**LIMIT OF LIABILITY**

The designs in this booklet are based on extensive research of the causes and effects of windstorm damage to buildings. Safe rooms designed and built to these standards should provide a high degree of occupant protection during extreme windstorms (tornadoes and hurricanes). Any substitution of either materials or design concepts may decrease the level of occupant protection and/or increase the possibility of personal injury during a severe wind event.

Because it is not possible to predict or test all conditions that may occur during severe windstorms or control the quality of construction among other things, the designer does not warrant the design. The designer neither manufactures nor sells safe rooms built from these designs. The designers have not made and do not make any representation, warranty, or covenant, express or implied, with respect to the design, condition, quality, durability, operation, fitness for use, or suitability of the safe room in any respect. Whatsoever. The designers shall not be obligated or liable for actual, incidental, consequential, or other damages of or to users of the safe room, or any other person or entity arising out of or in connection with the use, condition, and/or performance of the safe room built from this design or from the maintenance thereof.

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**FEMA P-320 SAFE ROOM CONSTRUCTION PLANS**

**TAKING SHELTER FROM THE STORM:**

**BUILDING A SAFE ROOM IN YOUR HOME OR SMALL BUSINESS** *

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**DRAWING #** | **SHEET TITLE**
--- | ---
SR0.0 | INDEX SHEET
SR0.1 | GENERAL NOTES
SR0.2 | GENERAL NOTES
SR0.3 | TABLES
SR1.0 | CMU SAFE ROOM PLANS AND DETAILS
SR1.1 | CONCRETE SAFE ROOM PLANS AND DETAILS
SR1.2 | ICF SAFE ROOM PLANS AND DETAILS
SR1.3 | WOOD FRAME SAFE ROOM PLANS AND DETAILS
SR1.4 | WOOD / CMU INFILL FRAME SAFE ROOM AND DETAILS
SR1.5 | DETAILS FOR SAFE ROOMS THAT USE BASEMENT WALLS
SR2.1 | SHEATHING REQUIREMENTS & WOOD FRAME SAFE ROOM WITH STEEL SHEATHING
SR2.2 | EXHAUST / VENTILATION DETAILS

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* SAFE ROOMS FOR SMALL BUSINESSES OR RESIDENTIAL USE WITH MORE THAN 16 OCCUPANTS ARE COMMUNITY SAFE ROOMS THAT HAVE ADDITIONAL REQUIREMENTS THAT THESE CONSTRUCTION PLANS DO NOT PROVIDE FOR. SEE SECTION 4.2 OF FEMA P-320 FOR FURTHER DETAILS.
1. THE CONSTRUCTION DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INCLUDE CONSTRUCTION MEANS AND METHODS. CONTRACTORS ARE ADVISED TO REVIEW THE "CONSTRUCTION SPECIFICATIONS" AND TO SEEK ADDITIONAL INFORMATION AS NECESSARY TO COMPLETE THE DRAWINGS. THE DRAWINGS SHOULD NOT BE SCALED. DIMENSIONS APPLY.

2. TO ENSURE THE SAFE ROOM PROVIDES THE DESIRED LEVEL OF PROTECTION, A PROFESSIONAL ENGINEER OR ARCHITECT SHOULD BE CONSULTED FOR ANY DESIGN CONDITION FOUND TO BE DIFFERENT FROM THOSE REPRESENTED BY THESE PLANS.

3. PROVIDE ALL DETAILS SHOWN OR REQUIRED BY CODE. INCLUDE BUT ARE NOT LIMITED TO BRACING, SHORING FOR CONSTRUCTION LOADS, TEMPORARY PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES IN ACCORDANCE WITH THE LOCAL BUILDING DEPARTMENT. ALL WORK OR CONSTRUCTION SHALL BE COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATIONS, AND SAFETY REQUIREMENTS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION AND COORDINATION OF ALL DIMENSIONS AND ELEVATIONS.

5. OPTIONS ARE FOR CONTRACTORS CONVENIENCE. IF AN OPTION IS USED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES AND SHALL COORDINATE ALL DETAILS.

6. DETAILS AND NOTES SHALL APPLY, THOUGH NOT NECESSARILY AT A SPECIFIC LOCATION ON PLANS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. DETAILS MAY ONLY SHOW ONE SIDE OF CONNECTION OR OMIT INFORMATION FOR CLARITY. WHERE DISCREPANCIES OCCUR IN THESE DRAWINGS, DETAILS AND NOTES ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.

7. NOT ALL OPENINGS ARE SHOWN IN THESE DRAWINGS. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR MECHANICAL, PLUMBING, AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS, AND SUBCONTRACTORS PRIOR TO CONSTRUCTION. OPENINGS MAY REQUIRE ADDITIONAL REINFORCING OR SUPPORTS AS SHOWN ON TYPICAL DETAILS. OPENINGS NEED TO BE PROTECTED PER ICC 500 316.1 AND 316.2.

8. COMPLETE INSPECTION REQUIREMENTS SHALL BE AS DIRECTED BY THE LOCAL BUILDING DEPARTMENT.

9. THE CONSTRUCTION DRAWINGS SHOULD NOT BE SCALABLE. DIMENSIONS APPLY.

10. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLING UPFRIGHT SHEAR RESISTANCE CONNECTORS.

11. PROVIDE ALL DETAILS SHOWN OR REQUIRED BY CODE. INCLUDE BUT ARE NOT LIMITED TO BRACING, SHORING FOR CONSTRUCTION LOADS, TEMPORARY PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES IN ACCORDANCE WITH THE LOCAL BUILDING DEPARTMENT. ALL WORK OR CONSTRUCTION SHALL BE COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATIONS, AND SAFETY REQUIREMENTS.

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18. COMPLETE INSPECTION REQUIREMENTS SHALL BE AS DIRECTED BY THE LOCAL BUILDING DEPARTMENT.

19. THE CONSTRUCTION DRAWINGS SHOULD NOT BE SCALABLE. DIMENSIONS APPLY.

20. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLING UPFRIGHT SHEAR RESISTANCE CONNECTORS.
1. YIELD STRENGTH FOR METAL IS 36 KSI MINIMUM IN HURRICANE-PRONE REGIONS, ALL METAL SHOULD BE G60 GALVANIZED BY THE MANUFACTURER.

2. SAFE ROOM W/ STEEL SHEATHING COVERED W/ GYP. BOARD FINISH OR OTHERWISE.

3. SAFE ROOM W/ STEEL SHEATHING UNCOVERED AND AVAILABLE FOR CONTACT BY SAFE ROOM OCCUPANTS MUST BE GROUNDED AT A SINGLE LOCATION W/ COPPER WIRE AND GROUND ROD TO MEET NATIONAL ELECTRIC CODE AND LOCAL REQUIREMENTS.

DOOR NOTES


2. FOR WOOD FRAMED SAFE ROOM, DOOR MUST BE PLACED ON LONGEST WALL.

3. FOR SMALL BUSINESS APPLICATIONS, DOORS MUST BE REQUIRED TO BE GROUNDED ACCESSIBLE WITH A MINIMUM WIDTH OF 3'-6".

COLD-FORM (LIGHT GAUGE) SHEATHING NOTES

1. MINIMUM WIND LOAD WALL REINFORCEMENT SHALL BE INSTALL TO THE REQUIREMENTS OF 1.0 RISK CATEGORY SR0.2.

2. FOR MASONRY SHEATHING WHICH IS COVERED OR UNCOVERED ARE SPECIFIED BY OTHERS.

3. SHEATHING WITHIN 5'-0" AT BLOCK WALL OPENINGS SHAL BE 2X TRIMMER STUDS AT EACH SIDE OF OPENING.

4. SHEATHING MAYS BE INSTALLED ON INSIDE OR OUTSIDE FACE. SINGLE LAYER TO "TYPICAL ROOF DEAD LOAD"

5. SHEATHING REINFORCEMENT SPACING SHOWN ON PLANS ARE AT MAXIMUM ON CENTERS. ALL BARS IN AREA OF THE BUILDING, EXISTING ORGANIC MATERIAL, UNSUITABLE SOIL, ±0.55 TO 1.0, 1.0, 1.0, LOOSE ANGLE BRICK LINTELS SHALL BE SPECIFIED BY OTHERS.

6. CONCRETE FOR ICF WALLS SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI MINIMUM. WHERE CALLED FOR ON THE PLANS TO USE FRAMING ANCHORS USE GALVANIZED NAILS.

7. DRAINAGE FILL SHALL BE A FREE-DRAINING GRANULAR MATERIAL. USE #57 STONE OR SELF-DRAINING MATERIAL.

8. CONCRETE ELEMENTS USING EPOXY ADHESIVES OR MECHANICAL ANCHORAGE.

9. REINFORCING BARS MAY BE INSTALLED ON OPPOSITE FACE.

10. MINIMUM MASONRY LINTEL SHALL BE AS INDICATED IN THE PLANS. ALL LINTEL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615.

11. THE SELECTED DOOR SHALL BE A TESTED ASSEMBLY AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

12. CONCRETE FRAMING LUMBER TO HAVE MODULUS OF ELASTICITY = 1,200,000 PSI MINIMUM.

13. EXTREME CARE SHOULD BE TAKEN WHEN VIBRATING THE CONCRETE INSIDE THE VIBRATING PLATE.

14. INTERNAL PRESSURE (GCpi)

15. TOPOGRAPHIC FACTOR (Kzt)

16. DIRECTIONALITY FACTOR (Kd)

17. EXPOSURE CATEGORY

18. WIND IMPORTANCE FACTOR (I)

19. TYPICAL ROOF LIVE LOAD (LR)

20. COLLABORATE LOAD

21. FOUNDATION NOTES

22. ALL FOOTINGS SHALL BEAR ON AND BE FORMED BY CLEAN, UNDISTURBED, VIRGIN, SAFE ROOM W/ STEEL SHEATHING COVERED W/ GYP. BOARD FINISH OR OTHERWISE.

23. ALL UNITS SHALL BE PLACED IN RUNNING BOND OR CORROSION-RESISTANT EQUIVALENT STEEL FRAMING ANCHORS.

24. ALL LINEMAN IN CONTACT WITH CONCRETE OR MASONRY SHALL BE TREATED AND SHALL COMPLY WITH APPLICABLE SAFETY STANDARDS.

25. GENERAL WOOD FRAMING NOTES

26. MINIMUM MASONRY LINTEL SHALL BE AS INDICATED IN THE PLANS. ALL LINTEL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615.

27. THE VERTICAL REINFORCEMENT INTERSECTS HORIZONTAL REINFORCING, BOTH SHALL BE CONTINUOUS.

28. MINIMUM MASONRY LINTEL SHALL BE AS INDICATED IN THE PLANS. ALL LINTEL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615.

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42. MINIMUM MASONRY LINTEL SHALL BE AS INDICATED IN THE PLANS. ALL LINTEL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615.

43. THE VERTICAL REINFORCEMENT INTERSECTS HORIZONTAL REINFORCING, BOTH SHALL BE CONTINUOUS.
### Concrete Development and Splice Table

<table>
<thead>
<tr>
<th>Bar Size</th>
<th>Tension (Class B Splice)</th>
<th>Compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤5,000 psi</td>
<td>≥4,000 psi</td>
<td>≥5,000 psi</td>
</tr>
<tr>
<td>Top</td>
<td>Other</td>
<td>Top</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>27</td>
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<td>7</td>
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<td>40</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>62</td>
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</table>

### Masonry Development and Splice Lengths

<table>
<thead>
<tr>
<th>Bar Size</th>
<th>Tension / Compression</th>
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<tbody>
<tr>
<td>6&quot; Masonry</td>
<td>8&quot; Masonry</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
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<tr>
<td>4</td>
<td>20</td>
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<td>5</td>
<td>32</td>
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<tr>
<td>6</td>
<td>54</td>
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</table>

### Wood Construction Connector Schedule

<table>
<thead>
<tr>
<th>Location</th>
<th>Required Uplift Capacity (lbs)</th>
<th>Simpson Strong-Tie</th>
<th>United Steel Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>#50</td>
<td>HGA16</td>
<td>HGA10</td>
</tr>
<tr>
<td>B</td>
<td>1,850</td>
<td>SSTB16 &amp; BPS BS-6&quot;</td>
<td>STB16-12-2</td>
</tr>
<tr>
<td>C</td>
<td>1,500</td>
<td>2-2MT12</td>
<td>2-MT12</td>
</tr>
<tr>
<td>D</td>
<td>1,600</td>
<td>HTA16</td>
<td>HTA16</td>
</tr>
<tr>
<td>E</td>
<td>1,850</td>
<td>HGM10</td>
<td>HGM10</td>
</tr>
<tr>
<td>F</td>
<td>1,500</td>
<td>LUTZ</td>
<td>LUTZ</td>
</tr>
<tr>
<td>G</td>
<td>1,100</td>
<td>2-SP7</td>
<td>2-SP7</td>
</tr>
<tr>
<td>H</td>
<td>*</td>
<td>HTA 16 OR PGA23</td>
<td>2-HTA12</td>
</tr>
<tr>
<td>J</td>
<td>4,500</td>
<td>HDSB-SDS2.5</td>
<td>PH3</td>
</tr>
</tbody>
</table>

### Roof Design Options

<table>
<thead>
<tr>
<th>Material</th>
<th>Span (ft)</th>
<th>8 ft</th>
<th>≤10 ft</th>
<th>≤12 ft</th>
<th>≤14 ft</th>
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</thead>
<tbody>
<tr>
<td>Wood</td>
<td>4&quot;</td>
<td>2x12</td>
<td>1x14</td>
<td>1x16</td>
<td>1x18</td>
</tr>
<tr>
<td></td>
<td>6&quot;</td>
<td>2x12</td>
<td>1x14</td>
<td>1x16</td>
<td>1x18</td>
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</table>

### Wall Reinforcement Schedule

<table>
<thead>
<tr>
<th>Wall Type</th>
<th>Reinforcement Per General Notes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; CMU</td>
<td>(1) #5 Bar Per Cell Over 2'-0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>8&quot; CMU</td>
<td>(1) #5 Bar Per Cell Over 2'-0&quot;</td>
<td>2</td>
</tr>
<tr>
<td>8&quot; Concrete</td>
<td>(1) #5 Bar Top And Btm</td>
<td>2</td>
</tr>
<tr>
<td>4&quot; ICF</td>
<td>(1) #5 Bar At 6&quot; OC</td>
<td>1.2</td>
</tr>
<tr>
<td>6&quot; ICF</td>
<td>(1) #5 Bar At 6&quot; OC</td>
<td>1.2</td>
</tr>
</tbody>
</table>

### Footing Schedule

<table>
<thead>
<tr>
<th>Footing Type</th>
<th>Roof Type</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Frame</td>
<td>Wood</td>
<td>4'-0&quot; x 1'-6&quot;</td>
<td>5</td>
</tr>
<tr>
<td>Concrete</td>
<td>Concrete</td>
<td>2'-0&quot; x 1'-0&quot;</td>
<td>3</td>
</tr>
</tbody>
</table>

### Notes

- **Top Bars are horizontal reinforcement placed so that more than 12" of fresh concrete is cast below the reinforcement.**
- **Lap splice lengths are based on bars spaced at 4 bar diameters or more on center. Notify Engineer if spacing is less than 4 bar diameters.**
- **Concrete development and splice table shown on detail SR/RT 1.0.**
- **Wood framed safe rooms can only use wood framed roof designs.**
- **When using wood roof with concrete, CMU, or ICF walls, sheathing must be installed on interior of ceiling as shown on detail SR/RT 1.0.**
- **Wood construction connector schedule shown on detail SR/RT 1.0.**
- **Use only hardware that have been evaluated through an approved product certification body such as APA-OES or ICC-ES.**
ALTERNATIVE CMU SAFE ROOM TO FOUNDATION WALL

CONNECTION TO FOUNDATION WALL:
- Use #5 bars at 16" O.C., with 24" embedment (expansion or epoxy set).
- Use 2" x 12" PT ledger board attached to foundation walls with 1/2" expansion or epoxy A.B. to resist 1,300 lbs. Install at 16" O.C.
- Reinforce intersection vertically with #5 bars at 16" O.C., insert into each wall Min. 24" embedment.

ALTERNATIVE WOOD SAFE ROOM TO FOUNDATION WALL

CONNECTION TO FOUNDATION WALL:
- Use #4 bars at 12" O.C., EW, full height, consult with local professional engineer for additional reinforcement criteria for non-safe room loads.
- Use 2" x 12" PT ledger board attached to foundation walls with 1/2" expansion or epoxy A.B. to resist 1,300 lbs. Install at 16" O.C.
- Reinforce intersection vertically with #5 bars at 16" O.C., insert into each wall Min. 24" embedment.

ALTERNATIVE CIP FOUNDATION ELEVATION

CASTING REQUIREMENTS:
- Minimum reinforcement shall be #4 bars at 12" O.C. EW, full height, consult with local professional engineer for additional reinforcement criteria for non-safe room loads.
- Vertical reinforcement continuous to footing and properly integrated with footing reinforcement.

ALTERNATIVE CMU FOUNDATION ELEVATION

CASTING REQUIREMENTS:
- Minimum reinforcement shall be #5 bars at 24" O.C. vertically, install horizontal reinforcing per general notes, grout walls solid full height per general notes, consult with local professional engineer for additional reinforcement criteria for non-safe room loads.
- Vertical reinforcement continuous to footing and properly integrated with footing reinforcement.

CORNER SAFEROOM PARTIAL PLAN

CONNECTOR EACH JOIST PAIR "H" SEE SCHEDULE 4/SR0.3
- Bond beam by others 8" bond beam w/ (1) #5 bar at bearing elevation.
- CMU wall (8" min) and footing by others.

CONNECTOR "C" SEE SCHEDULE 4/SR0.3
- Cast in place concrete wall and footing by others.
- Vertical reinforcement continuous to footing and properly integrated with footing reinforcement.
**1. Plywood Sheathing Attachment Pattern for Protection Layers on Exterior of Safe Room**

- **1st Layer Interior Plywood Sheathing**
- **3rd Layer Exterior Plywood Sheathing**
- **2nd Layer Plywood Sheathing**
- **3rd Layer Interior Steel Sheathing**
- **1st Layer Exterior Steel Sheathing**

**Sheathing Attachment Schedule**

<table>
<thead>
<tr>
<th>Sheathing Attachment Schedule</th>
<th>16d Nails</th>
<th>#6 x 3&quot; Wood Deck Screws</th>
<th>1/4&quot; x 1 1/2&quot; Self-Tapping Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>2'-6&quot; to 8'-0&quot;</td>
<td>2&quot; OC at edges 6&quot; OC in field</td>
<td>2&quot; OC at edges 6&quot; OC in field</td>
<td>3&quot; OC at edges 6&quot; OC in field</td>
</tr>
<tr>
<td>5'-1&quot; to 7'-0&quot;</td>
<td>3&quot; OC at edges 6&quot; OC in field</td>
<td>3&quot; OC at edges 6&quot; OC in field</td>
<td>4&quot; OC at edges 6&quot; OC in field</td>
</tr>
<tr>
<td>7'-1&quot; to 14'-0&quot;</td>
<td>4&quot; OC at edges 8&quot; OC in field</td>
<td>4&quot; OC at edges 8&quot; OC in field</td>
<td>6&quot; OC at edges 8&quot; OC in field</td>
</tr>
</tbody>
</table>

**NOTE:**

1. Sheathing attachment varies based on wall length, see attachment schedule for proper spacing.
2. Protection layers are to be installed alternating the long axis of the material from horizontal to vertical.
3. Minimum unbroken wall length is 3'-0".
4. With CMU infill option, omit steel layer and install 2nd layer of sheathing of final layer requirements.
5. Minimum sheathing piece width of 1'-0" exception 2nd layer of detail 1/8" may require upper sheathing piece width to be 7", 8-3/4", or 10-3/4 depending on joist depth.
6. Sheathing may be installed on inside or outside face, single layer to be installed on opposite face.

**SR2.1 Scale: 3/8" = 1'-0"**

**2. Plywood Sheathing Attachment Pattern for Protection Layers on Interior of Safe Room**

- **2nd Layer Plywood Sheathing**
- **3rd Layer Exterior Plywood Sheathing**
- **3rd Layer Interior Steel Sheathing**
- **1st Layer Exterior Steel Sheathing**

**Sheathing Attachment Schedule**

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</tr>
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</tr>
<tr>
<td>7'-1&quot; to 14'-0&quot;</td>
<td>4&quot; OC at edges 8&quot; OC in field</td>
<td>4&quot; OC at edges 8&quot; OC in field</td>
<td>6&quot; OC at edges 8&quot; OC in field</td>
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**NOTE:**

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2. Protection layers are to be installed alternating the long axis of the material from horizontal to vertical.
3. Minimum unbroken wall length is 3'-0".
4. With CMU infill option, omit steel layer and install 2nd layer of sheathing of final layer requirements.
5. Minimum sheathing piece width of 1'-0" exception 2nd layer of detail 1/8" may require upper sheathing piece width to be 7", 8-3/4", or 10-3/4 depending on joist depth.
6. Sheathing may be installed on inside or outside face, single layer to be installed on opposite face.

**SR2.1 Scale: 3/8" = 1'-0"**
<table>
<thead>
<tr>
<th>TORNADO SAFE ROOM OCCUPANCY</th>
<th>PASSIVE VENTILATION AREA REQUIRED (INCHES SQUARED)</th>
<th>MINIMUM NUMBER OF PIPE VENTS PER DETAIL 1</th>
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*PER ICC 500 SECTION 702.1 EXCEPTION, AIR INTAKE OPENING(S) MUST BE INSTALLED A MINIMUM OF 72" ABOVE SAFE ROOM FLOOR. WHEN INSTALLED ONLY IN UPPER PORTION, EXCEPTION REQUIRES 4 SQUARE INCHES PER OCCUPANT.*

**PASSIVE VENTILATION AREA PER ICC 500 SECTION 702.1 AND ASSUMES AIR INTAKE OPENINGS ARE DISTRIBUTED BETWEEN THE UPPER AND LOWER PORTIONS OF SAFE ROOM AS SPECIFIED THEREIN. AREA AND RESULTING NUMBER OF VENTS REQUIRED MUST BE DOUBLED WHEN AIR INTAKE OPENINGS ARE INSTALLED EXCLUSIVELY IN THE UPPER PORTION AS PROVIDED PER EXCEPTION IN SECTION 702.1.

CONSULT WI LOCAL BUILDING OFFICIAL AND REFER TO ICC 500 SECTION 306.3 AND 306.4 FOR OPENING PROTECTIVE REQUIREMENTS.

*2" DIA PIPE VENTILATED OUTSIDE SAFE ROOM SPACE WITH ELBOW FACING DOWN*