BOROUGH OF NEW MILFORD
BUREAU OF CODE ENFORCEMENT
PLANNING AND ZONING

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Sample Guide For 1&2 Family Dwelling Basement Renovations *Rev 2-18-2021*

This generic guide is not all inclusive and does not address all conditions.

Based on the 2018 International Residential Code New Jersey Edition

Please submit two sets of scaled drawings. All drawings must indicate the owner's name, address of job site, block and lot number. The homeowner may prepare plans if the proposed project is located at the homeowner's primary residence. The homeowner 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 or New Jersey Licensed Professional Engineer must prepare the plans.

(CONTRACTORS CANNOT PREPARE PLANS)

Required inspections:

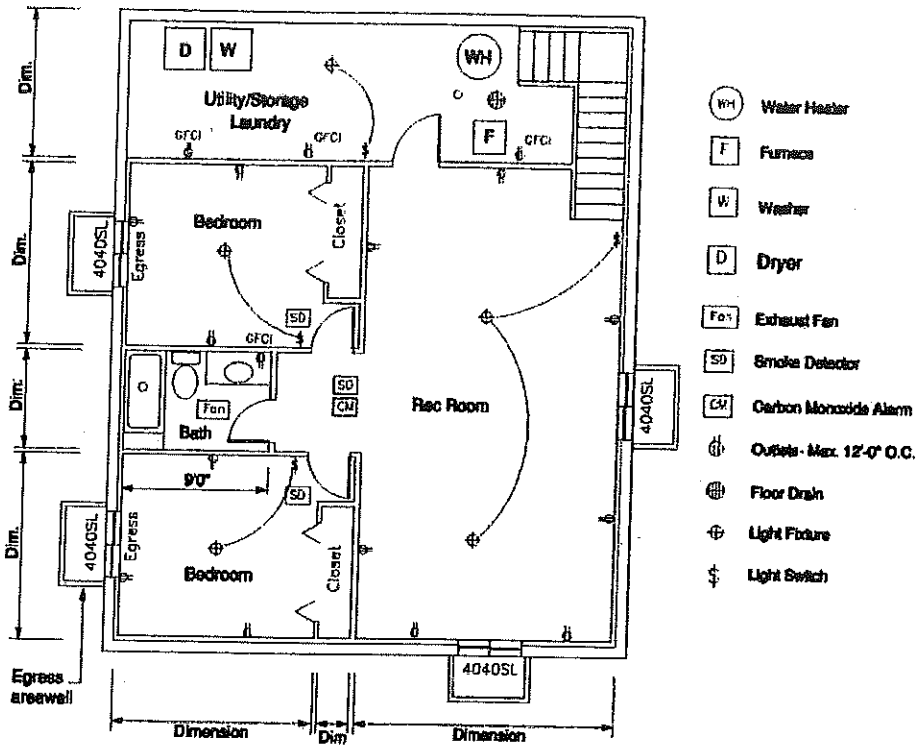
1. Rough Electrical.
2. Rough Plumbing Underground. **If applicable**
3. Rough Plumbing Venting, Waste, Water and Gas pressure test.
4. Framing. (Only after all other subcode rough inspections have passed)
5. Insulation
6. Above ceiling (Building and Electric) Draft Stopping *if applicable* (drop ceilings or open trusses over 1000sq/ft).
7. Final Inspections as applicable FIRE ELECTRIC PLUMBING BUILDING MECHANICAL

INFORMATION REQUIRED FOR PLAN REVIEW:

Plans shall be drawn to scale and include the following information on the plans

1. Code design information. N.J.A.C 5:23-6.6 & 2018 IRC NJ Edition.
2. Entire floor plan and label each room for their intended use.
3. Provide a wall section with material identification, framing,fireblocking, insulation, finishes,etc
4. Stairways, Landings, Guards and Graspable Handrails.
5. Indicate the style of ceiling being 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, fireplaces, bilco doors, other exterior exits and stairwells. For fuel burning appliances provide combustion air worksheet on page 6.
8. Legal Basement Bedrooms: Indicate location, minimum egress requirements.
9. Provide wall section including: Plate, wall frame size and material, Fireblocking and draftstopping, air space, insulation R-value, ceiling finish, wall finish and floor finish.
10. Plumbing layout: Ejector pump pit locations *if applicable,* water, waste and gas riser diagrams for all new equipment.
11. Electrical layout: Switch, receptacle, lighting, smoke detectors and C.O. detectors.



SAMPLE FLOOR PLAN

Draw to Scale: Min. 1/4"=1'0"

Floor Plan drawn to ¼" = 1'0" or larger standard scale

- **Label all rooms (bedroom, bathroom, closet, etc.) and dimension all walls**
- **Indicate all window locations and include size and type (e.g. 48" x 48" slider)**
- **Indicate the proposed layout of bathroom fixtures (tub, toilet, sink, shower)**
- **Indicate approximate location of all new or existing electrical receptacles, switches, lights, bathroom exhaust fans, and smoke detectors. Label all GFCI protected receptacles.**
- **Indicate location of any new or existing sump pump**
- **Indicate location of all new or existing furnaces and water heaters. Include location and size of all new or existing combustion air pipes**

Major Structural Changes i.e. Removal of columns, load bearing walls, enlarging masonry openings in lentils are required to have detailed structural information and supporting documents. The assistance of a New Jersey Licenced Architect of Engineer may be helpful for this aspect of work.

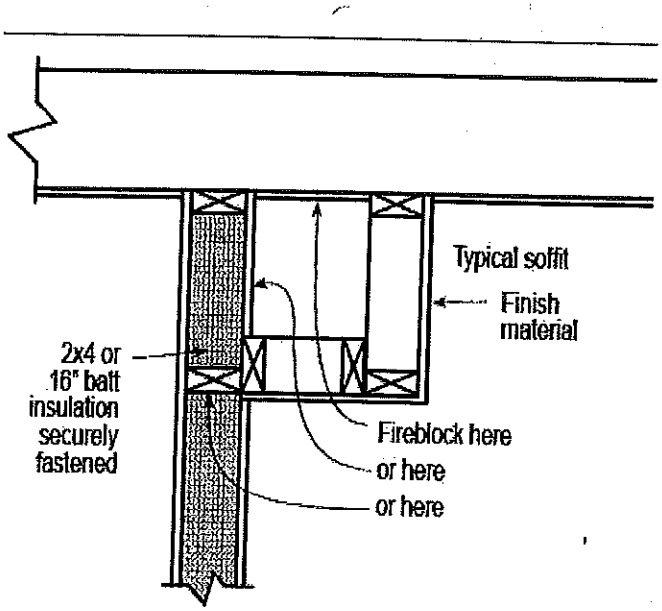
Wood in contact with masonry: R-317 Where wood is in contact with masonry or subjected to decay damage the material used must be preservative treated and listed for said use. Fasteners in this material must be listed and rated for the application.

Framing: Non-Load Bearing Walls: R602.5 Wall framing may consist of wood or metal studs framed (16" OC or 24" OC) Interior non-load bearing walls shall be capped with at least a single top plate. Provide sufficient fasteners for walls to remain rigid and in place. Framing shall not be connected to ductwork or supported by drywall facings. In Wood construction Framing connectors in treated material shall be hot-dipped galvanized, stainless steel, silicon bronze or copper.

Fire blocking: R302.11 Fire blocking shall be provided to cut off all concealed spaces to prevent both vertical and horizontal flame communication, to form a fire barrier between stories and between a top story and roof space. Fire blocking shall be provided 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.
- At all interconnections between concealed vertical and horizontal spaces. Ex. soffits, drop ceilings, cove ceilings.
- In concealed spaces between stair stringers at the top and bottom run.
- At openings around vents, pipes, ducts, cables and wires at ceiling and floor level (with an approved or prescriptive material to resist the passage of flame.

See Images below for examples of fireblocking and wall details.



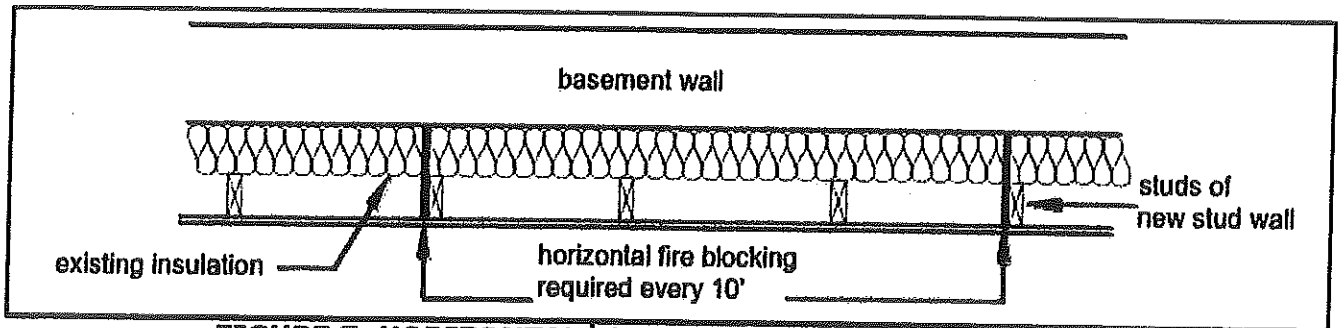


FIGURE 7: HORIZONTAL FIRE BLOCKING (LOOKING DOWN)

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 ½" gypsum board.

Fire block material: R302.11.1 Except as provided in R302.11 Item 4, Fire blocking shall consist of

- 2-inch nominal lumber
- Two thickness of 1 inch nominal lumber with broken laps
- One thickness of 23/32 inch plywood with joints backed by 23/32 inch plywood
- ¾ Particle board with joints backed by ¾ particle board
- ½ Gypsum board
- ¼ Cement based mill board

Batts or blankets of mineral wool or glass fiber (not fiberglass insulation) shall be permitted as an acceptable fire blocking material. Batts or blankets of mineral wool glass fiber shall be permitted for compliance with the 10 foot horizontal fire blocking in walls using parallel rows of staggered studs.

Draft Stopping: R302.12 Where there is usable space both above and below concealed spaces of a floor/ceiling assembly, draft stops shall be installed so that the area of the concealed space does not exceed 1000sq/ft. Draft stopping shall divide the concealed space into approximately equal area.

- Drop ceiling area below the floor framing.
- Floor framing that is constructed of open web floor trusses or perforated members.

Draft stopping materials:

- Minimum ½ drywall
- ⅜ plywood
- Other approved materials

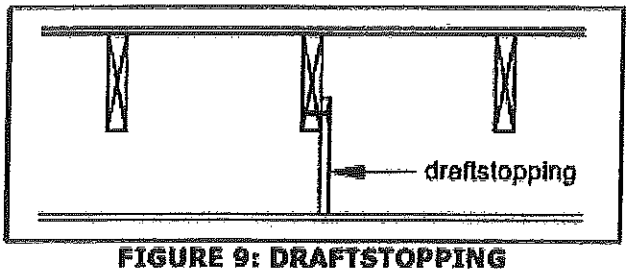


FIGURE 9: DRAFTSTOPPING AT DROP CEILING

Draft stopping shall be installed parallel to the floor frame down to the top of drop or drywall ceilings. ****The integrity of all draftstops shall be maintained.****

Insulation: N.J.A.C 5:23-6.6-17 When the work being performed creates or exposes the entire framing of any wall, floor, ceiling or roof assembly that is part of or alters the building thermal envelope (encloses conditioned space) insulation meeting Table R402.1.2 shall be installed so that it fills the cavity of the framed assembly. Insulation must be installed with the vapor barrier to the warm side of the conditioned space and fasted to the wall framing to remain permanently in place. Refer to manufacturers instructions.

Interior finishes: R302.9 Wall and ceiling finishes shall have a flame spread classification of not greater than 200 and a smoke development index of not greater than 450.

Drop Ceilings: Drop ceilings shall be installed per manufacturer's specifications. Lighting fixtures, fans and diffusers shale be supported by the track and not by the tile.

Stairways: R311.7 Maximum rise is 8 ¼ inches and minimum tread depth is 9 inches. When a tread depth is less than 11 inches a minimum ¾ inch and maximum 1-¼ inch nosing shall be provided and must be continuous (and uniform to ⅜") throughout the entire flight of stairs. The largest rise and tread shall not exceed the smallest rise and tread by 3/8 inch. Open risers are permitted to a maximum of 4 inches. Stairways with 4 or more rises are required to have at least 1 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. Landing shall be firm and level.

Guards: All walking surfaces that are 30 inches or more above grade measured at 36" horizontal from the face edge of the walking surface shall have a guard 36" minimum in height, and have balusters or other construction such that a sphere of 4 inches cannot pass through any opening. Exception: Openings in required guards on the sloped sides of stairs shall not allow a sphere of 4 3/8 inches to pass through. All stairways with a vertical rise of 30 inches or more are required to have guards on open sides measuring 34 inches or more above the leading edge of the tread. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such size that a 6 inch sphere can not pass through. Guards shall be designed and constructed such for a concentrated load of 200 pounds applied at any point and in any direction along the top railing member. The "in fill" area of a guard shall be designed and constructed for a horizontal concentrated load of 50 pounds applied on a one foot area in any point of the system, including intermittent rails or other elements serving this purpose

Handrails: At least one graspable handrail shall be provided on any stairway with (4) four or more rises. Handrails shall be minimum 30 inches to 38 inches measured vertically from the sloped plane of the adjacent tread. Handrails shall be continuous from a point above the top riser to the lowest riser. Ends shall be returned to a post or wall. Minimum space from handrail to wall surface is 1 ½ inches. Handrails shall be smooth and splinter free and have a minimum 1 ¼ inch to a maximum 2" circular cross section. Other handrail shapes that comply with section 2018 NJ IRC 311.7.8.5 are permissible, please submit details.

Requirements for bedrooms: R 310 Each sleeping room shall have at least one operable emergency escape and rescue opening. Such openings shall be within the sleeping room and open directly into a public way, yard or court that open directly to a public way. Emergency escape and rescue openings may be a door or window.

- Minimum window open area shall be 5.7sq/ft.
- Minimum required open width of 20"
- Minimum required open height of 24"
- The maximum sill height from finished floor shall be 44"
- For required window wells see R 310.2
- Hardwired smoke detectors shall be installed (1) in each new bedroom and (1) in the immediate vicinity of the bedrooms in accordance with NFPA 72.
- Carbon monoxide detectors shall be installed in the immediate vicinity of each sleeping area, if the home has a fuel burning appliance or attached garage. N.J.A.C 5:23-6.6(g)
    - Carbon monoxide may be battery operated, hardware or of the plug in type.

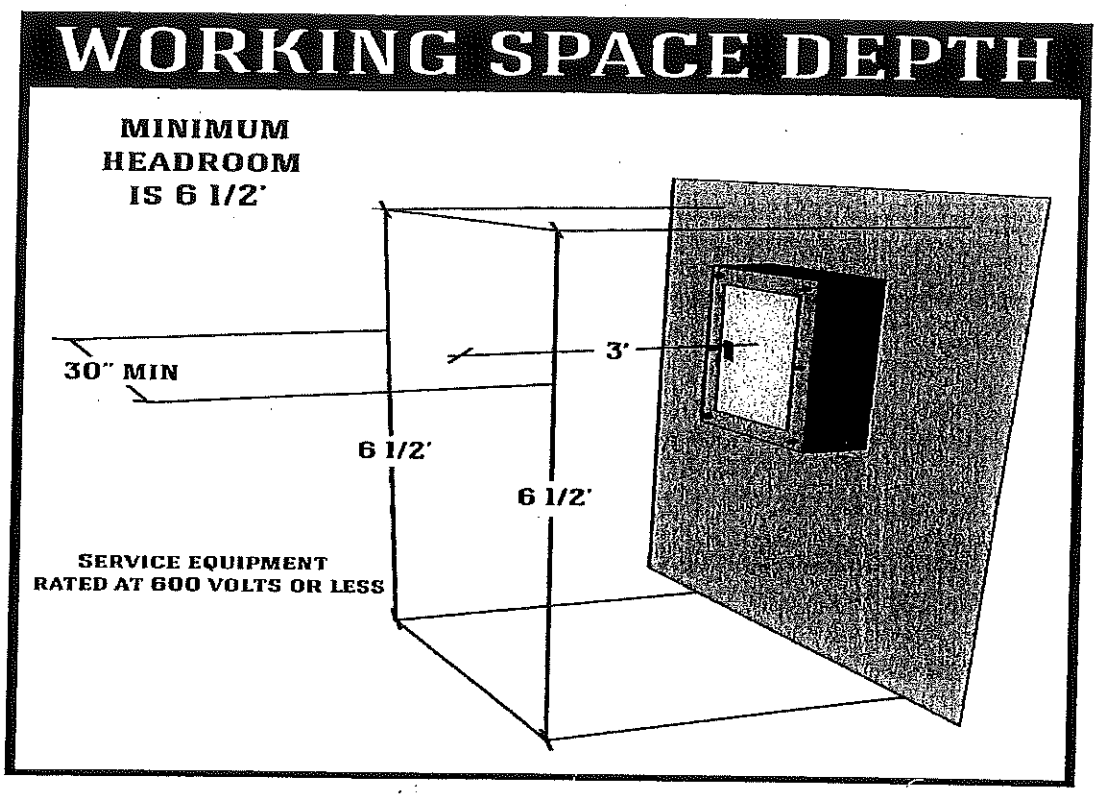
Plumbing: Plan Review information to be submitted with permit.

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 Sub-code for additional information that may be required.

Electrical: Based on the 2017 National Electrical Code

- Plans must show locations of all receptacles, switches, lighting, ejector pits, new fastened in place appliances, electric baseboard heaters, phone, network, CATV, smoke detectors, speakers etc.
- Receptacles to be spaced according to Article 210.52
- Receptacles shall be tamper resistant per Article 406.12
- Each unfinished area shall have at least one GFCI protected convenience receptacle per Article 210.8 (A)(5) and 210.52 (G)(3)
- Junction boxes shall be accessible after installation of all finishes Article 314.29
- Each finished or unfinished area shall have at least one switch-controlled Luminaire per Article 210.70(A)(1)+(3)
- Equipment requiring servicing shall have a lighting outlet at or near the equipment per Article 210.70(A)(3)

- Stairways must have at least one Luminaire and be controlled by one switch at each level per Article 270(A)(3)
- New circuits installed for finished areas shall be Arc Fault Protected per Article 210.12(A)
- Workspace clearances need to be considered around Panelboards and Sub Panels. No storage or foreign mechanical systems allowed in this zone. 36 inches depth, 30 inches wide from either side of the Panel, and height of 6' 6" as per Article 110.26
- 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)
- All wiring above a suspended ceiling must be supported independently by approved means per Article 300.11(2)



Informational Note: A luminaire is a light fixture.

Please consult the Electrical Sub-code official for additional information if needed.

Instructions on How to Complete A Combustion Air Calculation Sheet

A Combustion Air Calculation Sheet 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.

See worksheet below for a combustion air template

Plumbing Subcode Official

Hillsborough, NJ

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, as dryers require make up air not combustion air.***

_____ + _____ + _____ + _____ + _____ = _____**TOTAL BTU**

Furnace Water Heater Gas Fireplace Other Other

2. _____**Total BTU** ÷ 1000 x 50 = _____**Required Cubic Feet of Air Needed**

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

Room **Length** **Width** **Height**

_____ 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 = _____

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.

_____ ÷ 1000 = _____ Square inches (Minimum of 100 sq.in.)

TOTAL BTU

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

8. LouverLength	X	Width	X	Coefficient		Unobstructed Opening
_____	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

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.