Tornado Safe Room Worksheet

For preliminary Benefit-Cost Analysis conducted by the State Mitigation Technical Team

Applies for the following mitigation activities: **TORNADO SAFE ROOM projects which include community and residential safe rooms.** For assistance, contact the State of Florida Mitigation Technical Unit.

IMPORTANT: This worksheet is required as part of your application. The State of Florida Mitigation Technical Unit will conduct a Benefit Cost Analysis (BCA) for your project and the following information is needed to evaluate cost effectiveness. Once a preliminary BCA is completed, the reviewer will contact you with results and/or to collect support documentation.

NOTE: A complete worksheet will expedite the Technical Review.

Requirements

To complete a successful project application, a minimum amount of technical information is required for review. Data collected in this worksheet will provide reviewers with preliminary information necessary to evaluate project eligibility, feasibility, and cost effectiveness. Carefully review and confirm that you are aware of the following information.

Standalone safe room projects: The safe room should be designed and constructed to provide protection against the wind speed requirements for safe room construction in the project area. The safe room construction shall be designed to provide "near-absolute protection" based on the criteria contained in the standards of the Department of Homeland Security, Federal Emergency Management Agency guidance manual FEMA P-361 Design and Construction for Community Safe Room which refers to applicable ICC 500 and ASCE 7 standards. Construction documents for community safe rooms designed for more than 50 occupants, as well as for safe rooms in an elementary school, secondary school, day care facility with an occupant load greater than 16, or any Risk Category IV building, are required to undergo peer review. Only eligible expenditures that are directly related to and necessary for the hazard mitigation purpose of providing immediate life-safety protection shall be reimbursed. Eligible and ineligible costs are outlined in the latest edition of the HMA Guidance. Activities shall be completed in strict compliance with Federal, State, and Local applicable Rules and Regulations.

Internal safe room projects: The internal safe room or area should be designed and constructed to be structurally independent of the host building, providing protection against the wind speed requirements for safe room construction in the project area, the same as a stand-alone safe room. The design of the safe room should assume the failure of the host building. The internal safe room construction shall be designed to provide "near-absolute protection" based on the criteria contained in the standards of the Department of Homeland Security, Federal Emergency Management Agency guidance manual FEMA P-361 Design and Construction for Community Safe Room which refers to applicable ICC 500 and ASCE 7 standards. Construction documents for community safe rooms designed for more than 50 occupants, as well as for safe rooms in an elementary school, secondary school, daycare facility with an occupant load greater than 16, or any Risk Category IV building, are required to undergo peer review. Only eligible expenditures that are directly related to and necessary for the hazard mitigation purpose of providing immediate life-safety protection shall be reimbursed. Eligible and ineligible costs are outlined in the latest edition of the HMA Guidance. Activities shall be completed in strict compliance with Federal, State, and Local applicable Rules and Regulations.

I confirm that I have reviewed the requirements listed above (signature): _____

For additional information and resources, please refer to FEMA Technical Review Job Aid for Safe Room projects.

Section I – Project General Information

Project Name:	*Worksheet completed by:* *Name:* *Title:* *Phone:* *Email:*
Sub-Applicant:	

Section II – Project Cost Information

Mitigation Project Cost:	*Annual Maintenance Cost:*

Section III – Project Specific Information

Safe room location (address):

Is this a community or residential safe room?

☐ Community ☐ Residential

Are you proposing to retrofit an existing structure?

☐ Yes ☐ No

Are you proposing a stand-alone or an internal safe room?

☐ Stand-alone ☐ Internal Safe Room

What is the wind speed the safe room will be designed to withstand?

☐ 130 MPH ☐ 160 MPH ☐ 200MPH ☐ 250 MPH

Is the safe room going to be constructed at the designated location or is the safe room prefabricated? Select one:

☐ Constructed at a location ☐ Prefabricated

Provide the number of occupants expected to use the safe room and describe how the number of potential occupants was derived:

What is the predominant structure type(s) that people will leave to go to the safe room. Indicate up to two types:

Structure Type 1
- Select -

Structure Type 2
- Select -

Enter the percent of total occupancy coming from each structure type (Each period must equal 100%):

	Time	Type 1	Type 2	Total
Day	*6:00 AM – 6:00 PM*			
Evening	*6:00 PM - Midnight*			
Night	*Midnight – 6:00 AM*			

Section IV – Additional Mitigation Action

Are you proposing to install a generator to support all critical functions of the safe room?

☐ *No (Explain why in section V below)* ☐ *Yes (Complete Generator Worksheet)*

Section V – Additional Information

Please use this page to expand on the information provided above or to include any additional information relevant to the proposed mitigation project

TORNADO SAFE ROOM WORKSHEET INSTRUCTIONS

Refer to the instructions below to complete the Tornado Safe Room Worksheet using the best available data.

Section I – Project General Information

Project Name: Enter the name of the project title. The title should be short but descriptive (e.g., City of Orlando, Eagles Elementary School, Tornado Safe Room).

Sub-Applicant: Enter your organization's legal name.

Worksheet completed by: Enter name, title, phone number, and email of the person completing this Worksheet. This person must have the knowledge and/or the resources to accurately answer all questions and provide supporting documentation, as needed. Information may come from multiple creditable sources.

Section II – Project Cost Information

Mitigation Project Cost: Enter the total cost of the project. A lump sum on this worksheet is acceptable for preliminary BCA, but a detailed breakdown attached to your application is required.

Annual Maintenance Cost: Relates to the amount of money you expect to spend every year maintaining the project, to ensure functionality at the time of a high wind event.

Section III – Project Specific Information

Project Location: Provide a full description of the specific geographical location of the project.

Is this a community or residential safe room?

Community Safe Room: Community safe rooms are designed and constructed to protect a larger number of people. The number of persons taking refuge in the safe room can be up to several hundred or more. These safe rooms include not only public but also private safe rooms for businesses and other types of organizations.

Residential Safe Room: Can be internal, in-home retrofits or newly constructed, stan-alone structures that are external to the resident. In both cases, these rooms are small, specially designated "hardened" rooms, which are intended to provide a place of refuge for the people who live in the home. Internal safe rooms may be a retrofit of an existing bathroom or closet, while an external safe room is a separate structure installed outside the home, either above or below ground. According to P3-61, a residential safe room can have a maximum occupancy of 16 persons.

Are you proposing a stand-alone or an internal safe room?

Stand-alone: A separate building (i.e., not within or attached to any other building) that is designed and constructed or retrofitted to withstand extreme winds and the impact of windborne debris during tornados.

Internal Safe Room: A specially designed and constructed room or area within or attached to a larger building. An internal safe room should be designed and constructed or retrofitted to be structurally independent from the larger building and provide the same wind and windborne debris protection as a standalone safe room.

Is the safe room going to be constructed at the designated location or is the safe room prefabricated? Select one option:

- Constructed at a location: The proposed hurricane safe room will be constructed at the project site. A signed and sealed letter from a professional engineer, certifying that the structure will be designed and constructed in accordance with the most current edition of FEMA P-361 (for non-prescriptive designs) or FEMA P-320 (for prescriptive designs), is recommended.

- Prefabricated: For prefabricated safe rooms, a National Storm Shelter Association (NSSA) certification is recommended. The certification provided by the NSSA must state that the safe room design meets or exceeds the FEMA program requirements. For prefabricated safe rooms that are non-NSSA certified, a signed and sealed letter from a professional engineer, certifying that the prefabricated structure will be designed and constructed in accordance with the most current edition of FEMA P-361 is recommended.

What is the wind speed the safe room will be designed to withstand? Enter the wind speed that the safe room will be designed to withstand. Tornado safe room design wind speed must be consistent with the wind speed zone of the project location, which can be found in FEMA P-361.

Provide the number of occupants expected to use the safe room and describe how the number of potential occupants was derived: Enter the number of people who will be expected to use the safe room during a tornado warning. For example, a community safe room for a school would need to accommodate the number of students, teachers, support staff, administrators, and average daily visitors. All occupancy data must be documented, but the occupancy documentation may vary

depending on the population serviced with the following as some examples:

Residential (one-or two-family residences and manufactured housing): average household size per U.S. Census data.
Schools: student enrollment records, school employment data, and average daily visitor logs.
Businesses: maximum number of employees per day and average number of daily clients.
Open areas (park or fairground): historical site usage records.
Institutional building: hospital beds and average utilization rate data.

What is the predominant structure type(s) that people will leave to go to the safe room. Indicate up to two types: From the dropdown menu, select the predominant structure type(s) that people will leave to go to the safe room. Select up to two (2) types. The predominant structure type represents the location (before-mitigation) of the population during a tornado event and should be selected based on where the occupants will evacuate from in the response area. Different structure types that the occupants will evacuate from have different "building performance" against the wind hazard, meaning that a manufactured home will not provide as much protection from high winds as a solidly-constructed institutional building. This factors into the likelihood for before-mitigation causalities that will be mitigated by the project. The occupancy data for a second predominant structure type may be entered if applicable to the project, but is not required. For safe rooms built inside an existing building, the predominant structure type selection should include that structure as a predominant structure type.

Enter the percent of total occupancy coming from each structure type (Each period must equal 100%): In whole numbers, enter the percent (not the actual number) of occupants in the safe room coming from the structure type(s) for each time period. Whether one or two predominant structure types are used in the analysis, the percentage of occupancy for at least one time period (typically the "Day" period) must add up to be 100%. The occupancy during other time periods may be or add up to be less than 100% to reflect the percentage of the maximum occupancy available to use the safe room. Documentation should clearly explain the methodology used for determining the Percent of Total Occupancy for Structure Type for the one or two predominant structure types in the analysis.

Section IV – Additional Mitigation Action

Are you proposing to install a generator to support all critical functions of the safe room? Select yes or no. If no, provide a brief explanation. If yes, please complete generator worksheet.