

PROCEDURES FOR DEVELOPING SCOPES OF WORK FOR WIND RETROFIT PROJECTS

August 11, 2006

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>PROCEDURES FOR DEVELOPING SCOPES OF WORK FOR WIND RETROFIT PROJECTS</p> <p>1. PURPOSE</p> <p>The Federal Emergency Management Agency (FEMA) administers two grant programs to assist communities in mitigating the effects of wind hazards: the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) competitive grant program. State, Tribal, and local government agencies may apply through the States to receive funds for these programs. FEMA requires these sub-applicants to meet a specific set of requirements when applying for the funds to ensure that proposed projects meet the program requirements, Federal environmental laws and regulations, feasibility, and cost-effectiveness requirements.</p> <p>By submitting the data described in Section 2, the sub-applicant facilitates both State and FEMA review of the funding application. Scopes of Work (SOWs) without these data may result in delays or the project funding request being declined. An example application exhibiting the components described in this guidance is included.</p> <p>The left column (Procedures) presents information on the format and requirements for sub-applicants to provide technical and other data in support of their request for funding. The right column (Sample Data) provides examples of data and the presentation or format of the data that the State and FEMA will need to review during its evaluation of the application.</p>	

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<p>Specific information regarding the administrative and eligibility requirements for mitigation programs is not presented here. This report represents a summary of areas that should be covered in an SOW for a mitigation project application. Some areas can be significantly expanded using FEMA or other guidance for implementing specific programs, conducting an environmental/historic preservation compliance review, and completing a benefit-cost analysis (BCA) to determine cost-effectiveness. The State Hazard Mitigation Officer (SHMO) or FEMA Regional Office should be contacted for additional information. Also, additional requirements from the SHMO are not covered in this document.</p> <p>2. DEVELOPING THE SCOPE OF WORK FOR A WIND RETROFIT PROJECT</p> <p>One goal of FEMA’s mitigation programs is to reduce the potential of future damage from natural hazards (i.e., tornadoes or hurricanes). To achieve this goal, FEMA may provide funding to communities for wind retrofits to structures, provided that the property owner agrees to the retrofit.</p> <p>Two methods of reducing future deaths, injuries, and damage from high winds are (1) retrofitting structures to protect the integrity of the building envelope, thus avoiding failure and reducing damage and (2) adding a safe room. Wind retrofits strengthen the building components to withstand the forces of high winds. Safe rooms provide a place for occupants to take refuge.</p>	

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<p>A wind retrofit mitigation project has one purpose: to protect the integrity of the building envelope. It must be able to minimize damage and avoid building failure by envelope penetration. This must be reflected in the SOW, which must include an engineer’s assessment that the building has adequate structural integrity to withstand the design wind.</p> <p>Summary of Required Sub-Application Information</p> <p>When a community applies for funding for a wind retrofitting project, the following information must be submitted with the sub-application:</p> <ol style="list-style-type: none"> 1. Basic sub-applicant, contact, and community information (Section 2.1). 2. Information regarding the applicable Hazard Mitigation Plan for the jurisdiction in which the project is being implemented (Section 2.1). 3. Descriptions of the hazard, the problem, and the project (Section 2.1). 4. Information regarding the Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) if applicable (Section 2.2). 5. Property site inventory (Section 2.3). 6. Description of the decision-making process and evaluation of alternatives (Section 2.4). 	<p>The City has followed the applicable program guidance and available checklists in providing and organizing the data to support the funding request.</p>

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<p>7. BCA and supporting documentation (Section 2.6).</p> <p>8. Detailed SOW, which includes a project description (Section 2.7).</p> <p>9. Sources of the Cost Share (Section 2.7).</p> <p>10. Schedule for completing the scope of work once the retrofit is completed (Section 2.8).</p> <p>11. Cost estimate (Section 2.8).</p> <p>12. Description of environmental/historic preservation considerations and supporting documentation (Section 2.9).</p> <p>Internet Resources</p> <p>The FEMA website (www.fema.gov) and the e-Grants portal (https://portal.fema.gov/famsVu/dynamic/mitigation.html) provide useful information to assist sub-applicants. Other useful websites include:</p> <ul style="list-style-type: none"> • FEMA Mitigation Division, Education and Training (http://www.fema.gov/about/training/index.shtm). • FEMA Mitigation Division, Mitigation Grant Programs, HMGP (http://www.fema.gov/government/grant/hmgp/index.shtm). 	

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<ul style="list-style-type: none">• FEMA Mitigation Division, Mitigation Grant Programs, PDM (http://www.fema.gov/government/grant/pdm/index.shtm).• FEMA Mitigation Division, Success Stories and Case Studies (http://www.fema.gov/plan/prevent/bestpractices/casestudies.shtm).• Hurricane Hazards (http://www.fema.gov/hazard/hurricane/hu_hazard.shtm).• Tornado Hazards (http://www.fema.gov/hazard/tornado/index.shtm).• National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center (www.spc.noaa.gov/faq/tornado/).• National Climatic Data Center (http://www.ncdc.noaa.gov/oa/ncdc.html).• NOAA Coastal Services Center (http://hurricane.csc.noaa.gov/hurricanes/index.htm).• National Hurricane Center (www.nhc.noaa.gov).• FEMA Environmental/Historic Preservation (http://www.fema.gov/plan/ehp/ehp-applicant-help.shtm).	

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<ul style="list-style-type: none">• FEMA Environmental/Historic Preservation Helpline (toll free at 866-222-3580 or via e-mail at ehhelpline@dhs.gov).• FEMA BCA (www.fema.gov/pdf/government/grant/pdm/guidelines_for_bca.pdf).• FEMA BCA Helpline (toll free at 866-222-3580 or via e-mail at bchelpline@dhs.gov).• FEMA Engineering Feasibility Helpline (toll free at 866-222-3580 or via e-mail at enghelpline@dhs.gov).• FEMA 320 - Taking Shelter From the Storm: Building a Safe Room Inside Your House (http://www.fema.gov/pdf/fima/fema320).• FEMA 361 - Design and Construction Guidance for Community Shelters (http://www.fema.gov/fima/fema361.shtm).• FEMA 247 - Against the Wind: Protecting Your Home From Hurricane and Wind Damage (http://www.fema.gov/pdf/rebuild/recover/agstwnd.pdf).• For other FEMA Hurricane Resource publications (http://www.fema.gov/plan/prevent/howto/index.shtm#5).	

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<p>2.1. STEP 1: OBTAIN BASIC PROJECT INFORMATION</p> <p>The sub-applicant must provide the following basic information to apply for funds:</p> <ul style="list-style-type: none"> • Information regarding the organization applying for the grant, including: <ul style="list-style-type: none"> - Legal status and function. - State and Federal employer tax identification numbers. - DUNS Number. - State and Federal legislative district information. • Information for primary and alternate State and local contacts. Contacts for data clarification or additional data and all consultants should also be clearly identified. 	<p><u>Sub-applicant:</u> City of Adversity, located in Prosperity County in the State of Any State (AS).</p> <p>State Employer Tax Identification Number: 4576-3456-7782</p> <p>Federal Employer Tax Identification Number: 8897-5643-7743</p> <p><u>Legislative Districts:</u> 1st Congressional District; 2nd State Assembly District; 3rd State Senate District</p> <p>Primary Local Point of Contact:</p> <table border="0"> <tr> <td>Taylor Gilmour</td> <td>Job Title:</td> <td>Director of City Services</td> </tr> <tr> <td>City of Adversity, AS</td> <td>Telephone:</td> <td>(111) 711-0022</td> </tr> <tr> <td>City Hall, Room 410</td> <td>Fax:</td> <td>(111) 711-0333</td> </tr> <tr> <td>35003 Tornado Alley</td> <td>E-mail:</td> <td>tgilmour@adv.as.us</td> </tr> <tr> <td>Adversity, AS 40009</td> <td></td> <td></td> </tr> </table> <p>Alternate Local Point of Contact:</p> <table border="0"> <tr> <td>James Koff</td> <td>Job Title:</td> <td>Chief Engineer</td> </tr> <tr> <td>City of Adversity, AS</td> <td>Telephone:</td> <td>(111) 711-0045</td> </tr> <tr> <td>City Hall, Room 312</td> <td>Fax:</td> <td>(111) 711-0335</td> </tr> <tr> <td>35003 Tornado Alley</td> <td>E-mail:</td> <td>jkoff@adv.as.us</td> </tr> <tr> <td>Adversity, AS 40009</td> <td></td> <td></td> </tr> </table>	Taylor Gilmour	Job Title:	Director of City Services	City of Adversity, AS	Telephone:	(111) 711-0022	City Hall, Room 410	Fax:	(111) 711-0333	35003 Tornado Alley	E-mail:	tgilmour@adv.as.us	Adversity, AS 40009			James Koff	Job Title:	Chief Engineer	City of Adversity, AS	Telephone:	(111) 711-0045	City Hall, Room 312	Fax:	(111) 711-0335	35003 Tornado Alley	E-mail:	jkoff@adv.as.us	Adversity, AS 40009		
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<ul style="list-style-type: none"> • National Flood Insurance Program (NFIP) community name, Community Identification Number (CID), participation status, and compliance history. • Information clearly defining the location of the proposed project, including latitude and longitude. Attach maps showing the location of the project. Acceptable formats include recent topographic maps or aerial photographs, and U.S. Geological Survey (USGS) quadrangle maps. Also, note the existence of any deeds or restrictions that might limit Federal funding for the project. • Identification of any FEMA grant funds previously received for the project. For example, if the facility was damaged during an event that the President declared to be a disaster, the sub-applicant may have received a grant to repair the facility under the Public Assistance Program. • A description of any projects or components of this project, whether funded by FEMA or another entity, that will be completed in the vicinity of the project. FEMA must evaluate cumulative effects of projects when conducting the environmental review. 	<p><u>NFIP Community Name:</u> City of Adversity, located in Prosperity County in the State of Any State (AS); CID = 006006.</p> <p><u>NFIP Participation Status:</u> Participating since June 1974. Last Community Assistance Visit conducted in January 2000. The City has adopted the minimum floodplain management criteria required under the NFIP.</p> <p>The project is located in the central business district in the southwestern section of the City of Adversity. The attached aerial map (dated 1997) shows the locations of the project, with GPS coordinates given for the structure.</p> <p>The project is located in a relatively flat lowland area with an overall slope towards the Gulf of Mexico. The land adjacent to the Gulf is 1 to 5 feet above normal high tide sea level, with a sharp rise adjacent to the Gulf.</p> <p>The City has not previously received disaster assistance for repairs or wind retrofitting of this structure. However, the City received assistance from FEMA for emergency response and debris removal following the Presidential disaster declaration for the 03/28/02 event.</p> <p>No other projects are currently proposed for the area in which the project is to be implemented.</p>

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<ul style="list-style-type: none"> • A description of the proposed mitigation project that is the preferred solution (i.e., Solution No. 1). Identify the wind retrofit method(s) proposed for the project. Options for wind retrofits may include reinforcing the structural elements of the building. <p>A Wind Retrofit project can take two forms based on whether the project is meant to reduce damages to a building or to provide a place of shelter from wind or wind-borne debris. It will probably be necessary to seek the help of a professional engineer or architect, a building contractor, or the local building department. All wind retrofits must also meet the requirements of local and/or state building codes.</p> <p>Wind mitigation projects may include modifications to the foundation, exterior and load bearing walls, roof, or doors and windows to keep the building envelope intact and provide adequate anchorage to transmit wind forces from the roof down through the foundation.</p> <p>A shelter may be constructed outside an individual home as a stand-alone shelter separate from the main building, or as an internal shelter/safe room built within an existing building such as a school, library, city hall, police station, fire station, or hospital.</p>	<p>Solution No. 1 - (Preferred Solution)</p> <p>The proposed project will protect Community Hospital (a critical facility) located in the central business district of the City. The mitigation measure will involve a hurricane wind retrofit, including wind and door shutters and interior shelter areas. The hospital administration has expressed strong interest in this project.</p> <p>The proposed shutter project will consist of a steel roll-down shutter system covering the entire 6,000 square feet of exterior glass area (64 individual windows and 8 double doors). The shutter system includes electric motors to allow automated closure and a manual override for operation during a power outage.</p> <p>The existing hospital was designed in 1984 as an enclosed building with an Importance Factor of 1.15 and Exposure Category C. The building and exterior doors were originally designed and constructed to withstand a 90-mph fastest mile design wind. However, wind design was not incorporated into the design of the building envelope and currently no windows or glass doors are protected from wind pressures or windborne debris. The shutter system will be designed to withstand positive and negative wind pressures associated with wind speeds up to 110 miles per hour, and resist debris impact forces in accordance with the International Residential Code/International Building Code (IRC/IBC).</p>

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<p>The retrofit to reduce damage may include reinforcing or replacing garage doors, reinforcing double-entry doors, bracing gable end roof framing, or installing shutters or window covers.</p> <ul style="list-style-type: none"> • A description of the problem that will be solved through implementation of the wind retrofit project. 	<p>Because of the need to keep critical care patients at the hospital during a hurricane, the interior shelters will be multi-use facilities that can be used for day-to-day business when the shelter function is not needed. The critical care facility, surgical suites, neo-natal unit, lunch room, and hallways will be hardened for patients, medical and other hospital staff, and visitors. It has been determined that load-bearing and non-load-bearing walls will withstand wind pressures and missile impacts (see engineering report).</p> <p>Existing exterior doors will be strengthened or replaced to increase their stability and all windows will be covered by the shutter system.</p> <p>The proposed project will reduce future damage from high winds, health and safety risks, clean-up costs, and displacement time from Community Hospital. The building is located outside of the 500-year floodplain but has sustained water damage due to heavy rainfalls and localized flooding from several hurricanes and tropical storms. Although the building has not been struck by a tornado spawned by the hurricanes, several tornadoes have struck in the vicinity of the hospital. A list of the damages and repair costs is attached.</p> <p>An analysis of the damage history indicates that typical damage is to equipment and patients' rooms and has led to costly disruptions to the hospital functions. The proposed mitigation project will reduce wind damage by adding shutters to the building windows and exterior doors and provide safe rooms for protection from a Category 3 event and partial protection from a Category 4 event.</p>

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<ul style="list-style-type: none"> • A description of how the proposed wind retrofit project will solve the problem. • The scheduled completion date for the project. • If applicable, the community’s Community Rating System (CRS) status. • If applicable, the status of the community’s multi-hazard mitigation plan should be provided. If the community has a plan, but no recorded approval such as a letter from FEMA, a copy of the plan may be required. • If the community has an approved multi-hazard mitigation plan, the application should reference how the plan recommends mitigating the problem. • Additional information that will be required to support the project application is described below. Include any 	<p>Future high wind damage for Community Hospital will be reduced by reinforcing the existing exterior doors and reducing the effect of wind-borne damage to windows. Internal shelters will be constructed to protect the life and safety of critical care patients, hospital staff, and visitors. The safe rooms will be compliant with the design standards in FEMA 361 - Design and Construction for Community Shelters. The critical care area, surgical suites, neo-natal unit, lunch room, and hallways will be retrofitted to safe-room standards.</p> <p>The City anticipates completing the project by November 2007. This assumes approval of the grant application by October 2006.</p> <p>The City is a signatory to the multi-jurisdictional plan prepared for Prosperity County. The City adopted the plan on July 1, 2003, and the plan was approved by FEMA on September 1, 2003. This plan includes a specific section addressing wind hazard mitigation.</p> <p>The July 1, 2003, multi-jurisdictional plan for Prosperity County referenced reduction of high wind hazards throughout the City of Adversity by installing wind retrofit projects for homes and safe rooms within critical facilities.</p>

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<p>information, such as photographs, newspaper accounts, damage surveys, or owner receipts for repairs.</p> <p>2.2. STEP 2: GATHER HAZARD INFORMATION FOR THE PROJECT AREA</p> <p>2.2.1. Wind Hazard Data</p> <p>Information regarding wind hazard data can be found in many technical documents. For instance, two specific FEMA documents provide excellent information and references on wind zones:</p> <ul style="list-style-type: none"> • FEMA 320 - Taking Shelter From the Storm: Building a Safe Room Inside Your House (http://www.fema.gov/pdf/fima/fema320); and • FEMA 361 - Design and Construction Guidance for Community Shelters (http://www.fema.gov/plan/prevent/saferoom/index.shtm). <p>Also, several building code councils include wind speed maps or wind design manuals as part of the services that they offer.</p> <p>Applicants and sub-applicants are encouraged to contact their state emergency management office and discuss their proposed mitigation project with the State Hazard Mitigation Officer (SHMO) to obtain a more state-specific hazard map and assistance.</p>	

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<p>Once you have identified wind hazard data affecting the building, structure information should be submitted with the application supporting this, such as:</p> <ul style="list-style-type: none"> • A copy of the Design Wind Speed Map for Community Shelters form FEMA Publication 361, dated July 2000. The map should be copied at the same scale as other maps of the project area. • A copy of a community map with the location(s) of the structures to be retrofitted clearly marked. <p>2.2.2. High Wind History</p> <p>The sub-applicant should document the history of high wind problems in the project area. Essential information includes date(s) of high wind events, hurricane names, high wind characteristics, damage location, description of damage, duration, and extent of the high winds, and cost of damage. Other key data include:</p> <ul style="list-style-type: none"> • Wind load provisions are based on the American Society of Civil Engineers (ASCE) publication 7-05. ASCE used historical data from the Storm Prediction Center to 	<p>See attached copy of the Design Wind Speed Map for Community Shelters from FEMA Publication 361, dated July 2000, and copy of a local topographic map (based on an aerial survey from April 1997) with the project site marked in red on each map.</p> <p>See attached copy of a City street map with the location of the hospital marked in red.</p> <p>Many residents in Adversity live on or near the Gulf of Mexico, and approximately 1,500 property owners have suffered high wind damage since records have been kept. Most recently in 2005, a Category 3 hurricane struck the Adversity area, causing significant damage to numerous structures, including the hospital proposed for the wind retrofit project.</p> <p>Due to Adversity’s proximity to the Gulf of Mexico, the community has experienced hurricanes on an average of once every 10 years over the last half a century.</p> <p>Additionally, the cost of damage to the hospital from each hurricane event is increasing from \$200,000 in May 1970, to \$1,340,000 in 2005.</p> <p>Hurricane Gamma (August 2005) was a Category 3 hurricane. Adversity was located just left of landfall of the eye of the hurricane. The May 1970 hurricane was similar, but Adversity was to the right side of the landfall of the eye.</p>

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<p>establish wind speeds and zones associated with areas susceptible to tornado occurrence. The Storm Prediction Center, in turn, uses National Weather Service storm intensities using the Fujita scale, which assigns an intensity based on wind speeds.</p> <ul style="list-style-type: none"> • Design speeds for hurricanes are based on the Saffir-Simpson scale, which also assigns intensities based on wind speeds. This data is then used to identify areas of the U.S. that are susceptible to the types of winds included in the Fujita scale and the Saffir Simpson scale. Damage can occur from both tornadoes and hurricane winds radiating out from the hurricane’s eye. However, intense damage from hurricanes is usually much heavier to the right of the eye than to the left of the eye. • Cost of damage to buildings, contents, and infrastructure (broken out by each of these three components, if possible). These damage costs should focus on the structures that will be protected by the proposed mitigation measure(s) and <u>not</u> for all damaged structures. 	<p>05/26/70 – Category 3 hurricane 07/05/84 – Category 2 hurricane 09/25/90 – Category 1 hurricane 09/01/04 – Category 2 hurricane 08/12/05 – Category 3 hurricane</p> <p>Note: The amounts listed below represent total damages reported (combined buildings, contents, and infrastructure).</p> <p>05/26/70 – Reported total damages of \$2,400,000. Damages to the previous building (of lesser value) on this site were \$200,000.</p> <p>07/05/84 – Reported total damages of \$4,400,000. Damages to Community Hospital were \$340,000.</p> <p>09/25/90 – Reported total damages of \$7,800,000. Damages to Community Hospital were \$740,000.</p> <p>09/01/04 – Reported total damages of \$8,200,000. Damages to Community Hospital were \$985,000.</p> <p>08/12/05 – Reported total damages of \$14,700,000. Damages to Community Hospital were \$1,340,000.</p>

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<ul style="list-style-type: none"> • The wind damage functions for buildings and structural contents for the structures to be retrofitted, if available. • Specific data for the structures to be retrofitted (discussed in more detail in Section 2.3). <p>The State Hurricane Program Manager may provide historical hurricane information and the State Hazard Mitigation Officer may provide historical tornado information. However, other potential sources of this information include:</p> <ul style="list-style-type: none"> • National Hurricane Center (www.nhc.noaa.gov). • U.S. Army Corps of Engineers (http://chl.ercd.usace.army.mil/CHL.aspx?p=s&a=ARTICLES;370). • NOAA Storm Prediction Center (http://www.spc.ncep.noaa.gov). • FEMA (http://www.fema.gov/business/guide/section3e.shtm). 	<p>Portions of the hospital were out of service after each event, with an average loss of service time of 2 weeks per event. Patients had to be relocated to a neighboring hospital and emergency vehicles had to be rerouted to the nearest hospital, a distance of 10 miles for approximately 12 one-way vehicle trips per day. The proposed retrofit will mitigate up to a Category 3 hurricane.</p> <p>The wind damage functions in the FEMA Wind Full Data BCA module and the Hurricane and Tornado Shelters module are representative of the damages for this project.</p>

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<ul style="list-style-type: none"> • National Weather Service (http://nws.noaa.gov). • National Climatic Data Center (http://www.ncdc.noaa.gov/oa/ncdc.html). • NOAA Storm Events Data Center (http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms). <p>Note: The Federal agency website addresses above are for the agency national headquarters. The websites contain links to agency offices or districts within individual States.</p> <p>2.2.3. NFIP Flood Hazard Data</p> <p>Information regarding flood hazards can usually be obtained from the NFIP maps for the community in which the project is located. Floodplain boundaries and flood elevations are shown on the FIRM for the community. Additional information, including flood profiles (a graph showing the relationship of the water surface elevation of a flood event to a location along a body of water) and supporting technical information, may be found in the accompanying FIS report. FIRMs and FIS reports may be obtained through the FEMA Map Service Center at www.msc.fema.gov or by calling a toll free number at 800-358-9616.</p> <p>The following data should be submitted with the application:</p> <ul style="list-style-type: none"> • A copy of the FIRM with FIRM title block, including the NFIP CID number, effective date, and panel number and 	<p>The effective FIRM for the project area is from the FIS for the City of Adversity, CID No. 006006, Panel 010C, and dated March 6, 1994 (See attached FIRM).</p> <p>See attached FIRM (at same scale as original FIRM) with project site marked in red on each map. The project site is not located in the 100-year floodplain.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>suffix. The FIRM should be copied at the same scale as other maps of the project area. The applicant should determine if the community has requested a revision to these maps that has not yet been incorporated, and if so, whether the change would affect the property.</p> <p>2.3. STEP 3: PREPARE A PROPERTY INVENTORY</p> <p>An inventory of structures to be retrofitted must be developed. This inventory should be updated as new information is collected or property owners decline to participate in the program.</p> <p>Property owners may initially express interest in the high wind retrofit program but subsequently decide not to take part. In some cases, these withdrawals occur after FEMA has approved grant funding. Consequently, the inventory should include alternate properties that may be retrofitted when withdrawals occur.</p> <p>For each property, the community should record all relevant information that led the community to decide to include this structure in the project, attaching at least two color photographs of the main structure (from two different sides). Specific data regarding the structure and its high wind history should be collected, including:</p> <ul style="list-style-type: none"> • For hurricanes, the building type, number of stories above grade, foundation type (slab, basement, pier or post, crawl space) and floor area. 	<p>Note: Sample data is for one structure while the property inventory will contain similar information for all structures to be retrofitted.</p> <p>Building name: Community Hospital</p> <p>Property: Parcel No. 301-0011-008, 1375 Hurricane Way</p> <p>Property owner and co-owner information: Jerome Cress, Administrator, Community Hospital Corporation</p> <p>Mailing address: P.O. Box 7510, Adversity, AS 40233</p> <p>Daytime Telephone Number: (111) 228-7725</p> <p>This property is a two-story hospital with a basement. It was built in 1984 on a concrete slab foundation and was fully engineered. The hospital occupies the total area of 180,000</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<ul style="list-style-type: none"> • Area to be used as shelter space. • The occupancy of the shelter. • Building code in effect on the date of construction and the code requirements that relate to the wind retrofit projects. • For hurricanes, the number of miles inland from the nearest coast, and if applicable, appropriate floodplain management regulations. • For Hurricanes, the Building Replacement Value (BRV), expressed in dollars per square foot, is a key determinant of the amount of damage. The information should show the cost of labor and materials to construct a building similar in size (total square footage and number of stories), function, and contents at the same location. • For hurricanes, the amount of damage (as a percentage of the pre-event building replacement value of the building) that would result in demolition. The standard amount of damage used in a BCA is 50 percent; this percentage may be higher for important historical buildings. 	<p>square feet. The hospital is valued at \$10,400,000 based on a professional appraisal dated 01/25/06 (copy attached).</p> <p>10,000 square feet of the building is to be used as shelter space.</p> <p>The City Building Department has certified the total occupancy for the shelters at 520 individuals (due to the amount of medical equipment contained within the shelters).</p> <p>The existing hospital was constructed according to the 1980 Southern Building Code. The code required roof clips, but lacked standards for optional shutters.</p> <p>The hospital is 5.5 miles inland from the coast. The City has advised the hospital about appropriate floodplain management regulations for areas near riverine and coastal floodplain areas. A copy of a statement that the hospital administrator received these regulations is attached.</p> <p>See attached estimate completed by the Adversity Building Department.</p> <p>The amount of damage that would result in demolition is the FEMA standard value of 50 percent.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<ul style="list-style-type: none"> • The wind speeds (in mph) that will occur for the 1-, 10-, 50-, 100-, and 2000-year intervals for the coast and 125 miles inland. • The expected annual number of windstorms from Class 0 to Class 5, including the estimated building damage and contents damage for each class. • The time period for which the occupants are expected to be displaced to temporary quarters due to wind damage. • The time period for which public or commercial services are lost from a building. • For commercial buildings, the estimated net loss of business income due to closure of the facility. • For shelters or buildings housing shelters, the length in feet of the longest side of the building and the longest width of the building. • For shelters or buildings housing shelters, the construction type, materials, and area and occupancy of the shelter to be constructed. • For shelters or buildings housing shelters, the time zone in which the facility is located. • For shelters or buildings housing shelters, indicate whether tornado hazard information is by county or State. 	<p>A wind map with recurrence intervals is attached.</p> <p>FEMA standard values used.</p> <p>The average time for displacement due to hurricane damage, based on previous hurricane events, is 25 days.</p> <p>FEMA standard values are used.</p> <p>FEMA standard values are used.</p> <p>Based on the original construction plans for the hospital, the length is 300 feet and the width is 200 feet.</p> <p>As seen in the attached plans, the structure and retrofits were designed in accordance with FEMA Publication 361.</p> <p>This building is located in the central time zone.</p> <p>The tornado hazard information is not applicable for the proposed project.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<ul style="list-style-type: none"> • For shelters or buildings housing shelters, indicate the dollar values of major/minor injuries and casualties. • For shelters or buildings housing shelters, indicate the wind speed to which the shelter is designed. • For shelters or buildings housing shelters, indicate the number of injuries per wind speed and the effectiveness of the project in reducing injuries and deaths. • The community should collect latitude and longitude for each property to assist FEMA with future tracking of mitigation projects. • Property owners located in Special Flood Hazard Areas (SFHAs) who participate in a mitigation project that improves their structure must obtain and maintain flood insurance on the property prior to award. • Acknowledgement of Conditions for Mitigation of Property in a SFHA with FEMA grant funds must be provided to FEMA prior to award. • For mitigation projects selected for further review, the sub-applicants' signed statements of voluntary participation must be provided to FEMA prior to award. 	<p>FEMA standard values were used.</p> <p>Per the design engineer, the interior shelters are designed to withstand a Category 3 hurricane.</p> <p>FEMA standard values are used for the number of injuries per wind speed. The engineer that designed this shelter has indicated that the effectiveness at preventing injuries is 99%.</p> <p>Latitude and longitude are only available for the structures surveyed for this project (data attached).</p> <p>The hospital is not located within a mapped riverine or coastal floodplain area.</p> <p>A signed statement from the hospital administrator indicating his voluntary participation in the project is included in the application support data.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>2.4. STEP 4: DEVELOP ALTERNATIVE SOLUTIONS TO THE PROBLEM</p> <p>FEMA will evaluate the project for feasibility and cost-effectiveness, and the sub-applicant must describe why the proposed project is the best solution to the problem. In addition, because the project will be considered for funding under a Federal program, it will be subject to review under the National Environmental Policy Act (NEPA) and Executive Order (EO) 11898, both of which require that any reasonable alternatives and their impacts be considered. Consequently, the sub-applicant should document the alternatives that were considered for meeting the purpose and need for the project. NEPA and other environmental requirements are further discussed on Section 2.9 of this document.</p> <p>Typically, when alternatives are required, at least three alternative solutions to the problem should be considered. One of the alternatives should be the proposed retrofit project (i.e., the preferred solution). The analysis should also consider the “no-action” alternative; this alternative reflects conditions that would exist if the proposed action were not taken. That is, what would be the consequences if the structures in question were not retrofitted or otherwise mitigated?</p> <p>For each action alternative, consider the local hazard mitigation goals, the project cost, economic benefits, the potential for additional damage, environmental impacts, and public health and safety risks. Document alternatives that are not preferred over the proposed alternative and provide reasons.</p>	<p>Solution #2: Wind Retrofit Without Adding Safe Rooms</p> <p>Although a wind retrofit of the hospital will reduce future structure and contents damage from high winds, the lack of safe rooms will not reduce the life-safety risk for critical care patients that cannot be moved or the hospital staff and visitors.</p> <p>Solution #3: No Action</p> <p>Calculations based on the history of high winds in Adversity indicate that, with no action, Adversity could expect to suffer damage, injury, or death of even greater magnitude in the future. Assuming that the hospital would experience similar amounts of damage every 8 to 10 years, and assuming a 15-year lifetime of the shutter portion of the proposed project, the no action alternative could result in future damages of approximately \$2,000,000 over the next 15 to 20 years.</p> <p>The No Action option does nothing to reduce or eliminate future risk to City residents, damage to their property, or the need for emergency response, and it does not offer a means to reduce or eliminate the need for future disaster assistance.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.5. STEP 5: ESTABLISH A METHOD FOR DETERMINING BUILDING REPLACEMENT VALUE</p> <p>When funding wind retrofit projects, FEMA requires communities to establish and document a building replacement value (BRV) derived from a reasonable methodology that has been applied consistently throughout the community. Two methods of calculating building replacement value are acceptable:</p> <ul style="list-style-type: none"> <p>Estimates. Professional estimates typically yield the most accurate results. Methods include inspections, comparisons with similar properties, checking building permit information, and reviewing documentation of recent improvements. Estimates must show the breakdown of the value of the structures and the value of land. In the BCA, the sub-applicant may only enter the value of the structure for the BRV and cannot include the land value. Communities may also use estimates by local building officials, construction firms or from national cost-estimating guides such as R.S. Means or Marshall and Swift.</p> 	<p>The hospital BRV is based on pre-disaster building cost information. Due to the unique construction and contents of the hospital, the City used estimates that the hospital received from a hospital construction firm, a professional appraiser, and the hospital’s insurance coverage for the building and contents. The average of the three estimates was used in the grant application (copies of original estimates are attached).</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.6. STEP 6: PREPARE A BENEFIT-COST ANALYSIS</p> <p>A BCA is FEMA’s method for determining whether building retrofit projects or safe rooms are cost-effective, and therefore, a viable option for wind mitigation. It is recommended that a preliminary BCA be completed using rough estimates of the project costs and benefits to evaluate the project. Once a detailed scope of work has been determined, a more thorough and precise BCA should be prepared using specific data. A complete BCA is required for all FEMA-funded mitigation projects.</p> <p>The BCA is completed using the wind recurrence information and high wind history for the project area, the property inventory, and the estimated project costs. All information used to prepare the BCA must be documented, including data sources, dates, assumptions, and analysis procedures. Data from recognized sources such as FEMA, the USGS, the U.S. Army Corps of Engineers (USACE), and State agencies have a high degree of credibility. When local data are used, supporting documentation from an engineer or other qualified source must be submitted.</p> <p>This section presents general guidance regarding the application of BCAs to wind retrofit projects. More detailed information regarding BCAs is available on the FEMA website at www.fema.gov/pdf/government/grant/pdm/guidelines_for_bca.pdf and the <i>FEMA Mitigation BCA Toolkit CD</i> (available through the BCA Helpline, see below).</p>	

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>FEMA has also established a BCA Helpline, which can be reached through a toll free number, 866-222-3580, or by e-mail at bchelpine@dhs.gov.</p> <p>Along with the BCA for each property or group of similar aggregated properties being considered for mitigation, the sub-applicant should include a completed Data Documentation Template (DDT) to support the values used in the BCA. The DDTs are available on the <i>FEMA Mitigation BCA Toolkit CD</i>.</p> <p>Generally, sub-applicants use a FEMA-approved software-based BCA to determine the cost-effectiveness of projects. Projects submitted for consideration under any of these programs must adhere to all requirements set forth in the various governing statutes and program regulations.</p> <p>2.6.1. Using FEMA’s BCA Modules</p> <p>FEMA has developed software and guidance to prepare BCAs in accordance with agency requirements. The BCA software involves modules for different hazards, including high winds. Applicants and sub-applicants are encouraged to use the FEMA BCA software to ensure that the calculations and methods are standardized. Alternative BCA software may be used only if approved by FEMA in advance of submitting an application based on the alternative software.</p> <p>Many of the FEMA BCA modules contain standard or default data. Use of such data is acceptable as long as the data are applicable to the specific wind retrofit project being proposed. Several modules are applicable for wind projects. Hurricane projects can use the Full Data module and the Tornado and</p>	<p>Both the FEMA Wind Full Data and Hurricane and Tornado Shelter BCA modules were used for the BCAs prepared for this project.</p> <p>The default values in the FEMA Wind Full Data and Hurricane and Tornado Shelter BCA modules were used in the analyses for this project.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>Hurricane Shelter module. Tornado projects use just the Tornado and Hurricane Shelter module.</p> <p>The Hurricane Wind module can be used for evaluating structural and non-structural wind retrofit projects. The Hurricane and Tornado Shelter module can be used to assess projects that will provide shelter to individuals or groups of people in reinforced, freestanding structures or safe rooms. The information needed to complete this module may include, but is not limited to:</p> <ul style="list-style-type: none"> • Documentation of wind hazard. • Project cost, useful life and building/facility replacement value. • Building/facility wind damage function estimates before- and after-mitigation. • Value of services to community provided by building (if loss of function benefits need to be considered). • Estimates of deaths and injuries due to high wind events. 	<p>See the information cited in High Wind History and the attached copies of the effective Wind Hazard maps, which have been marked in red to show the property location.</p> <p>The Project Engineer has estimated that the proposed wind retrofit and safe room construction will cost \$243,850. After careful study of the existing building, he has indicated that the useful life of the structure will be extended 20 years by the project (see attached letter). The building replacement value is noted in Section 2.5.</p> <p>Not Applicable.</p> <p>There were no deaths and documentation for the injuries is explained under the “Benefits” category below. The values used for injuries were in accordance with the FEMA guidance provided on the <i>FEMA Mitigation BCA Toolkit CD</i>.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>The Hurricane Wind module uses quantitative data to evaluate structural and non-structural retrofits for buildings, and engineering data to calculate damages and losses before and after mitigation. Common data inputs may include, but are not limited to:</p> <ul style="list-style-type: none"> • Building data for structures to be protected by the project. • Wind hazard data. <p>2.6.2. Preparing the BCA</p> <p>Considerations for preparing the BCA are described below. It should be noted that net social benefits (total costs – both federal and local share) and non-Federal costs, as opposed to the benefits and costs to the Federal Government, should be the basis for evaluating whether a project is cost-effective. Therefore, all social benefits would be considered.</p>	<p>See the Property List attached to the City’s application.</p> <p>See the information cited in Wind History and the attached copies of the effective FEMA Wind Hazard Maps, which have been marked in red to show the property location.</p> <p>All of the interested property owners have agreed to 50 percent as the amount of damage per structure that would result in demolition.</p> <p>The displacement time for the structure in this project was one month after the 1970 hurricane and 25 days after the 2005 hurricane.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.6.2.1. Benefits</p> <p>The benefits of wind retrofits of structures are the reduction in damage, losses, and casualties that would occur if occupancy continued at the current standards. For example, if the project building and contents have been damaged, then strengthening the supporting beams and installing shutters over the windows would lessen the need to repair the structure in the future.</p> <p>Examples of common benefits include avoided (or reduced):</p> <ul style="list-style-type: none"> • Damage to the buildings and contents, including public buildings, commercial structures, and residences, as well as damage to infrastructure serving the structures. • Displacement costs incurred by businesses, residents, or institutions that must relocate while buildings are repaired. • Emergency response costs for police, fire, and other public services when the buildings are damaged. • Loss of utility services to the buildings, as well as repairs to damaged utilities. • Economic losses resulting from displacement of commercial or light industrial uses of the structures. • Deaths and injuries. Refer to the <i>FEMA Mitigation BCA Toolkit CD</i> for current statistical values for deaths, major injuries, and minor injuries. 	<p>The benefits claimed for structure and contents damage, displacement costs, and injuries (there were no deaths) are documented with the attached benefits data. The data followed the guidance from the Data Documentation Templates on the <i>FEMA Mitigation BCA Toolkit CD</i>.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>“Multiplier” effects cannot be counted. A multiplier effect is an indirect or secondary benefit such as tourism or recreational benefits.</p> <p><i>2.6.2.2. Project Costs</i></p> <p>All costs should be reflected in the project SOW. Only costs that are relevant to the implementation of the project should be counted in the total project cost. Project costs should:</p> <ul style="list-style-type: none"> • Include all costs associated with the retrofitting of the structure. These costs should be shown in an itemized cost estimate and include all construction and permit costs. • Be based on a reasonable estimate – that is, there should be no obvious over- or under-estimate of the true cost of the project. If construction will be completed using a contractor, all elements of the contractor’s costs, including overhead and profit, should be included. • Include separate retrofitting costs and site restoration costs, if applicable, for each structure within the project. • Be based on the same methodology, approach, and local cost multipliers used for other structures within the project. • Be calculated using present-day dollars. • Be based on current project and structure information. 	<p>The benefits claimed here do not involve secondary benefits.</p> <p>A detailed breakdown of the project costs is attached. All costs are relevant to the project (per guidance form the FEMA Regional Office).</p> <p>Yes.</p> <p>The structural and non-structural costs are listed by property address and Tax ID number in the detailed project cost.</p> <p>Copies of the estimated BRVs for this project are attached. These data include the estimated value after averaging the three estimates.</p> <p>Yes.</p> <p>Yes, refer to detailed project cost estimate.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.7. STEP 7: PREPARE A SCOPE OF WORK FOR THE PROJECT</p> <p>The scope of work (SOW) describes the objectives, methodology, outcomes, timeline, milestones, resources, and deliverables of the proposed hazard mitigation project and documents the benefits, feasibility, and effectiveness of the project. The SOW serves as the basis for FEMA’s review of eligibility, feasibility, and cost-effectiveness.</p> <p>The project sub-application SOW should include the following as well as applicable references and supporting documentation (see specific program guidance for additional information):</p> <ul style="list-style-type: none"> • Number of properties or facilities to be protected. • Primary use of the properties or facilities to be protected. • Residential properties should include information on whether the property is owner-occupied, rental, or seasonal. • Public buildings should indicate shelter space (if applicable). • Purpose of the project (i.e., the goal). 	<p>The proposed shutter project will consist of a roll-down shutter system covering the entire 6,000 square feet of exterior window and door areas. The exterior glass involves 64 individual windows and 8 double doors. The shutter system includes electric motors to allow for automated operation; however, the shutters can be manually operated in the event of a power outage. The existing hospital was built in 1984 as an enclosed building with an Importance Factor of 1.5 and Exposure Category C, and the building structure (including all doors) was originally designed and constructed to withstand a 90-mph fastest mile design wind. However, no wind design was incorporated into the design of the hospital envelope, and currently no windows or glass doors are protected from wind pressures and windborne debris.</p> <p>The project involves one non-residential building (a hospital) that is owner-occupied. This property is a two-story hospital with a basement. It was built in 1984 on a concrete slab foundation and was fully engineered. The hospital occupies the total area of 180,000 square feet.</p> <p>The hospital does not currently include shelter space built to current building code standards. The project includes 10,000 square feet of interior shelter space for 520 people and will be built to the FEMA 361 standards for shelters.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<ul style="list-style-type: none"> • Clear, concise description of the proposed project and the means to implement and construct it (i.e., how the project will be implemented and by whom). A description of any associated construction activities such as temporary access roads, staging yards, or borrow areas should also be provided. • Outcomes (i.e., the expected accomplishments). <p>2.7.1 Feasibility</p> <p>Mitigation projects funded by the PDM program must be both feasible and effective at mitigating the hazard(s) for which the project was designed. The scope of work should include documentation of the feasibility and effectiveness provided by the proposed project, including engineering design parameters and copies of or references to:</p> <ul style="list-style-type: none"> • Proposed schematic or detailed engineering drawings, or engineering design. • Applicable building code/edition or engineering standard used and specific code requirements that relate to the proposed project (e.g., for drainage projects this may be a State or local standard or requirement). • Level of protection provided by the proposed project (i.e., wind speed, building code/edition, and debris impact standard). For example, with a wind project this would include the level of protection for the entire building and 	<p>The shutter system will be designed to withstand positive and negative wind pressures associated with wind speeds up to 110 miles per hour and resist debris impact forces in accordance with SSTD 12.</p> <p>Based on the engineering report, the roof system is capable of withstanding wind loads; however, mechanical equipment located on the roof will have to be protected by placing shields around the equipment that can be closed when a hurricane approaches (see plans). Signage and a high wind warning system will be added to the hospital. Thermal and moisture protection will be added to all walls, and an emergency electrical system capable of operating independently for 96 hours will be added.</p> <p>The applicable building code is the International Building Code (IBC), Windborne Debris Region, dated 04/2002. The code contains minimum standards when shutters are used on critical facilities (see attached copy of building code with the shutter requirements highlighted).</p> <p>An engineering analysis of the existing hospital indicates that adding the shutter system will reduce structural wind damages from a Category 2 Hurricane (wind speed range 96-100 mph) by 80 percent and provide partial protection from Category 3 and 4 storm events. The analysis also confirmed that the building</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.7.2. Wind Retrofitting Process</p> <ul style="list-style-type: none"> • As a safety precaution, the community should consider the installation of fencing that restricts entrance onto the site and placement of signage to secure the property. • Coordinate utility disconnections with electricity, gas, and water companies. • Conduct additional surveys, as necessary, such as lot line surveys or detailed investigations for the presence of hazardous or toxic materials. • Arrange for the removal and proper disposal of household hazardous wastes, such as paints; appliances, such as refrigerators; and potentially hazardous features, such as storage tanks for home heating oil. These items must be disposed of in accordance with all appropriate local, state, and Federal laws and regulations. • Retrofit the structure. Remove debris and ensure that it is taken to a permitted disposal facility. • Grade and seed the site, as necessary. 	<p>Windows will be boarded up and signs and fences will be installed to secure the property.</p> <p>The City Public Works Department will be responsible for disconnecting electricity, gas, and water, as needed.</p> <p>Given the land use history of the project area, hazardous or toxic materials are not expected to be present. Therefore, a detailed investigation for the presence of hazardous or toxic materials will not be required.</p> <p>The owner will be responsible for removing all hazardous materials from the project site.</p> <p>The contractor will retrofit the structure and remove all construction debris.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.8. STEP 8: PREPARE A COST ESTIMATE AND SCHEDULE</p> <p>2.8.1. Cost Estimate</p> <p>The sub-application must be accompanied by a cost estimate for completion of the project. Elements of the cost estimate are described below. For all of these items, reasonable costs can be obtained by contacting two or three potential vendors and then applying the average cost for a single property to all properties involved in the retrofit project. Another alternative for determining costs is to contact nearby communities that may have recently undertaken a similar project.</p> <ul style="list-style-type: none"> • Estimate. To determine the construction price, an estimate should be based on bids from a licensed contractor. • Property Surveys. Survey costs may vary depending on environmental and historic considerations. If hazardous materials are present, an Environmental Site Assessment may be required. • Management Costs. See specific program guidance for additional information. • Environmental/Historic Preservation Costs. The costs should include a detailed estimate for avoiding or treating any potential adverse impacts of the project (see Section 2.9). Costs associated with remediation of hazardous materials, such as asbestos abatement and aboveground storage tank removal, should be included. 	<p>A detailed cost estimate has been prepared by the City and is included with the other attachments.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<ul style="list-style-type: none"> • Legal Fees. If the city or county attorney is not responsible for this project, it may be necessary to hire an outside attorney. <p>2.8.2. Schedule</p> <p>A schedule for completing the work must be submitted with the sub-application. This schedule must include the time frame for all actions described in the Scope of Work, from initial public meetings through completion of retrofitting the last structure. The duration of each phase of the project should be identified. The schedule may be presented in terms of time frames following certain activities; for example, offers will be made to property owners within 1 month of notification that funds for the project have been approved.</p> <p>2.9. STEP 9: CONSIDER ALL ENVIRONMENTAL AND HISTORIC PRESERVATION IMPACTS</p> <p>2.9.1. National Environmental Protection Act (NEPA)</p> <p>NEPA requires FEMA to evaluate the effects of its actions and actions it funds on the natural and human environments. FEMA must also ensure that its actions comply with all other applicable Federal environmental laws and regulations, such as the Endangered Species Act and the National Historic Preservation Act (NHPA). Although FEMA is responsible for ensuring Federal-level compliance, the sub-applicant must provide information required for the compliance process. The sub-applicant is also responsible for ensuring that the project complies with applicable State, Tribal, and local environmental laws and permitting requirements.</p>	<p>The anticipated schedule for the proposed project is included with the other project information and calculations attached to the application. The shutter project will be completed within 12 months of project approval with minimal disruption to hospital operations.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>Specific considerations are outlined below. The information requested is the minimum required and should not constrain sub-applicants from providing more information where potential impacts are identified. Lack of documentation may delay completion of FEMA’s review or cause the sub-application to be declined.</p> <p>For purposes of environmental and historic preservation review, the sub-applicant must evaluate not only the potential impacts of the project itself, but also of any associated construction activities, such as temporary access roads, staging yards, borrow areas, and site restoration or remediation. All costs associated with avoidance and minimization measures must be included in the project cost estimate (see Step 8).</p> <p>Any action that may affect the environment must first try to avoid impacts, then mitigate impacts, and finally, compensate for any adverse effects. The intent is to design a proposed project and avoid or minimize impacts. Doing so usually minimizes delays in the permitting process.</p> <p>Temporary impacts, such as heavy equipment crossing over wetlands or floodplain areas, economic losses due to closed roads, and detour costs should be discussed and documented within the application. Sub-applicants should also explain their intent to avoid or mitigate these impacts.</p> <p>As part of the NEPA environmental review FEMA has determined that certain categories of action normally have no significant effect on the human environment and, therefore, can be categorically excluded (by means of a “CATEX”) from</p>	

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>the preparation of environmental impact statements and environmental assessments except in extraordinary circumstances as defined below. The following are exclusion categories that might be relevant to retrofit projects:</p> <ul style="list-style-type: none"> iii. Studies that involve no commitment of resources other than manpower and funding (Level 1). iv. Inspection and monitoring activities, actions to enforce standards or regulations (Level 1). vii. Acquisition of properties and associated demolition/removal when the acquired property will be dedicated in perpetuity to uses that are compatible with open space, recreational, or wetland practices (Level 2). ix. Acquisition, installation, or operation of utility and communication systems that use existing distribution systems or facilities, or currently used infrastructure rights-of-way (Level 2). xi. Planting of indigenous vegetation (Level 1). xii. Demolition of structures and other improvements or disposal of uncontaminated structures and other improvements to permitted off-site locations, or both (Level 2). xv. Repair, reconstruction, restoration, elevation, retrofitting, upgrading to current codes and standards, or replacement of any facility in a manner that substantially conforms to the preexisting design, function, and location (Level 2). 	

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>xvi. Improvements to existing facilities and the construction of small scale hazard mitigation measures in existing developed areas with substantially completed infrastructure, when the immediate project area has already been disturbed, and when those actions do not alter basic functions, do not exceed capacity of other system components, or modify intended land use; provided the operation of the completed project will not, of itself, have an adverse effect on the quality of the human environment (Level 3).</p> <p>xvii. Actions conducted within enclosed facilities where all airborne emissions, waterborne effluent, external radiation levels, outdoor noise, and solid bulk waste disposal practices must comply with existing Federal, State, and local laws and regulations.</p> <p>The documentation required varies depending on whether the CATEX is a Level 1, Level 2, or Level 3. As a minimum, sub-applicants should prepare a:</p> <p>Level 1. The project file should indicate the CATEX for which the project or action qualifies and justification, if necessary.</p> <p>Level 2. Requires indication and justification of the specific CATEX(s) being used. Also requires an indication that there are no extraordinary conditions or, where appropriate, documentation of consultations. Requires completion of the Section 106 process of the National Historic Preservation Act if there are historic resources involved.</p>	

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>Level 3. CATEX xvi requires full review, consultation and documentation as appropriate and as described in the NEPA Desk Reference for:</p> <ul style="list-style-type: none"> • National Historic Preservation Act; • Archaeological & Historical Preservation Act; • Endangered Species Act; • Farmlands Protection Policy Act; • Section 404 of the Clean Water Act; • Executive Orders 11988, 11990, and 12898; • Any other environmental laws and executive orders if they apply; and • Extraordinary circumstances. <p>If one or more of the following extraordinary circumstances exist and may be impacted by the project, the project may no longer qualify as a CATEX, and an Environmental Assessment would need to be prepared.</p> <ul style="list-style-type: none"> i Greater scope or size than normally experienced for a particular category of action; ii Actions with a high level of public controversy; iii Potential for degradation, even though slight, of already existing poor environmental conditions; 	

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>iv Employment of unproven technology with potential adverse effects or actions involving unique or unknown environmental risks;</p>	
<p>v Presence of endangered or threatened species or their critical habitat, or archaeological, cultural, historical or other protected resources;</p>	
<p>vi Presence of hazardous or toxic substances at levels which exceed Federal, State or local regulations or standards requiring action or attention;</p>	
<p>vii Actions with the potential to affect special status areas adversely or other critical resources such as wetlands, coastal zones, wildlife refuge and wilderness areas, wild and scenic rivers, sole or principal drinking water aquifers;</p>	
<p>viii Potential for adverse effects on health or safety;</p>	
<p>ix Potential to violate a Federal, State, local or Tribal law or requirement imposed for the protection of the environment; and</p>	
<p>x Potential for significant cumulative impact when the proposed action is combined with other past, present and reasonably foreseeable future actions, even though the impacts of the proposed action may not be significant by themselves.</p>	

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>2.9.2. Historic Properties: Structures</p> <p>Under Section 106 of the National Historic Preservation Act, FEMA must consider the effects of its finding on buildings, structures, sites, districts, and objects that are listed or eligible for listing on the National Register of Historic Places. Consultation with the State or Tribal Historic Preservation Officer (SHPO/THPO), other consulting parties, and the public is required as part of this consideration.</p> <p>Even if the property is not listed on the National Register, FEMA must evaluate properties 50 years or older for their historic significance and determine whether the property is eligible for listing in the National Register. The sub-applicant should provide information to FEMA supporting this evaluation.</p> <p>Determine if any of the structures to be retrofitted are potentially historic or adjacent or close to historic properties or a historic district. Consider roads, bridges, and other infrastructure as part of this evaluation. The preferred source of information to determine original age of a structure is a review of building permit data, engineering documents, or tax or land records. The SHPO/THPO, relevant local government agency, historic commission, or historical society may be contacted to obtain information on identification of structures, local or State surveys, and the presence of historic districts encompassing or adjacent to the proposed project site.</p> <p>If the project affects a historic property or if any nearby structures are over 50 years old or located within a known or potential historic district, provide:</p>	<p>None of the structures in the project area are 50 years or more in age or have historic significance. The SHPO concurred with this finding (letter attached).</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<ul style="list-style-type: none"> • The property address, date of original construction, and source of documentation for each structure. • At least two color photographs showing at least three sides of the structure. If outbuildings are present, such as a separate garage or barn, provide photographs of two sides of these structures as well. • Documentation associated with the structure being listed or determined eligible for listing on the National Register of Historic Places. • A detail of the property location(s) or proximity to a historic district on 1:24,000 scale USGS topographic map. • Documentation of coordination with the SHPO/THPO, or other parties. <p>2.9.3. Historic Properties: Archaeological Resources and Historic Sites</p> <p>Consideration of effects on historic properties is not limited to buildings and other built-environment features. Previously undisturbed or agricultural areas may also be significant, either because archaeological resources may exist at the site or because the site is in an area where a historic event occurred, including sites significant to Native Americans. If any resources are located during the construction of this project, construction activity will stop immediately and FEMA will be contacted to initiate appropriate notification and coordination.</p>	<p>There is high probability that prehistoric or historic archaeological resources are located in the project area. There are several documented archaeological sites on the same land forms in surrounding areas. However, according to the SHPO (see letter dated 05/05/04 in Attachments), the project should have no effect on these resources as long as no grading occurs of the previously undisturbed soil surrounding the foundations.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>Determine if the wind retrofitting requires ground-disturbing activities. If so, provide documentation of:</p> <ul style="list-style-type: none"> • The area of disturbance on a 1:24,000 USGS topographic map, including dimensions and location, and site maps. • Past uses of the area to be disturbed, including the results of a literature search to determine if known archaeological sites exist in the area. • Coordination with the SHPO/THPO, or other parties. <p>2.9.4. Endangered Species and Biological Resources</p> <p>Under Section 7 of the Endangered Species Act (ESA), FEMA must evaluate the effects of its actions on federally listed threatened and endangered species and their habitat. While wind projects are often undertaken in urban areas that are unlikely to have suitable habitat for listed species, any project dealing with rivers and streams must be carefully evaluated for potential impacts on aquatic species and species associated with riparian habitat. Additionally, aspects of a project such as access roads and staging may have effects on nearby biological resources that should be evaluated. The sub-applicant can speed the review process by obtaining species information and initiating contact with appropriate State wildlife agencies, the U.S. Fish and Wildlife Service (USFWS) and, if ocean-going fish are affected, with the National Marine Fisheries Service (NMFS). However, any formal consultation with Federal agencies must be handled by FEMA.</p>	<p>Impacts will be minimal and none of the natural features of the project area will be altered in size, shape, or natural material by the proposed project. Contact was made with the State Department of Environmental Protection (DEP) for consultation on fish, wildlife, and endangered species. This project will not affect any endangered or threatened species. See attached correspondence from the State DEP dated 09/21/06.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>Another law that addresses waterways and associated species with a particular interest in the effects brought about by changes in hydrology is the Fish and Wildlife Coordination Act. Since this act is also overseen by the USFWS and NMFS, it should be handled at the same time as the ESA.</p> <p>Potential effects on biological resources should be evaluated if aspects of the project:</p> <ul style="list-style-type: none"> • Are located within or adjacent to (typically within 200 feet) a body of water, such as a perennial, intermittent, or seasonal stream; drainage swale; seasonally wet area; pond; lake; creek; or coastal waterway. • Result in the removal of vegetation. • Are located within or adjacent to identified critical habitat for federally listed species known to occur in the project area; locations of critical habitat can be obtained from the USFWS and NMFS. • Affect the hydrology or hydraulics of the waterway. <p>If biological resources have the potential to be affected, submit:</p> <ul style="list-style-type: none"> • A map showing the nearby water body, its dimensions, the proximity of the project to the water body, and the expected and possible changes to the water body, if any. Identify all water bodies regardless of whether there may be an effect. 	<p>Information regarding the presence of federally listed threatened and endangered species was obtained from the U.S. Fish and Wildlife Field Office. The project area does not fall within designated critical habitat, nor does the project area contain suitable habitat for threatened or endangered species known to be present in the vicinity.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<ul style="list-style-type: none"> • Documentation and map showing the amount and type of vegetation affected. Discuss the presence of critical habitat or other significant feature with Federal or State wildlife agencies before undertaking extensive field work or mapping. • Documentation of species in or near the project area. <p>Documentation of coordination with the USFWS or NMFS, or both, regarding the potential occurrence of federally listed species and potential impacts to species.</p> <p>If a reviewing agency suggests redesign of the project or use of measures to reduce effects on species, the application scope of work, budget, and project decision-making description should address the suggested changes.</p> <p>2.9.5. Clean Water Act and Protection of Wetlands</p> <p>Waters of the United States and designated wetlands are protected through the Federal Clean Water Act (CWA) and through Executive Order 11990, Protection of Wetlands in order to comply with the NEPA regulations. Applicable resources include rivers, streams, ponds, lakes, and coastal waterways and include seasonal as well as perennial bodies of water. If the structures are floodprone, they may be located adjacent to water bodies or wetlands, and activities such as staging, disposal of debris, and site remediation may have effects that must be considered. Permits for work in waters of the United States are issued by the USACE under Section 404 of the Clean Water Act. The sub-applicant is also responsible</p>	<p>The project will not involve work near or in a waterway or designated wetland. The USACE was consulted and they confirmed this project will not affect any wetlands. See attached correspondence from the USACE dated 09/21/06.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>for obtaining any permits required under State law, such as the CWA section 101 water quality certificates and the National Pollutant Discharge Elimination System (NPDES) permit.</p> <p>If the wind retrofit involves disposal, excavation, fill placement or other modifications to water bodies or wetlands, submit:</p> <ul style="list-style-type: none"> • Documentation of coordination with the USACE, or any State or local agencies with jurisdiction over wetlands regarding the potential for wetlands, and applicability of permitting requirements. • Map showing the relationship of the project to National Wetlands Inventory information or other available wetlands delineations. • Documentation of the alternatives considered to eliminate or minimize impacts to wetlands. For example, if earthwork during site remediation could result in silt-laden runoff, water quality could be affected; a plan for reducing erosion and runoff should therefore be included. • Documentation that applicable permits have been applied for or obtained at the time of project application. 	<p>Copies of the required permits, including a letter from the USACE determining that there was no impact under their jurisdiction, are attached. (The support documentation for all of the permits has not been attached, but is on file at the City and can be provided upon request.)</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>2.9.6. Floodplain Management</p> <p>Executive Order 11988, Floodplain Management, states that each Federal agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. In accordance with Executive Order 11988, FEMA must ensure that its actions avoid to the extent possible the long- and short-term adverse effects associated with the occupancy and modification of floodplains.</p> <p>While very few wind retrofit projects are likely to affect the floodplain (see below), there may be an opportunity to consider the inclusion of flood mitigation in the project. For example, if a building being retrofitted is in the floodplain and has utilities in a basement that is below the base flood elevation (BFE), moving those utilities to an elevation above the BFE could minimize flood risks as well as other hazard risks.</p> <p>The project application must include flood hazard data, including a floodplain map, as described in Step 2. However, if the project involves additional work in the floodplain after the</p>	<p>There are no floodplain impacts in the project area.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>structure is retrofitted, such as the placement of fill as part of the site remediation, submit documentation of:</p> <ul style="list-style-type: none"> • Analysis regarding the means or the alternatives considered to eliminate or minimize impacts of retrofitting activities in the floodplain. • Hydrologic and hydraulic information from a qualified engineer or hydrologist to demonstrate how drainage and flood flow patterns would be changed and to identify any upstream and downstream effects. • Consultation with the USACE with regard to Section 404 of the Clean Water Act, as described in Section 2.9.5. • Coordination with the corresponding State agency, if applicable, with jurisdiction over modification of waterways. <p>2.9.7. Coastal Issues</p> <p>Coastal Zone Management Act</p> <p>Under the Coastal Zone Management Act, FEMA must ensure that its actions are consistent with the approved State Coastal Zone Management Plan. Coastal zones may also be defined by how far ocean-living fish migrate upstream. If the project is located in the State’s designated coastal zone, obtain a permit or clearance letter from the appropriate State agency that implements the Coastal Zone Management Plan or attach documentation regarding application of coastal zone</p>	<p>The project area is not located within a coastal zone.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>management requirements to the project.</p> <p>Coastal Barrier Resources Act</p> <p>The Coastal Barrier Resources Act (CBRA) was designed to protect barrier islands along the East Coast, Gulf of Mexico, and Great Lakes. The law prohibits Federal funding for construction of any new structure or appurtenance on barrier islands. Also, no new flood insurance coverage may be provided on or after October 1, 1983 for any new construction or substantial improvement of a structure located in a Coastal Barrier Resources System (CBRS).</p> <p>2.9.8. Hazardous and Toxic Materials</p> <p>Further, FEMA does not fund the retrofitting of contaminated property. Contamination may result from previous uses of the property or from commercial and light industrial uses found in residential areas, such as auto repair. Properties eligible for wind retrofitting may contain common hazardous materials, including lead, asbestos, heating oil tanks, and hazardous materials such as solvents and paints. FEMA must ensure that the sub-applicant takes steps to dispose of such materials properly when the structure is retrofitted.</p> <p>Site contamination may be of concern if:</p> <ul style="list-style-type: none"> • Current or past land uses of the property or the adjacent properties are associated with hazardous or toxic materials. 	<p>At present, property owners are responsible for appropriate disposal of any known hazardous materials that they are capable of removing (such as paint, cleaning solvents, and pesticides). If any other hazardous materials are found during demolition, either the demolition contractor will dispose of them appropriately or the City will extend the SOW for a special contractor.</p>

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<ul style="list-style-type: none"> • Studies, investigations, or enforcement actions exist for the property. <p>If contamination is suspected:</p> <ul style="list-style-type: none"> • Provide any relevant documentation regarding the contamination. It may be necessary to conduct an Environmental Site Assessment to formally identify hazardous materials concerns. • Consult with the appropriate State or local agency to obtain permit and requirements for handling, disposing of, or addressing the effects of hazardous or toxic materials. <p>The SOW description for the project must describe the retrofit components and the plan for disposing of debris. The plan must include steps for proper disposal of hazardous waste, including compliance with any State or local requirements.</p> <p>2.9.9. Effects on Minority and Low-Income Populations</p> <p>Executive Order 12898, Environmental Justice, requires Federal agencies to identify and address, where appropriate, adverse human health, environmental, economic, and social effects when they disproportionately affect minority or low-income populations. The Executive Order also directs Federal agencies to avoid excluding persons from receiving the benefits of programs because of their race, color, or national origin. Further, Federal agencies are encouraged to integrate this executive order with the NEPA process to identify potential effects and related mitigation measures in</p>	<p>There are no minority families living in the project area. Some properties are owned by low-income residents; however, it is the position of the City that retrofit projects will benefit them by reducing damage, displacement, and the fear and trauma associated with high winds.</p>

<p style="text-align: center;">PROCEDURES</p>	<p style="text-align: center;">SAMPLE DATA FOR THE SCOPE OF WORK</p>
<p>consultation with affected communities. Consequently, the effects of wind projects that are undertaken in communities with a high proportion of minority or low-income residents must be evaluated. If potential adverse disproportional effects caused by the project are identified, then it would be necessary to determine if the conditions of this executive order are triggered.</p> <ul style="list-style-type: none"> • Either of two conditions would trigger the need to consider this Executive Order: 1) if the community is predominately minority or low income and 2) if the demographic profile of the area affect by the wind project has a significantly higher minority or low-income percentage than the surrounding area that is not impacted. This can be determined using data collected by the U.S. Census Bureau or by local entities such as social services agencies or redevelopment authorities. If adverse effects from the project meet either of the above conditions, then there are disproportionate impacts that must be addressed. If adverse effects fall on a community or part of a community where the impacts are evenly distributed then there is no disproportionality and the executive order is not triggered. • If the Executive Order is triggered, then it is necessary to communicate with the affected population to determine what mitigation measures can be taken to minimize the impacts. Often this includes translations for public notices, documents, and other key communications to ensure notification of all residents. 	

PROCEDURES	SAMPLE DATA FOR THE SCOPE OF WORK
<p>2.9.10. Land Use and Socioeconomic Effects</p> <p>Under NEPA, the potential effects of the wind retrofit project on the community must be evaluated. Determine if the project will:</p> <ul style="list-style-type: none"> • Disrupt the physical and economic arrangement of an established community. For example, if homes are retrofitted in the middle of a block, will the aesthetics of the community be affected? If a significant portion of the residents in a small town relocate, will the tax base suffer? • Affect fire or police protection, schools, maintenance of public facilities, or other governmental services. • Interrupt utilities and service systems. • Be consistent with the zoning and the general plan of the jurisdiction. It may be necessary to adopt changes to zoning ordinances to accommodate the retrofitting after the project is completed. 	<p>The County has no economic concerns or issues because no business areas are affected by this project.</p>

Sample Property Inventory Summary					
See subsequent pages for additional properties.					
<i>Project #</i>	<i>Lot or Parcel #</i>	<i>NFIP Policy #</i>	<i>Property Owner's Name</i>	<i>Property Address & Zip Code</i>	<i>Estimated BRV*</i>
1	301-0011-008	NA	Community Hospital of Adversity, Inc.	1375 Hurricane Way, Adversity, AS 40233	\$10,400,000
Total Estimated BRVs this page					\$10,400,000

* BRV = Building replacement value

Note: Although the example presented in this SOW involves only one location/property, mitigation projects involving multiple buildings, structures, or locations would be presented here as a summary of all properties include in the project.

(FROM STEP 7): SAMPLE COST ESTIMATE AND SCHEDULE**Cost Estimate**

Item Description	Unit	Quantity	Unit Cost	Amount	Source
Appraisal	Lump Sum	1	\$3,000	\$3,000	Acme Appraisal Services
Property survey	Lump Sum	1	\$3,000	\$3,000	Smith Surveyors
Title search and closing	Lump Sum	1	\$6,000	\$6,000	First Bank
Wind Retrofit *	Lump Sum	1	\$228,850	\$228,850	Average of three cost estimates
Legal fees	Lump Sum	1	\$3,000	\$3,000	Sheldon and Howe, Attorneys
Total Project Cost				\$243,850	
Total Federal Share (@75%)				\$182,887.50	

*** Breakdown of Lump Sum Costs for Wind Retrofit**

Item Description	Unit	Quantity	Unit Cost	Amount	Source
Mobilization	LS	1	\$4,045	\$4,045	Contractor
Roll-down metal shutters	SF	6,000	\$14	\$84,000	Manufacturer
Shutter installation	SF	6,000	\$8	\$48,000	Contractor
Electric motors and controls	EA	72	\$800	\$57,600	Manufacturer
Motor and control installation	EA	72	\$200	\$14,400	Contractor
Subtotal				\$208,045	
Engineering design and construction inspection (@ 10.0%)				\$20,805	
Total				\$228,850	

Proposed Project Schedule (to start within one month of grant award)				
Description of Task	Starting Point	Unit of Time	Duration	Unit of Time
Bid proposal and award	1	Month	2	Months
Permitting and contracting	2	Month	3	Months
Site inspection and preparation	3	Month	1	Months
Construction (including clean-up)	4	Month	5	Months

Damage History		
Date	Event	Damages to Community Hospital
05/26/70	Category 3 hurricane	\$200,000
07/05/84	Category 2 hurricane	\$340,000
09/25/90	Category 1 hurricane	\$740,000
09/01/04	Category 2 hurricane	\$985,000
08/12/05	Category 3 hurricane	\$1,340,000