

- 6 Material used for slab edge insulation shall meet the following minimum specifications:
- Water absorption rate no greater than 0.3 percent.
  - Water vapor permeance no greater than 2.0 perm/inch.
  - Concrete slab perimeter insulation must be protected from physical damage and ultraviolet light deterioration.

(Title 24, Part 6, Chapter 7, Section 150 (i))

- 7 Concrete-slab floor perimeter insulation shall be provided 16 inches deep, or the depth of the footing of the building, whichever is less.

(Title 24, Part 6, Chapter 8, Section 151(f))

- 8 If insulation is installed in the existing attic of a low-rise residential building, the total resultant R-value after addition of insulation shall be at least R-30.

(Title 24, Part 6, Chapter 2, Section 118)

- 9 Raised floors separating conditioned spaces from unconditioned spaces shall be insulated between wood-framing members with insulation having an installed thermal resistance of R-13 or greater.

(Title 24, Part 6, Chapter 7, Section 150 (d))

#### 5 Lighting

- a) **High Efficacy Luminaires.** High Efficacy Luminaires that are not high efficacy lamps and that contain a medium screw base socket (E26/E29). A high efficacy lamp has a lamp efficacy that is no lower than the efficacy contained in TABLE 150-C. Ballasts for lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

**EXCEPTION 1 to Section 150 (k) 1:** High intensity discharge luminaires containing hardwired electromagnetic ballasts in medium screw base sockets shall be considered high efficacy luminaires for the purposes of meeting Section 150 (k) 1, provided they meet the efficacies contained in TABLE 150-C.

**NOTE:** To determine the minimum lamp efficacy category only the watts of the lamp (not the ballast) are to be considered.

- b) **Lighting in Kitchens.** Permanently installed luminaires in kitchens shall be high efficacy luminaires.

**EXCEPTION 2 to Section 150 (k) 2:** Up to 50 percent of the total rated wattage of permanently installed luminaires in kitchens may be in luminaires that are not high efficacy luminaires, provided that these luminaires are controlled by switches separate from those controlling the high efficacy luminaires. The wattage of high efficacy luminaires shall be the total nominal rated wattage of the installed high efficacy lamp(s). The wattage of luminaires shall be determined as specified by Section 150 (c).

- c) **Lighting in Bathrooms, Garages, Laundry Rooms, and Utility Rooms.** Permanently installed luminaires in bathrooms, garages, laundry rooms, and utility rooms shall be high efficacy luminaires.

**EXCEPTION 3 to Section 150 (k) 3:** Permanently installed luminaires that are not high efficacy shall be allowed provided that they are controlled by a motion sensor(s) that have an override allowing the luminaire to be always on.

- d) **Lighting other than in Kitchens, Bathrooms, Garages, Laundry Rooms, and Utility Rooms.** Permanently installed luminaires located other than in kitchens, bathrooms, garages, laundry rooms, and utility rooms shall be high efficacy luminaires.

**EXCEPTION 1 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed provided they are controlled by an occupant sensor(s) certified to comply with Section 119 (d). Such motion sensors shall not have an override that allows the luminaire to be turned on automatically or that has an override allowing the luminaire to be always on.

**EXCEPTION 2 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with Section 119 (d). Such motion sensors shall not have an override that allows the luminaire to be turned on automatically or that has an override allowing the luminaire to be always on.

**EXCEPTION 3 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with Section 119 (d). Such motion sensors shall not have an override that allows the luminaire to be turned on automatically or that has an override allowing the luminaire to be always on.

**EXCEPTION 3 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed in closets less than 70 square feet.

**NOTE:** Lighting in areas adjacent to the kitchen, including but not limited to dining and nook areas, are considered kitchen lighting if they are not separately switched from kitchen lighting.

**EXCEPTION 4 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed in areas less than 70 square feet, provided they are controlled by a motion sensor(s) that have an override allowing the luminaire to be always on.

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**EXCEPTION 6 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed in areas less than 70 square feet, provided they are controlled by a motion sensor(s) that have an override allowing the luminaire to be always on.

**EXCEPTION 7 to Section 150 (k) 4:** Permanently installed luminaires that are not high efficacy shall be allowed in areas less than 70 square feet, provided they are controlled by a motion sensor(s) that have an override allowing the luminaire to be always on.

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- 13 Field manufactured fenestration products and exterior doors, other than unframed glass doors and fire doors, shall be caulked between the fenestration products or exterior door and the building, and shall be weatherstripped.

(Title 24, Part 6, Chapter 2, Section 116)

- 14 Joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weatherstripped, or otherwise sealed to limit infiltration and exfiltration.

(Title 24, Part 6, Chapter 2, Section 117)

- 15 Insulation shall be certified by the manufacturer as compliant with the California Quality Standards for Insulating Material, Title 24, Part 12, Chapter 12.8.13, CCR.

(Title 24, Part 6, Chapter 2, Section 118)

- 16 Urea formaldehyde foam insulation may only be used in exterior side walls, and requires a four-mil-thick plastic polyethylene vapor barrier between the urea formaldehyde foam insulation and the interior space.

(Title 24, Part 6, Chapter 2, Section 118)

- 17 All insulating material shall be installed in compliance with the flame spread rating and smoke density requirements of the UBC.

(Title 24, Part 6, Chapter 2, Section 118)

- 18 If insulation is installed on an existing space conditioning duct, it shall comply with Section 605 of the CMC.

(Title 24, Part 6, Chapter 2, Section 118)

- 19 If external insulation is installed on an existing unfired water storage tank or on an existing back-up tank for a solar water-heating system, it shall have an R-value of at least R-12, or the heat loss of the tank surface based on an 80 °F water-air temperature difference shall be less than 6.5 Btu per hour per square foot.

(Title 24, Part 6, Chapter 2, Section 118)

- 20 Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 2, Chapter 49 of the ASHRAE Handbook and HVAC application handbook.

(Title 24, Part 6, Chapter 2, Section 113)

- 21 Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.

(Title 24, Part 6, Chapter 2, Section 113)

- 22 The opaque portions of framed demising walls shall have insulation with an installed R-value of at least R-13 between framing members.

(Title 24, Part 6, Chapter 2, Section 118)

#### E. Residential Notes

- 1 A masonry or factory-built fireplace shall have the following:
- Closable metal or glass doors covering the entire opening of the firebox.
  - A combustion air intake to draw air from the outside of the building directly into the firebox, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device.

(Exception: An outside combustion-air intake is not required if the fireplace will be installed over concrete slab flooring and the fireplace will not be located on an exterior wall.); and

- c) A flue damper with a readily accessible control.

(Title 24, Part 6, Chapter 7, Section 150 (e))

- 2 All heating and/or cooling systems other than wood stoves shall have an automatic thermostat with a clock mechanism or other setback mechanism approved by the Executive Director of the California Energy Commission that shuts the system off during peak periods of nonuse and that allows the building occupant to automatically set back the thermostat set points for at least two periods within 24 hours.

(Title 24, Part 6, Chapter 7, Section 150 (i) & 151 (i))

- 3 The minimum installed weight per square foot of any loose-fill insulation shall conform with the insulation manufacturer's labeled R-value.

(Title 24, Part 6, Chapter 7, Section 150 (b))

- 4 Insulation shall be provided for water heaters as follows:
- Storage gas water heaters with an energy factor < 0.58 shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater.
  - Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater or have internal insulation of at least R-15 and a label on the exterior of the tank showing the insulation R-value.

- c) Piping, whether buried or unburied, for recirculating sections of domestic hot water systems, piping from the heating source to the storage tank for an indirect-fired domestic water-heating system and the first five feet of hot and cold water pipes from the storage tank for nonrecirculating systems and cooling systems shall be thermally insulated as specified in subsection A & B.

- d) Solar water-heating systems and/or collectors shall be certified by the Solar Rating and Certification Corporation.

(Title 24, Part 6, Chapter 7, Section 150 (j))

#### D. General Notes

Attach the following notes to plan:

- 1 Operating instructions. The builder shall provide the building owner a copy of the appropriate Certificate(s) of Compliance and a list of the features, materials, components, and mechanical devices installed in the building and instructions on how to operate them efficiently. The instructions shall be consistent with specifications set forth by the executive director.

For residential buildings, such information shall, at a minimum, include information indicated on forms Certificate of Compliance (CF-1R), Mandatory Measures (MF-1R), Installation Certificate (CF-IR), Insulation Certificate (IC-1), and a manual which provides all information specified in this section 10-103(b). The Home Energy Manual (P400-92-031, July 1992) may be used to meet the requirement for providing this manual.

Title 24, Part 1, Section 10-103(c)

- 2 The builder shall provide to the building owner at occupancy maintenance information for all features, materials, components, and manufactured devices that require routine maintenance for efficient operation. Required routine maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label may be limited to identifying, by title and/or publication number, the operation and maintenance manual for that particular model and type of feature, material, component, or manufactured device.

For dwelling units, buildings or tenant spaces which are not individually owned or operated, or are centrally operated, such information shall be provided to the person(s) responsible for maintaining the feature, material, component, or mechanical device installed in the building.

Title 24, Part 1, Section 10-103(c)

- 3 All systems, equipment and/or building components shall comply with the applicable manufacturer provisions and installation provisions of Title 24, Part 6, Chapter 2, Sections 111 through 119.

(Title 24, Part 6, Chapter 2, Section 111)

- 4 All appliances for which a California Standard has been established in the Appliance Efficiency Regulations shall be certified by the manufacturer as compliant with the applicable standards.

(Title 24, Part 6, Chapter 2, Section 111)

- 5 Service water-heating systems that have a total capacity greater than 157,000 Btu/hr, shall have separate remote heaters, heat exchangers, or boosters to supply higher temperature outlets that require higher than service water temperatures as listed in the 1995 ASHRAE Handbook.

(Title 24, Part 6, Chapter 2, Section 113)

- 6 Controls for service water-heating systems shall limit the outlet temperature at public lavatories to 110 °F.

(Title 24, Part 6, Chapter 2, Section 113)

- 7 Unfired service water-heater storage tanks and backup tanks for solar water-heating systems shall have:

- External insulation with an installed R-value of at least R-12.
- Internal and external insulation with a combined R-value of at least R-16, or
- The heat loss of the tank surface, based on an 80 °F water-air temperature difference shall be less than 6.5 Btu/hr per square foot.

(Title 24, Part 6, Chapter 2, Section 113)

- 8 Any pool or spa heating system or equipment shall:
- Have a thermal efficiency for gas-fired systems of at least 78%, when tested according to ANSI standard Z21.58-1994.
  - Have a readily accessible on-off switch, mounted on the outside of the heater that allows shutting off the heater without adjusting the thermostat setting.
  - Have a permanent, readable, weatherproof instruction card, that gives instructions for the proper, energy efficient operation of the pool or spa.
  - Not utilize electric resistance heating or a pilot light.
  - Have at least 36 inches of pipe between the filter and heater to allow for the future addition of solar heating equipment.
  - Have a thermal insulation cover for outdoor pools or spas.
  - Have directional inlets for the pool or spa that adequately mix the pool water.
  - Have a time switch for the circulation pump that allows the pump to run in the off-peak electric demand period, and for the minimum time necessary to maintain the water in the condition required by applicable public health standards.

(Title 24, Part 6, Chapter 2, Section 114)

- 9 Space conditioning equipment shall meet the efficiency standards specified in Title 24, Part 6, Chapter 2, Section 112.

(Title 24, Part 6, Chapter 2, Section 112)

- 10 Pilot lights shall be prohibited for:
- Fan-type central furnaces.
  - Household cooking appliances, except noted below.
  - Pool heaters.
  - Spa heaters.

except for household cooking appliances without an electrical supply voltage connection and in which each pilot consumes less than 150 Btu/hr.

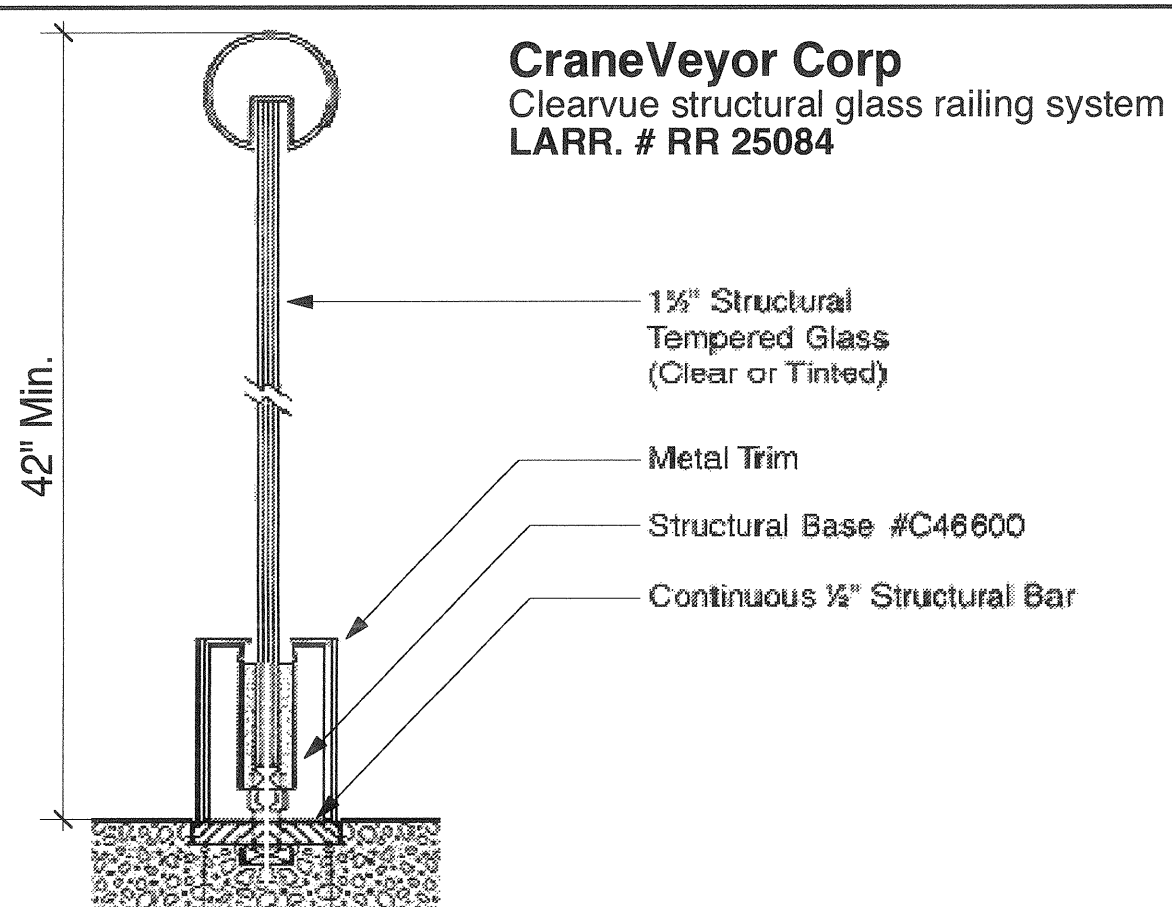
(Title 24, Part 6, Chapter 2, Section 115)

- 11 Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft<sup>2</sup> of window area, 0.3 cfm/ft<sup>2</sup> of residential door area, 0.3 cfm/ft<sup>2</sup> of nonresidential single door area, and 1.0 cfm/ft<sup>2</sup> of nonresidential double door area.

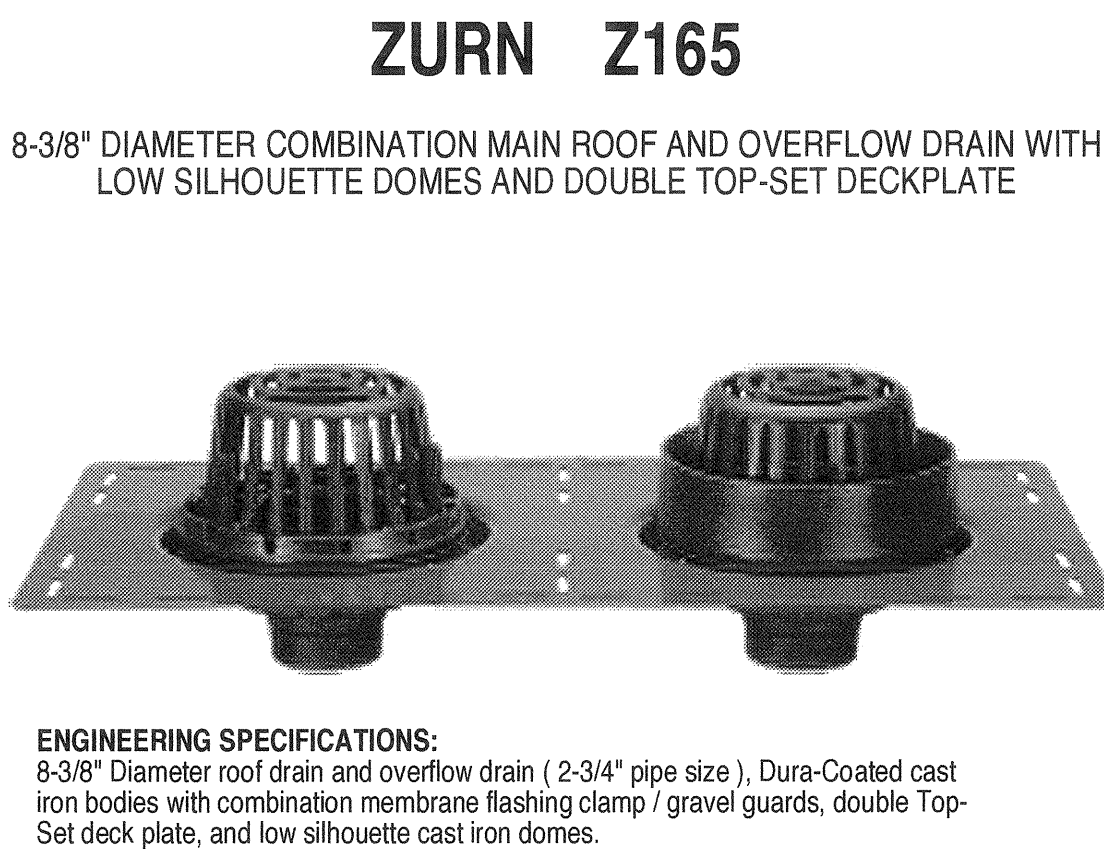
(Title 24, Part 6, Chapter 2, Section 116)

- 12 Fenestration products, other than products which are removed and reinstalled, shall be certified for overall U-values and overall SHGC, and shall have a temporary label which lists the certified U-value and SHGC, and certifies that applicable air infiltration requirements are met.

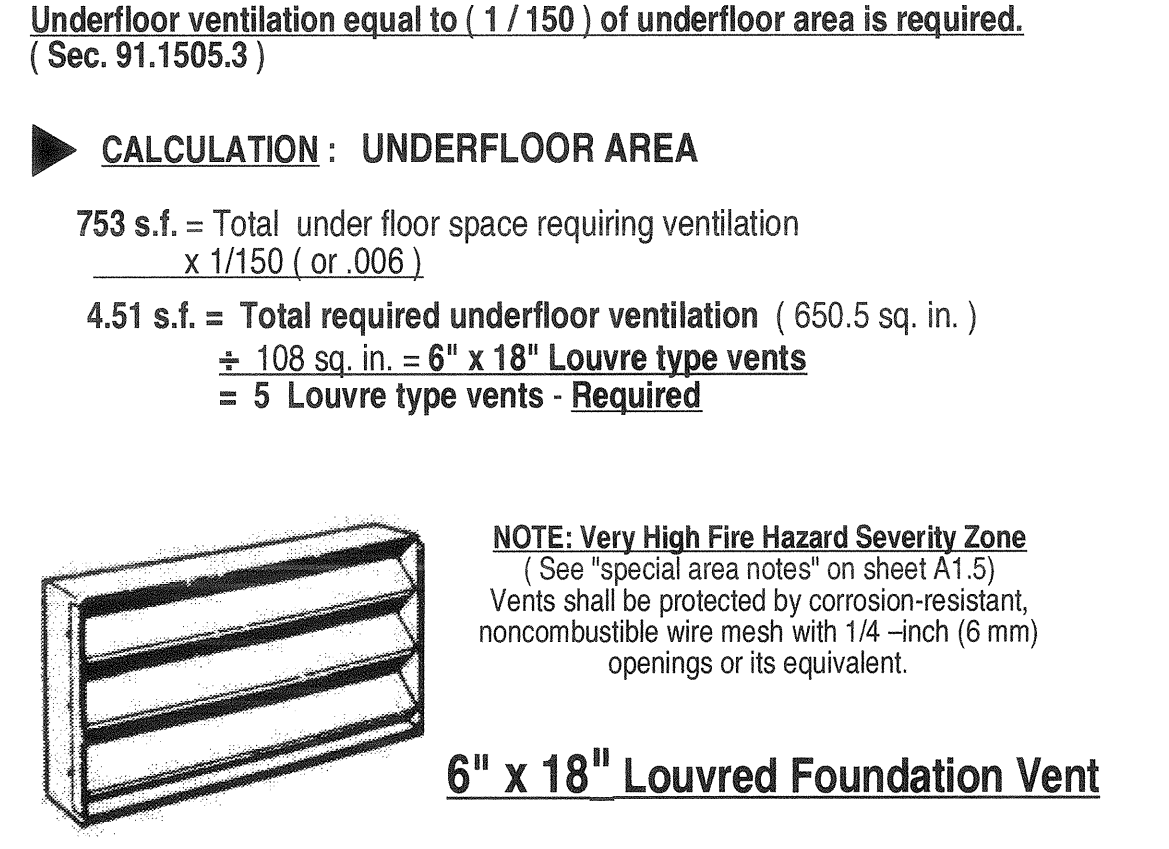
(Title 24, Part 6, Chapter 2, Section 116)



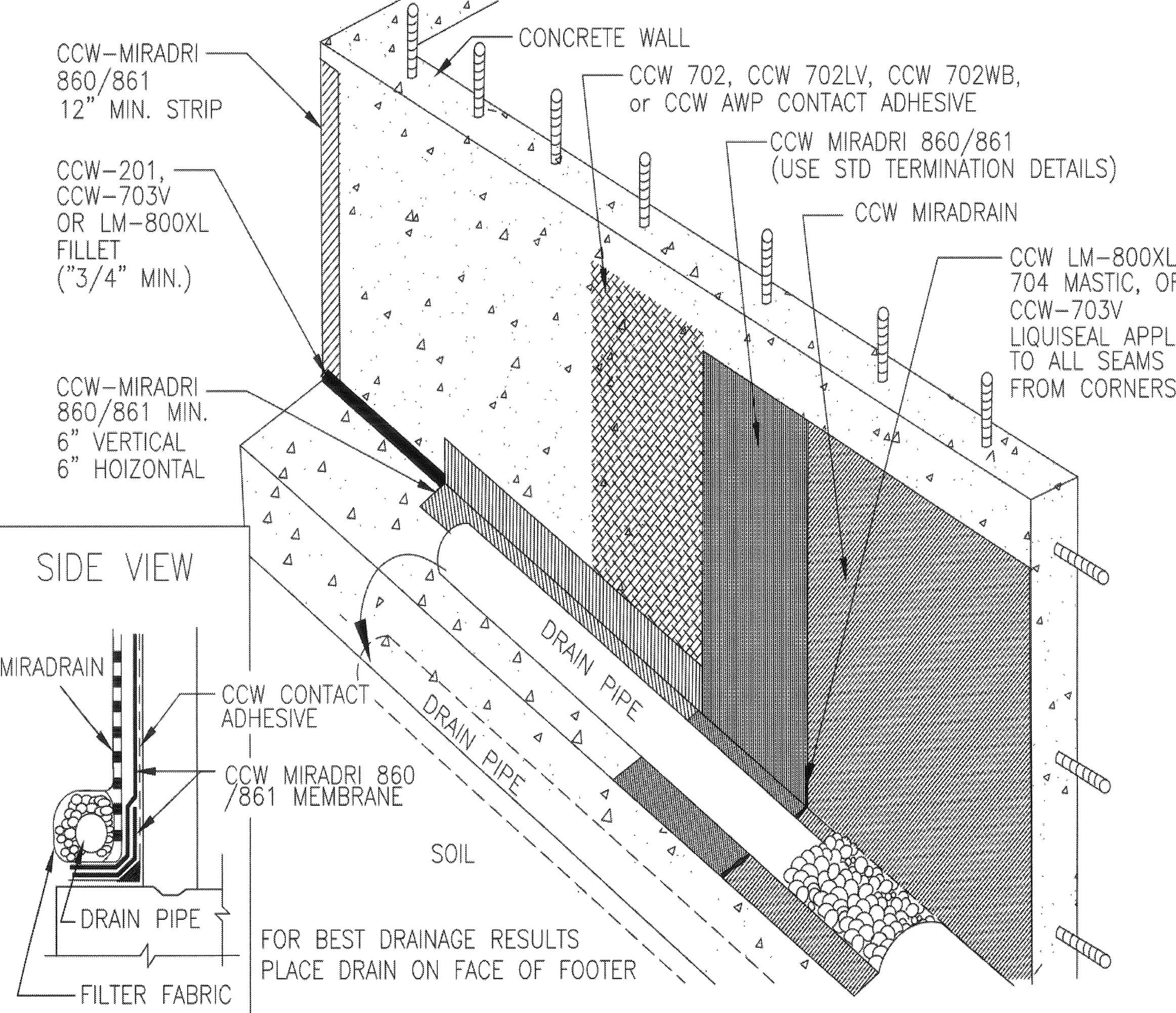
GLASS GUARDRAIL SYSTEM  
N.T.S.



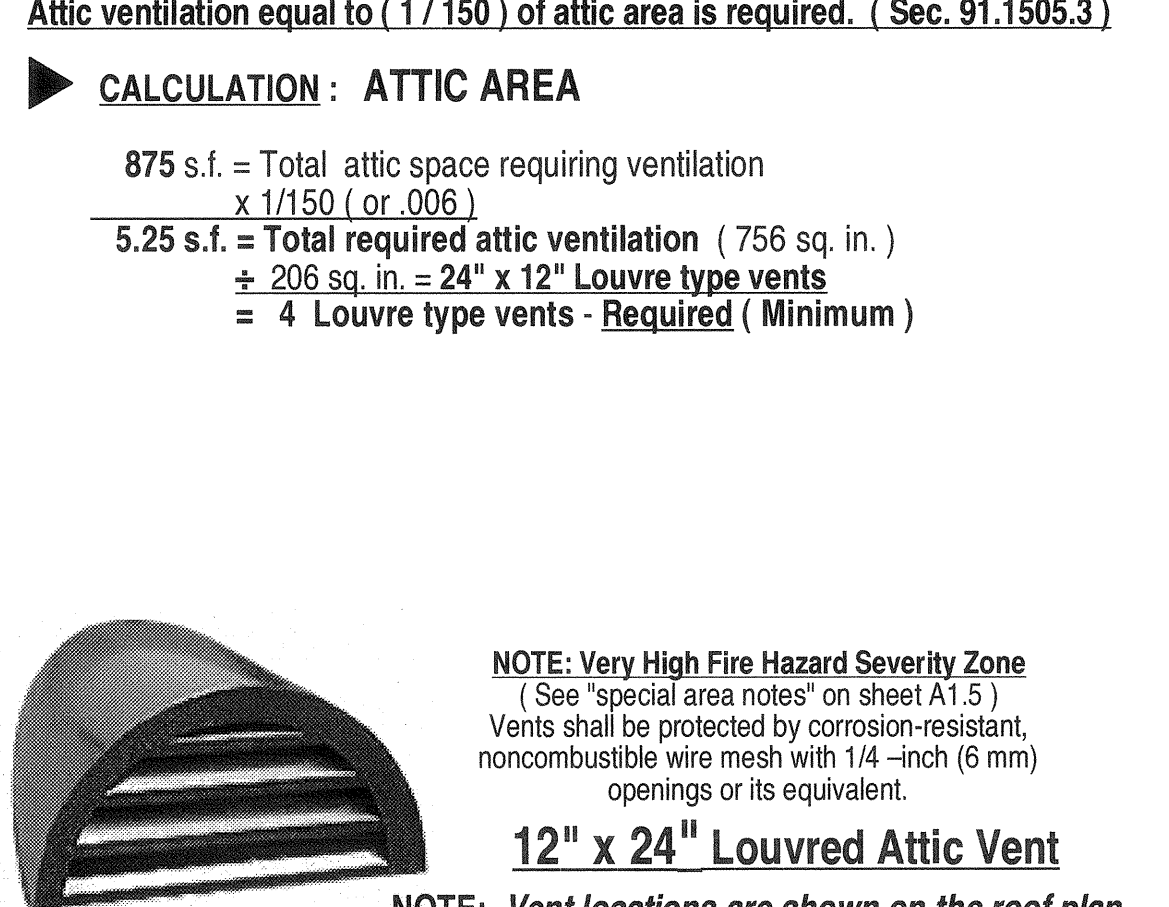
ROOF DRAIN & OVERFLOW DRAIN  
NOT TO SCALE



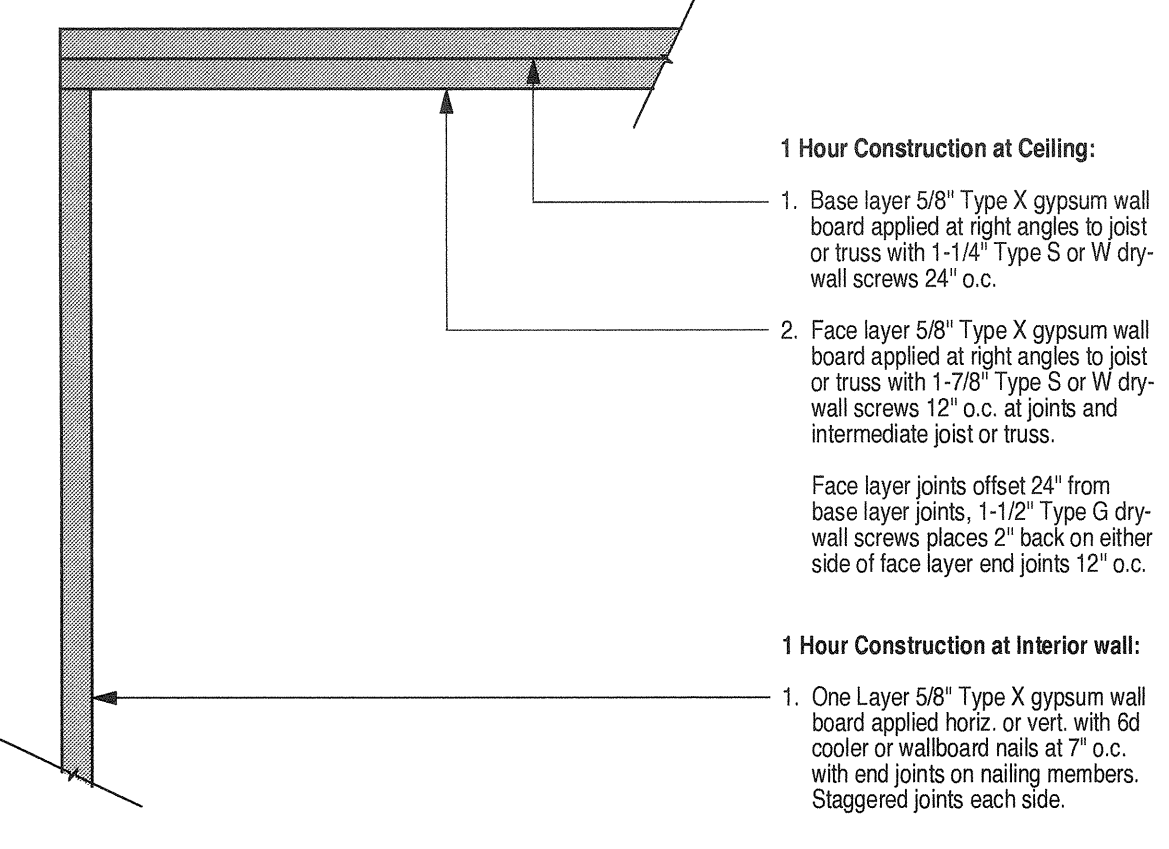
UNDERFLOOR VENTILATION CALC.  
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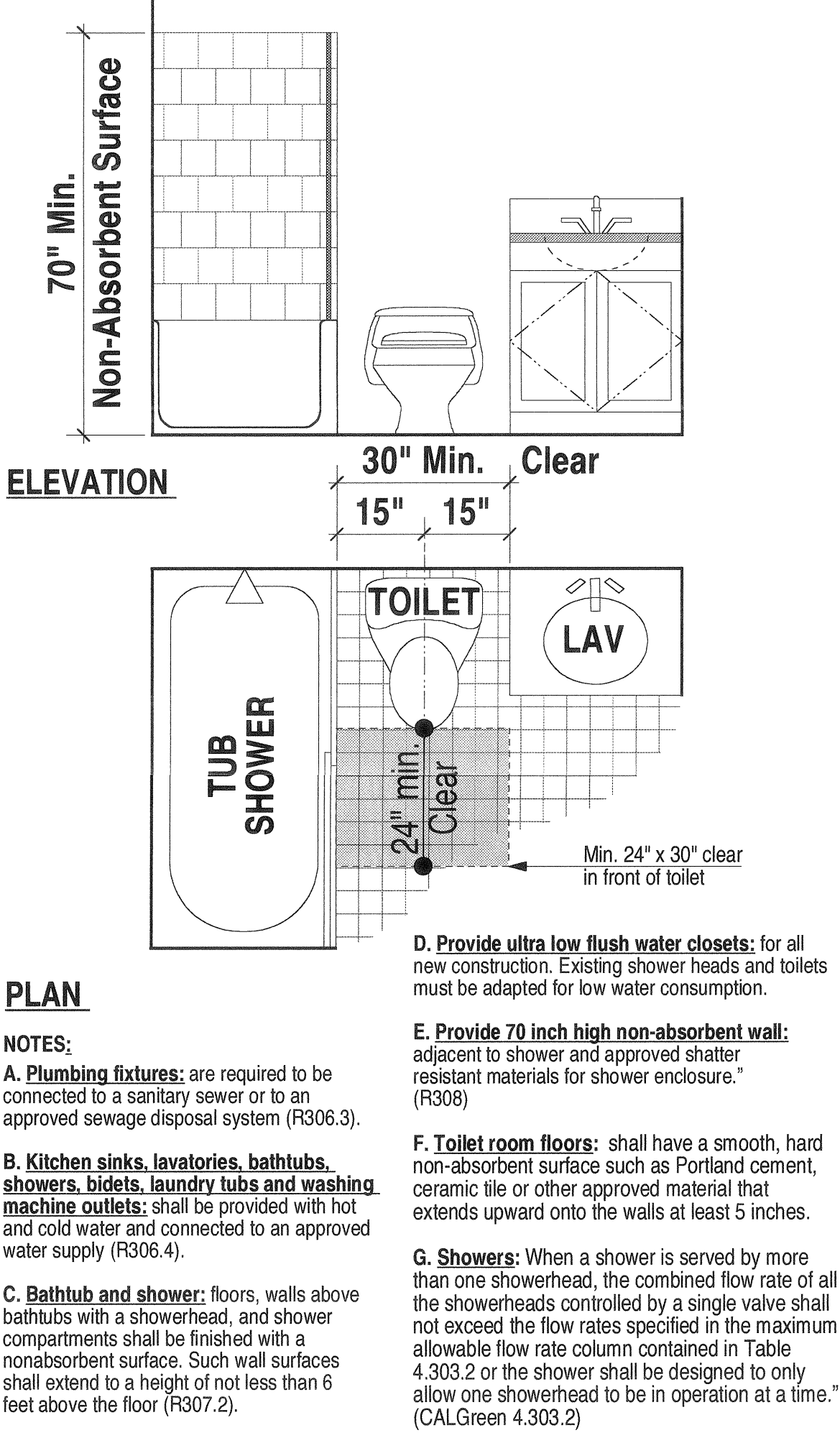
BASEMENT WATERPROOFING DETAIL  
NO SCALE



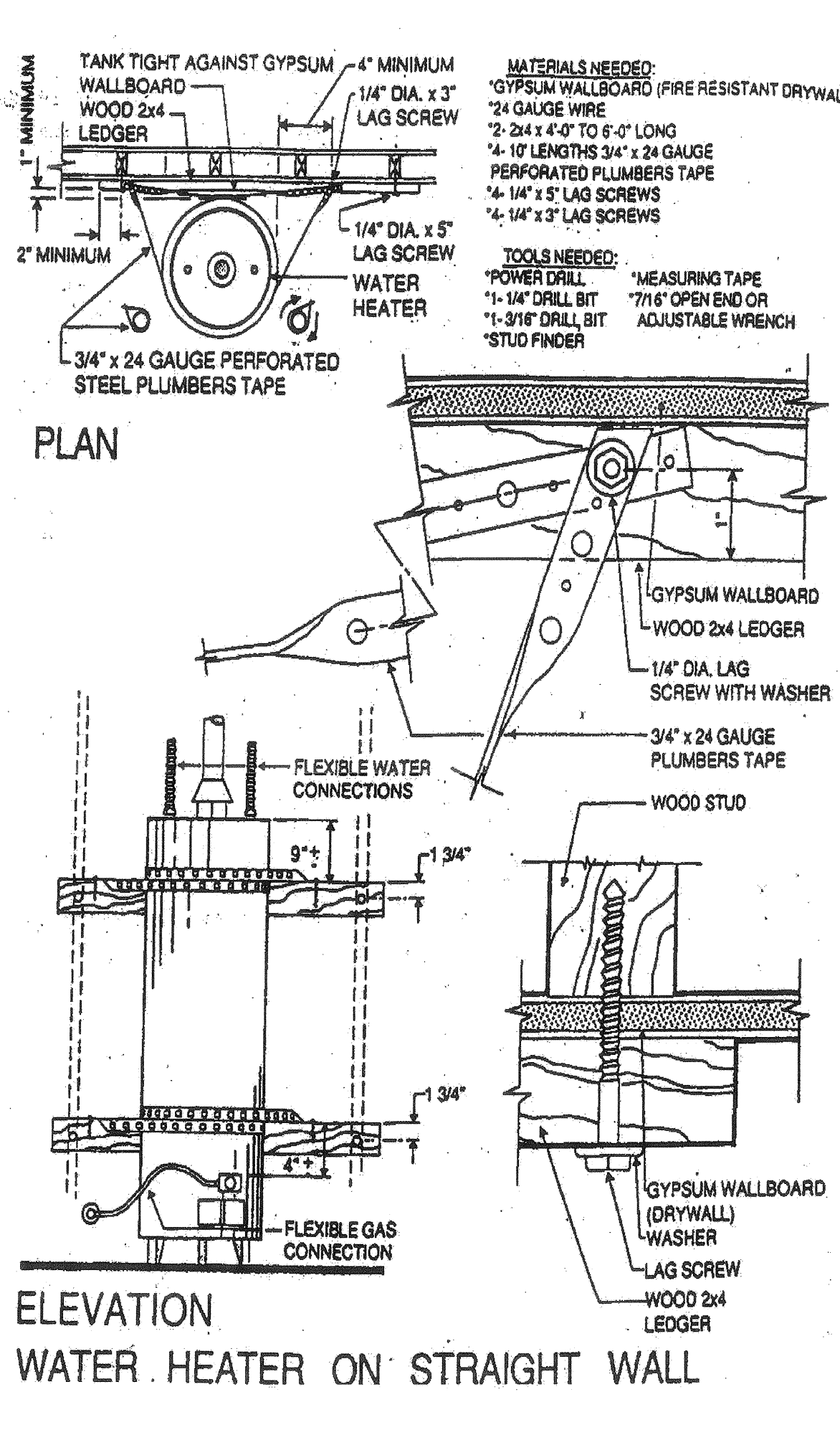
ATTIC VENTILATION CALC.  
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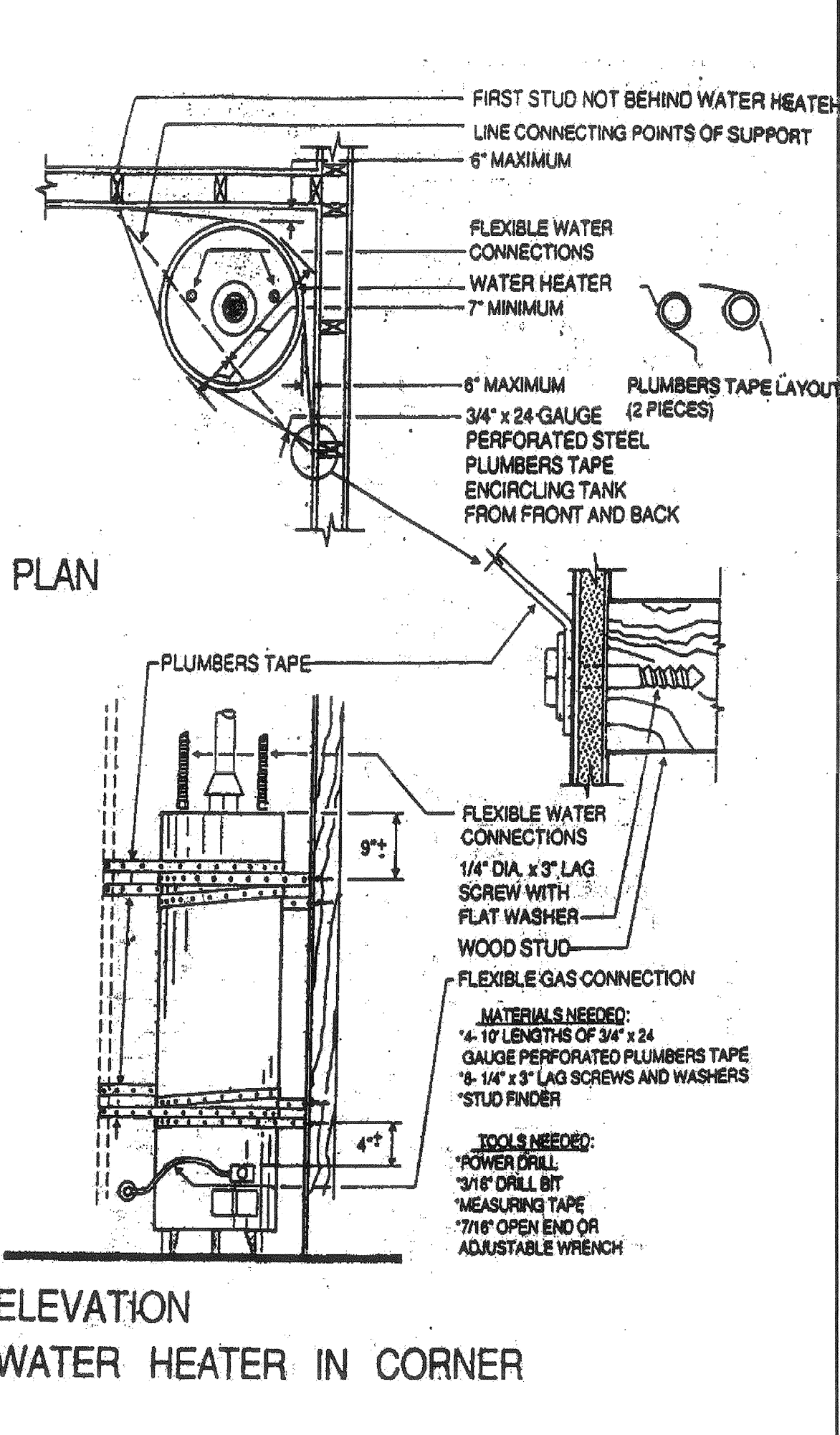
1 HR RATING - WALLS / CEILINGS  
3" = 1' - 0"



BATH & PLUMBING NOTES / DTL.  
1/2" = 1' - 0"



WATER HEATER BRACING DETAILS  
NOT TO SCALE



STAIRWAY DETAILS - TYP.  
1/2" = 1' - 0"

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