

Post-Wildfire Soil Stabilization Mitigation Technical Review

This job aid supplement covers the requirements associated with the technical reviews for post-wildfire soil stabilization projects funded by Hazard Mitigation Assistance. The job aid supplements the Soil Stabilization Technical Review Job Aid. FEMA will also conduct an Environmental Planning and Historic Preservation review of each project. Refer to the Wildfire: Information Required for Environmental Review Job Aid and Soil Stabilization: Information Required for Environmental Review Job Aid.

The Disaster Recovery Reform Act (DRRA) Section 1205 states that recipients of hazard mitigation assistance provided under Stafford Act Sections 404 may use the assistance to conduct activities to help reduce the risk of future damage, hardship, loss or suffering in any area affected by wildfire. Section 1205 also lists 14 eligible activities that are currently eligible under the Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC). This Technical Review Supplement provides additional information, examples and potential sources of documentation for items listed in the job aid to help communities applying for HMA grants comply with application requirements.

- All Hazard Mitigation Assistance (HMA) applications must comply with the requirements outlined in the HMA Guidance.
- According to the guidance, in addition to a general programmatic review, an EHP review and a technical review will be performed by FEMA for each proposed project.
- The technical review will verify that a project demonstrates feasibility, effectiveness and cost-effectiveness. This document is intended for technical reviews of applications only.
- For assistance completing EHP compliance reviews, see the EHP Supplemental Job Aids.

Introduction

The following provides a review of the information that should be provided with the subapplication, including recommended documentation and a list of supplementary information, to assist FEMA when conducting technical reviews of the project application. The information provided in this supplement applies to post-wildfire soil stabilization projects, including reseeding ground cover with quick-growing or native species, planting grass to prevent the spread of noxious weeds, hydroseeding, installing erosion control mats, blankets or fiber rolls, and mulching with straw or chipped wood. For information about additional HMA-funded soil stabilization projects, refer to the Soil Stabilization Mitigation Technical Review Supplement. Technical resources are identified throughout this supplement to provide clarifying information on specific project application components. The final section provides a comprehensive list of resources identified throughout this supplement.



FEMA

It is recommended that the grant applicant consult a professional engineer, geologist or contractor to assist in preparing the application, as many of the documentation requirements are technical in nature.

The project-specific guidance in this supplement does not provide all the information necessary to apply for funding through an HMA program and must be read in conjunction with all other relevant guidance documents.

Additional Resources

- Hazard Mitigation Assistance Guidance (HMA Guidance)
- Hazard Mitigation Assistance Guidance Addendum
- Hazard Mitigation Grant Program – Post Fire
- Job Aid for Disaster Recovery Reform Act, Section 1205

A list of all resources referenced is provided on the last page of the supplement.

Summary of Steps

- STEP 1: Provide a Scope of Work
- STEP 2: Provide Available Technical Data
- STEP 3: Provide a Project Schedule
- STEP 4: Provide a Project Cost Estimate
- STEP 5: Provide a Project Site Map
- STEP 6: Provide Property Location Information
- STEP 7: Provide Project Photographs
- STEP 8: Document the Before-Mitigation Risk
- STEP 9: Cost-Effectiveness Analysis
- STEP 10: Environmental and Historic Preservation Considerations

Important Terms

Erosion Control Mats or Blankets: Fibers, straw or other plant material that protects the soil from precipitation can be used on hillsides and along valleys.

Fiber Rolls: Used as a temporary fix to control sediment and soil runoff and erosion. These are particularly useful to protect against sedimentation of water sources near burn sites. Fiber rolls are made from materials such as straw or coconut fiber and are rolled into a tube.

Hydroseeding: A slurry of seed and mulch mixed with water and fertilizer to promote growth of native grasses. Grasses help reduce soil erosion because they have an extensive root system to hold soil in place.

Mulching: Covering the area with a protective straw layer. Mulch should be covered with plastic netting or adhered to the soil with a tacking agent to minimize loss of straw to adverse weather.

Nature-Based Soil Stabilization: Methods to reduce the risk to structures, infrastructure or land from erosion and landslides include reseeding ground cover with quick-growing or native species, planting grass to prevent the spread of noxious weeds, hydroseeding, installing erosion control mats, blankets or fiber rolls, and mulching with straw or chipped wood.

Soil Stabilization: Methods to reduce the risk to structures or infrastructure from erosion and landslides include installing geotextiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles and stabilizing with riprap and other means of slope anchoring.

Technical Review Components

To complete a successful project application, some technical information must be provided for review. The following is a step-by-step approach addressing the major components of a Post-Wildfire Soil Stabilization project. Data collected in these steps will provide reviewers with the necessary information to determine whether a project is feasible and effective.

The data requirements in the following steps should be compiled in an attachment to the project application. If the project impacts multiple structures or land areas, this information must be followed for each structure or land area.

STEP 1: Provide a Scope of Work

Description: Provide a project narrative identifying the proposed mitigation action and structures or land areas to be mitigated, including a description of the proposed activities and a clear explanation of how the project will mitigate risk. The SOW should include key milestones and correspond with the design information, project schedule and cost estimate.

References: When preparing the SOW, refer to the following:

- HMA Guidance Part IV, Section H: Scoping Narrative: Scope of Work, Schedule, and Cost Estimate
- Job Aid for Disaster Recovery Reform Act, Section 1205 Additional Activities for Wildfire and Wind Implementation under Hazard Mitigation Assistance Programs

Approach: A licensed engineer, geologist or contractor may be required to assist in collecting the necessary information for the mitigation project application. The following items are recommended for inclusion in the SOW, and specific details and documentation required to support the narrative will be documented in the remaining steps in this job aid:

- Provide a detailed narrative of the erosion risk being mitigated, including landslide hazard information in the project area, if available.
- Describe the existing conditions of the project area. Define the problem and extent of the erosion/instability.
- Define the level of protection the mitigation will provide. Include a narrative on the frequency of the event that the mitigation will withstand.
- Describe the structure(s) and infrastructure that will benefit from the project (e.g., the project will reduce the landslide damages to 10 single-family homes).

- Explain the proposed mitigation activity in a scoping narrative, including the mechanism for the mitigation (e.g., reseeded ground cover with quick-growing or native species, planting grass to prevent the spread of noxious weeds, mulching with straw or chipped wood), identifying the tasks required to complete the proposed activity, and defining the tasks to be accomplished in clear, concise and meaningful terms. All cost elements must match SOW and schedule tasks and provide sufficient detail for FEMA to determine whether the application is eligible. The scoping narrative will become part of the conditions of the award.
- Verify that the project will meet current industry standards and minimum requirements of the selected soil stabilization method to be implemented.
- Mitigation project alternatives are required as part of the application development. Document at least three alternatives, including the preferred alternative, that were considered during the planning or design phase. Indicate which alternative is the preferred mitigation alternative and discuss why it is the most practical, effective and environmentally sound alternative. One alternative often considered is the “no-action alternative” and reflects conditions expected to exist if a mitigation project is not completed.
- Describe the mitigation method and the steps required to implement the soil stabilization mitigation activities, including the mechanism for the mitigation. A professional engineer, geologist, ecologist or contractor may need to be consulted.
- Describe the project activities, such as:
 - Site access, equipment and vehicle storage, and staging area(s)
 - Site preparation
 - Earthwork, including importation or disposal of fill
- Describe all permits necessary for the project.

STEP 2: Provide Available Technical Data

Description: It is necessary to demonstrate that a project is feasible and effective at reducing risk. Provide existing project plans; these may be conceptual (e.g., sketches or schematics) at the time of project application. If not available during application development, the conceptual design plans can be further developed after grant award but should be explained and accounted for in the scoping narrative, schedule and cost estimate.

Approach: Project plans should comply with the applicable codes and standards requirements. For planting and reseeded projects, including information about the plant species, planting schedule and plans for implementation. Providing project plans will allow reviewers to determine the technical feasibility for the proposed mitigation project and check the validity of the cost estimate against the plans. Document how the SOW solves the identified hazard risk.

STEP 3: Provide a Project Schedule

Description: Include a detailed project schedule for all tasks identified in the project cost estimate and SOW. The schedule identifies major milestones with start and end dates for each activity. Project schedules must

show completion dates of all activities, including construction period, within the period of performance (POP) allowed by the relevant HMA program. Sufficient detail must be provided so FEMA can determine whether the proposed activities can be accomplished within the POP.

References: HMA Guidance Part VI, Section D.4: Program Period of Performance and Part IV, Section H: Scoping Narrative: Scope of Work, Schedule, and Cost Estimate

Approach: Verify that the information in the schedule supports the SOW and aligns with the project cost estimate.

STEP 4: Provide a Project Cost Estimate

Description: Include a detailed line-item cost estimate for all tasks identified in the project schedule and SOW. Allowable costs are costs that are necessary and reasonable for the proper and efficient performance and administration of the federal award. All costs included in the application should be reviewed to verify they are necessary, reasonable and allocable consistent with the provisions of 2 Code of Federal Regulations (CFR) Part 200. Include sufficient detail so that FEMA can determine whether costs are reasonable based on proposed activities and the level of effort. Costs incurred prior to award may be considered pre-award costs and may be eligible for reimbursement. Eligibility may depend on the date they occurred and the grant program. Refer to HMA Guidance and the Notice of Funding Opportunity for specifics.

Reference: HMA Guidance Part IV, Section H: Scoping Narrative: Scope of Work, Schedule, and Cost Estimate

Approach: Verify that the information in the cost estimate supports the SOW and aligns with the schedule. Well-documented project cost estimates contain quantities, unit costs and a source for each unit cost. Lump sum cost estimates are not acceptable. Source material used to support the cost estimate should be referenced.

Allowable costs are costs that are necessary and reasonable for the proper and efficient performance and administration of the federal award. They may include, but are not limited to:

- Engineering services for design, geotechnical assessments and cost estimate preparation
- Project administration and management
- Surveying and inspection
- Soil sampling and classification
- Completion of a title search and deed recording fees
- Permitting and/or legal fees
- All construction activities required for soil stabilization
- Debris disposal and erosion control

It is necessary to verify that an annual maintenance cost has been determined using appropriate methods. The annual maintenance cost is necessary to address those costs associated with maintaining the effectiveness of the mitigation measures. Annual maintenance costs are not funded by FEMA.

STEP 5: Provide a Project Site Map

Description: Provide a map showing the project location. If the project includes multiple structures, show the project boundaries, including staging area. **Figure 1** provides an example of a project site map.

Potential Sources: Official site survey, assessor maps, topographic maps obtained from the project engineer or planner, maps created using a web-based service such as Google Maps

Approach: Provide a map showing the project location, including structure(s), map scale and location information. For any maps provided, verify that a scale bar is included, and the map is clearly labeled to identify the project boundaries.

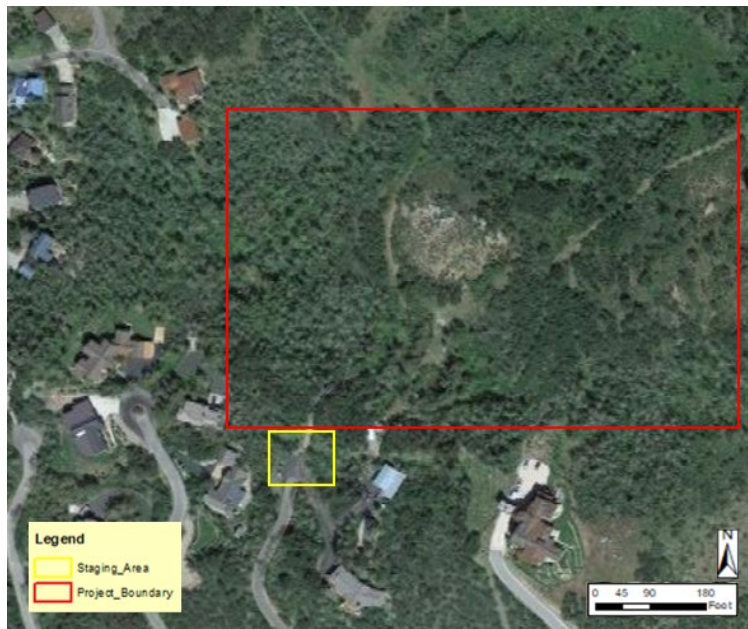


Figure 1. Example of a project site map for a reseeding ground cover stabilization project. The map identifies the project boundaries and staging area and includes a north arrow and a scale.

STEP 6: Provide Property Location Information: Address and Latitude and Longitude

Description: Provide the physical address(es) and the latitude and longitude of all mitigation activities. For projects that include multiple mitigation areas, tables containing all relevant information by property should be provided.

Potential Sources: Use a cellular telephone, tablet, or camera to take clear, quality photos for inclusion in the application.

PROPERTY ADDRESS

Approach: Provide property address(es) for each structure involved in the mitigation project. This includes street name and number; city, county or parish; state; and zip code. A post office box number is not an acceptable address.

If the address provided does not clearly match up with the structure(s) to be acquired, provide photos or a site map with the structure(s) footprint(s) clearly identified.

Potential Sources: Property owner, local building inspector, tax assessor records, deed to the property, engineering plans

Example: 456 Terremoto Road, San Francisco, San Francisco County, CA 94102

LATITUDE AND LONGITUDE

Approach: Provide the latitude and longitude of the project site and each structure involved in the mitigation. The latitude and longitude should be taken at the center of the property or project area. The latitude and longitude can be provided in either decimal degrees (e.g., 27.9807, -82.5340) or degrees, minutes and seconds (27° 58' 50.5" N, 82° 32' 2.4" W).

Potential Sources:

- GPS device
- Free online map tools or search engines that generate latitude and longitude when an address is supplied

Example: 27.9807, -82.5340 or 27° 58' 50.5" N, 82° 32' 2.4" W

STEP 7: Provide Project Photographs

Description: Provide representative photographs of the project area and any structure(s) impacted by the mitigation, if applicable. Photos should indicate the relative direction the photograph was taken (e.g., east side, looking west).

Potential Sources: Use a cell phone, tablet, or camera to take clear, quality photos for inclusion in the application.

STEP 8: Document the Before-Mitigation Risk

Description: Provide information on the risk of an erosion or stormwater runoff event and the effects of that event in physical damages to the surrounding landscape and adjacent waterbodies due to charred debris, soil and mud entering waterways and moving downslope uncontrolled.

Approach: Provide documentation of the calculations, studies or data used to determine the increased toxicity levels due to runoff debris contamination from the wildfire event.

STEP 9: Cost-Effectiveness Analysis

Description: HMA Guidance indicates soil stabilization projects to reduce risk to structures or infrastructure from erosion and landslides are eligible activities for HMA funding. Applying a sustainable approach to natural landscape preservation using green infrastructure is supported by HMA activities. FEMA developed pre-calculated benefits for the effectiveness evaluation of soil stabilization projects to support expedient implementation of post-wildfire mitigation actions. Soil stabilization post-wildfire projects under the cost of \$5,250 per acre are considered cost-effective and no further BCA is required.

A benefit-cost analysis may be completed for projects that do not qualify for pre-calculated benefits. See Soil Stabilization Mitigation Technical Review for guidance.

STEP 10: Environmental and Historic Preservation Considerations

Description: Environmental and historic preservation compliance will be considered as part of the application review process for soil stabilization projects. The assistance of a licensed professional engineer, architect or contractor may be required to help obtain the necessary information about EHP compliance. To understand the EHP considerations and requirements for the proposed project, refer to the Soil Stabilization EHP Supplement.

References

Below is a comprehensive list of resources identified throughout this supplement. Not all these resources are necessary for every post-wildfire soil stabilization project but are provided to ease identification of source material.

PROGRAM AUTHORITIES

- [Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, 42 U.S.C. 4001 et seq.](#)
- [2 Code of Federal Regulations, Part 200](#)

PROGRAM GUIDANCE

- FEMA Hazard Mitigation Assistance Guidance (and Hazard Mitigation Assistance Guidance Addendum)
- Hazard Mitigation Grant Program – Post Fire

TECHNICAL GUIDANCE AND STANDARDS

- Job Aid for Disaster Recovery Reform Act, Section 1205
- Streambank Bioengineering Job Aid
- Engineering with Nature. Alternative Techniques to Riprap Bank Stabilization
- Streambank and Shoreline Protection Manual

ADDITIONAL TOOLS AND RESOURCES

- Cost-Estimating Principles for Hazard Mitigation Assistance Applications
- Hazard Mitigation Assistance Application Development Scope of Work Examples
- EHP Review Supplements
- FEMA Hazard Mitigation Assistance Job Aids
- USGS Landslide Hazard Program