screws <sup>b</sup> |  |

|     |                                  |                  |    |   |    |  |
|-----|----------------------------------|------------------|----|---|----|--|
| 1/2 | Ceiling                          | Either direction | 16 | 7 | 12 | 13 gage, 1 <sup>3</sup> / <sub>8</sub> " long, 1 <sup>9</sup> / <sub>64</sub> " head; 0.098" diameter, 1 <sup>1</sup> / <sub>4</sub> " long, annular-ringed; 5d cooler nail, 0.086" diameter, 1 <sup>5</sup> / <sub>8</sub> " long, 1 <sup>5</sup> / <sub>64</sub> " head; or gypsum board nail, 0.086" diameter, 1 <sup>5</sup> / <sub>8</sub> " long, 9/ <sub>32</sub> " head. |
|     | Ceiling <sup>d</sup>             | Perpendicular    | 24 | 7 | 12 |  |
|     | Wall                             | Either direction | 24 | 8 | 12 |  |
|     | Wall                             | Either direction | 16 | 8 | 16 |  |
| 5/8 | Ceiling                          | Either direction | 16 | 7 | 12 | 13 gage, 1 <sup>5</sup> / <sub>8</sub> " long, 1 <sup>9</sup> / <sub>64</sub> " head; 0.098" diameter, 1 <sup>3</sup> / <sub>8</sub> " long, annular-ringed; 6d cooler nail, 0.092" diameter, 1 <sup>7</sup> / <sub>8</sub> " long, 1/ <sub>4</sub> " head; or gypsum board nail, 0.0915" diameter, 1 <sup>7</sup> / <sub>8</sub> " long, 1 <sup>9</sup> / <sub>64</sub> " head. |
|     | Ceiling                          | Perpendicular    | 24 | 7 | 12 |  |
|     | Type X at garage ceiling beneath | Perpendicular    | 24 | 6 | 6  | 1 <sup>7</sup> / <sub>8</sub> " long 6d coated nails or equivalent drywall   |

|  |                 |                  |    |   |    |   |
|--|-----------------|------------------|----|---|----|---|
|  | habitable rooms |                  |    |   |    | screws. Screws shall comply with Section R702.3.5.1   |
|  | Wall            | Either direction | 24 | 8 | 12 | 13 gage, 1 5/8" long, 1 9/64" head; 0.098" diameter, 1 3/8" long, annular-ringed; 6d cooler nail, 0.092" diameter, 1 7/8" long, 1/4" head; or gypsum board nail, 0.0915" diameter, 1 7/8" long, 1 9/64" head. |
|  | Wall            | Either direction | 16 | 8 | 16 |   |

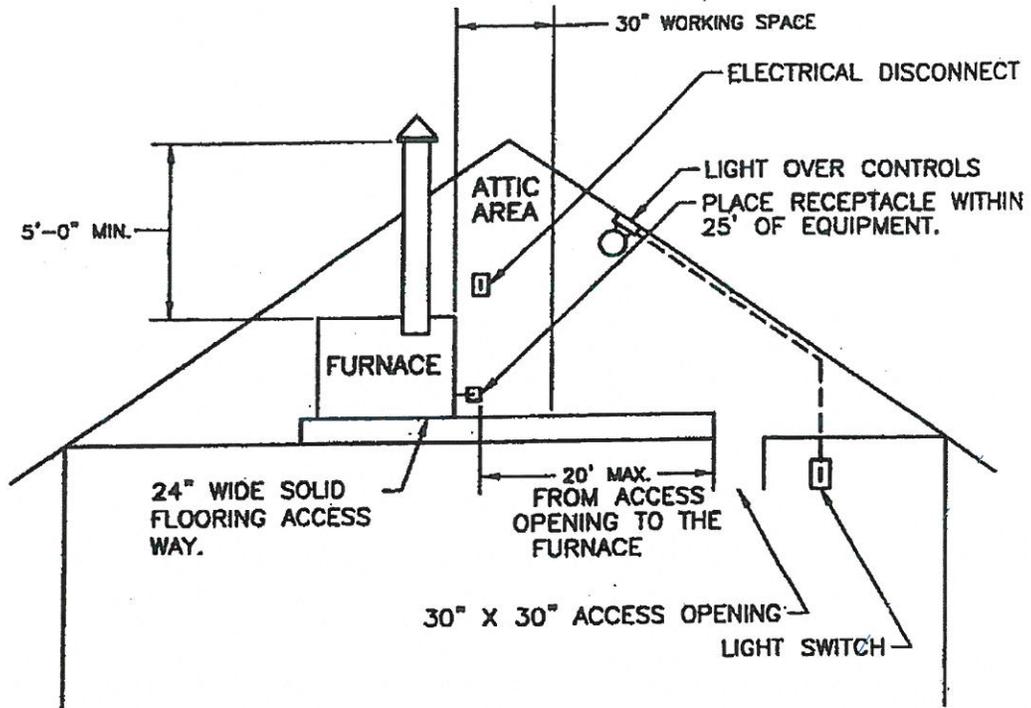
### **FINAL INSPECTION CHECKLIST**

1. Septic and plumbing in total working order.
2. Concrete approach pads, guard and hand rails at correct heights & spacing.
3. Electric panels labeled, and outlets closed up and properly working.
4. GFCIs and inter-connected smoke detectors installed where required.
5. Furnace and water heater rooms vented with self-closing doors as required for gas.
6. Temperature & Pressure Relief Valves (T&P) can be plumbed to pan or to exterior.
7. Pan must be plumbed with no less than 3/4" diameter pipe to the outside exterior of the structure, not less than 6" and not more than 24" above ground surface.
8. Solid core, self-closing door from garage to dwelling.
9. No obstructions in stem wall or attic access openings.
10. Yard landscaped for proper water drainage, slope 6 inches in 10 feet.
11. Spark arrester installed and chimney capped.
12. Garage door operable
13. No under-floor (Liquid Propane Gas) L.P.G. units
14. Proper fall on sewer lines & no debris in crawlspace
15. Culvert installed (if required).
16. Additional inspections may be required as site conditions dictate.

A Temporary Certificate of Occupancy may be issued for a single-family dwelling, provided all safety issues are in compliance with an approved sanitary system, contingent upon corrections and/or completion within 60 days from the date of this inspection.

17. If Wood stove is used as a primary or secondary heat source, the heat source must be installed per MFG specs

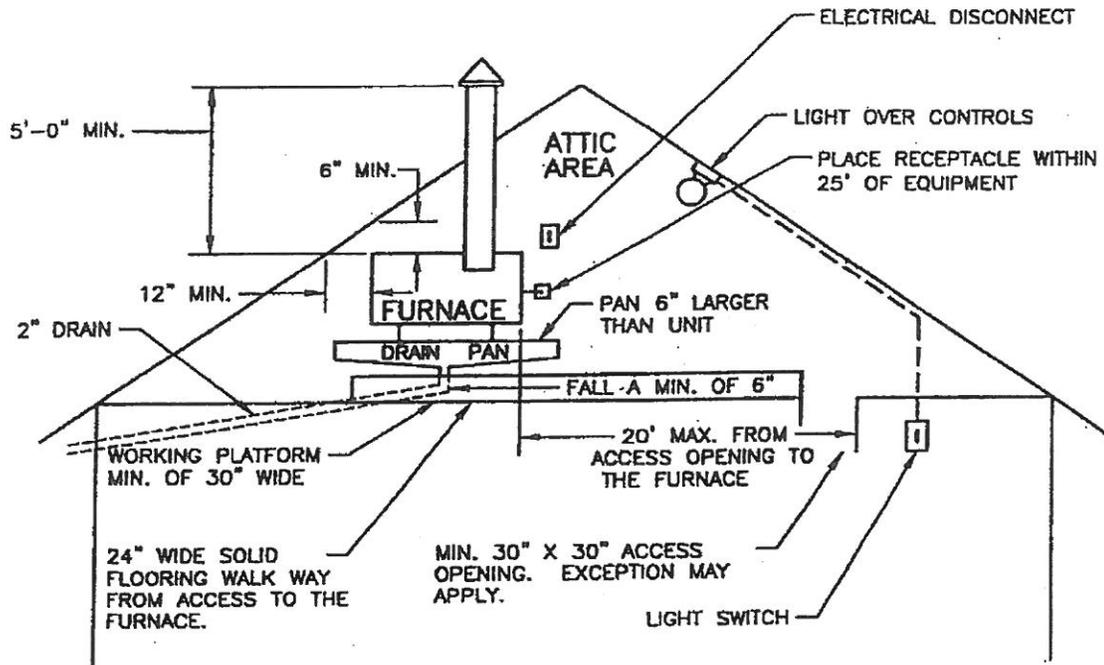
ATTIC FURNACE INSTALLATION



\* NOTES:

1. THIS DIAGRAM IS NOT FOR INSTALLATION OF LIQUID PETROLEUM GAS.
2. A MINIMUM OF 30" ATTIC HEADROOM IS REQUIRED FOR FURNACE INSTALLATION.

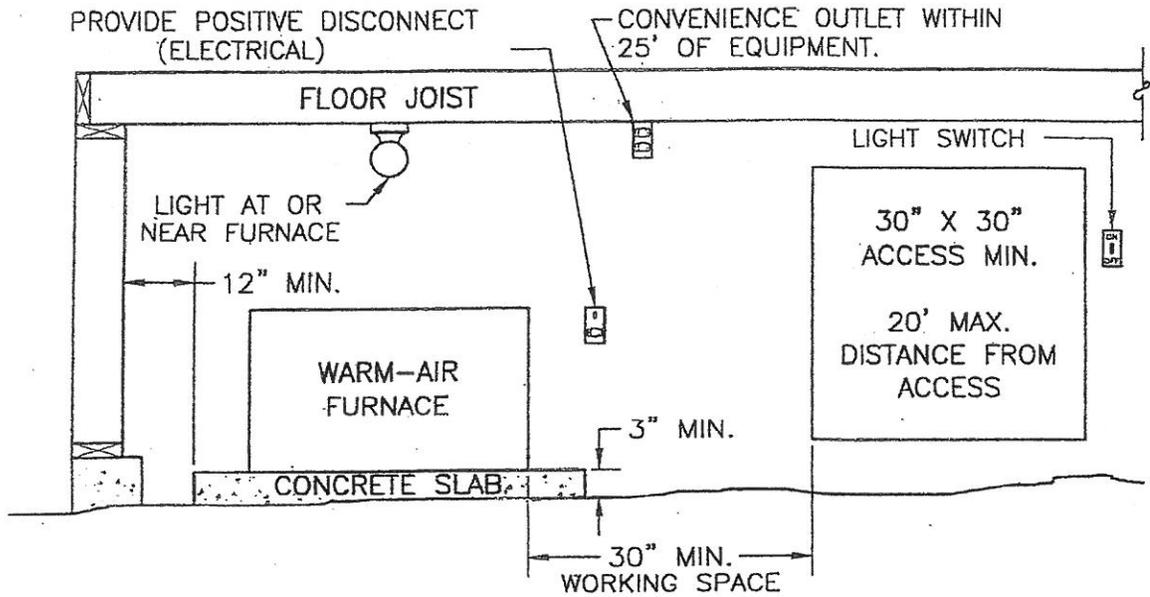
ATTIC FURNACE INSTALLATION HUNG FROM RAFTERS WITH PAN FOR L.P.G.



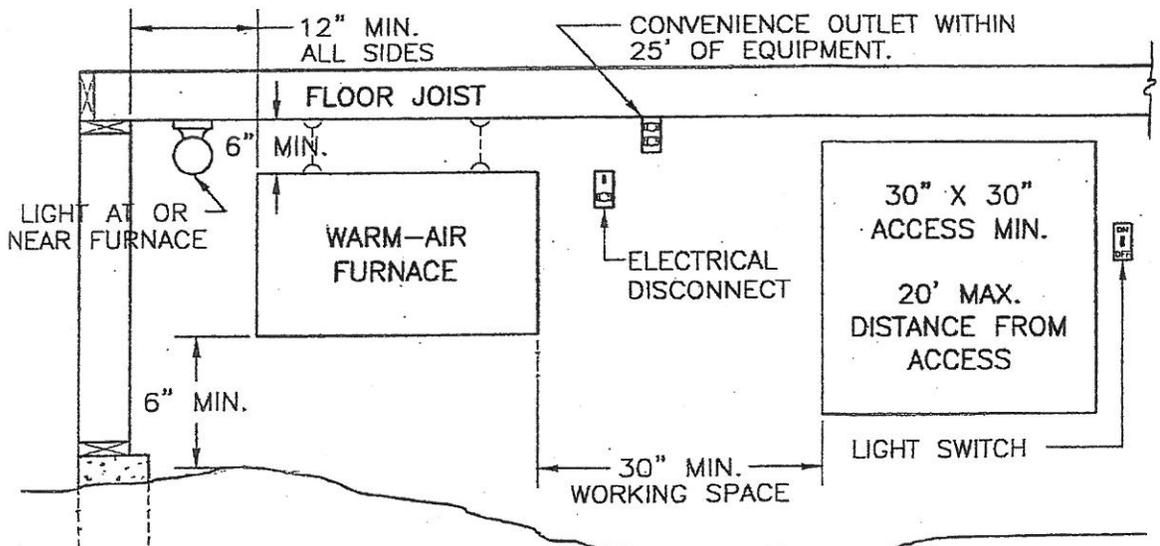
**NOTES:**

1. ALL SUPPORTING TRUSSES MUST BE ENGINEERED TO HANG UNIT.
2. ALL RAFTERS ON WHICH UNIT IS HUNG SHALL BE DOUBLED.
3. A MINIMUM OF 30" ATTIC HEADROOM IS REQUIRED FOR FURNACE INSTALLATION.
4. ATTIC VOLUME SHALL BE NO LESS THAN 50 CUBIC FT. PER 1000 BTU APPLIANCE RATING.
5. L.P.G. UNITS REQUIRE A DRAIN PAN AND VENTS IN THE LOWEST PART OF THE ATTIC.

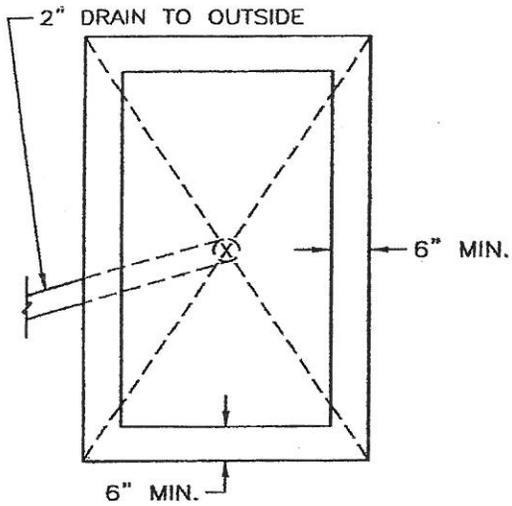
# FURNACE SUPPORTED FROM GROUND



# SUSPENDED FURNACE

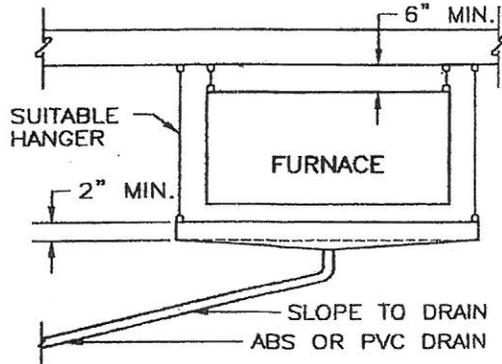


NOTE:  
L.P.G. SERVICE, FACILITIES, SUPPLY, OR STORAGE SHALL NOT BE INSTALLED IN A BASEMENT, PIT, OR CRAWLSPACE.

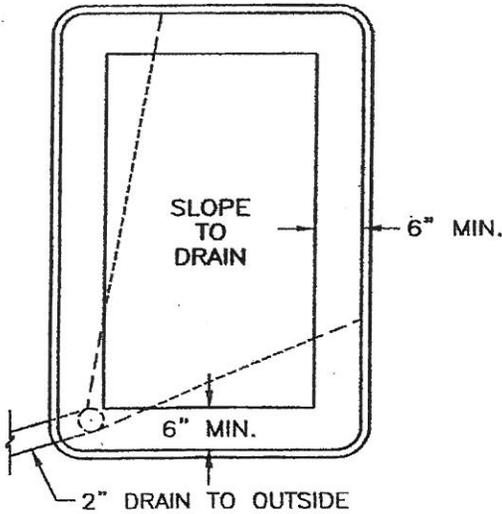


SHEET METAL DRAIN PAN SUSPENDED  
TOP

SEE ILLUSTRATIONS FOR UNDERFLOOR  
FURNACE INSTALLATIONS.



FRONT



TOP

DRAIN PAN ILLUSTRATIONS ON THIS PAGE ARE ONLY  
FOR ATTIC INSTALLATIONS OF L.P.G. UNITS.

VENTS ARE ALSO REQUIRED AT THE LOWEST PART  
OF THE ATTIC.

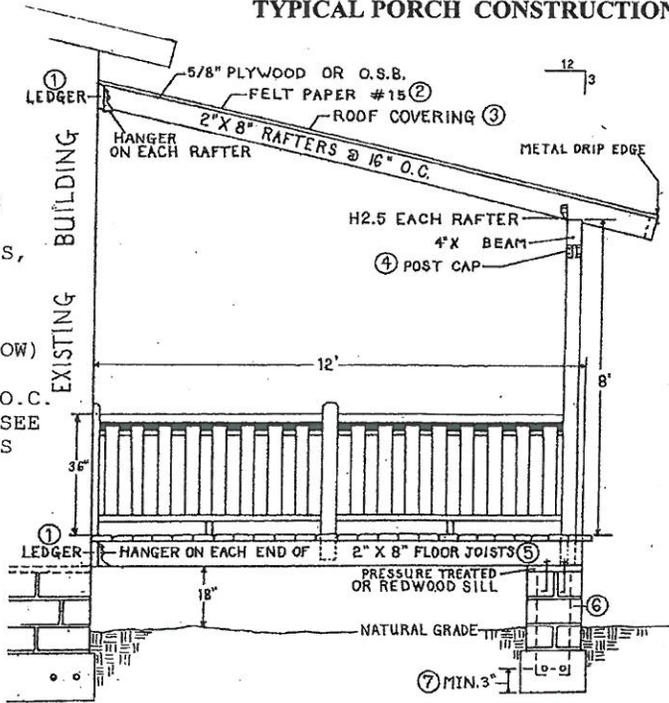
L.P.G. UNITS SHALL NOT BE INSTALLED UNDER THE  
HOUSE.

GAS UNITS INSTALLED IN BEDROOMS OR BATHROOMS  
HAVE STRICT LIMITATIONS REGARDING TYPES AND  
BTU RATINGS - CHECK WITH YOUR LOCAL BUILDING  
OFFICIAL BEFORE INSTALLING ANY GAS UNIT  
ANYWHERE EXCEPT IN A GARAGE OR ATTIC.

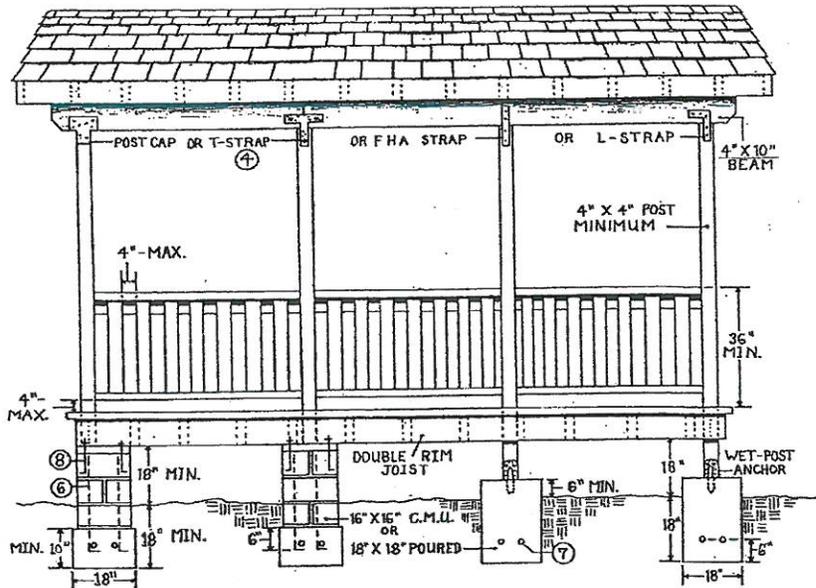
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### TYPICAL PORCH CONSTRUCTION

- ① LEDGER: LAG BOLTS INTO EXISTING STUDS OR RIM JOIST @ 32" O.C.
- ② ROOF PITCH LESS THAN 3-12 REQUIRES #90 ROLLED ROOFING
- ③ OPTIONS: ASPHALT, FIBERGLASS, CONCRETE, OR WOOD SHAKES; TILE, METAL, ETC.
- ④ SEE FRONT VIEW OPTIONS (BELOW)
- ⑤ 2" X 8" FLOOR JOISTS @ 16" O.C. NEEDED FOR THIS SIZE ROOM. SEE SPAN TABLES FOR LUMBER SIZES REQUIRED FOR YOUR PROJECT.
- ⑥ (2) 1/2" VERTICAL REBARS EMBEDDED 6" INTO CONCRETE (4 REBARS FOR 2 STORY)
- ⑦ (2) 1/2" HORIZONTAL REBARS (LOWEST 1/3 OF CONCRETE)
- ⑧ 1/2" X 10" ANCHOR BOLTS

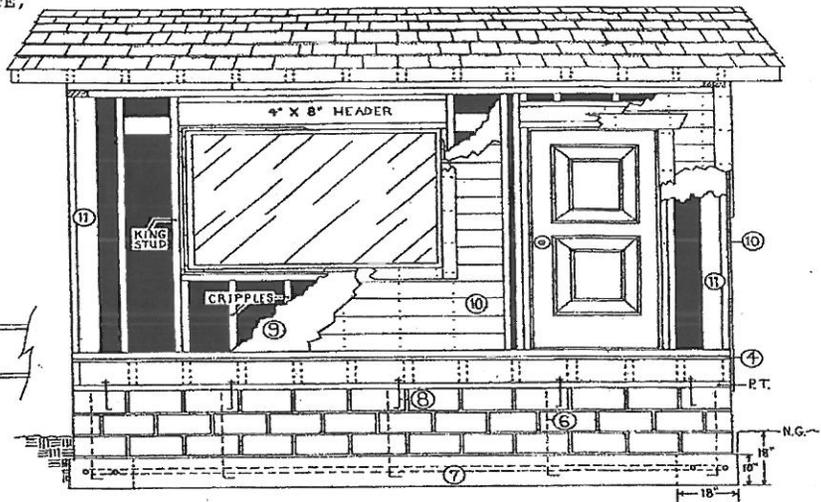
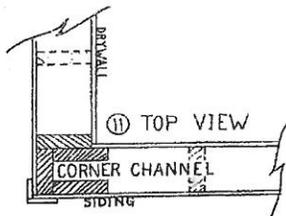
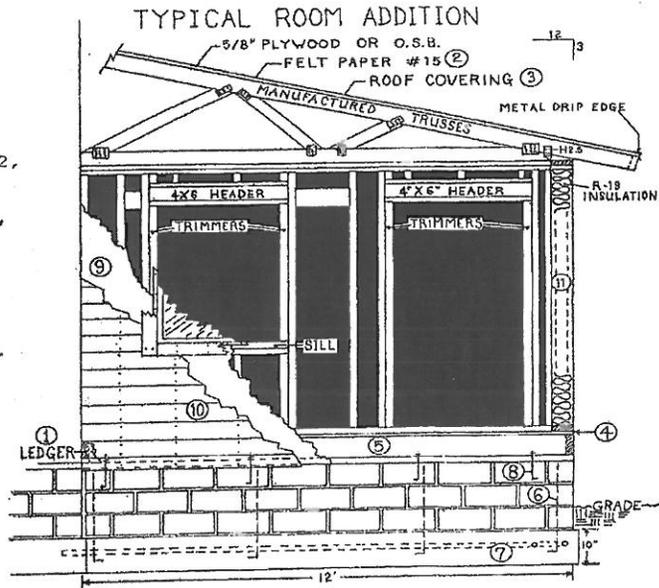


NOTE: WHEN ENCLOSING AN EXISTING PORCH INTO LIVING AREA, A NEW BUILDING PERMIT IS REQUIRED.



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- ① LEDGER: LAG BOLTS INTO EXISTING STUDS OR RIM JOIST @ 32" O.C.
- ② IF ROOF PITCH IS LESS THAN 3-12, #90 ROLLED ROOFING IS REQUIRED
- ③ OPTIONS: ASPHALT (COMPOSITION), FIBERGLASS, CONCRETE, OR WOOD SHAKE SHINGLES; TILE, METAL, OR ROLLED ROOFING, ETC.
- ④ 3/4" T & G PLYWOOD FLOOR
- ⑤ 2" X 8" FLOOR JOISTS @ 16" O.C. NEEDED FOR THIS SIZE ROOM. SEE SPAN TABLES FOR LUMBER SIZES REQUIRED FOR YOUR PROJECT.
- ⑥ (2) 1/2" VERTICAL REBARS EMBEDDED 6" INTO CONCRETE
- ⑦ (2) 1/2" HORIZONTAL REBARS 6" BELOW CONCRETE SURFACE
- ⑧ 1/2" X 10" ANCHOR BOLTS
- ⑨ AIR FILTRATION BARRIER
- ⑩ SIDING OPTIONS: LOG, T1-11, ALUMINUM, MASONITE, LAP, VINYL, ETC.
- ⑪ CORNER CHANNEL



## Girder and Header Spans for Exterior Bearing Walls

| Girders /<br>Headers<br>Supporting | SIZE   | Building Width (a) |       |         |       |         |       |
|------------------------------------|--------|--------------------|-------|---------|-------|---------|-------|
|                                    |        | 20 feet            |       | 28 feet |       | 36 feet |       |
|                                    |        | Span               | Jacks | Span    | Jacks | Span    | Jacks |
| <b>SINGLE<br/>STORY</b>            | 2-2x4  | 3'6"               | 1     | 3'2"    | 1     | 2'10"   | 1     |
|                                    | 2-2x6  | 5'5"               | 1     | 4'8"    | 1     | 4'2"    | 1     |
|                                    | 2-2x8  | 6'10"              | 1     | 5'11'   | 2     | 5'4"    | 2     |
|                                    | 2-2x10 | 8'5"               | 2     | 7'3"    | 2     | 6'6"    | 2     |
|                                    | 2-2x12 | 9'9"               | 2     | 8'5"    | 2     | 7'6"    | 2     |
|                                    | 3-2x8  | 8'4"               | 1     | 7'5"    | 1     | 6'8"    | 1     |
|                                    | 3-2x10 | 10'6"              | 1     | 9'1"    | 2     | 8'2"    | 2     |
|                                    | 3-2x12 | 12'2"              | 2     | 10'7"   | 2     | 9'5"    | 2     |
|                                    | 4-2x8  | 9'-2"              | 1     | 6'1"    | 2     | 5'5"    | 2     |
|                                    | 4-2x10 | 11'8"              | 1     | 10'6"   | 1     | 9'5"    | 2     |
|                                    | 4-2x12 | 14'1"              | 1     | 12'2"   | 2     | 10'11"  | 2     |
| <b>TWO<br/>STORY</b>               | 2-2x4  | 2'8"               | 1     | 2'4"    | 1     | 2'1"    | 1     |
|                                    | 2-2x6  | 3'11"              | 1     | 3'5"    | 2     | 3'0"    | 2     |
|                                    | 2-2x8  | 5'0"               | 2     | 4'4"    | 2     | 3'10"   | 2     |
|                                    | 2-2x10 | 6'1"               | 2     | 5'3"    | 2     | 4'8"    | 2     |
|                                    | 2-2x12 | 7'1"               | 2     | 6'1"    | 3     | 5'6"    | 3     |
|                                    | 3-2x8  | 6'3"               | 2     | 5'5"    | 2     | 4'10"   | 2     |
|                                    | 3-2x10 | 7'7"               | 2     | 6'7"    | 2     | 5'11"   | 2     |
|                                    | 3-2x12 | 8'10"              | 2     | 7'8"    | 2     | 6'10"   | 2     |
|                                    | 4-2x8  | 7'-2"              | 2     | 4'5"    | 2     | 3'11"   | 2     |
|                                    | 4-2x10 | 8'9"               | 2     | 7'7"    | 2     | 6'10"   | 2     |
|                                    | 4-2x12 | 10'2"              | 2     | 8'10"   | 2     | 7'11"   | 2     |

(a): Building width is measured perpendicular to the ridge  
 Jacks: Number of jack studs (trimmers) required to support each end

### HEADER SPANS FOR EXTERIOR BEARING WALLS

| SIZE                                 | MAXIMUM SPAN |
|--------------------------------------|--------------|
| 4x4 Doug Fir                         | 3'-0"        |
| 4x6 Doug Fir                         | 4'-0"        |
| 4x8 Doug Fir                         | 6'-0"        |
| 4x10 Doug Fir                        | 8'-0"        |
| 4x12 Doug Fir                        | 10'-0"       |
| 6" x 6" Doug Fir (rough sawn only)   | 9'-0"        |
| 6" x 8" Doug Fir (rough sawn only)   | 11'-6"       |
| 6" x 10" Doug Fir (rough sawn only)  | 14'-0"       |
| Note all lumber to be placed on edge |              |

### PLYWOOD ROOF SHEATHING-RECOMMENDED MAX SPANS

|  |
|--|
| ½" FACE GRAIN AT RIGHT ANGLES TO RAFTERS = 16" ON CENTER<br>(FOR UNATTACHED GARAGES OR STORAGE BUILDINGS ONLY) |
| 5/8" FACE GRAIN AT RIGHT ANGLES TO RAFTERS = 24" ON CENTER   |
| ¾" FACE GRAIN AT RIGHT ANGLES TO RAFTERS = 32" ON CENTER   |
| Wafer board may be used the same as plywood  |

### HEADER SPANS FOR INTERIOR NON-BEARING WALLS

| SIZE                                  | MAXIMUM SPAN |
|---------------------------------------|--------------|
| 4x4 or 2-2x4                          | 3'           |
| 4x6 or 2-2x6                          | 6'           |
| 4x8 or 2-2x8                          | 8'           |
| 4x10 or 2-2x10                        | 10'          |
| 4x12 or 2-2x12                        | 12'          |
| Note: All lumber to be placed on edge |              |

## ALLOWABLE SPANS FOR JOISTS AND RAFTERS

| Lumber Sizes    | LL=40 DL=10                         | LL=40 DL=15                | Ceiling Joists With Drywall | LL=45 DL=15                         |                                  |
|-----------------|-------------------------------------|----------------------------|-----------------------------|-------------------------------------|----------------------------------|
|                 | Floor Joists No Drywall Below<br>1* | Floor Joists Drywall Below |                             | Rafters 0:12 up to 4:12 Pitch<br>2* | Rafters 4:12 Pitch or More<br>2* |
| 2x4 @ 12" O.C.  |                                     |                            | 9'8"                        |                                     |                                  |
| 2x4 @ 16" O.C.  |                                     |                            | 8'3"                        |                                     |                                  |
| 2x4 @ 24" O.C.  |                                     |                            | 7'8"                        |                                     |                                  |
| 2x6 @ 12" O.C.  | 10'8"                               | 9'9"                       | 15'2"                       | 11'2"                               | 12'0"                            |
| 2x6 @ 16" O.C.  | 9'6"                                | 8'10"                      | 13'9"                       | 9'9"                                | 10'8"                            |
| 2x6 @ 24" O.C.  | 8'4"                                | 7'8"                       | 12'0"                       | 7'11"                               | 8'8"                             |
| 2x8 @ 12" O.C.  | 13'10"                              | 12'10"                     | 19'11"                      | 14'10"                              | 16'0"                            |
| 2x8 @ 16" O.C.  | 12'8"                               | 11'8"                      | 18'1"                       | 12'10"                              | 14'8"                            |
| 2x8 @ 24" O.C.  | 10'3"                               | 10'2"                      | 15'10"                      | 10'6"                               | 11'6"                            |
| 2x10 @ 12" O.C. | 17'8"                               | 16'5"                      | 25'5"                       | 18'11"                              | 20'0"                            |
| 2x10 @ 16" O.C. | 16'0"                               | 14'11"                     | 21'9"                       | 16'4"                               | 17'7"                            |
| 2x10 @ 24" O.C. | 12'9"                               | 12'3"                      | 20'2"                       | 13'4"                               | 14'8"                            |
| 2x12 @ 12" O.C. | 21'6"                               | 19'11"                     |                             | 23'0"                               | 24'6"                            |
| 2x12 @ 16" O.C. | 18'6"                               | 17'9"                      |                             | 19'11"                              | 21'8"                            |
| 2x12 @ 24" O.C. | 15'0"                               | 14'4"                      |                             | 16'3"                               | 17'9"                            |

Notes: Joists calculated @ LL deflection = 360, DL deflection = 240 with ¼" Min. Sheathing  
 All spans based on Douglas Fir Lumber: 1\* = #1 or Better 2\* = Select Structural  
 Reduce spans by 10% if Pine Lumber is used.