

STANDARD OPERATING PROCEDURES FOR THE MITIGATION ASSESSMENT TEAM PROCESS

Prepared for:



FEMA

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Acronyms and Abbreviations

BSB	Building Science Branch
CADD	computer-aided design and drafting
FCO	Federal Coordinating Officer
FDRC	Federal Disaster Recovery Coordinator
FEMA	Federal Emergency Management Agency
FIMA	Federal Insurance and Mitigation Administration
GIS	Geographic Information System
GPO	U.S. Government Printing Office
GPS	Geographic Positioning System
HQ	Headquarters
JFO	Joint Field Office
MAT	Mitigation Assessment Team
PO	(FEMA) Project Officer
Pre-MAT	MAT Preliminary Field Assessment Team
RAA	Request for Allocation Advice
RRCC	Regional Response Coordination Center
RO	(FEMA) Regional Office
SME	subject matter expert
SOP	Standard Operating Procedure
TRO	Transitional Recovery Office

1. INTRODUCTION AND BACKGROUND

The Federal Emergency Management Agency (FEMA) carries out many actions in response to natural disasters such as floods and hurricanes. Sometimes one of the actions is to deploy a Mitigation Assessment Team (MAT) to the natural disaster location to conduct field assessments and make technical observations on the performance of buildings and infrastructure¹ subjected to the effects of the natural hazard event. MATs are typically deployed after natural hazards and are not expected to be deployed after a manmade hazard. The MAT's observations are used to recommend changes to building codes and standards groups, prepare recovery advisories, gather information to improve guidance, and contribute to research efforts. The results of these actions help communities build back better and stronger.

MAT members typically include representatives from FEMA Headquarters (HQ); FEMA Regional Offices (ROs); State and local governments; other Federal agencies; industry associations; codes and standards organizations; experts in technical fields such as structural, electrical, mechanical, civil engineering, architecture, historical preservation, academia, building design and construction, land use, and floodplain management; mapping; personnel with local expertise; and other technical, administrative, and general support personnel.

MATs are formed by, and operate under the direction of, the Federal Insurance and Mitigation Administration (FIMA), Risk Reduction Division, Building Science Branch, which is functionally part of FEMA HQ. Although the MAT program is typically managed from FEMA HQ, personnel from ROs and Joint Field Offices (JFOs) play key roles in approving the deployment, funding, strategy, priorities, planning, scope, execution, and staffing of the MAT.

1.1 Purpose of This Document

FEMA has a proactive and comprehensive approach to the pre-disaster planning, pre-deployment planning, deployment, field assessment, and post-deployment components of the MAT process to make it an integral part of disaster response and hazard mitigation. For example, when adequate warning of an impending disaster is provided, FEMA can assemble and deploy a MAT immediately after a disaster by having potential team members already identified, qualified through the MAT screening process, and placed on standby for deployment in advance of the disaster event.

The MAT process, from pre-disaster planning to post-deployment activities, requires coordination among Federal, State, local, and private entities. To facilitate coordination, FEMA has developed Standard Operating Procedures (SOPs) for the MAT process. The SOPs are described in this document, *Standard Operating Procedures for the Mitigation Assessment Team*

¹ For purposes of the MAT, "buildings and related infrastructure" is defined as buildings used for residential and non-residential purposes and the utility elements inside them. It does not include the utility infrastructure that feeds into the building utility systems, such as electrical transmission or the main public water and wastewater piping systems.

Process. The SOPs are reviewed regularly and revised as needed as FEMA continues to improve the MAT process via lessons learned from every disaster deployment.

The SOPs cover all components of the MAT process, from pre-disaster planning, through deployment of the MAT, to preparing the MAT report and completing post-disaster follow-up activities.

This document begins with a discussion of logistics and activities that support the MAT process (Section 2). The three main phases of the MAT process are then presented: pre-deployment planning (Section 3), deployment and field operations (Section 4), and post-deployment (Sections 5 and 6).

1.2 Scope of a MAT

The MAT is deployed to observe and document the performance of a variety of building types subjected to the effects of the natural hazard event. The MAT's observations are limited to identifying the effect of the damage on the building's operations, and the design practices, construction methods, and building materials that either failed or resisted the forces generated by the event. The geographic extent of the MAT's observations and evaluations depends on the type of event, size of the disaster area, and other event-specific factors.

The MAT's observations, conclusions, and recommendations for improving building performance in future natural disasters are normally published in a report. Products such as recovery advisories and fact sheets are also developed for some disasters to aid rebuilding in the weeks and months after the event. Because of time and cost limitations, MAT observations and evaluations cannot be comprehensive; MAT reports and other products are not intended to serve as treatises on all aspects of a disaster. The assessments are meant only to capture trends in building performance of key structure/occupancy types and improve future building performance.

The following types of efforts can be supported by a MAT:

- **Non-field deployment** – Subject matter experts (SMEs) can support the JFO directly by maintaining a presence in the JFO immediately after a disaster event.
- **Small-scale focused study** – A team can be deployed to study a single issue. See Section 2.3, *MAT Equipment*
- *Equipment* that may be used by a MAT must be maintained and occasionally upgraded. The MAT Contractor maintains a “Go Kit” that consists of a digital camera, global positioning system (GPS) mobile unit, and associated equipment.

While the MAT Contractor maintains a centralized “Go Kit,” each SME is expected to have a personal digital camera with GPS capability. The digital cameras used by MAT personnel should have enough storage capacity for one day of fieldwork, which is a minimum of 500 high-resolution photographs meeting current U.S. Government Printing Office (GPO) publication quality standards.

The MAT Contractor is responsible for providing the services for field staff to upload their photographs to a central location housed away from the disaster (i.e., the MAT Contractor home office.) The photographs are stored by the MAT Contractor for the duration of the MAT deployment and provided to FEMA in digital format when the project is complete.

The MAT Contractor is also responsible for the following:

- Providing hard hats to MAT personnel (steel-toed boots, gloves, and other personal protective gear are individual MAT member responsibilities)
- Providing Internet hotspot capability for MAT sub-teams
- Other equipment as determined by the MAT Team Lead and contractor lead during pre-planning
- Study Topic Maintenance.
- **Pre-MAT support** – A small field team can be deployed to determine the need for a full MAT.
- **Full MAT study** – A full MAT can be deployed to the field for investigation and data collection with the purpose of evaluating building performance and developing a summary report.

Appendix A provides additional information about the purpose and potential need for a MAT, as well as details about how the MAT program aligns with FEMA’s mission.

1.3 Authorization of MAT

MATs are deployed at the request of FEMA leadership, typically at the Regional level or a Federal Coordinating Officer (FCO) at the JFO. FEMA can deploy a MAT after a Presidential declaration to provide technical assistance to communities.

The President has authority to declare a major disaster, which makes assistance available to the affected States and local communities when they cannot adequately respond to the effects of the disaster. Assistance provided by the President’s declaration of a major disaster is authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288 as amended, 42 U.S. Code 5121 et seq. (Stafford Act). One of the actions the President may take under the Stafford Act is to provide technical assistance through the use of Federal agencies as stipulated in Section 402(3), General Federal Assistance. Technical assistance can take many forms—reports, technical bulletins, recovery advisories, fact sheets, presentations, reviews of key draft documents, and meetings and other forms of outreach. The MAT is an example of technical assistance.

1.4 Roles of Key Personnel

The MAT is composed of FEMA personnel, contractors, and interested parties. Each plays an integral part in the MAT study and the development of the MAT products. The roles of key personnel are outlined below.

1.4.1 Joint Field Office Staff

Mitigation Branch

The President's authority to make assistance available after declaring a disaster is delegated to the FCO in charge of coordinating Federal, State, and community efforts in the disaster area. If the magnitude of the disaster is sufficiently large, the FCO assigns deputies to specific areas of responsibility. One of the key components of the Incident Command System structure is an operations section headed by an Operations Section Chief. The Hazard Mitigation function, which includes MAT efforts, operates under the Operations Section as the Mitigation Branch. The Mitigation Branch Lead is the ranking mitigation staff for that disaster TYPE. This Mitigation Branch Lead, in consultation with the Hazards and Performance Analysis Group Supervisor and FIMA HQ, requests that a MAT be deployed to a disaster area. The final decision to activate the MAT rests with FIMA at FEMA HQ with input from the FCO/Federal Disaster Recovery Coordinator (FDRC) or Regional Administrator.

In addition to being involved in the decision to deploy a MAT, the Mitigation Branch must ensure that funds are placed in the appropriate account for the MAT deployment in a process called a Request for Allocation Advice (RAA). It is important to ensure the FEMA staff involved in developing the Mitigation Strategy and budget for the JFO have the required documentation, justification, and support to secure MAT funding. The funds are currently allocated through FEMA's automated disaster management system, called the National Emergency Management Information System. FEMA's Enterprise Coordination and Approvals Processing System (eCAPS) allows electronic coordination and approval for requisition of services.

The Mitigation Branch also assists in scheduling and coordinating MAT visits to specific facilities and areas and collecting daily MAT accomplishments to include in JFO reporting.

FEMA MAT JFO Representative

The MAT JFO Representative is selected by the Mitigation Branch Director to act as the liaison between the MAT and the JFO, and the affected States and communities. The MAT JFO Representative, with regular communication with the Operations Section Chief, coordinates all activities related to these entities, including notifying State and local officials of the upcoming deployment and movement of the MAT, attempting to include State and local representatives on the MAT, and attempting to arrange meetings with State and local officials.

1.4.2 FEMA Headquarters Staff

FEMA Building Science

The FEMA Building Science Branch (BSB) is the primary liaison between the MAT Contractor (see Section 1.4.4), FEMA field personnel, FCO/FDRC, Operations Section Chief, and Mitigation Branch Lead. In some cases, a representative from the Region may serve in lieu of the BSB as the primary liaison. FEMA BSB personnel make initial contact with FEMA field personnel and are the primary point of contact for all FEMA groups throughout the MAT process.

FEMA BSB assigns a single point of contact as the BSB MAT Lead to represent the interests of the BSB, whether that person is from HQ or the Region. Where applicable for the type and size of disaster, the BSB MAT Lead coordinates with the FEMA Modeling Task Force to obtain maps or geospatial data related to the impending disaster and the initial impacts derived through geospatial and remote sensing means. The BSB MAT Lead also contacts other groups within FEMA that may have an interest in MAT evaluations (e.g., insurance, mapping, public assistance) and coordinates with them as needed.

FEMA MAT Media Affairs Liaison

A MAT Media Affairs Liaison is selected by the JFO Public Information Center or External Affairs Staff to act as the liaison between the MAT, Joint Information Center staff in the JFO, and the media. All media contacts are referred to the MAT Media Affairs Liaison (also may be an HQ Strategic Communications Branch employee).

1.4.3 FEMA Regional Staff

Regional Response Coordination Centers (RRCCs)

RRCCs operate within each of the 10 FEMA Regions. They support response and recovery and coordinate with States and tribal governments until a JFO is established. Mitigation staff deployed to support an activated RRCC can begin the process of requesting a MAT and coordinate with FCOs on transitioning as the JFO or Virtual JFO is established. This method allows a quicker response and mobilization to the field so the MAT can collect perishable data.

Regional Mitigation Division Director and Risk Analysis Branch Chief

The Regional Mitigation Division Director and the Regional Risk Analysis Branch Chief play an important role in determining the need for a MAT and championing its deployment. Their support and understanding of the program is pivotal in establishing whether there is a need for and benefit to be gained from MAT deployment given their established relationships with Regional Administrators and FCOs/FDRCs, as well as their understanding of the RRCCs.

Regional Building Science Point of Contact

Each FEMA Region has a Regional Building Science point of contact who represents that Region on FEMA Building Science issues and coordinates directly with BSB via an established Building Science Working Group. It is the responsibility of the Building Science point of contact to be knowledgeable about the purpose and benefits of the MAT and explain it to Regional leadership, help to champion a potential MAT when a need is determined, and potentially to serve on the MAT when it is deployed.

MAT Regional Representative

FEMA BSB will coordinate with the FEMA Regional Mitigation Division Director and Risk Analysis Branch Chief to determine the Regional Representative for the MAT. MAT Regional Representatives act as liaisons between the FEMA Region, the MAT, and affected States and communities. With the JFO Representative, MAT Regional Representatives coordinate with State and local officials in regard to MAT activities.

1.4.4 MAT Contractor

The MAT Contractor is hired by FEMA to lead MAT activities. The MAT Contractor is the primary point of contact and liaison for the subcontractors conducting MAT activities. After receiving notification from FEMA that a MAT-related effort is required, the MAT Contractor identifies a single point of contact to lead MAT activities at the inception of a disaster (or pre-disaster if warning is provided), and the point of contact is designated as the MAT Contractor Lead. Once the MAT Contractor Lead is assigned, the MAT Contractor contacts the appropriate Tier 1 SMEs (see Section 2.1 for information on SME tiers) to alert them that deployment may be possible, secure their commitment for the time required, and begin the subcontracting process with them as needed. The MAT Contractor should make every effort to have the Tier 1 SMEs badged and authorized for site visits prior to commencing any MAT field activities.

1.5 Background Checks and Badges

FEMA background checks and badges are important during disaster operations for controlling public access to the JFO/Transitional Recovery Office (TRO) and facilitating FEMA access to disaster sites. It is assumed that all FEMA employees deployed to the MAT would already have had a background check and received a FEMA badge in accordance with Department of Homeland Security/FEMA security policy.

However, because the FEMA background check and badging process can take several weeks to months, it may not be possible for all non-FEMA staff to be badged before being deployed. Current FEMA policy permits MAT Contractor employees and other staff to be used on a MAT even if they have not been issued a FEMA badge if they have signed the *MAT Confidentiality Agreement*, provided as Appendix B.

MAT Contractor employees who frequently support FEMA and who are likely to be deployed on a MAT should have a background check done and obtain a FEMA Contractor badge prior to the formation of a MAT.

1.6 Notice of Arrival

The BSB MAT Lead coordinates discussions on the arrival of the MAT with the FCO/FDRC, Mitigation, and other leaders as needed. Whenever possible, the MAT should meet at the JFO/TRO prior to initiating fieldwork to gain a better understanding of current disaster operations and local issues related to hazard mitigation and the disaster that just transpired. Depending on the phase or extent of the disaster, the JFO structure may change in size or complexity. The BSB MAT Lead determines whom the MAT should interface with at the JFO level.

The initial meeting should be used to brief the JFO leadership on the proposed activities, anticipated outcomes, manage expectations, provide a general overview and timelines, and any specific requests the MAT may have for support in accomplishing its mission.

2. MAT PROCESS SUPPORT ACTIVITIES

FEMA implements several pre-disaster planning activities to support the MAT process. The activities help FEMA, other government representatives, and the MAT Contractor and subcontractors support mitigation and recovery efforts.

To facilitate the rapid and effective deployment of MATs, FEMA has tasked the MAT Contractor with the following pre-disaster planning activities:

- Identifying highly skilled SMEs, both FEMA and non-FEMA personnel, from all areas of the country who are candidates for participation on a future MAT. The SME information is maintained in a national database. SMEs consist of local and other technical experts who have agreed to serve as members of, or advisors to, a MAT. This database of available SMEs and their specialties is updated regularly and reviewed by the MAT Contractor quarterly. The list is available to both FEMA and the MAT Contractor at all times (see Section 2.1).
- Identifying appropriate academic and industry partners (see Section 2.2).
- Maintaining MAT equipment (see Section 2.3). Identifying relevant future MAT study topics. The list of potential study topics is kept by the BSB and updated regularly using input from the FEMA Regions, the MAT Contractor, and others as is appropriate (see Section 2.3).
- Remaining abreast of the latest technology in data collection, geographic information systems (GIS), tools and anything that can aid the MAT in gathering valuable information.

2.1 National Database of Subject Matter Experts

A national database of local, Regional, and national SMEs is maintained by a FEMA contractor. Experts are identified and added to the database jointly by FEMA and the contractor. The database is reviewed quarterly to ensure that each SME in the database is identified as a Tier 1, Tier 2, or Tier 3 SME. Tier 1 SMEs are the most experienced, having served on a MAT or similar disaster mission, while Tier 3 SMEs may not have much field experience, but have extensive knowledge of a specific subject. The tier system provides a method to ensure that SMEs with the most applicable experience are given the first opportunity to serve on a MAT.

Additional information pertaining to the national database:

- SME workload information and other circumstances that may affect an SME's ability to deliver MAT products in a timely manner can be added to the database, thereby ensuring the database is current and useful for determining MAT assignments.
- Where possible, SMEs should be classified or cross-trained in more than one technical area for efficiency of team make-up and fulfillment of the MAT mission.

- SMEs must maintain the minimum insurance required by the MAT Contractor or will not be considered deployable. The MAT Contractor is responsible for ensuring that the database has accurate insurance information.

Table 1 lists the target number of experts in the technical areas relevant to a MAT. Maintaining the target number of experts in the national database will ensure that enough SMEs are available for multiple disasters and accommodate a complex workload. In a typical deployment, one or two sub-teams are deployed, but in a large catastrophic event, four or five sub-teams may be deployed.

Table 1. Target Number of Experts

Technical Area	Target No. of Experts
Architecture / building envelope	4
Building code: Wind	4
Building code: Flood	4
Building construction	4
Civil engineering	4
Coastal engineering	4
Electrical engineering	3
Fire protection engineering	3
Floodproofing	4
Geologist (seismic)	4
Hazard Mitigation Assistance	2
Local construction practices	4
Mechanical (HVAC)	3
National Flood Insurance Program	4
Residential construction	4
Seismic	4
Shelter/safe room	4
Structural engineering	4
Wildfire	4
Wind engineering	4

HVAC = heating, ventilation, and air conditioning

2.2 Academic and Industry Partners

An important pre-disaster planning activity is identifying academic and industry partners that can either join the field investigation or support the study as SMEs.

Responsibility of MAT Contractor: The MAT Contractor is expected to identify, and maintain relationships with, relevant potential academia and industry partners that can support MAT field investigations and/or contribute to the study. Industry and academic partners may be included in the MAT roster, or may support the MAT by providing information or conducting professional reviews of certain topics.

Responsibility of Academic Partner: FEMA frequently requests the participation of academic and industry partners on FEMA MATs.

- In many cases, academic or industry partners participating in the MAT program are independent entities not subcontracted to the MAT Contractor.
- Academic and industry partners who participate in MAT fieldwork are expected to provide field notes, and also to participate in writing and reviewing MAT deliverables, regardless of whether or not they are under subcontract to the MAT Contractor (see Section 6.1).
- Academic and industry partners should be prepared to share their photographs and follow the same protocol as the contracted partners of the MAT for storage of the photographs.
- Participating partners will be listed as team members in the acknowledgments section of the final MAT deliverable.

Academic and industry partners can reference and use the data produced by the MAT as follows:

- The MAT Contractor will provide MAT data requested by an academic or industry partner only after the 90 percent version of the deliverable has been completed and submitted to FEMA.
- The MAT deliverable can be referenced only after it has been published on the FEMA website.
- If requested by academic and industry partners, the MAT Contractor will provide presentation materials to support delivery of the MAT message(s) to audiences that support the partners' involvement in the MAT and to whom they must communicate their activities.

2.3 MAT Equipment

Equipment that may be used by a MAT must be maintained and occasionally upgraded. The MAT Contractor maintains a "Go Kit" that consists of a digital camera, global positioning system (GPS) mobile unit, and associated equipment.

While the MAT Contractor maintains a centralized "Go Kit," each SME is expected to have a personal digital camera with GPS capability. The digital cameras used by MAT personnel should have enough storage capacity for one day of fieldwork, which is a minimum of 500 high-resolution photographs meeting current U.S. Government Printing Office (GPO) publication quality standards.

The MAT Contractor is responsible for providing the services for field staff to upload their photographs to a central location housed away from the disaster (i.e., the MAT Contractor home office.) The photographs are stored by the MAT Contractor for the duration of the MAT deployment and provided to FEMA in digital format when the project is complete.

The MAT Contractor is also responsible for the following:

- Providing hard hats to MAT personnel (steel-toed boots, gloves, and other personal protective gear are individual MAT member responsibilities)
- Providing Internet hotspot capability for MAT sub-teams
- Other equipment as determined by the MAT Team Lead and contractor lead during pre-planning

2.4 Study Topic Maintenance

The MAT Contractor is responsible for developing and maintaining a list of study topics that may be useful for and appropriate to MATs. FEMA and the MAT Contractor should work together on the study topics listed below, but the study topics should not be limited to this list. Some topics may be easily covered in small, focused events and studies, but others may require more extensive investigations with additional SMEs. There should be general agreement between FEMA and the MAT Contractor about which topics deserve more study, including the potential benefits of the study.

The MAT program is not limited to post-forensic assessments, which have been the primary focus of past MAT efforts. Additional small-scale focused study topics might include:

- Forensic study involving detailed statistical evaluation of actual damage compared to expected performance
- Study of a single issue of strategic importance (e.g., collapse of a structure such as the residential property in North Carolina built to modern I-Codes that pancaked in a strong tornado, or the snow loading that collapsed roofs in the northeast in the winter of 2014/2015)
- Study of building performance to determine compliance with existing building code
- Losses avoided
- Performance of new methods, materials, or systems (e.g., green buildings, green roofs)
- Performance of older methods, materials, or systems that may need additional research or documentation to help mitigate or reduce future losses

3. PRE-DEPLOYMENT PLANNING

Pre-deployment planning consists of the actions FEMA takes after it determines that a natural disaster (e.g., hurricane, storm, riverine flood) is imminent but before a MAT is deployed. Pre-deployment planning consists of two stages: pre-event (Section 3.1) and post-event (Section 3.2). The post-event stage includes an assessment of scale and often involves deployment of a Preliminary Field Assessment Team, also called a Pre-MAT.

3.1 Pre-Event Stage

The pre-event stage is limited to FEMA staff, the MAT Contractor Lead, and MAT Contractor-associated staff. The MAT Contractor Lead is responsible for monitoring and reporting on the imminent event. Implementing the pre-event activities described in this section enables FEMA to anticipate potential disasters and be better prepared to respond effectively once a disaster has occurred. Identifying the resources that may be needed and planning for their acquisition results in significant gains in operational efficiency and effectiveness for FEMA's Risk Reduction Division, the ROs, and the affected communities.

Pre-deployment activities are funded through an annual allocation of non-disaster-specific funds. This allows the MAT Contractor to conduct pre-deployment activities without requiring verbal authorization to incur expenses directly related to a specific disaster.

The BSB MAT Lead notifies the MAT Contractor Lead, usually within 72 hours of the anticipated landfall of a hurricane and 12 to 24 hours before any other event. Upon notification, the MAT Contractor Lead begins gathering information. The activities listed below can be carried out before an impending event only when FEMA has sufficient warning of the event. In responding to disaster events that strike with little or no warning, such as earthquakes or tornadoes, some activities, such as pre-event monitoring, are precluded. The following information related to possible areas of study or the validity of deployment may be gathered:

- *Pre-event weather monitoring*: The MAT Contractor monitors the weather for specifics of the impending disaster and chosen area of study.
- *Building code information for affected area*: Code adoption and enforcement information for the area of interest can be determined through the following sources:
 - The Insurance Services Office Building Code Effectiveness Grading Schedule
 - The “Rating the States Report” from the Insurance Institute for Business and Home Safety (basic information at the State level)
 - International Organization for Standardization and International Code Council (building code data)
 - Technical Assistance and Research Contract (2010) Building Code Losses Avoided Studies Task Orders (2011 TO 24, 2012 TO 02, 2013 TO 12), especially sections of findings reports on the results and methods.

- *Building stock information:* The relative quantity of recent construction can be obtained from the following sources:
 - U.S. Census Bureau website (provides construction data in the form of building permits issued by the States)
 - FEMA insurance data (for flood hazard)
 - Private insurance data (for other hazards). If other private data services such as Pro-Logic become available, they may also be applied to situation reports concerning building stock.
 - Technical Assistance and Research Contract (2010) Building Code Losses Avoided Studies Task Orders (2011 TO 24, 2012 TO 02, 2013 TO 12), especially sections of findings reports on the results and methods.
- *News aggregation:* News aggregators are used for the efficient dissemination of information in the media. National media outlets generally provide broader information and better photographs and figures, while local media outlets are more likely to have location-specific information (including information on critical facilities and safe rooms) before national outlets. Outlets include:
 - Google News / Google Crisis Response
 - Yahoo News
 - Newslink
 - National media outlets (e.g., CNN)
 - Local media outlets

3.2 Post-Event Stage and Preparation for MAT Deployment

During the post-event stage, FEMA, in consultation with the MAT Contractor and other organizations, determines whether deployment of a MAT is appropriate and, if so, what the scale, composition, scope, timing, and activities of the team will be.

For events with no warning, such as tornadoes and earthquakes, the activities described in Section 3.1 must be carried out as soon as possible after the event. Such activities include early estimation of damages; early coordination with ROs, local officials, and key organizations; gathering and compiling damage information on structures; locations and specific damage of interest for potential assessments; Hazard Mitigation Assistance projects that might have been impacted; building codes for the area; and availability and early selection of technical experts.

- The MAT Contractor coordinates with the FEMA Modeling Task Force to gather damage data that will guide MAT planning and potentially be used by the MAT as part of their analysis.

- The scale of the disaster does not dictate the deployment of a MAT. MATs may focus on specific areas of study and produce only a white paper, or may conduct a larger, community-based study, such as was done for Hurricane Sandy, and produce a report.

Numerous activities occur after a disaster event but before a MAT is deployed. These activities can be grouped as follows:

- Immediate post-event response activities (Section 3.2.1)
- Deploying a Preliminary Field Assessment Team (Pre-MAT) (Section 3.2.2)
- Determining the need for full MAT deployment (Section 3.2.3)
- Determining the logistical needs of the MAT (Section 3.2.4)
- Determining the team composition of the MAT (Section 3.2.5)
- Assessing field conditions and possible hazards to MAT members (Section 3.2.6)
- Implementing confidentiality requirements (Section 3.2.7)

3.2.1 Immediate Post-Event Response Activities

Immediately after a disaster strikes, post-event response activities begin with local response activities such as dispatching police, fire, and emergency services; activating one or more Emergency Operations Centers, and declaring a state of emergency.

While FEMA and State and local governments, perform disaster response activities, BSB, the Regional Building Science point of contact, and the MAT Contractor gather data and prepare for a potential MAT deployment. For floods and hurricanes, immediate post-disaster response activities can often be planned and initiated before the flood or storm occurs. For disasters that occur with little or no warning, however, disaster response activities cannot be initiated until after the disaster strikes.

- At this point, the BSB coordinates with JFO and Regional staff to determine whether there is a need for a MAT and if so, whether funding can be secured.
- BSB works with the MAT Contractor to direct data collection activities.
- The MAT Contractor coordinates with academic, industry, and other Federal contacts to collect event and damage data.
- The MAT Contractor works with BSB to determine potential MAT composition.
- The BSB works with its single point of contact within FEMA's Deployment Tracking System (DTS) to build a DTS team, assign FEMA staff to the MAT, and secure their availability.

3.2.2 Deploying a Preliminary Field Assessment Team

Before deploying a full MAT, FEMA generally deploys a Preliminary Field Assessment Team, or Pre-MAT. A Pre-MAT is a small team (usually three or four members) consisting of SMEs

familiar with the event and types damaged facilities. The Pre-MAT conducts the first field inspection to refine FEMA's initial estimates of the types, severity, and geographic extent of damage, and the value of the information likely to result from deploying a full MAT. The assessment also helps FEMA verify, and if necessary revise, its original operations plan.

The objective of the Pre-MAT is to recommend whether a MAT should be deployed, what the composition of the team should be, how many sub-teams might be needed, where to go, where there is no need to go, general situational awareness, any impediments to avoid (e.g., bridge or road out), and damage of interest that may have escaped initial pre-planning, among other tasks. The Pre-MAT must quickly obtain a broad picture of the amount and type of damage that has occurred. The Pre-MAT is expected to obtain data from multiple sites affected by the event and to gauge the geographic extent of damage, but is not tasked with traveling to and observing the full geographic area affected by the event.

In addition to the Pre-MAT, the BSB may deploy a team to perform a forensic study of a particular type of building or specific issue. This forensic study may be requested to examine a significant issue that can be studied with a small number of SMEs and a possible concise field study in a targeted area. The forensic study may lead to a white paper, code change proposal, or be used to guide future mitigation guidance. The forensic study may not follow the deployment guidelines of the Pre-MAT listed below.

Aerial assessments can be crucial to determining the extent and type of damage incurred. U.S. Blackhawk helicopters are perfectly suited for conducting such assessments because they have six seats that provide an excellent view. However, military/other Federal agency assets can be difficult to obtain, which is why coordination for these flyovers should begin as soon as possible. A place to start on this is the JFO with any identified air operations resources for DHS/Customs Border Patrol helicopters. As many of these are equipped with video cameras, these flyovers can also result in useful footage. Department of Defense resources might also be an option.

Separate contracts should be planned in the event government/military overflights are not possible. After the rapid assessment has been completed, the Pre-MAT can meet with appropriate parties to report observations and make recommendations concerning the deployment of a full MAT, if beneficial or desired.

The Pre-MAT deployment should attempt to adhere to the following:

- Deploy as soon as emergency response has been completed, within 72 hours of event
- Identify a Pre-MAT lead, usually a FEMA person
- Identify the composition and size of the Pre-MAT, as defined by the event and determined by coordination between FEMA and the JFO
- Identify the general study area. Pre-MATs need to have flexibility to travel and observe impacts throughout the affected area
- Have three additional people (a driver, a navigator, and an SME)

- Use cross-trained personnel, if possible (e.g., the driver should also have subject matter expertise in a specific area)
- Identify one person on the team as being responsible for compiling notes and photographs, and planning the route in the field. This person is an integral member of the team.
- Prepare daily reports of about one to two paragraphs each day the team is deployed. The reports should concisely summarize the day's activities and the plan for the next day, if applicable. At a minimum, they should list the sites visited that day and the sites the team plans to visit the following day. Any issues the team encountered should be described. The daily reports are not intended to put forth conclusions or recommendations.
- Assign a dedicated SME contractor at the MAT Contractor's home office who is not deployed to support the team

Generally, the Pre-MAT will demobilize prior to deployment of the MAT. However, if the magnitude and nature of the event requires it, the Pre-MAT should remain in the field until full MAT deployment to maintain a consistent presence and communication of possible rapidly changing conditions. In this case, the Pre-MAT will demobilize once the full MAT is deployed with full transition of operations. No member of the Pre-MAT will be continuously deployed without a required 48-hour break.

In anticipation of the need to deploy a MAT, the Pre-MAT members must note during their fieldwork any hazards that members of a MAT may encounter and convey these to the future MAT members. This information should include buildings made unsafe by damage, contaminated sediments deposited by floodwaters, toxic chemicals released as a result of damage, and damage to the local infrastructure (e.g., roads, bridges) that would be better to simply avoid.

3.2.3 Determining the Need for Full MAT Deployment

The MAT Contractor submits a memo to FEMA outlining the knowledge gained from the Pre-MAT fieldwork within 24 to 48 hours of return of the Pre-MAT. The memo to FEMA should recommend whether a full MAT should be deployed and provide details on how deployment of the MAT could influence codes and standards and/or building practices. The memo should answer the following questions related to the possible deployment of a full MAT:

- Is there unique knowledge that could be potentially gained by deploying a full MAT?
- What is the anticipated potential effect on standards, codes, and practices?
- Has FEMA Leadership, Region, or Regions affected by the event requested a full MAT?
- What deliverables are expected to result from deployment? This item is subject to change depending on data collected and observations made during field operations.

The MAT Contractor memo also outlines the contractor/FEMA capacity to support the MAT study within the prescribed schedule with the required number of team members, including SMEs.

Full funding for MAT deployment must be available and contractually obligated prior to deployment.

3.2.4 Determining Logistical Needs

A MAT should be deployed only after a Pre-MAT is complete and members have come to a consensus on whether to deploy a MAT and areas to assess damage. Normally, deployments should occur after rescue operations have been completed but before significant cleanup commences (beyond making roads passable). This is necessary to allow observation of buildings with damaged components still intact. For hurricanes, deployment is typically approximately 14 days after landfall.

Each sub-team should have one vehicle, such as a 4-wheel drive car, sport utility vehicle, or van. The effort should be sized and staffed such that the entire MAT field deployment can be completed within 1 to 2 weeks, depending on the extent and complexity of damage. The size of the impacted area being studied and the focus of the study effort will help determine the required number of teams. Where appropriate, the MAT Contractor Lead should attempt to reserve hotel space for all MAT members so that all team members can stay in the same location. The importance of this was evident after Hurricane Sandy, where traveling a few miles across a bridge took many hours because of traffic and damage to infrastructure.

Field recording of assessment information should include daily reports and photo logs. Where appropriate and available, it is ideal if photographs can be uploaded to a server nightly. It is expected that SMEs will have the capacity to store several hundred photos throughout the field event (see also Section 2.3). All photographs should be named using a team-determined naming convention.

Teams should be given adequate time to rest each day throughout the deployment to ensure a safe work environment. Team workdays should be scheduled so the teams can meet in person after the fieldwork is complete to develop a preliminary schedule, report outline, and recommendations.

In developing a checklist of logistical needs for the MAT and establishing the schedule, the MAT Contractor should take into account the effects of the disaster on the availability of local equipment and supplies that the MAT may need. Equipment is to be provided by the MAT Contractor and may include the following:

- Communications equipment, including cell or satellite phones and pagers, team and sub-team Internet hotspots
- Computer equipment, including laptop computers and printers
- Digital and video cameras

- Flashlights, tape measures, and other equipment for site assessments
- Protective gear such as hardhats, reflective vests (steel-toed or hard-soled boots are personal items and are the responsibility of individual MAT members)
- Sunscreen and insect repellent
- Bottled water and coolers
- Specialty support
- GPS technology and mapping software
- Aerial assets, such as a helicopter or light plane (with support from FEMA)
- Rental cars, including vans and 4-wheel-drive vehicles
- Work/meeting areas, including access to copiers, fax machines, and telephones
- Accommodations for lodging and meals
- Proper identification such as FEMA contractor badges
- Extra emergency set of batteries for typical equipment (cameras)
- Damage assessment forms and other appropriate forms for use by the team
- Other items as determined by the FEMA and MAT Contractor leads

FEMA will consult with local officials regarding the availability and applicability of digital data for use in automated systems (e.g., GIS, CADD) if necessary. Custom applications of such data and systems can greatly enhance the efforts of the MAT and are useful in preparing the MAT deliverable.

3.2.5 Determining the MAT Composition

FEMA's coordination with Federal, State, and local officials is essential to the success of the MAT. It is the responsibility of the FEMA Project Officer (PO) and/or the BSB MAT Lead to secure the participation of representatives from other Federal agencies. It is the responsibility of the RO Representative to work through the RO and JFO to secure the participation of State and community representatives. During the post-event stage, the BSB MAT Lead will attempt to secure the participation of other Federal agency representatives, and the RO and JFO will attempt to secure the participation of State and local officials. Often after major disasters, some Federal agencies, States, and communities are overwhelmed and find it difficult to participate in MATs during the field deployment phase. In these cases, the MAT Contractor Lead and BSB MAT Lead will work with the RO and JFO to ensure that Federal, State, and community representative participation is facilitated at a minimum in the MAT report review process, as described in Section 6 this document.

The MAT should consist of:

- FEMA representative

- MAT Contractor Lead
- Navigator
- Driver
- Local building practitioner (where applicable and available)
- Appropriate SME(s) for the given disaster type (wind, flood, coastal etc.), for the damage seen (mechanical, electrical, plumbing, structural, etc.) or for the given expertise needed (e.g., roofing)

3.2.6 Assessing Hazards to MAT Members

In anticipation of the need to deploy a MAT, the Pre-MAT members should note during their fieldwork particular hazards for the MAT to avoid or be aware of, such as road or bridge closures or unusual hazards found during disaster operations. **Because access to medical supplies may be restricted, MAT members MUST bring adequate supplies of all required prescriptions and other medications they are taking.** Additionally, MAT members should be aware that travel to U.S. territories such as Puerto Rico and the Marianas Islands may be necessary. The MAT Contractor uses the Centers for Disease Control and Prevention website as a source for immunization information (www.cdc.gov/travel).

Other potential hazards include security issues such as restricted access or curfews in areas being observed and encounters with homeowners who are attempting to protect their properties. Information about these and other hazards will assist FEMA in its planning, development of operational guidance, and deployment of a MAT. This information should, if possible, be gathered during the pre-MAT phase of the MAT process.

As discussed in Sections 4 and 5, activities that occur both before and during a MAT deployment involve fieldwork at disaster sites. Working in and around damaged buildings, roads, electrical power lines, bridges, etc. entails hazards not usually encountered in other types of fieldwork. Furthermore, damage to cell towers, telephone lines, and transportation infrastructure may make it difficult to obtain emergency medical treatment. Health and safety requirements (explicit or implicit) in any contractual agreements between FEMA and the MAT Contractor must be adhered to by the MAT Contractor, subcontractors, and consultants. All potentially deployed contractor or subcontractor personnel must take a safety course prior to deployment as part of the MAT Contractor field safety program. The MAT Contractor is responsible for assigning a safety officer to each MAT prior to deployment; the safety officer will brief the team on field safety.

In addition, it may not always be possible for the team to obtain the property owner's permission to enter and assess a damaged building. Therefore, whenever possible, the local government official serving as a member of the MAT should be present during fieldwork. Having a local government official present when entering a building without the owner's permission may help the MAT avoid problems with the legality of such actions and reduce the likelihood that property owners attempting to protect their homes and contents from looters and vandals will confront team members.

3.2.7 Confidentiality

All non-governmental members of a MAT must sign FEMA's *Confidentiality Agreement* before participating. The *Confidentiality Agreement* is included in the initial contractual and cooperative agreement entered into as part of ongoing pre-disaster planning activities and in any subsequent contracts and agreements entered into at the time the MAT is formed. Signed *Confidentiality Agreements* must also be obtained from any logistical support personnel, outside vendors, academic or industry partners, and other parties involved in the MAT process, including all persons participating in fieldwork and reviewers of the deliverables.

FEMA developed its *Confidentiality Agreement*, included in Appendix B, to help ensure the confidentiality of the MAT's findings while the report is being developed and prior its publication as a final report. The *Confidentiality Agreement* is needed because the findings, conclusions, and recommendations of the MAT must be kept confidential throughout the entire MAT process until the most appropriate and often complex, nuanced language is developed and finalized through the iterative draft and SME review process. MATs include a variety of members with potentially different viewpoints and allegiances. Some team members may be tempted to use the team's work-in-progress for their own purposes, which may not be consistent with FEMA's objectives. In addition, the results of the MAT process are documented in a series of draft reports issued for review and comment by the appropriate audience and are not intended for general distribution.

All draft versions of MAT reports and all memorandums that transmit draft MAT reports to authorized reviewers must include confidentiality notices with this following language:

[On title page of draft reports, in bold typeface] This DRAFT report presents the preliminary findings of the MAT. The observations, conclusions, and recommendations presented herein are subject to review and revision. They are therefore to be considered a work-in-progress and are not appropriate for general dissemination. This report is to be provided only to those persons authorized by FEMA and is to be kept confidential by them.

[On front of memorandums, in bold typeface] The enclosed report is a DRAFT issued only to authorized reviewers. It is not to be copied or disseminated, and its contents are to be kept confidential.

Confidentiality extends not only to the MAT field results, observations, and findings, but also to the content of the MAT report. No personal information (e.g., names, telephone numbers) should be included in the MAT report unless written permission is obtained from the person. Limitations on the content of draft and final MAT reports are based on the Privacy Act. In general, no information beyond the type released under the Freedom of Information Act should be included in either draft or completed reports.

4. DEPLOYMENT AND FIELD OPERATIONS

The deployment and field operations phase begins immediately after FEMA makes the decision to deploy a MAT. As in the pre-deployment phase, several activities are carried out concurrently to ensure the effectiveness of the MAT process. These activities include developing logistical implementation schedules for assets such as aerial flyovers, defining field organizational assignments and responsibilities, establishing field coordination and reporting requirements, and identifying MAT coordination activities.

FEMA's goal in deploying a MAT is to obtain information and draw conclusions and recommendations that can be used in multiple ways. Some benefits of MAT deployment include: 1) Helping communities build back better and stronger after the event; 2) Helping FEMA improve its mitigation policies, procedures, and guidance; 3) Helping to improve model codes, standards, or other resources through specific FEMA code change proposals; 4) Understanding damage incurred by the built environment strategically to develop a remedy; 5) Documenting success stories and best practices; 6) Coordinating with partners at various levels (Federal, State, local, tribal, private sector, researchers, non-profits, industry, academia, or others) to address MAT findings in their areas of influence. To obtain the necessary technical information and develop sound, defensible recommendations, the MAT must be able to conduct its work in an effective, efficient, thorough, and organized fashion and clearly document its observations and conclusions.

4.1 MAT Operations

The following sections discuss the activation and deployment of a MAT. They include descriptions of MAT field observations, documentation, and reporting.

4.1.1 Activation and Deployment

The MAT Contractor Lead and the BSB MAT Lead work together to carry out and coordinate all activities required for deploying the MAT. Activities may include issuing written authorizations to proceed (issued by the FEMA Contracting Officer), developing preliminary schedules of performance milestones, identifying travel and meeting requirements or restrictions, developing field operations guidance or requirements, and identifying logistical requirements.

Once the necessary activities are completed, the members of the MAT are deployed and should report to their assigned rally point with team leadership and other team members. Once all MAT members are at the designated site, the BSB MAT Lead will meet with the entire MAT and continue coordination activities with local officials, SMEs, and RO staff. The BSB MAT Lead should help coordinate field and logistic activities such as resolving access issues/denials to damaged sites; adding critical sites to assess that may be in addition to preplanned sites; proactively planning ahead to intercept potential problems before they occur or to improve team operational efficiency or effectiveness; addressing unanticipated challenges to the team, coordinating between sub-teams where needed; gaining overall situational awareness; providing

and getting feedback on progress, issues, and concerns; and ensuring daily reports are being done properly, among other duties.

The MAT Contractor is responsible for the following:

- Leading and managing the efforts of its MAT employees, consultants, and sub-contractors
- Providing the deliverables to carry out the statement of objectives (SOO), statement of work (SOW), or contract
- Coordinating access to damaged assessment sites
- Coordinating, planning, and executing outreach efforts that might be included in the MAT deliverables, to include inbriefings, outbriefings, outreach meetings, training, etc.
- Being pro-active in addressing challenges in operations, and either resolving them when having the power to do so or coordinating with the FEMA MAT Lead to resolve.
- Providing accurate, sufficient, and timely documentation, situational reports, reporting of assessed damages, internal reviews of products and deliverables, and coordination with external organizations for their review of products and deliverables.
- Providing defensible observations, conclusions, and recommendations consistent with sound state-of-the-engineering practice and judgment, best practices for all deliverables, and supporting documentation
- Providing the MAT with necessary logistical and other support services including securing ground transportation, hotel arrangements, supplies, equipment, coordination, and planning
- Providing the FEMA MAT Lead with feedback, comments, concerns, or recommendations for improved operations
- Providing sound, accurate, applicable, defensible technical writing, graphic arts, proper grammar and spelling, and document “style and flow calibration” when dealing with multiple authors
- Identifying and coordinating with persons or organizations that can supply needed support services
- Investigating the availability of and obtaining, as appropriate, office space, digital data and/or software for the MAT

4.1.2 Contacting Local Officials During Site Visits

During the field deployment phase, the MAT Contractor Lead will try to contact local officials to better understand local conditions and issues. This is especially true when the RO or JFO has been successful in securing the assistance of community officials prior to the MAT’s arrival. If the assistance of a community official cannot be obtained, at a minimum, the MAT Contractor

Lead will ensure that the names of local officials are collected during the site visit so they can be contacted during the MAT report writing phase described in Section 6 .

4.1.3 Reporting Requirements

Following the data collection and documentation efforts, the MAT reports its progress to the FEMA MAT Lead, PO, or other authorized interested parties. Reporting is necessary because it is the BSB MAT Lead's responsibility to coordinate the MAT's activities with other FEMA, Federal, State, and local government operations and to ensure adequate progress is being made toward meeting MAT and FIMA goals.

The MAT Contractor Lead is responsible for working with a data collection expert and ensuring that the daily MAT log entry is promptly transmitted to FEMA. Once transmitted, the MAT Contractor Lead works with FIMA's website coordinator to ensure that the daily log entry is posted to FEMA's MAT website (<http://www.fema.gov/mitigation-assessment-team-program>) in a timely manner; logs are posted daily until the MAT has completed its field assessment work and has been demobilized.

A typical log entry or daily report should include:

- A description of notable observations from the day's field data collection
- A map showing field data collection points
- Photographs of significant observations or findings

Daily field reports should mainly document that day's field observations; there may be a need to also include planned operations, but these should be limited to those planned within the next 48 hours. Use of electronic messaging, a blog, or some other form of reporting, if agreed upon in advance, can be used for daily reporting in situations where lengthier reports are not necessary. The team may consider creating a MAT webpage to post daily reports.

In addition to the MAT daily log, the MAT Contractor Lead provides a written report to the FEMA PO, FEMA BSB Lead, and RO Representative every week during deployment. The report should include the following information at a minimum:

- General description of the completed work
- Estimate, in percentage, of the amount of work remaining to be completed by the team and an updated work schedule
- Description of special problems encountered, including the need for specialized technical support services not originally anticipated
- Summary of the team's preliminary findings
- List of projected needs for the remainder of the deployment
- Proposed actions the MAT Team Lead should take to help MAT operations

4.1.4 Field Operations Closeout Meeting

After the field operations have been completed, but before the MAT members return from the field, the MAT Contractor Lead should arrange a meeting with all MAT members, preferably in a conference setting. The BSB MAT Lead and/or the MAT Contractor Lead conduct the meeting. The data collection expert/technical writer, provided by the MAT Contractor, takes notes during the meeting and, if appropriate, records the meeting on tape. The purpose of the meeting is to discuss the following:

- Draft outline for the preliminary white paper and JFO presentation (see Section 5)
- Preliminary findings and a discussion of preliminary conclusions and recommendations
- Writing assignments for each MAT member for the white paper or report
- Coordination among the MAT members and the MAT Contractor regarding graphics for the report
- Schedule for MAT reporting requirements
- General expectations of MAT members over the next few months
- Appropriate technical team lead in each respective discipline (structural, hydrologic, critical facility, environmental, and technical writer) who will be responsible for the accuracy of the content for each draft submission

4.1.5 Public Relations and Media Relations

All disasters, especially those resulting in extensive damage to private and public property, present numerous challenges to meeting the immediate needs of communities and individual property owners. Among the challenges is responding to questions from the media about the nature and progress of FEMA's recovery efforts.

The work of a MAT has many short-term benefits to a given disaster through recovery advisories, fact sheets, and outreach and training efforts. However, it also has many strategic long-term benefits in hazard mitigation that may be misunderstood and mischaracterized by those more concerned with immediate relief. In addition, MAT findings, which address design processes, construction methods and materials, quality of workmanship by building contractors, and the regulatory activities of local governments, may prove controversial in the emotionally charged atmosphere that follows a disaster. Under these conditions, there will always be potential for misunderstanding, misrepresentation, ill will, and negative publicity, any of which might hamper FEMA disaster recovery or MAT activities. For these reasons, it is particularly important that the MAT members follow established guidelines when contacted by representatives of the media, particularly when conducting highly visible field observations and assessments.

All MAT members are to refer all media inquiries to the MAT Media Affairs Liaison (see Section 1.4.2). When in the field, a MAT member may respond to media questions only when authorized by the MAT Team Lead, in consultation with the Media Affairs Liaison. Additionally, no field

notes, logs, working documents, or draft presentations of findings may be released to the media without FEMA's express permission.

5. REPORTING AND POST-MAT OUTREACH

After MAT field operations are completed, FEMA carries out preliminary reporting and outreach activities to inform JFO leadership and staff of initial findings and support immediate recovery and rebuilding needs based on the damage observed. One way to support these needs is to offer guidance on established hazard-resistant construction practices through public outreach and targeted fact sheets and advisories.

The MAT Contractor provides preliminary reporting and outreach related to the MAT's initial findings and communicates applicable hazard-resistant construction practices to follow during rebuilding. These efforts may include the following tasks and deliverables:

- Recovery advisories
 - Delivery of pertinent existing recovery advisories from the MAT library. These are available to JFOs for immediate delivery.
 - Event-specific or region-specific issues may be worthy of new or revised recovery advisory guidance. This guidance should ideally be produced within weeks after the MAT returns from the field. Revised recovery advisories may require very little effort to update, but new recovery advisories may take several weeks or even months to finalize, depending on their number and the complexity of subject matter.
- SMEs may be requested to support the JFO shortly after the event.
- Presentation of preliminary MAT findings
 - FEMA may request that the MAT present its preliminary findings before leaving the JFO after the fieldwork is complete. FEMA and the MAT Contractor mutually decide the number of presentations to be provided. The number should be based on how many are necessary to effectively and efficiently convey the study results. This may be affected by the geographical and/or regional impact of the event and whether communications are necessary across multiple affected jurisdictional boundaries, such as multi-State impact zones. The presentations are to be provided with notes, so FEMA MAT, JFO, and other staff can adequately deliver the information.

5.1 Deliverables

MAT deliverables can be in a variety of forms depending on the nature of the event, level of data collected, complexity of damage, SOO/SOW objectives, and new information about design, codes, standards, or guidance. Deliverables can consist of one or more of the following:

- Technical white paper
- Recovery advisories/technical bulletins/fact sheets
- Presentation or series of presentations
- Training such as ½-day or full-day courses

- Language for building code proposals
- Delivery of existing or new course technical material
- Full MAT report

The deliverables should be provided in their final form within 6 months after field deployment is completed whenever possible. If a report is created, the content should be limited to new material, conclusions, and recommendations. Existing material found elsewhere (e.g., Internet, other publications) should not be included in the MAT report. The length of the final MAT report should be limited to keep it sharply focused on specific topics of study established during scoping.

Although the MAT should be aware of studies conducted by other groups, it is not anticipated that a full review of academic or industry reports will be included in any of the MAT deliverables. The content of MAT deliverables is to be based on the MAT's observations and findings.

Recovery advisories should be delivered to the JFO within 30 to 60 days of commencement of the fieldwork. Preference should be given to material that can be repurposed from previous deliverables, thereby expediting the delivery of the recovery advisories. New recovery advisories should be concise, focus on technical mitigation options about a particular technical topic, and contain limited background material.

The **JFO presentation** should be prepared based on discussions between the BSB MAT Lead and MAT Contractor Lead and in accordance with the following guidelines:

- The data collection expert/technical writer on the MAT Contractor's staff works with the BSB MAT Lead and the MAT Contractor Lead to review the findings, conclusions, and recommendations of the preliminary white paper.
- The preliminary white paper staff work together to reach consensus and distill the initial key findings, conclusions, and recommendations from the storyboarding process into a presentation outline based on the preliminary white paper.
- The data collection expert/technical writer, BSB MAT Lead, and MAT Contractor Lead designate MAT field operations staff to prepare PowerPoint visuals and bullet points to fill in the applicable sections of the presentation outline.
- MAT field operations staff should obtain consensus from other MAT members on any general findings or recommendations *before* submitting completed PowerPoint presentations.
- The PowerPoint contributions from the MAT field operations staff are submitted to the BSB MAT Lead and MAT Contractor Lead for review and then given to the data collection expert/technical writer for final review, assembly, formatting, and submittal of the JFO presentation.

- The standard JFO presentation is a 60-minute (or as appropriate) MS PowerPoint with photos and graphics embedded in the file.

5.2 Outreach Activities and Presentations

Based on the PowerPoint presentation given at the FEMA JFO, the MAT Contractor will use its MAT field operations staff to develop presentations and present them at various conferences, forums, meetings, and work groups on the MAT findings, conclusions, recommendation, recovery advisories, fact sheets, or training venues. For standard-scale disasters, the MAT Contractor provides one or two MAT field operations staff to conduct outreach presentations at conferences, forums, meetings, and training sessions. The conferences, forums, and meetings may focus on community education, and outreach presentations should be suitable for non-technical audiences (such as elected officials and the general public) and presented by the MAT Contractor's education and outreach expert. The second group of conferences, forums, and meetings are intended for a more technical audience (such as local building and code officials and designers or technical conference attendees) and presented by the MAT Contractor's engineering staff.

6. MAT REPORT

Preparation of the MAT report is a cooperative effort. Individual members of the MAT, FEMA staff, and representatives of the MAT Contractor and subcontractors are all expected to contribute to the report throughout the writing and review process. The joint report preparation responsibilities of FEMA and the MAT are primarily decision-making and coordination and encompass the following tasks:

- Identifying the report audience
- Verifying and, as necessary, revising the standards for report content, organization, and format
- Determining the types and number of photographs and graphics to be used
- Establishing the production schedules
- Identifying points of contact for coordination
- Identifying report reviewers in addition to those on the MAT

The primary responsibility of the MAT Contractor Lead is to coordinate the overall effort and ensure that the MAT report (to include recovery advisories, fact sheets, and other deliverables) is a comprehensive report of all technical activities conducted in the field following the disaster. The MAT Contractor Lead is the gatekeeper of information and manages all writing assignments. A review committee composed of FEMA, national SMEs, and industry association representatives are asked to review the report to make sure the event is fully covered and reported on accurately. Provide 2 to 3 weeks for reviews for each draft iteration, for significant materials, such as draft MAT reports. Provide at least 1 week for recovery advisories, fact sheets, or other smaller deliverables.

6.1 Completed Deliverables

Deliverables are prepared for distribution to the members of the MAT and other technical reviewers. The production schedule and number of deliverables required are outlined in the scope of services FEMA prepares and the work plan the MAT Contractor develops for each MAT task. The number of draft versions produced can vary according to the magnitude of the disaster, the number and sensitivity of technical and political issues involved, and other circumstances.

The primary goal of the draft production and review process is to establish the content of the report, and to ensure not only its technical accuracy, but also to develop the nuanced language often necessary to adequately capture or convey the conclusions, recommendations, or understanding of complex issues to the reader. Having a varied group of reviewers from different backgrounds, skillsets, organizations, levels of government, industry, academia or non-profits is invaluable to the writers, giving them differing and broad perspectives to ultimately improve the final deliverables and products.

6.2 Final GPO Version of Completed Report

Based on FEMA's completed report comment package, the MAT Contractor prepares the final GPO-compliant version of the completed deliverable. Decisions on page layouts and other issues that affect the appearance of the completed, printed report are also usually made at this stage.

A contractor selected by GPO prints the final GPO version of the completed report.

6.3 Archiving

After the completed MAT report has been issued, the MAT Contractor, at the direction of the FEMA PO, will request that all members of the MAT submit any media or other materials they developed or obtained as part of their MAT responsibilities. Materials developed or used by the MAT and the MAT Contractor during the MAT process include the following:

- Daily reports or MAT website
- Slides and photographs taken by the team members
- Field notes recorded by the team members
- Memorandums summarizing telephone conversations and meetings
- Draft versions of the MAT report and recovery advisories
- Reviewers' comments on draft versions of the report and comment responses
- Supplementary information used in the report preparation (e.g., reports, illustrations, photographs, videos, other materials produced by private or public entities)
- Chain-of-custody forms for each version of the report

These materials provide vital documentation for the entire MAT process, especially the recommendations presented in the MAT report. Therefore, the MAT Contractor must archive them for ready retrieval.

After receiving the materials from the MAT members, the MAT Contractor completes the following tasks:

- Review all the materials, including relevant in-house materials
- Resolve any questions concerning missing or incomplete materials with the FEMA PO
- Prepare a detailed inventory, organize the materials, and store them until the FEMA PO directs the contractor to transmit the materials to another location, such as at contract closeout

After the inventory is prepared, the MAT Contractor Lead provides a copy to the FEMA PO. The MAT Contractor Lead and the FEMA PO maintain the inventory so they can respond quickly if FEMA receives requests for copies of or inquiries concerning stored materials.

APPENDIX A
Purpose and Need of the Mitigation Assessment Team Program

Purpose and Need of the Mitigation Assessment Team Program

FEMA’s mission statement places an emphasis on building and improving the Nation’s disaster preparation, recovery, and mitigation capabilities.

One of the primary means of improving these capabilities is to evaluate current practices after they are tested by disaster events and determine potential areas for improvement, as well as successes that can be expanded. Mitigation Assessment Teams (MATs) are one mechanism FEMA uses to do just that. MATs are deployed after disaster events to evaluate building and related infrastructure performance and determine causes for failure or success.



Figure A-1. Two of the most recently complete MAT reports

MATs then recommend actions for Federal, State, and local governments, the construction industry, and building code communities to take to reduce future damage and protect lives. These actions help build community resilience and advance disaster preparation, recovery, and mitigation capabilities.

Further, the FEMA 2014-2018 Strategic Plan includes priorities and strategic imperatives that support the need for work the Building Science Branch does via the MAT program. The priority that most directly points to the MAT states that FEMA will enable disaster risk reduction nationally. By collecting and providing post-disaster building performance data and using nationally recognized SMEs from the government, private industry, and academia to develop action items aimed at making the Nation’s building stock more resilient, FEMA is providing communities, as well as code and building construction communities as a whole, with the data and tools to improve community disaster resistance. Table A-1 shows a sampling of references from the Strategic Plan and illustrates how the MAT program ties into them.



Figure A-2. MATs collect data on buildings like this residential property that sustained significant damage as a result of storm surge and wave action from Hurricane Ike (Bridge City, TX).

Table A-1. FEMA Strategic Plan and MAT Program Relevance

FEMA 2014-2018 Strategic Plan Reference	MAT Program Tie-In
Objective 1.2: Provide support to local leaders and tribal officials to strengthen recovery and mitigation core capabilities.	The MAT evaluates building performance and building codes at a local level and equips leaders with action items they can implement to improve disaster-resistance for the whole community.
Objective 4.1: Provide credible and actionable data and tools to support risk-informed decision-making.	Post-disaster building and infrastructure performance data is vital in evaluating risk. MAT reports present, analyze, and summarize the findings, then make recommendations about how to mitigate identified risks.
Strategic Imperative: Foster Innovation and Learning. The Agency will continue to advance a culture that fosters innovation and learning, both within FEMA and across the broader emergency management community.	The MAT is mobilized to study building and infrastructure performance and learn what is working well and where improvements are needed. Recommendations made by the MAT routinely incorporate innovation into reducing disaster risks.

Finally, the **National Disaster Recovery Framework** was developed to promote effective Federal recovery assistance. It describes key local, State, Tribal, and Federal roles and responsibilities and details core principles used to maximize the opportunity for recovery success. One of these core principles is Resilience and Sustainability. By incorporating mitigation and hazard resistance into recovery and rebuilding efforts, communities are strengthening their ability to withstand and recover from future events, thereby increasing their resilience. Clearly the MAT's efforts directly support this principle. The recovery advisories that incorporate hazard-resistant building techniques into recovery and rebuilding guidance and the MAT report recommendations work together to help build community resiliency.

Additionally, resilient rebuilding is identified as a factor of successful recovery characterized in part by communities incorporating stronger building codes for retrofitting, elevating, or removing vulnerable structures from future damage. These measures are typical of the recommendations often made in MAT reports.



Figure A-3. Joplin High School after the May 2011 tornado. MAT recommendations in the Spring 2011 tornadoes report spurred significant new requirements for safe rooms in schools and other critical facilities.



Figure A-4. MAT members visit a Hurricane Sandy-affected site

Therefore, the MAT's role in disaster recovery and mitigation directly ties to FEMA's priorities and mission. To be successful in promoting community resiliency, reducing property damage from disaster events, and saving human lives, FEMA needs to continue to evaluate performance of buildings exposed to disasters as it relates to current building practices, codes, and standards. By identifying strengths and areas for improvement and working with representatives from a variety of interested and affected stakeholders, FEMA can continue to develop recommendations that improve the Nation's and individual communities' resilience.

APPENDIX B
MAT Confidentiality Agreement

Mitigation Assessment Team Confidentiality Agreement

Subcontractors and all members of the Mitigation Assessment Team, herein called the MAT, agree not to divulge to third parties, or permit access to, information of any nature pertaining to the project or to this Agreement. Specifically, subcontractors and all other members of the MAT agree to maintain information developed during MAT field deployment and report preparation process in the strictest confidence. Disclosure of information may occur only when authorized in writing by the Federal Emergency Management Agency, herein called FEMA, or FEMA's MAT Contractor. The disclosure of information includes written or verbal release of information including data, conclusions, recommendations, or any work product related to the MAT's activities. Release of information includes presentations and interviews.

Subcontractors may not assign this Agreement or the process thereto nor employ lower-tier subcontractors without the express written permission of the MAT Contractor.

Subcontractors agree to abide by all applicable provisions of the Prime Contract between the MAT Contractor and Owner. The MAT Contractor shall make copies of such Prime Contract available upon request.

Subcontractors shall be responsible for all damage to life and property due to its activities in connection with the services required under this Agreement and shall indemnify, defend, and hold harmless the MAT Contractor and Owner and their officers, employees and agents against any claims or legal liability arising out of Subcontractor's wrongful act or negligent performance of its services under this Agreement. Subcontractor shall maintain workman's compensation, employer's liability, and general liability insurance and will submit to the MAT Contractor insurance certificates indicating coverage in amounts and with carriers satisfactory to the MAT Contractor.

Subcontractors shall advise the MAT Contractor of the name of the manager responsible for supervision of the services covered under this Agreement. Subcontractors warrant that they have no conflict of interest and will acquire none.

SUBCONTRACTORS

ALL OTHER MAT MEMBERS

Firm Name

Signed

Date

Authorized Signature

Date

Type / Print Name

Type / Print Name and Title

Contact Phone / Emergency Point of Contact

Phone Number / Emergency Point of Contact