



# **TOWNSHIP OF HILLSBOROUGH**

## **COUNTY OF SOMERSET**

Hillsborough Township Municipal Complex  
The Peter J. Biondi Building  
379 South Branch Road  
Hillsborough, NJ 08844



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**Building Department**  
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## **SAMPLE GUIDE FOR 1&2 FAMILY DWELLING BASEMENT RENOVATIONS**

**THIS GENERIC GUIDE IS NOT ALL INCLUSIVE AND DOES NOT ADDRESS ALL CONDITIONS**

PLEASE SUBMIT TWO SETS OF SCALED DRAWINGS. ALL DRAWINGS MUST INDICATE THE OWNER'S NAME AND ADDRESS OF JOB SITE, BLOCK AND LOT NUMBER. THE HOMEOWNER MAY PREPARE PLANS IF THE PROPOSED PROJECT IS LOCATED AT THE HOMEOWNERS PRIMARY RESIDENCE. THE HOME OWNER MUST SIGN ALL PAGES OF THE DRAWINGS AND MUST SIGN THE AFFIDAVIT ON THE INSIDE OF THE APPLICATION JACKET, OTHERWISE A NEW JERSEY LICENCED ARCHITECT MUST PREPARE THE PLAN

### **CONTRACTORS MAY NOT PREPARE PLANS**

#### **REQUIRED INSPECTIONS:**

1. ROUGH ELECTRICAL
2. ROUGH PLUMBING UNDERGROUND (IF APPLICABLE)
3. ROUGH PLUMBING VENTING, WASTE, WATER AND GAS PRESSURE TEST
4. FRAMING (ONLY AFTER ALL OTHER SUBCODE ROUGH INSPECTIONS HAVE PASSED) **THIS INSPECTION WILL INCLUDE FIRE-STOPPING AND DRAFT-STOPPING**
5. INSULATION
6. ABOVE CEILING (BUILDING AND ELECTRIC, DRAFT STOPPING IF APPLICABLE OVER 1000 SF)
7. FINAL (ALL SUBCODES)

**INFORMATION REQUIRED FOR PLAN REVIEW: (PLANS SHALL BE DRAWN TO SCALE) see detail pages**

1. CODE DESIGN PER **N.J.A.C 5;23-6.6 7 2021 IRC NJ EDITION**
2. ENTIRE FLOOR PLAN AND LABEL EACH ROOM FOR THEIR INTENDED USE
3. PROVIDE A WALL SECTION DETAIL WITH MATERIAL IDENTIFICATION, FRAMING, FIRE BLOCKING, INSULATION AND FINISHES
4. STAIRWAYS, LANDINGS, GUARDS AND GRASPABLE HANDRAILS
5. INDICATE THE STYLE OF THE CEILING TO BE USED WITH MATERIAL TYPE
6. INDICATE DOOR LOCATIONS/SWING, WINDOWS, PLUMBING, CLEANOUTS AND ELECTRICAL PANELS
7. INDICATE ALL MECHANICAL AND LAUNDRY EQUIPMENT AND THEIR FUEL TYPE, BATH AND KITCHEN FIXTURES
8. LEGAL BASEMENT BEDROOMS: INDICATE LOCATION & MINIMUM EGRESS REQUIREMENTS (see separate diagram pages for details)

**PLUMBING:****PLAN REVIEW INFORMATION TO BE SUBMITTED WITH APPLICATION**

1. Provide waste, water and venting riser diagrams for all new fixtures
2. Provide a gas riser diagram for any new fuel fired equipment
3. Provide manufacturer's specifications and installation instructions for sewer ejector systems
4. Please refer to the plumbing Subcode Official for additional information which may be required

**ELECTRICAL:****PLAN REVIEW INFORMATION TO BE SUBMITTED WITH APPLICATION**

1. Plans must show locations of all receptacles, switches, lighting, ejector pit, new fastened in place appliances, electric baseboard heaters, phone, network CATV, smoke detectors, speakers, etc.
2. Receptacles to be spaced according to Article 210.52
3. Receptacles shall be tamper resistant per Article 406.12
4. Each unfinished area shall have at least one GFCI protected convenience receptacle per Article 210.8 (A)(5) and 210 (G)(3)
5. Junction boxes shall be accessible after installation of all finishes per Article 314.29
6. Each finished or unfinished area shall have at least one switch-controlled luminaire per Article 210.70(A)(1)+3
7. Equipment requiring servicing shall have a lighting outlet at or near the equipment per Article 210.70(A)(3)
8. Stairways must have at least one luminaire and be controlled by one switch at each level per Article 270(A)(3)
9. New circuits installed for finished areas shall be arc fault protected per Article 210.12(A)
10. Workspace clearances need to be considered around panelboards and sub panels. No storage or foreign mechanical systems allowed in this zone. 36" depth and 30" wide from either side of the panel, and a height of 6'-6" per Article 110.26
11. Luminaires and boxes installed in suspended ceilings must be properly secured to the ceiling grid by mechanical means such as bolts, screws, clips, or rivets per Article 410.36(B)
12. All wiring above suspended ceilings must be supported independently by approved means per Article 300.11(2)

**MAJOR STRUCTURAL CHANGES:**

REMOVAL OF COLUMNS, LOAD BEARING WALLS, ENLARGING MASONRY OPENINGS, AND LINTELS ARE REQUIRED TO HAVE DETAILED STRUCTURAL INFORMATION AND SUPPORTING DOCUMENTS. THE ASSISTANCE OF A NEW JERSEY LICENCED ARCHITECT OR ENGINEER MAY BE REQUIRED

## **R 317 Protection of wood and wood-based products from decay**

R 317.1 Protection of wood and wood-based products from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1.

Wood framing members that rest on concrete or masonry exterior foundation walls and are less than 8 inches (203 mm) from the exposed ground.

## **R602.5 Interior nonbearing walls.**

Interior nonbearing walls shall be permitted to be constructed with 2-inch by 3-inch (51 mm by 76 mm) studs spaced 24 inches (610 mm) on center or, where not part of a *braced wall line*, 2-inch by 4-inch (51 mm by 102 mm) flat studs spaced at 16 inches (406 mm) on center. Interior nonbearing walls shall be capped with not less than a single top plate. Interior nonbearing walls shall be fireblocked in accordance with Section R602.8.

## **R302.11 Fireblocking**

In combustible construction, fireblocking shall be provided to cut off both vertical and horizontal concealed draft openings and to form an effective fire barrier between stories, and between a top story and the roof space.

Fireblocking shall be provided in wood-framed construction in the following locations:

In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:

Vertically at the ceiling and floor levels.

Horizontally at intervals not exceeding 10 feet (3048 mm)

At interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.

In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.

At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E136 requirements.

## **R302.7 Under-stair protection.**

Enclosed space under stairs that is accessed by a door or access panel shall have walls, under-stair surface and any soffits protected on the enclosed side with 1/2-inch (12.7 mm) gypsum board.

### **R302.11.1 Fire Blocking materials.**

Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials.

Two-inch (51 mm) nominal lumber.

Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints.

One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.

One thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.

One-half-inch (12.7 mm) gypsum board.

One-quarter-inch (6.4 mm) cement-based millboard.

Batts or blankets of mineral wool or glass fiber or other *approved* materials installed in such a manner as to be securely retained in place.

Cellulose insulation installed as tested in accordance with ASTM E119 or UL 263, for the specific application.

### **R302.12 Draftstopping.**

In combustible construction where there is usable space both above and below the concealed space of a floor-ceiling assembly, draft stops shall be installed so that the area of the concealed space does not exceed 1,000 square feet (92.9 m<sup>2</sup>). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor-ceiling assemblies under the following circumstances:

Ceiling is suspended under the floor framing

Floor framing is constructed of truss-type open-web or perforated members.

### **R302.12.1 Draft stopping Materials.**

Draftstopping materials shall be not less than 1/2-inch (12.7 mm) gypsum board, 3/8-inch (9.5 mm) wood structural panels or other *approved* materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise *approved* by the *building official*. The integrity of the draft stops shall be maintained.

### **INSULATION: N.J.A.C 5:23-6.6-17**

When the work being performed creates or exposes the roof decking/sheathing or the framing of any wall, floor, ceiling, or roof assembly that is part of the building thermal envelope (encloses conditioned space), any accessible voids in insulation shall be filled using insulation meeting the R values of Table R402.1.2 (N1102.1.2) of the residential energy code for wood framing. R402.2.6 (N1102.2.6) of the residential energy code for metal framing equivalents or of Table 5.5-4 or 5.5-5 of the commercial energy code, as applicable.

### **R302.9.1 Flame spread index.**

Wall and ceiling finishes shall have a flame spread index of not greater than 200. And a smoke development index of not greater than 450

### **DROP CEILINGS;**

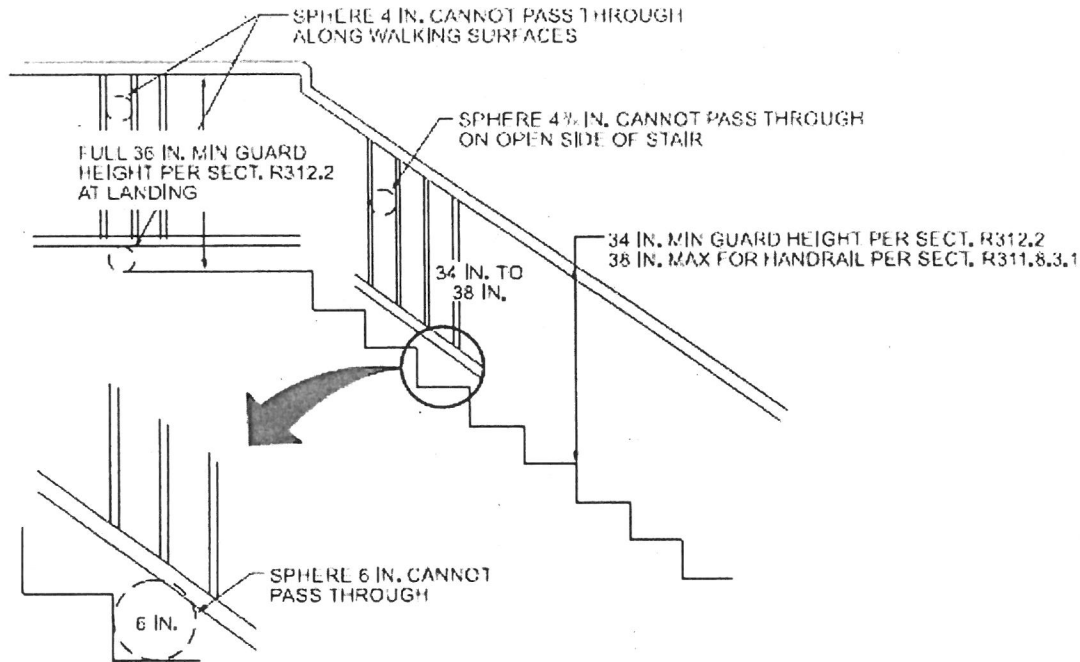
Drop ceilings shall be installed per manufacturer specifications

### **STAIRWAYS:**

Maximum rise is 8 ¼ inches, minimum tread depth is 9 inches. When a tread depth is less than 11 inches a minimum ¾ inch and a maximum 1-¼ inch nosing shall be provided and must be continuous throughout the entire flight of stairs. The largest rise and tread shall not exceed the smallest by more than ¾ inch. Open risers are permitted to a maximum of 4 inches. Stairways with 4 or more risers are required to have at least one graspable handrail with closed / returned ends. Graspable handrails may project into the clear opening a maximum of 4.5 inches. All stairways are required to have a landing the full width of the staircase and minimum 36 inches in the direction of travel.

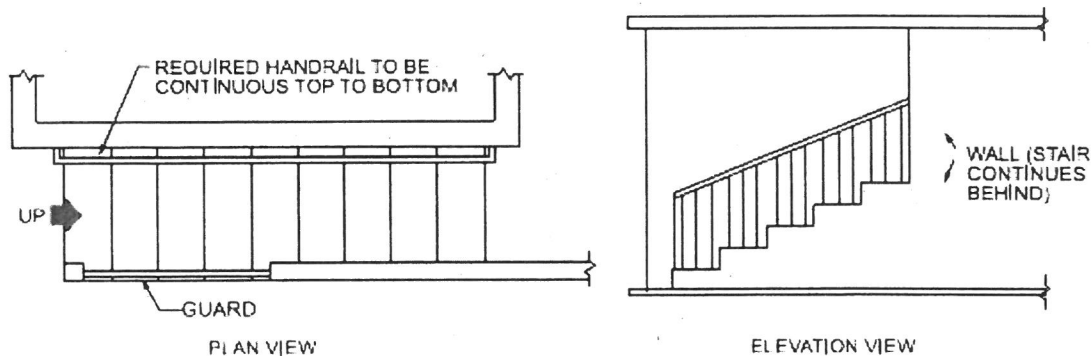
## GUARDS:

All walking surfaces that are 30" above grade measured at 36" horizontally from the face edge of the walking surface shall have a guard 36" minimum height and have balusters or other construction such that a 4 inch sphere can not pass through any opening. Except openings at sloped slides of staures shall not allow a sphere of 4  $\frac{3}{8}$  " to pass through



## R311.7.8 HANDRAILS.

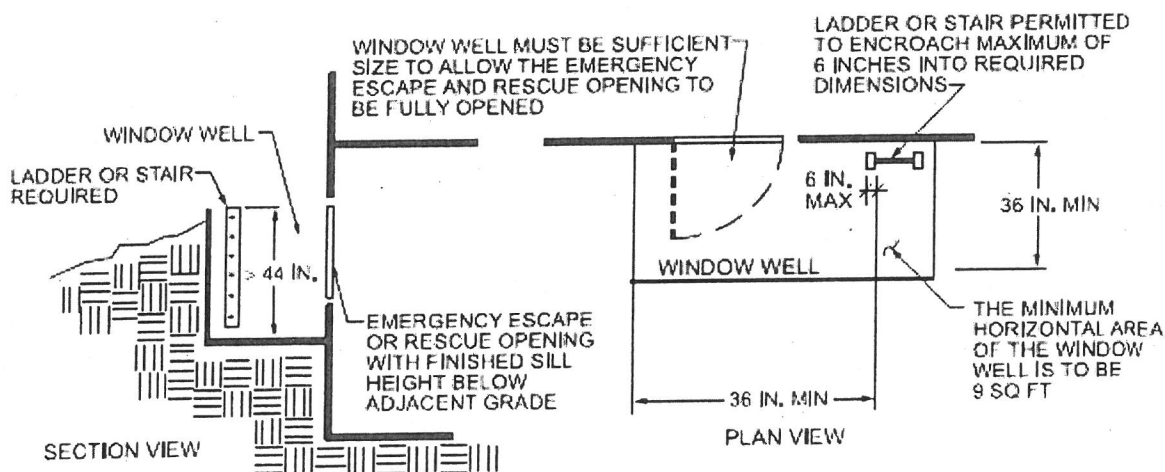
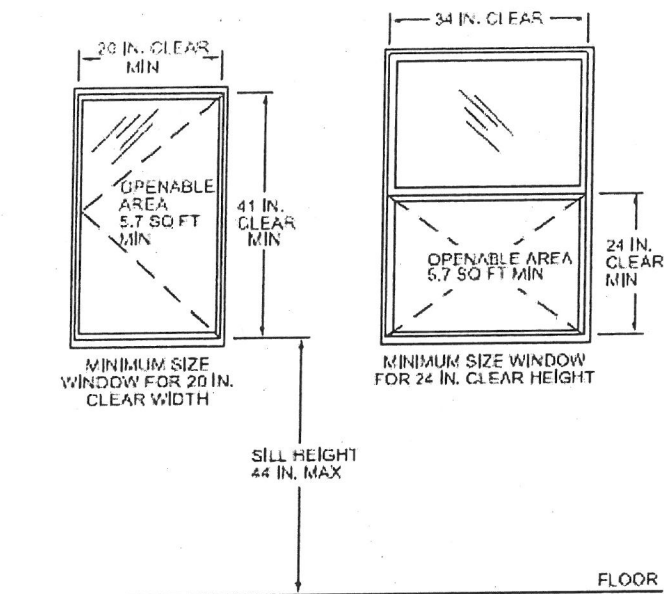
Handrails shall be provided on not less than one side of each flight of stairs with four or more risers.



## REQUIREMENTS FOR BEDROOMS:

### R310.1 Emergency escape and rescue opening required.

*Basements, habitable attics* and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where *basements* contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a *yard* or court that opens to a public way.







Instructions on How to Complete A Combustion Air Calculation Sheet  
**Combustion Air Form is Required Whenever you Alter a Space Containing a  
Fuel Burning Appliance.**

**What is a louver?** A louver is a ventilation product that allows air to pass through it while keeping out unwanted elements such as water, dirt and debris.

**What is a louver Free area?** The area derived by taking the total open area of a louver (after subtracting all obstructions (blades and frame).

**Step 1--**Locate all GAS FIRED appliances in the basement and fill in the BTU ratings associated with each appliance in the blank area at the top of the Calculation Sheet. Do not include the dryer. A dryer requires make up air not combustion air. An additional water heater and/or furnace should be listed under Other. Add up all the BTUs to come up with the **TOTAL BTUs**. The BTU rating of most appliances can be located either on the front of the appliance or as for a furnace, inside the front panel.

**Step 2--**Take the total BTUs and follow the calculation to come up with the **Required Cubic Feet of Air** you will need to properly supply the appliances.

**Step 3--**Supply a "Floor Plan" of the basement to be finished. Include **ALL room dimensions** and label each room for the intended use. The rooms listed on the Combustion Air form and the Bird's Eye View Drawing should be **identical**.

**Step 4--**List all the rooms on the Calculation Sheet including width, length and ceiling height. Multiplying these dimensions will give you the CUBIC feet of air in each room. Once you reach the **Required CUBIC Feet of Air Needed**, you can stop adding rooms.

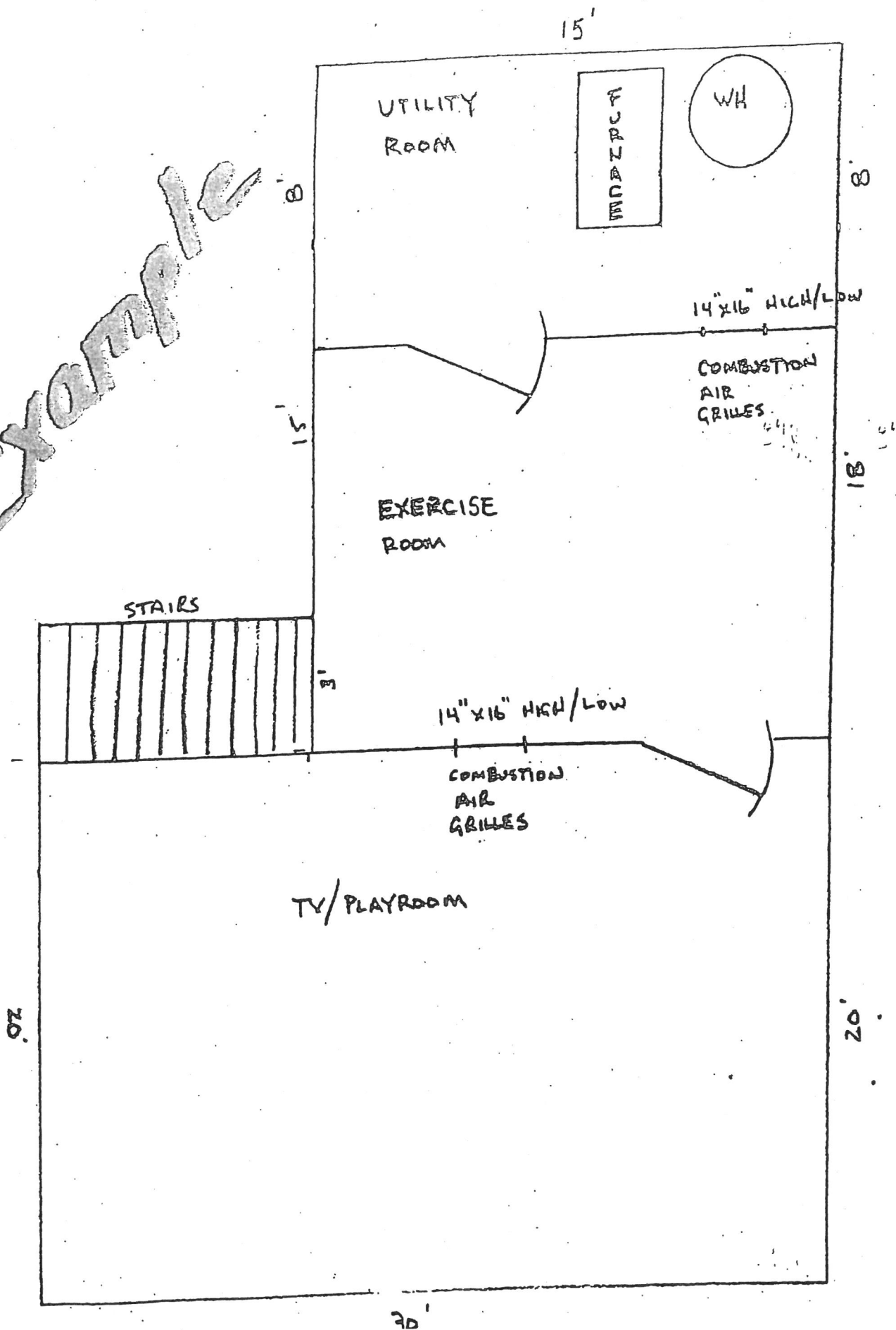
**Step 5--**The **Total Cubic Feet of Air Available** in Line 3 must meet or exceed the **Required Cubic Feet of Air Needed** in Line 2. If that is not the case, then these rooms will need to be connected via "combustion air grilles". The grilles/louvers will have to be located in the walls that connect the space and/or spaces.

**Step 6--**To find the required grille/louvers size, you will need the **Total BTUs of the appliances** (from Line 1). The total BTUs should be divided by 1000. This will give you the SQUARE INCHES required to connect the spaces. Each room that is required for combustion air will need these grilles/louvers installed. **The grilles/louvers need to be installed in a "high/Low" fashion.** This means in each connecting wall these grilles/louvers must be installed with one starting within 12" of the ceiling and one starting within 12" of the floor. These grilles/louvers must be indicated on the floor plan when it is submitted.

When the form is completed, submit it along with the Mechanical Technical Section for review. Indicate on the Mechanical form the Number and Size of grilles/louvers that will be installed.

Plumbing Subcode Official  
Hillsborough, NJ

Example



1. Total Appliance BTU input rating: Label on units will provide BTU input rating. Any additional furnace or water heater should be listed under Other. Don't include the dryer. Dryer requires make up air not combustion air.

$$\frac{\text{Furnace}}{\text{Furnace}} + \frac{\text{Water Heater}}{\text{Water Heater}} + \frac{\text{Gas Fireplace}}{\text{Gas Fireplace}} + \frac{\text{Other}}{\text{Other}} + \frac{\text{Other}}{\text{Other}} = \text{TOTAL BTU}$$

2.  $\text{Total BTU} \div 1000 \times 50 = \text{Required Cubic Feet of Air Needed}$

3. Area of Basement Room

**\*\* (All Calculations Need to be in Feet)**

	<u>Length</u>	X	<u>Width</u>	X	<u>Height</u>	=	
		X		X		=	Cubic Feet of Air
		X		X		=	Cubic Feet of Air
		X		X		=	Cubic Feet of Air
		X		X		=	Cubic Feet of Air

**Total Cubic Feet of Air Available** =

The **Total Cubic Feet Available (from all rooms above)** must meet or exceed the total from line 2.

Available air from adjacent rooms in the basement can be used to meet the requirement of the minimum cubic area required through use of air transfer grills/louvers. Combustion Air may be obtained from the exterior if the requirement from line 4 is not satisfied. **Combustion Air cannot be drawn from Bathrooms, Bedrooms & Garages.**

The first Grille/louver shall commence one foot from the ceiling.

The second Grille/louver shall commence one foot from the floor.

Louver doors may not meet this requirement. **(See Below for Referenced Code)**

Transfer grills/louvers shall have a clear open area of 1 inch per 1000 BTUs.

$$\text{TOTAL BTU} \div 1000 = \text{Square inches (Minimum of 100 sq.in.)}$$

**TOTAL BTU**

**\*\* (All Calculations Need to be in Inches)**

<u>Louver</u>	<u>Length</u>	X	<u>Width</u>	X	<u>Coefficient</u>	=	<u>Unobstructed Opening</u>
		X		X	.75	=	sq in. Metal Grille
		X		X	.25	=	sq in. Wood Louver/Louver Doors
		X		X	.25	=	sq in. Wood Louver/Louver Doors

**Efficient means** the free area within a louver.

Louver door is used, provide measurements of upper and lower grills/louvers only.

Total Required Cubic Feet in Line 2 is greater than Total Cubic Feet in Line 3, then additional combustion air is required.

**NOTE:** When combining spaces, each opening requires 1 sq. in net clear area per 1,000 BTU's, but not less than 100 sq. in. One opening shall be within 12" of the floor and one within 12" of the ceiling. Wood louvers have a net clear area of 25% and metal grills 75% net clear area. **See Current IRC Chapter 24 Section 2407 for all available options.** Please indicate on the other side how additional air will be provided.

# SAMPLE

1. Total Appliance BTU input rating: Label on units will provide BTU input rating. Any additional furnace or water heater should be listed under Other. Don't include the dryer. Dryer requires make up air not combustion air.

$$\frac{100,000}{\text{Furnace}} + \frac{50,000}{\text{Water Heater}} + \frac{\quad}{\text{Gas Fireplace}} + \frac{\quad}{\text{Other}} + \frac{\quad}{\text{Other}} = 150,000 \text{ TOTAL BTU}$$

2. 150,000 Total BTU  $\div 1000 \times 50 =$  7,500 Required Cubic Feet of Air Needed

3. Area of Basement **\*\* (All Calculations Need to be in Feet)**

Room	Length	X	Width	X	Height	=	
<u>Utility</u>	<u>8'</u>	X	<u>15'</u>	X	<u>8'</u>	=	<u>960</u> Cubic Feet of Air
<u>Exercise</u>	<u>18'</u>	X	<u>15'</u>	X	<u>8'</u>	=	<u>2,160</u> Cubic Feet of Air
<u>TV/Play room</u>	<u>20'</u>	X	<u>30'</u>	X	<u>8'</u>	=	<u>4,800</u> Cubic Feet of Air
<u>                    </u>	<u>          </u>	X	<u>          </u>	X	<u>          </u>	=	<u>          </u> Cubic Feet of Air

$$\text{Total Cubic Feet of Air Available} = \underline{7,920}$$

4. The Total Cubic Feet Available (from all rooms above) must meet or exceed the total from line 2.
5. Available air from adjacent rooms in the basement can be used to meet the requirement of the minimum cubic area required through use of air transfer grills/louvers. Combustion Air may be obtained from the exterior if the requirement from line 4 is not satisfied. **Combustion Air cannot be drawn from Bathrooms, Bedrooms & Garages.**
6. The first Grille/louver shall commence one foot from the ceiling.  
The second Grille/louver shall commence one foot from the floor.  
Louver doors may not meet this requirement. **(See Below for Referenced Code)**
7. Transfer grills/louvers shall have a clear open area of 1 inch per 1000 BTUs.

$$\frac{150,000}{\text{TOTAL BTU}} \div 1000 = \underline{150} \text{ Square inches (Minimum of 100 sq.in.)}$$

**\*\* (All Calculations Need to be in Inches)**

Louver-----	Length	X	Width	X	Coefficient	=	Unobstructed Opening
	<u>14"</u>	X	<u>16"</u>	X	.75	=	<u>168</u> sq in. Metal Grille
	<u>      </u>	X	<u>      </u>	X	.25	=	<u>      </u> sq in. Wood Louver/Louver Doors
	<u>      </u>	X	<u>      </u>	X	.25	=	<u>      </u> sq in. Wood Louver/Louver Doors

Coefficient means the free area within a louver.

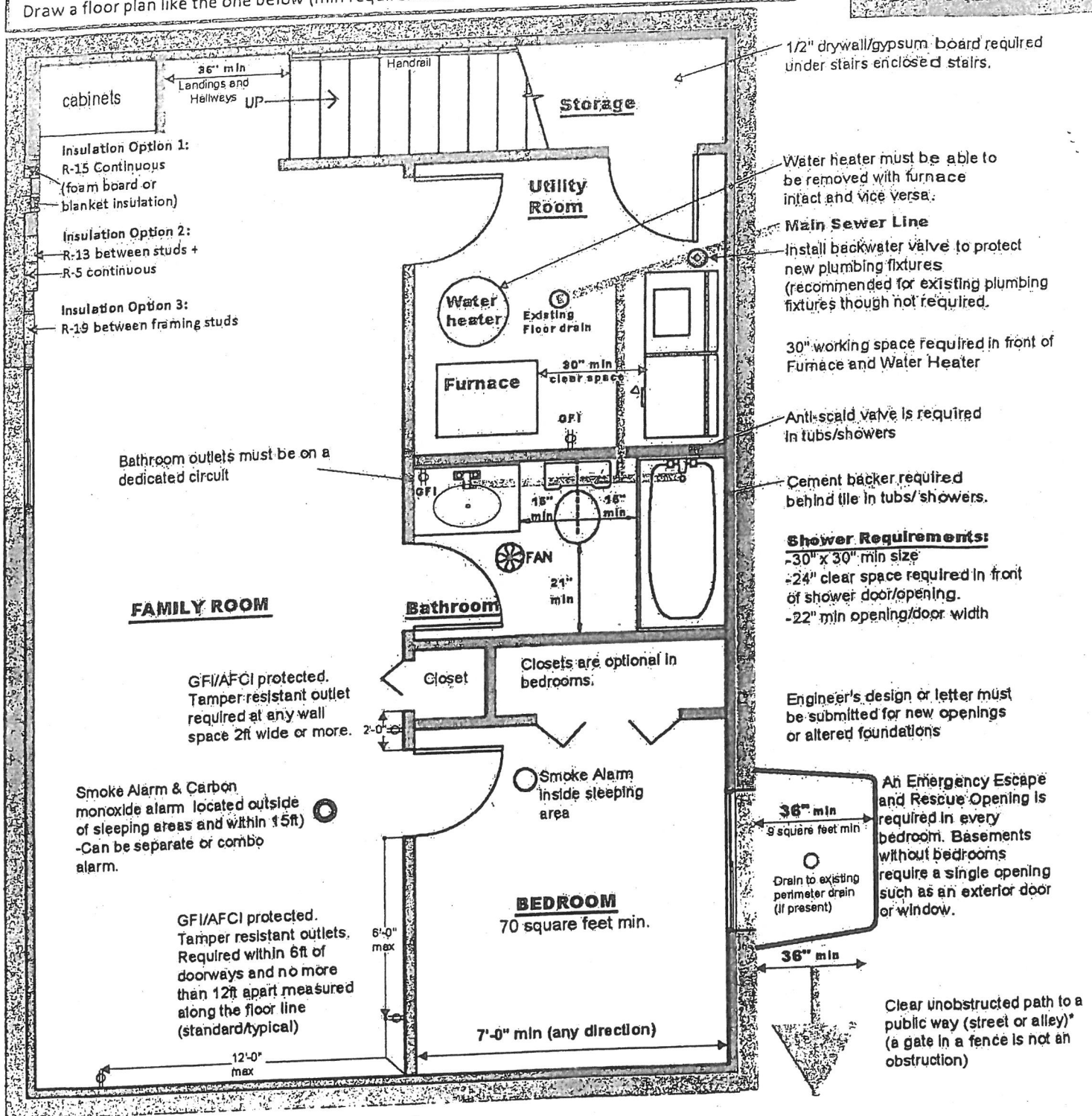
If Louver door is used, provide measurements of upper and lower grills/louvers only.

If Total Required Cubic Feet in Line 2 is greater than Total Cubic Feet in Line 3, then additional combustion air is required. .

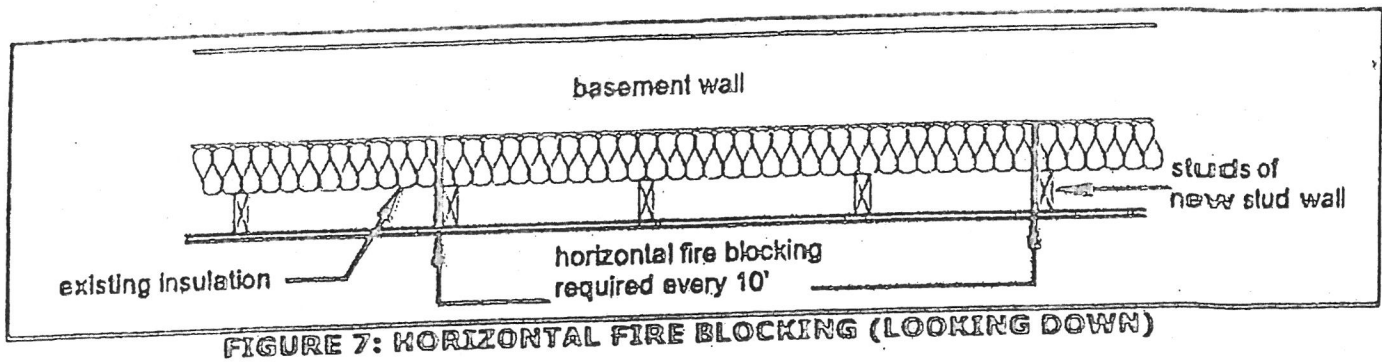
**NOTE:** When combining spaces, each opening requires 1 sq. in net clear area per 1,000 BTU's, but not less than 100 sq. in. One opening shall be within 12" of the floor and one within 12" of the ceiling. Wood louvers have a net clear area of 25% and metal grills 75% net clear area. **See Current IRC Chapter 24 Section 2407 for all available options.** Please indicate on the other side how additional air will be provided.

Draw a floor plan like the one below (min requirements are shown in this drawing for reference):

## Floor Plan



# SAMPLE



**Under Stair Protection:** R302.7 as preceded by N.J.UCC 6.6-(e)16 and R302.11. Enclosed accessible space under stairs shall have walls, under-stair surface and any soffits protected on the enclosed side by 1/2" gypsum board.

## Example of a Typical Finished Basement Walls Section

