



Public Assistance Debris Monitoring Guide

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FEMA

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Acronyms and Abbreviations

C&D	Construction and Demolition
CBRN	Chemical, Biological, Radiological, and Nuclear
CFR	Code of Federal Regulations
CY	Cubic Yards
DAP	Disaster Assistance Policy
DEQ	Department of Environmental Quality
DMS	Debris Management Site
EMMIE	Emergency Management Mission Integrated Environment
EPA	U.S. Environmental Protection Agency
FAR	Federal Acquisition Regulations
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GPS	Global Positioning System
GSA	U.S. General Services Administration
HHW	Household Hazardous Waste
M&IE	Meals and Incidental Expenses
OMB	Office of Management and Budget
PA	Public Assistance
POV	Privately Owned Vehicle
PW	Project Worksheet
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
S/NC	Selection/Negotiation Committee

Introduction

When a disaster or emergency that generates large amounts of debris occurs, eligible applicants (State governments, local governments, Indian Tribes or authorized Tribal organizations and Alaskan Native Villages, and certain Private Nonprofit organizations) may request Public Assistance (PA) grant funding from the Federal Emergency Management Agency (FEMA) to offset expenses incurred from debris removal. Effective coordination is required between the PA applicant, the State, and FEMA to ensure that debris removal operations are efficient, effective, and eligible for FEMA PA grant funding. Eligible PA applicants are encouraged to monitor their debris removal operations and document eligible quantities and reasonable expenses to ensure that the work is eligible for PA grant funding. Monitoring debris removal operations requires the PA applicant's comprehensive observation and documentation of debris removal work performed from the point of debris collection to final disposal. Monitoring debris removal work involves constant observation of crews to ensure that workers are performing eligible work in accordance with PA guidelines and all applicable Federal, State, and local regulations. Failure to properly monitor debris removal operations may jeopardize PA funding.

Accurate documentation of debris removal and disposal operations and eligible associated costs is the outcome of a good debris monitoring program. This documentation serves as the basis for PA Project Worksheets (PWs)—the documents that authorize grant reimbursements from FEMA. Debris monitoring documentation is critical to verify that debris operations are eligible for reimbursement, costs are reasonable, contract and procurement processes are appropriate, quantification of the debris is accurate, and the tracking of the debris to its final disposition is recorded and in compliance with all regulatory requirements.

An applicant may conduct debris operations in any manner it deems appropriate. However, only costs associated with applicants, facilities, and work deemed eligible according to FEMA eligibility criteria and complying with special consideration requirements are reimbursed under the FEMA PA Program. Therefore, these eligibility criteria and special consideration requirements should be taken into account by the applicant when developing its debris management plan. The benefits of debris monitoring should be balanced with the costs associated with the effort; therefore, the level of monitoring needs to be proportional to the eligible debris removal.

Chapter 1: FEMA, State, Tribal Government, and Applicant Monitors

Debris Monitoring Roles and Responsibilities

A number of different entities play a role in monitoring debris removal operations. It is important that these entities work together to resolve issues that may arise. Monitoring responsibilities and tasks of the different partners in the debris monitoring operations are addressed in this section.

Debris monitors need to understand FEMA PA policies and guidelines, including eligibility issues and specifically those relating to debris. However, the final determination of any PA debris eligibility issue will be made by FEMA PA management personnel.

FEMA Public Assistance Staff

The primary role of FEMA technical and debris monitoring specialists is to ensure that PA grant requirements and eligibility criteria are met by the applicant in all areas of the debris operation. FEMA debris monitoring specialists can guide applicants on the eligibility of debris removal efforts, but do not make eligibility determinations. Eligibility determinations are made by FEMA PA management personnel.

FEMA debris monitoring specialists are responsible for:

- Safety
 - Identifying possible health/safety risks and requiring proper field safety gear
- Eligibility
 - Verifying overall compliance with PA eligibility criteria
- Compliance
 - Checking debris loading, staging, reduction, and disposal sites at random to ensure compliance with PA eligibility criteria
 - Reporting any noncompliance, misconduct, or other negative actions to the appropriate FEMA representative for coordination and resolution with State and applicant representatives
- Debris Operations
 - Validating truck and trailer capacity certifications
 - Evaluating operational efficiency
 - Overseeing documentation requirements

FEMA debris monitoring specialists do not direct field operations on behalf of the applicant. The applicant has the primary responsibility for implementing and managing the debris monitoring activities.

Refer to Appendix A: Job Aids.

State/Tribal

While the applicant has the primary responsibility for daily monitoring operations, the State is responsible for verifying that those monitoring activities are implemented. The State should conduct random monitoring at loading and disposal sites to ensure compliance with PA grant requirements.

The State should ensure that the applicant is performing all required responsibilities of adequate monitoring, including:

- Safety
 - The contractor is complying with public and employee safety standards
 - Safety requirements are being met during the conduct of debris operations on State highways and roads (including load limits and truck covers, where required)
- Compliance
 - All work complies with local ordinances and State and Federal regulations
 - Environmental compliance is occurring on all debris management sites (DMSs)
 - Appropriate preservation measures are taken for places and buildings pertaining to the State's historic and archaeological treasures
- Debris Operations
 - Trucks are measured, certified, and operate properly
 - Trucks are loaded properly and loads are accurately evaluated
 - Load tickets are properly completed and controlled by the applicant
- Management and Oversight
 - Debris sites are properly mobilized and administered
 - Accurate records and appropriate documentation are kept
 - Contractor activities are conducted as mandated in contractor scope of work

Refer to Appendix A: Job Aids.

Applicant

The applicant has the primary responsibility for monitoring its debris removal operations. The applicant fills three roles in monitoring debris removal operations: field supervisor, loading monitor, and tower/site monitor.

FEMA recommends that applicants clearly outline their debris monitoring requirements in their debris management plan, requests for proposals (RFPs), and debris removal contracts. These documents should include instructions on actions to take to document and correct non-compliance issues. If an applicant decides to undertake work that is ineligible for FEMA funding, a methodology should also be established to separate ineligible work from eligible work. Optimally, this methodology should be discussed with the State and FEMA prior to implementation to ascertain compliance.

Refer to Appendix B for a sample debris monitoring plan, including monitoring forms. Contract documents are located in Appendix C.

Applicant Debris Monitors

Debris monitors serve as the applicant's field representatives. They ensure that the terms and specific monitoring and documentation requirements of debris removal contracts are adhered to and met. For force account debris removal operations, debris monitors ensure that the debris removal operations are efficient, safe, and properly documented to substantiate the applicant's grant claim.

General Debris Monitor Qualifications

Applicant debris monitors should have a complete understanding of their responsibilities and:

- Fully understand their responsibilities in accordance with the terms of the debris removal contract and other specific guidance provided by the applicant
- Possess the capability to estimate debris quantities accurately and objectively
- Understand all phases of debris management operations, including loading sites, DMSs, and final disposition locations
- Be able to differentiate between debris types
- Be able to fill out load tickets properly
- Understand site safety procedures
- Communicate effectively and efficiently
- Possess previous construction site experience (preferred)
- Have general knowledge pertaining to the operation of large construction machinery (preferred)

Debris monitors do not need to be registered professional engineers.

Duties of Debris Monitors

Applicants need to provide monitoring for all aspects of the debris removal operation, including activities at all loading, staging, and disposal sites. Debris monitors may have different roles and responsibilities at different stages or components of a debris removal operation; an individual may assume the role of each monitor type at various stages of the disaster. Debris monitors report directly to the field supervisor regarding their daily oversight. All logs and load tickets are submitted daily to the field supervisor.

Loading Site Monitors

The loading site monitors will perform on-site, street-level debris monitoring at all loading sites to verify debris eligibility based on contract requirements, and initiate debris removal documentation using load tickets. Loading site debris monitors' primary jobs are to:

- Estimate load volumes and issue load tickets at the load sites, retaining a copy of the ticket (for detailed description of load ticket chain-of-custody, refer to Appendix B)

- Maintain logs of daily subcontractor performance, eligibility, or other activities as required

Their other duties include, but are not limited to:

- Safety
 - Checking the area for safety considerations, such as downed power lines, children playing in the area, traffic control needs, and safe operation of trucks and equipment
 - Implementing all safety requirements
 - Performing a pre-work inspection of debris collection areas before loading to identify the location of covered utility meters, transformers, fire hydrants, mail boxes, etc., as a baseline to account for any collateral damage as a result of the debris removal operation
 - Ensuring that debris loads are contained properly before leaving the loading area
- Eligibility
 - Determining whether each load is to be claimed for reimbursement based upon PA eligibility criteria and marking load tickets if ineligible for FEMA reimbursement
 - Documenting eligible hazardous trees, including hangers, leaners, and stumps
 - Verifying global positioning system (GPS) readings or an address/location of leaning trees, trees with hanging limbs, and uprooted/exposed stumps that constitute an immediate threat; a separate ticket should be written if required in the contract
 - Not issuing tickets for trucks that arrive at pick-up sites already loaded or partially loaded
 - Ensuring that force account labor and/or debris contractor work is within the assigned scope of work
- Compliance
 - Certifying truck measurements
 - Obtaining the requirements outlined in all debris removal and disposal contracts, to ensure the contract requirements are implemented correctly
 - Reporting to supervisor if debris removal work does not comply with all local ordinances, as well as State and Federal regulations (i.e., proper disposal of hazardous wastes)
- Debris Operations
 - Ensuring that hazardous wastes are not mixed in with debris loads
 - Recording equipment details for time-and-materials contracts, including the type of equipment, the hours each piece of equipment was used along with operator name, and downtime of each piece of equipment by day



Figure 1: Contractor debris operation

- Ensuring only debris that is specified by the applicant is collected for loading and hauling (Figure 1)
- Ensuring only debris from public areas is removed
- Ensuring the work area is clear of debris before equipment moves to a new loading area
- Evaluating and recording performance and productivity of debris removal crews
- Communication
 - Remaining in constant contact with debris management/dispatch center or supervisor
 - Reporting issues (such as safety concerns, contractor non-compliance, and equipment use) to their field supervisor
 - Photographing and providing a written document of any damages made to utility components, driveways, road surfaces, private property, vehicles, etc.
 - Performing other duties as directed by the debris management project manager or designated debris management personnel

Tower/Site Monitors

Debris monitors at a DMS are often referred to as “tower” or “site” monitors.” The tower/site monitor’s role encompasses the following scope of duties:

- Safety
 - Checking the area for safety considerations, such as downed power lines, children playing in the area, traffic control needs, and safe operation of trucks and equipment
 - Implementing all safety requirements
- Compliance
 - Obtaining the requirements outlined in all debris removal and disposal contracts, to ensure the contract requirements are implemented correctly
 - Reporting to supervisor if debris removal work does not comply with all local ordinances, as well as State and Federal regulations (i.e., proper disposal of hazardous wastes)
- Debris Operations
 - Ensuring that hazardous wastes are not mixed with debris loads
 - Recording equipment details for time-and-materials contracts including the type of equipment, the hours each piece of equipment was used along with operator name, and downtime of each piece of equipment by day
 - Accurately measuring and documenting load hauling compartments for trucks and trailers to compute volume capacity in cubic yards (CY) for each truck and trailer prior to its commencement of debris hauling operations
 - Recertifying truck capacities on a regular basis
 - Verifying calibration of scales (if tonnage contract is used for debris removal)

- Ensuring that truck loads are accurately credited
- Estimating the percentage of full capacity for each truck or trailer load
- Ensuring that trucks are not artificially loaded (e.g., debris is wetted, debris is fluffed or not compacted)
- Initialing each load ticket before permitting any truck to proceed from the tower entrance to the dumping location
- Properly and accurately completing and physically controlling load tickets (for both tower and loading monitors)
- Monitoring site development and restoring DMSs
- Communication
 - Remaining in constant contact with debris management/dispatch center or supervisor
 - Reporting issues (such as safety concerns, contractor non-compliance, and equipment use) to their field supervisor

Field Supervisor

The applicant's field supervisor is responsible for scheduling and deploying the loading and tower/site debris monitors and overseeing their daily activities at loading sites and disposal and staging sites. The field supervisor resolves field operational, eligibility, and safety issues, and communicates these issues to the applicant. Communication and coordination of daily activities with FEMA, State, and applicant field personnel is required. The field supervisor also conducts or oversees truck certifications, load measurements, and photo-documentation as required. The field supervisor collects daily logs from the debris monitors and tabulates truck load data for the daily report.

In addition to the general qualifications for debris monitors detailed above, field supervisors need to:

- Possess the ability to communicate with field staff as well as management
- Be able to resolve conflicts and issues in the field
- Understand when to elevate issues to the applicant's management

Field supervisor duties include, but are not limited to:

- Safety
 - Being familiar with, maintaining, and implementing all safety requirements
- Eligibility
 - Ensuring that a reasonable level of effort is applied to the monitoring process, commensurate with the debris operations and the schedule (refer to Section 3.3, Reasonable Level of Effort Guidance)
 - Ensuring only eligible debris is collected for loading and hauling

- Compliance
 - Obtaining and becoming familiar with the requirements outlined in all debris removal and disposal contracts
 - Making unannounced visits to all loading and disposal sites within an assigned area
- Debris Operations
 - Ensuring only debris from approved public areas is loaded for removal
 - Assisting in the measuring of all debris hauling trucks and trailers with the appropriate contractor representatives, if applicable
 - Taking photographs of all trucks and trailers used in the debris operations to establish a baseline inventory of equipment
- Management and Oversight
 - Serving as the first-line of management for the debris monitors and assisting as necessary with any questions or conflicts that arise in the field
 - Preparing a daily written report of all activities observed and including photographs
 - Being familiar with all phases of the debris management operation, including loading sites, DMSs, and final landfill sites

Chapter 2: Eligibility Requirements

FEMA PA Program Debris Removal Eligibility

In order to be eligible for PA Program funding, debris must be generated by a Presidentially declared disaster; located within the designated disaster area; be the legal responsibility of an eligible applicant to remove; and present an immediate threat to life, improved property, or public health and safety (44 CFR §206.223 and §206.224).

Only FEMA has the authority to make eligibility determinations for FEMA PA Program grant funding.

Applicants should consult the Public Assistance Guide (FEMA 322); Public Assistance Debris Management Guide (FEMA 325); and FEMA's Recovery 9500 Policy Series for detailed guidance on debris and general eligibility criteria under the PA Program. This information is also available online at www.fema.gov/government/grant/pa/debris_main.shtm.

Eligible Debris Removal

The applicant is responsible, through the use of debris monitors, for ensuring that the claimed debris removal activities are completed in accordance with contract specifications and other supplemental guidance, and that appropriate costs are claimed to the FEMA PA Program for reimbursement. FEMA PA management personnel will determine eligibility based on the defined scope of work of the debris removal operation, field observations, documentation, and monitoring costs.

Ineligible Debris Removal

An applicant is free to authorize the removal of any debris it deems appropriate. However, the removal of ineligible debris should be clearly documented and delineated as ineligible in the loading tickets, monitoring notes, and summary of debris totals. If an applicant chooses to process ineligible debris, it must be separated from the FEMA claim, and any monitoring costs associated with that work are ineligible for FEMA funding.

Final determinations on eligible costs are not made in the field. They are made by FEMA PA management personnel during development and review of the PWs. Therefore, it is imperative that debris removal and debris monitoring procedures be well documented throughout debris operations.

Eligible Monitoring Work and Costs

Reasonable costs associated with the following activities may be eligible for PA funding:

- Labor and material costs associated with field supervisors, loading and tower/site monitors, and completing documentation as necessary to substantiate PA grant funding
- Data compilation of load tickets and field debris monitoring reports to verify eligible work and costs invoiced by the debris removal contractor (if under contract)
- Training of debris monitors on debris removal operations, debris monitoring and documentation processes, and FEMA eligibility. *Note: FEMA can provide training to applicant debris monitors upon request.*

- Use of electronic load ticket system or automated debris monitoring system to document debris quantities and eligibility. The applicant should demonstrate through a cost analysis that the use of the system is cost effective and the cost is reasonable.

Ineligible Work and Costs

Costs that FEMA determines to be associated with an unreasonable level of effort, including disproportionate numbers of debris monitoring personnel and clerical staff related to the scope of the debris removal operation, are not eligible debris monitoring costs under the PA Program.

Project Supervision and Management Costs

The fees associated with using staff with professional qualifications may not be considered reasonable for reimbursement from FEMA. In order to be eligible, the applicant must document the reason specific professional qualifications are required.

Costs considered project supervision or management costs, as defined under Disaster Assistance Policy (DAP) 9525.6, Project Supervision and Management and Supervision Costs, differ from eligible debris monitoring costs. Project supervision and management costs should be separated, documented, and claimed separately in accordance with DAP9525.6. The eligibility of this work and its cost will be evaluated separately and on a case-by-case basis in accordance with DAP9525.6.

Such project supervision or management costs may include costs associated with direct management of the debris removal operation by an applicant's in-house staff, or by a consulting firm retained to analyze, design, and oversee the debris removal operation. These costs may also include labor costs associated with project management services for the debris removal operation, developing reports to establish contractor performance measures, and evaluating operational efficiency.

Reasonable Level of Effort Guidance

FEMA will evaluate the level of effort of debris monitoring operations for reasonableness when determining the eligibility of debris monitoring costs. The level of effort for debris monitoring operations should be commensurate with the magnitude of the disaster, the types and quantities of debris to be removed, and the scope of the debris removal operation.

Level of Effort for Debris Loading Sites

Historical data for debris monitoring operations suggest the following level of effort may be appropriate for field efforts.

Rural areas: One loading monitor should be provided for each loading site to verify that the collected debris is eligible under PA Program criteria. The number of loading monitors can be amended to allow one monitor to oversee two or even three contractor loading sites, as long as the truckloads are reviewed at a controlled access point and the collected debris can be documented and verified as eligible or ineligible.

Urbanized or higher-density areas: One loading monitor should be provided for every three to four loading sites. This presumes that the loading monitor can monitor the sites via line-of-sight or a controlled access point.

Level of Effort for Debris Management Sites

Tower/site monitors: Tower/site monitors are required at DMSs (temporary or permanent). Depending on the set-up of the DMS, a minimum of one tower/site monitor is required to document load quantities and verify that trucks are emptied. Additional tower/site monitors may be needed at exit locations to verify that trucks are emptied, or at reduction (grinding/burning) locations to document and verify production rates.

Field supervisors: If multiple DMSs are in operation, one field supervisor may be added for every 10 debris load site monitors, or as needed for exceptionally large and unique operations to ensure adequate management of operations.

Clerical/data entry support: Typically one or two data entry personnel can accommodate the daily data amassed when debris operations use load tickets for documentation. Larger or faster operations may require additional clerical support. The number of data entry personnel should be adjusted to the needs of the applicant. The use of automated debris monitoring documentation systems may significantly reduce the required level of effort for clerical support.

Reasonable Cost Guidance

Costs associated with debris monitoring must be reasonable and necessary as defined by the Office of Management and Budget (OMB) Circular A-87 and Title 44 Code of Federal Regulations (CFR) Part 13. Competitively bid debris monitoring contracts that comply with Federal, State, and local procurement regulations and procedures will establish reasonableness for debris monitoring costs. However, FEMA will determine reasonable costs for contracts that are not competitively bid.

FEMA's Recovery Fact Sheet 9580.201, Debris Contracting Guidance, includes cost analysis guidance that applicants may use to help assess reasonableness. The Fact Sheet provides guidance to applicants in conducting analyses of:

- **Labor:** Are labor rates, labor classifications, and number of proposed labor hours reasonable for the proposed scope of work? The labor rates should be commensurate with the skill level required by the job function. Professional engineers and qualifications are not required to perform debris monitoring duties.
- **Materials and Supplies:** Are costs necessary and reasonable?
- **Profit:** Was profit negotiated as a separate element of the contract price?

FEMA and applicants may also use other sources of cost information when assessing the reasonableness of force account labor costs, including, but not limited to, FEMA Cost Codes available in the Emergency Management Mission Integrated Environment (EMMIE).

Applicants are encouraged to use all of these resources and other available sources of information in their assessment of reasonable debris monitoring costs.

Debris Operations – Level of Effort Scenario

The U.S. Army Corps of Engineers developed this scenario based on historical data from multiple disasters. Every disaster and impact area is unique; accordingly, debris removal and monitoring operations vary based on the conditions of each disaster.

Scenario: A storm generates approximately 1,000,000 CY of debris, and the cleanup period is estimated to be 60 days. Each debris removal crew can load and dispose of 600 CY/day. The calculation of CY per crew for the duration of the cleanup period is:

$$60 \text{ days} \times 600 \text{ CY/day} = 36,000 \text{ CY per crew}$$

If the storm generates roughly 1,000,000 CY of debris, and one crew can move 36,000 CY of debris within 60 days, 28 debris crews would be needed to haul debris in this scenario. One loading monitor can be used for every three to four crews (if circumstances allow). If 28 crews are used, 10 loading monitors and 2 field supervisors would be needed to effectively monitor the pick-up portion of the debris operation at the loading sites.

If the cleanup period is protracted, the number of crews and loading monitors may be reduced. However, the overhead costs associated with keeping personnel in the field longer may increase the overall costs of the debris monitoring mission.

Planning assumptions:

1. A typical debris removal crew consists of:
 - One front loader or knuckle-boom
 - Four to five trucks (depending on the travel time and distance to the DMS)
2. A typical debris removal crew can transport approximately 600 CY of debris per day
3. The number of loading monitors should be based on:
 - Estimate of the amount of debris to be moved from the rights-of-way (FEMA-eligible debris) to the DMS
 - Estimated timeframe for cleanup

Chapter 3: Debris Monitoring by Debris Type

Debris monitoring considerations and responsibilities may vary depending on the type of debris being removed. Debris monitoring considerations for each of the primary debris types are described below. Refer to Appendix A: Job Aids for additional debris monitoring recommendations.

Vegetative Debris

Vegetative debris may consist of whole trees, tree stumps, tree branches, tree trunks, and other leafy material. Depending on the size of the debris, the collection of vegetative debris may require the use of flat bed trucks, dump trucks, and grapple loaders.

Considerations for Monitoring Operations

- Hand-loaded trucks/trailers are graded at 50 percent of a load because of the low compaction achieved by hand-loading, pursuant to DAP9523.15, Debris Operations – Hand-Loaded Trucks and Trailers (Figure 2).
- This type of debris may be recyclable or have salvage value. Document separation and salvage operations when implemented.
- For special vegetative debris considerations, refer to Disaster Assistance Fact Sheet 9580.204, Documenting and Validating Hazardous Trees, Limbs, and Stumps.



Figure 2: Hand-loaded truck

Construction and Demolition Debris

Construction and demolition (C&D) debris can be defined as damaged components of buildings and structures, such as lumber and wood, gypsum wallboard, glass, metal, roofing material, tile, carpeting and floor coverings, window coverings, pipe, concrete, fully cured asphalt, equipment, furnishings, and fixtures. The definition of C&D debris may vary between jurisdictions—what is included in one jurisdiction may be excluded in another.

Considerations for Monitoring Operations

The C&D debris must be disaster-generated (i.e., eligible C&D debris cannot be the result of an applicant's rebuilding efforts) and present an immediate threat to be considered for FEMA eligibility.

Hazardous Waste

The applicant should comply with Federal, State, and local environmental requirements for handling hazardous waste. Hazardous waste is regulated under the Resource Conservation and Recovery Act (RCRA) and contains properties that make it potentially harmful to human health or the environment. In regulatory terms, a RCRA hazardous waste is a waste that appears on one of the four hazardous waste lists (refer to Title 40 of the CFR Part 261) or exhibits at least one of the following four characteristics:

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

Considerations for Monitoring Operations

- Hazardous wastes may require segregation and special handling (Figure 3)
- Improper segregation of the hazardous waste debris should be documented
- If unsafe practices are observed during the handling and disposal of hazardous materials, the appropriate authorities should be notified
- Safety precautions will vary depending upon the circumstances and type of hazardous materials encountered, but they may include personal protective equipment, decontamination stations, closed and secured containers, and covered trucks or specialized containers
- Monitor hazardous material processing carefully and regularly to verify that proper precautions are taken and that the chain-of-custody is maintained
- Verify that hazardous materials are delivered to an appropriate DMS since hazardous wastes typically require special handling, transportation, and final disposition that are significantly more costly than typical waste disposal



Figure 3: Segregation of hazardous debris

Household Hazardous Waste

Household Hazardous Waste (HHW) refers to hazardous products and materials that are used and disposed of by residential consumers, rather than commercial or industrial consumers. HHW includes some paints, stains, varnishes, solvents, pesticides, and other products or materials containing volatile chemicals that catch fire, react, or explode under certain circumstances, or that are corrosive or toxic.

Considerations for Monitoring Operations

- Verify and document that HHW is picked up and handled by specialists licensed by the Grantee's Department of Environmental Quality (DEQ) and managed in designated areas within the DMS

- Verify and document that the chain-of-custody is maintained throughout the collection, handling, transport, and disposal of HHW

Electronic Waste

Electronic waste (e-waste) refers to electronics that contain hazardous materials, such as cathode ray tubes. Examples of e-waste include computer monitors and televisions. Typically, these products contain minerals and chemicals that require specific disposal methods.

Considerations for Monitoring Operations

- Ensure that e-waste is segregated
- Ensure that e-waste is removed intact, collected, and stored at the DMS for later processing
- This type of debris may be recyclable or have salvage value, document separation and salvage activities that are implemented

White Goods

White goods are defined as discarded household appliances such as refrigerators, freezers, air conditioners, heat pumps, ovens, ranges, washing machines, clothes dryers, and water heaters. Many white goods contain ozone-depleting refrigerants, mercury, or compressor oils that must be removed and processed following environmental protocols and procedures before the white goods can be further processed for disposal and recycling.

Considerations for Monitoring Operations

- Document that white goods are collected separately, cleaned and processed to remove putrescent debris inside and to remove all oils, solvents, and refrigerants (Figure 4)
- If white goods are to be collected without being cleaned, verify and document that the DMS includes ample space for processing the collected white goods
- This type of debris may be recyclable or have salvage value. Document separation and salvage activities that are implemented



Figure 4: White goods being staged

Soil, Mud, and Sand

Floods, landslides, winds, and storm surges often deposit soil, mud, and sand on improved public property and public rights-of-way. Facilities commonly affected by this type of debris include streets, sidewalks, storm and sanitary sewers, water treatment facilities, drainage canals and basins, parks, and public swimming pools.

Considerations for Monitoring Operations

- Document that only the disaster-generated silt and soils are removed. This requires an understanding of pre-disaster conditions as well as the documented maintenance of the affected area.

- Contaminated soils may require special handling depending on the contaminant. Document any contaminated soil issues to ensure proper handling, processing, and disposition.
- Verify that any contaminated disaster-generated soils are addressed by specialists from the State's DEQ and/or EPA and managed appropriately in designated areas.

Vehicles and Vessels

Vehicles and vessels may be damaged, destroyed, displaced, or lost as a result of a disaster (Figure 5). These vehicles and vessels may eventually be abandoned because of the damage incurred or because the original owners have relocated. Vehicles and vessels may be classified as debris if they block public access and critical facilities.



Figure 5: Boat and vessel debris

Considerations for Monitoring Operations

- Verify that each vehicle or vessel identification number is documented and processed appropriately.
- Verify that collected vehicles and vessels are transported to a collection area where they are secured and protected. Depending on the ownership, the vehicles can be returned, salvaged, or destroyed.
- Verify that vehicles are processed to remove all minerals and fluids before processing or destruction.
- This type of debris may be recyclable or have salvage value. Document separation and salvage activities that are implemented.

Putrescent Debris

Putrescent debris is any debris that will decompose or rot, such as animal carcasses and other fleshy organic matter. Putrescent debris handling must comply with applicable Federal, State, and local requirements.

Considerations for Monitoring Operations

- Document that putrescent debris is collected in accordance with contract specifications or other specific requirements.
- Document the volume of putrescent debris. The volume of putrescent materials cannot be determined based solely on the volume of the originally inventoried materials because the spoiled materials may have lost a significant portion of their volume. The actual volume removed needs to be documented.

Infectious Waste

Infectious waste is waste capable of causing infections in humans and can include contaminated animal waste, human blood and blood products, medical waste, pathological waste, and

discarded sharps (needles, scalpels, or broken medical instruments). Clearance, removal, and disposal of infectious waste may be under the authority of another Federal agency (the Centers for Disease Control and Prevention, EPA, etc.). Upon review of applicable Federal statutes, regulations, and policies governing infectious waste, FEMA will determine eligibility on a case-by-case basis.

Considerations for Monitoring Operations

- Document that the disaster-related infectious waste is collected and separated in accordance with prescribed safety and medical practices. Local, State, or Federal health officials may dictate the collection process, including collection containers, protective gear, decontamination requirements, and disposal methods.
- The volume of debris should be documented, but is typically secondary to proper documentation of the collection method.
- Verify that infectious waste debris quantities are well documented and that chains-of-custody of the collected materials are maintained. Based on the condition and type of materials, this debris may require special handling, containerization, and disposal, including incineration.

Chemical, Biological, Radiological, and Nuclear-Contaminated Debris

Chemical, biological, radiological, and nuclear (CBRN)-contaminated debris is any debris contaminated by chemical, biological, radiological, or nuclear materials as a result of a natural or man-made disaster, such as a weapon of mass destruction event. The clearance, removal, and disposal of CBRN-contaminated debris should be performed in accordance with applicable Federal statutes, regulations, policies, and other guidance documents.

Considerations for Monitoring Operations

- Man-made disasters may create debris that is considered evidence as part of a crime scene. Law enforcement officials may need to clear the activities before debris operations can begin. Monitors should ensure the CBRN-contaminated debris is cleared by law enforcement officials before removal so as not to undermine the integrity of the crime scene. Debris operations may also proceed concurrently with incident investigations.
- Be aware of the types of evidentiary material being sought in case CBRN-contaminated debris is encountered outside of the identified crime scene area.
- CBRN-contaminated debris may be either disposed of or taken to a special collection area for further processing. Verify and document that separation, processing, and disposal follow the prescribed procedures.

Documenting Eligible Work and Costs for Public Assistance Funding

Proper documentation enables an applicant to fully account for debris clearance and removal costs incurred as a result of a Presidentially declared disaster. The load ticket provides the most comprehensive information and a paper trail for FEMA PA Program reimbursement. To support the documentation provided by the load tickets, monitors should use tower-monitoring logs,

oving monitor reports, daily issue logs, and truck certification forms as part of their reporting process. Samples of these forms are included in Appendix B.

Documentation is required to support an applicant's request for PA funding for debris clearance, removal, and disposal work. The following describes the types of documentation that can support an applicant's reimbursement request. This documentation should be supplied to FEMA PA staff for inclusion in the PWs to substantiate eligible work performed and associated costs for grant funding.

Documenting Force Account Debris Operation Costs

When an applicant uses its own force account resources to perform debris removal and disposal work, requests for reimbursement should be supported by documentation of the labor and equipment charges incurred in the operation. This documentation includes:

- Payroll records of full-time and temporary employees who worked on the debris removal operation
- Records of applicant-owned equipment used in the debris removal operation, including documentation of equipment hours in service, associated equipment rates, and operator name
- Invoices of rental equipment used in the debris removal operation
- Documentation from permitted final disposal locations including:
 - Invoices of disposal tipping fees
 - Quantities of debris disposed
- Documentation of the location of the debris removal activities demonstrating FEMA debris eligibility and/or documentation certifying that FEMA-eligible debris work was performed

Documenting Contractor Debris Operation Costs

When an applicant has hired a contractor to perform debris removal work, documentation should correspond with the invoiced costs and line item prices of the debris removal contract. This documentation will be provided on monitoring forms and reports (refer to Appendix B), including load tickets and tower logs, which will provide information on:

- Locations of debris removal
- Type of debris removed
- FEMA debris removal eligibility determination
- Debris quantities (volume or weight, determined at inspection site)
- Identification of debris hauling truck/trailer and contractor
- Location of permitted final debris disposal site
- Documentation of labor, equipment, and materials charges including hours of service, and associated charges (for time and materials contracts)

- Documentation of quantities of debris reduced or recycled at DMSs and associated detailed charges
- Invoices of disposal tipping fees

In addition to the load tickets, summaries of the information included in the load tickets are typically provided in support of an applicant's PA funding request in a PW. FEMA and the State may also request to see all backup supporting documentation and reports, including truck certification forms, tower logs, roving monitor reports, and daily issue logs used to substantiate costs claimed in the PW. Refer to *Appendix B: Sample Debris Monitoring Plan and Monitoring Forms*.

The debris operation, if completed by contract, should have adequate controls in place to ensure contract terms are adhered to, that only specified debris is removed, and proper documentation is collected and compiled for payment purposes. Debris removal contractors are required to adhere to contract terms and to monitor the performance of their crews.

Monitoring Reports

Applicants should have debris monitors submit daily reports, to the applicant, on operational issues, including DMS operations and safety issues, to promote situational awareness and help identify and resolve issues. Regular reporting promotes quality assurance and provides the applicant with a consistent accounting of operations, issues, and costs in the field. This information is included in reports such as tower monitor logs, roving monitor reports, and daily issue logs.

Electronic Load Tickets and Automated Reporting

Historically, debris monitoring operations have used the four-part paper load ticket system. Depending on the size of the event, the manual process of filling out load tickets, transferring copies, and entering data for reporting and data compilation purposes can be very labor and time intensive, and can result in significant levels of human error.

Recent advances in automated debris management tracking systems have provided real-time and automated tracking and reporting. Electronic load tickets, computer tablets, and systems employing electronic contractor ID cards allow for instant data tracking, verification, and reporting. Some systems also incorporate truck tracking systems, GPS capability, and enhanced analytical capabilities of debris monitoring data.

FEMA embraces technological advancements and recognizes the potential benefits of these automated systems. As discussed in **Chapter 2: Eligibility Requirements**, reasonable costs associated with the use of electronic load ticket systems and other automated debris monitoring systems may be eligible for PA funding.

Chapter 4: Force Account vs. Contract Monitoring

Applicants may use force account resources, contractors, or a combination of both to monitor their debris removal operations. When the debris monitoring activities are beyond the capacity of an applicant, it may contract out such services. When using contract services for debris monitoring, the applicant is augmenting its workforce with additional staff and expertise that does not normally reside within its own force account labor. (Force account eligibility criteria are detailed in 44 CFR §206.228.)

Does the applicant have access to a local labor force qualified to perform monitoring functions? Options may include:

- University students
- Code enforcement employees
- Retired local government personnel

Using Force Account Resources to Monitor Operations

Applicants are encouraged to use their own employees to monitor debris removal operations, as their employees are the most familiar with the jurisdiction and know the priorities of the applicant's debris management plan. Force account labor tends to have a vested interest in keeping debris monitoring costs to a minimum.

Other benefits of using force account labor for debris monitoring include:

- The local workforce may be able to respond immediately after the disaster
- Standard timesheet and equipment documentation procedures are typically adequate for documentation purposes

Using Contractor Resources to Monitor Operations

An applicant may hire contractors to provide debris monitoring services. Debris monitoring contractors should not be employed by or affiliated with the debris removal contractor.

Applicants can expedite the procurement processes during emergencies by having competitive contracts already established before a disaster occurs. Methods include:

- Pre-drafted contracts
- Pre-qualified contractors
- Pre-positioned contracts

Reasonable costs associated with using debris monitoring contractors to perform certain activities can be reimbursable under the FEMA PA Program. Applicants should use competitive contract bidding procedures when procuring these services and should also use proper oversight of these contracts to ensure compliance with contract terms.

Applicants are strongly encouraged to consider the following guidance when procuring and overseeing contracts for debris monitoring services:

- Procurement Process
 - Applicants must use competitive bidding procedures to meet procurement requirements for Federal grants, as set forth in 44 CFR Part 13.36, Procurement.
 - Use abbreviated emergency procurement procedures that include an expedited competitive bid process only if time does not allow for more stringent procedures and if they are allowed under State or local laws, codes, or ordinances.

- Require bidders to provide copies of references, licenses, financial records, and proof of insurance and bonding.
- Document procedures used to obtain/award contracts (procurement information, bid requests, and tabulations, etc.).
- Applicant's legal representatives should review the contract, and process used to procure it, to ensure that the applicant is in compliance with all Federal, State, and local requirements.

Section 307 of the Stafford Act requires communities to give preference to local firms in the awarding of contracts in major disasters and emergencies to the extent it is feasible and practicable. This includes contracts for debris clearance. Preference may be given through a local area set-aside. Applicant's should also take the necessary steps to ensure there are opportunities to award contracts to minority, women-owned, and Labor Surplus Area businesses and firms whenever possible. FEMA will review, on an ongoing basis, procurement documents to validate that affirmative steps to utilize minority and women-owned businesses are being followed during the administration of an award.

- Scope of Work

- Verify that all requests for proposals, bids, and contracts have a well-defined scope of work, specified costs, basis of payment, performance schedule, and descriptions of the type of service provided by each labor category and skill class.
- Ensure that labor rates are commensurate with the skill level required by the debris monitoring job function. Professional engineers and other similar qualifications are not required to perform monitoring duties.
- Require use of a load ticket system (paper or electronic) to record with specificity (e.g., street address) where debris is picked up and the amount picked up, hauled, reduced, and disposed of.
- Ensure that the level of effort provided by the monitoring contractor and the contract terms are reasonable.

- Reasonable Cost

- Ensure that debris monitoring contract costs are reasonable and necessary as defined and required by OMB Circular A-87 and 44 CFR Part 13. Competitively bid contracts that comply with Federal, State, and local procurement regulations and procedures will establish reasonable costs for the work.
- Complete and document a cost analysis to demonstrate price reasonableness on any contract or contract modification where adequate price competition is lacking, as detailed in 44 CFR §13.36(f), **Contract Cost and Price**. Guidance for completing a cost analysis is included in the Recovery Fact Sheet 9580.201, Debris Contracting Guidance.

- Contract Requirements

- Ensure that your time-and-materials contract (most commonly used contract type for debris monitoring) contains a not-to-exceed clause pursuant to 44 CFR §13.36.

- Award contracts to responsible bidders who are reputable and qualified licensed contractors. Applicants should conduct reference checks on contractors' performance history with the State's contractor licensing board and with previous clients before awarding contracts. Applicants should also verify that potential contractors are not on a State's "Debarred Contractor" listing.
- Require the contractor to provide a safe working environment, including properly constructed monitoring towers.
- Ensure that you keep complete and accurate records of contractor activities and costs to include in your reimbursement requests.

Applicants should always use their standard procurement processes and practices that conform to local and State procurement policies and regulations, as well as those required by Federal regulations. Be aware that in some instances Federal regulations may require more competitive procurement processes than local and State regulations. Applicants jeopardize FEMA PA Program funding when procurement procedures are overlooked in the interest of time. Applicants are strongly encouraged to work with State emergency management staff and FEMA to ensure compliance with the provisions of the PA Program, as well as other applicable statutes and regulations, if they intend to seek PA grant funding.

Upon request, FEMA PA Program personnel will review an applicant's procurement process to determine whether the process meets the standards set forth in CFR §13.36, **Procurement**. FEMA can also review contracts for compliance with Federal requirements.

Applicants may enter into any contractual arrangements they wish. However, FEMA is not bound to applicant contractual obligations because it is not a party to those contracts.

Chapter 5: Debris Monitoring Contract Provisions and Methods

Contracting out debris monitoring services does not absolve the applicant of its responsibility to supervise the performance of the contract. The applicant should provide clear direction, direct supervision, and a system of control and verification of the performance of debris monitoring contract services. To ensure that the contracts are in accordance with the Federal, State, and local procurement laws, the applicant debris planning staff should seek guidance from their legal counsel.

Basis of Payment

The basis of payment and the payment process should be clearly outlined in the contract. Contractor payments should be based upon verification of completed work, and the required information for the payment request should be included within the provisions of the contract.

The scope of work and costs for the service are key factors in analyzing reasonable costs. Reasonable costs are those that include a reasonable level of effort for the monitoring services, supervision, and support services to perform the job requirements effectively and efficiently. Debris monitoring services should be tailored to the scale of the debris operations as well as the schedule requirements and the applicant's overall concept of operations, including planning for the number of DMSs and final disposition sites, acceptable travel distances, truck routes, neighborhood safety issues, personnel planning, and documentation requirements.

The debris monitoring contract should include provisions on the basis of payment, contract duration, performance measures, termination for convenience, and a conflict resolution process. The applicant should:

- Consider using a progress payment method for contract services. This method requires specific documentation from the contractor to verify and validate the completed work and support the contractor's invoices.
- Provide supervision and oversight of the debris monitoring operations to ensure that only approved and necessary hours are applied to the debris monitoring contract.
- Confer with the contractor to determine the deployment of monitors, daily schedules, and the number of personnel, supervisors, and clerical/data support assigned at any given time.

Typical documentation for debris monitoring reimbursement includes:

- Personnel assignments, duties, and responsibilities
- Timesheets
- Debris monitoring reports
- Debris totals (CY and tonnage)
- DMS reports
- Exception reports (when debris monitoring reveals problems with debris operations)
- Truck/Trailer Certification reports
- Geographic information system (GIS) planning and progress reports

- Debris progress reports
- Safety reports

Duration of Contract

To ensure that debris monitoring and removal services are conducted expeditiously, contracts should include specific timelines for work to be completed. The duration and scheduled milestones of the contract should be clearly stated. By doing so, the applicant sets clear expectations for the contractor. Moreover, the contractor can effectively manage resources and schedule work to meet the applicant's requirements. The applicant should determine the contractor's mobilization requirements (e.g., whether debris monitors are required during the debris clearance phase).

Performance Measures and Termination Clause

The contract should include performance measures that specify how performance will be evaluated and measured, including the size and number of monitoring crews, the number of truckloads monitored each day by the monitoring crews, the number of truckloads arriving at each DMS or final disposition site, the processing rate for a reduction site, and the number of monitoring crews in relation to the debris removal crews. In addition, the contract should include a convenience and default clause for early termination, thereby allowing the applicant to terminate the contract if the contractor does not deliver services in the manner specified in the contract. This clause should describe probable reasons for termination.

Conflict Resolution Process

The conflict resolution process should be well defined in the contract. The process should include alternatives for mediation in case an issue proves difficult to resolve. *Refer to Appendix C: Monitoring Contract Process/Documents for contract documents, including an RFP cover letter and a sample scope of services.*

Impacts of Different Types of Debris Removal Contracts on Monitoring

There are several types of debris removal contracts that can be utilized. Each type of debris removal contract has variables that can dictate adaptations to the necessary debris monitoring activities to protect the applicant's interests. The different types of contracts, specific contract provisions, monitoring efforts, and documentation requirements are described in this discussion and summarized in Table 1 at the end of Section 6. The most common types of debris removal contracts are unit price, lump-sum, and time-and-materials. *Refer to Appendix A: Job Aids.*

Unit Price

Unit price contracts are used when the individual work tasks are known, but the total amount of work cannot be known in advance. Units of work can be measured in terms of weight, volume, or any other quantifiable measure (Figure 6). The contractor uses estimated quantities to establish a total contract price.

Impact of Unit Price Contracts on Debris Monitoring

Since a unit price contract is initiated based on an estimate of debris quantities, documentation of the location, eligibility, and quantities of debris (CY or tons) during the debris processing is essential.

- Debris monitoring is essential during pick up, transportation, eligibility determination, segregation, staging, reduction, and final disposition.
- The applicant should manage the measurement of the trucks/trailers used to haul the debris. The volume of each truck should be measured and certified before being allowed into service.



Figure 6: Debris monitors determine type and quantity of debris

Lump-Sum

Lump-sum contracts are used when the scope of work can be identified and quantified. These bid requests include a set of specifications that have a well-defined scope of work for a finite amount of time.

The advantage of a lump-sum contract is that the total price for the specified work is known at the time the contract is awarded. For example, 250 tons of mulched debris hauled from 1000 N. Debris Road to the county landfill at 3450 S. Main Street will equal \$XX,XXX.

Impact of Lump-Sum Contracts on Debris Monitoring

Loading monitors are required to validate that only contract-identified debris is collected. These quantities should match the quantities identified in the debris removal contract.

- The DMS site/tower monitors should carefully review the processing of materials, especially the quantities of materials collected for processing (grinding, chipping, incineration) and the quantities at the back end of the processing.
- Documentation of truckloads and debris volumes are still needed (if the final tally of debris quantities vary significantly from the original contract estimates, change orders may be necessary to adjust the contract price). This documentation is essential to establish final debris volumes.
- When applicable, the debris quantities entering a DMS should be compared with the debris quantities that have been processed (chip piles or outbound truckloads can be measured to corroborate the debris volumes).

Time-and-Materials

Time-and-materials contracts may be used when the scope of work necessary to achieve an outcome is unknown. The FEMA PA Program will typically only reimburse applicants for a time-and-materials contract for eligible debris clearance during the first 70 hours of work following a declared disaster. After the first 70 hours of work, the applicant should have sufficient information to effectively solicit a competitively procured lump-sum or unit price contract. For types of debris work where time-and-materials contracts are the most cost-effective

and well-suited options, applicants should work closely with the State and FEMA when awarding such contracts to ensure PA eligibility requirements are met.

A time-and-materials contract establishes hourly rates for labor and equipment that will be used to perform specific tasks. For example, backhoe with loader, 1 CY bucket, and operator = \$50/hour. The contractor is paid based on the actual time spent to perform the specified tasks and equipment use. The contractor is also paid for the actual cost of materials used during operations.

Impact of Time-and-Material Contracts on Debris Monitoring

Monitoring time-and-materials contracts is extremely important. Debris monitors should produce daily inspection reports that clearly quantify the amount of work accomplished each day, including:

- The number of hours worked (scheduled work hours/crew size).
- The type and quantity of each type of truck/trailer/equipment used (Figure 7).
- Verification of equipment hours. Only active work hours should be submitted for FEMA reimbursement.
- Standby time is not eligible for FEMA reimbursement.
- Verification of labor hours as compared to equipment hours. Intermittent use of equipment may result in a crew having more equipment hours than labor hours; this type of discrepancy needs to be verified by the debris monitors.
- The weather conditions as they affect daily work.
- Production rates for each staging and reduction site.
- Quantities of debris hauled (CY). If debris is hauled based on CY, load tickets may be used as a way of checking contractor efficiency.



Figure 7: Type and duration of equipment used must be documented

Table 1 outlines the monitoring requirements for each type of contract.

Table 1: Monitoring Requirements by Contract Type

Type of Contract	PW Scope of Work	Monitoring Required					Comments
		Crew Efficiency	Collection Site	DMSs	Disposal Site	Compliance	
Lump-Sum	Defined debris quantities and reasonable costs. Estimate is basis for contract costs.		✓		✓		- Assess debris eligibility at collection site - Quantities are required to determine reasonable costs and establish change orders - Ensure ONLY debris from within contract limits is processed
Unit Price – CY	Based on eligible debris listed on load tickets.	✓	✓	✓	✓	✓	- Assess debris eligibility at collection site - Document debris quantities - Verify debris processing volumes
Unit Price – Ton	Based on actual weight measurements of eligible debris listed on load tickets.	✓	✓	✓	✓	✓	- Assess debris eligibility at collection site - Document debris quantities - Verify debris processing weights - Verify calibration of scales
Time-and-Materials	Based on labor, equipment, and materials records. Reasonable costs evaluated by determining costs per unit.	✓	✓		✓	✓	- Assess debris eligibility at collection site - Typically used for road clearance activities during the Response Phase - Eligible costs are typically limited to 70 work hours - Supervising and monitoring every work crew is required - Tracking debris removal quantities is still required to determine reasonable costs

Source: FEMA Disaster Assistance Fact Sheet 9580.203, *Debris Monitoring*

Appendix A: Job Aids

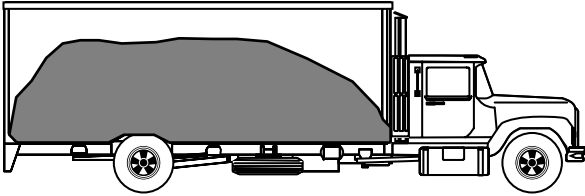
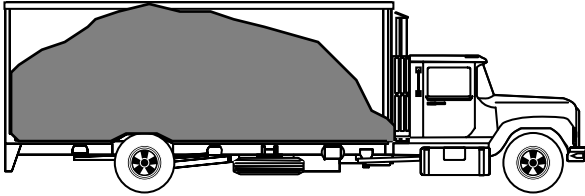
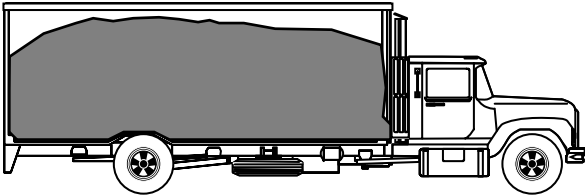
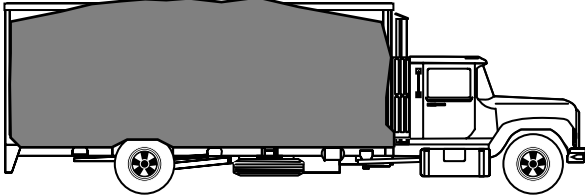
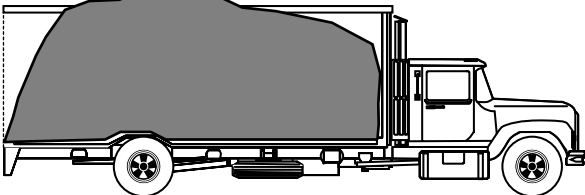
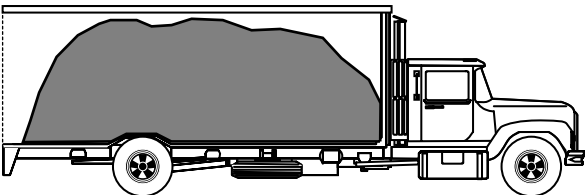
DEBRIS MONITOR DUTIES AND RESPONSIBILITIES		
FEMA Debris Monitor	State/Tribal Debris Monitor	Applicant Field Supervisor
Safety		
• Ensure safety by identifying possible health/safety risks and requiring proper field safety gear	• Ensure contractor is complying with public and employee safety standards • Ensure safety requirements on State highways and roads are observed during debris operations (load limits, truck covers, etc.)	• Be familiar with and maintain/ implement all safety requirements
Eligibility		
• Verify compliance with FEMA PA Program requirements (i.e., provide eligibility guidance, timeframe requirements, and documentation and reporting requirements)	• N/A	• Ensure that a reasonable level of effort is applied to the monitoring process, commensurate with the debris operations and the schedule • Ensure only eligible debris is collected for loading and hauling
Compliance		
• Spot check debris loading, staging, reduction, and disposal sites to ensure compliance with eligibility requirements • Report any noncompliance, misconduct, or other negative actions to the assigned FEMA Debris Specialist for appropriate coordination and resolution with State and applicant officials	• Ensure all work complies with local ordinances and State and Federal regulations • Monitor environmental compliance on all debris management sites (DMSs) • Monitor preservation of places and buildings pertaining to the State's historic and archaeological treasures	• Obtain and become familiar with the requirements outlined in all debris removal and disposal contracts to ensure the contract requirements are implemented correctly • Make unannounced visits to all loading and disposal sites within an assigned area • Take photographs of all trucks and trailers used in the debris operation, to establish a baseline inventory of equipment
Debris Operations		
• Validate certification of trucks and trailers • Evaluate operational efficiency • Oversee documentation requirements	• Ensure trucks are measured, certified, and operated properly • Ensure trucks are loaded properly and loads are accurately evaluated • Verify load tickets are properly completed and controlled by the applicant	• Ensure only debris from approved public areas is removed • Assist in measuring all debris hauling trucks and trailers with the appropriate contractor representatives, if applicable
Management and Oversight		
• N/A	• Ensure debris sites are properly mobilized and administered • Ensure accurate recordkeeping and appropriate documentation • Ensure contractor activities are conducted as mandated in contractor scope of work	• Serve as the first line of management for debris monitors and assist with any questions or conflicts that arise • Prepare a daily written report of all activities observed and include photographs • Be familiar with all phases of debris management operations

DEBRIS MONITOR DUTIES AND RESPONSIBILITIES (continued)	
Applicant Debris Loading Monitor	Applicant Debris Tower/Site Monitor
Safety	
• Check area for safety considerations, such as downed power lines, children playing in the area, traffic control needs, and safe operation of trucks and equipment • Implement all safety requirements • Before work begins, inspect areas to identify covered utility meters, transformers, fire hydrants, mail boxes, etc. (as a baseline to account for any damage as a result of the debris removal operations) • Ensure that debris loads are contained properly before leaving the loading area	• Check area for safety considerations, such as downed power lines, children playing in the area, traffic control needs, and safe operation of trucks and equipment • Implement all safety requirements
Eligibility	
• Determine whether each load is to be claimed for reimbursement based on established criteria, and mark load tickets if ineligible for FEMA reimbursement • Validate eligible hazardous trees, including hangers, leaners, and stumps • Verify global positioning system (GPS) readings or an address/location for leaning trees, trees with hanging limbs, and uprooted/exposed stumps that constitute an immediate threat; a separate ticket should be written for these items if required in the contract • Do not issue tickets for trucks that arrive at pick-up sites already loaded, or partially loaded • Ensure that force account labor and debris contractor work is within the assigned scope of work	• N/A
Compliance	
• Obtain and become familiar with the requirements outlined in all debris removal and disposal contracts to ensure the contract requirements are implemented correctly • Report to field supervisor if debris removal work does not comply with all local ordinances as well as State and Federal regulations (i.e., improper disposal of hazardous wastes)	• Obtain and become familiar with the requirements outlined in all debris removal and disposal contracts to ensure the contract requirements are implemented correctly • Report to field supervisor if debris removal work does not comply with all local ordinances as well as State and Federal regulations (i.e., improper disposal of hazardous wastes) • Verify relevant permits were obtained for debris reduction methods such as burning

DEBRIS MONITOR DUTIES AND RESPONSIBILITIES (continued)	
Applicant Debris Loading Monitor	Applicant Debris Tower/Site Monitor
Debris Operations	
• Ensure that hazardous wastes are not mixed into loads • Record the types of equipment used (for time-and-materials contracts) • Record the hours equipment was used, including down time of each piece of equipment by day (for time-and-materials contracts) • Ensure that only debris specified by the applicant is collected for loading and hauling • Ensure only debris from approved public areas is removed • Ensure the work area is clear of debris before equipment is moved to a new loading area • Prepare complete and accurate load tickets • Issue load tickets for each debris load to the truck driver • Evaluate and record performance and productivity of debris removal crews	• Ensure that hazardous wastes are not mixed into loads • Record the types of equipment used (for time-and-materials contracts) • Record the hours equipment was used, including down time of each piece of equipment by day (for time-and-materials contracts) • Accurately measure and document load hauling compartments for trucks and trailers to compute volume capacity in cubic yards (CY) for each truck and trailer prior to its commencement of debris hauling operations (recertify on regular basis) • Recertify truck capacities on a regular basis • Ensure that truck loads are accurately credited ○ Estimate the percentage of full capacity for each truck or trailer load ○ Ensure trucks are not artificially loaded (e.g., debris is wetted, fluffed, or not compacted) • Collect load ticket from truck driver and initial each load ticket before permitting any truck to proceed from the tower entrance to dumping location • Physically control load tickets • Ensure that all debris is removed from trucks at DMSs • Monitor site development and restoration of DMSs • Oversee debris reduction (burning, chipping)
Communication	
• Remain in constant contact with debris management/dispatch center or field supervisor • Report issues (such as safety concerns, contractor non-compliance, and improper equipment use) to field supervisor • Maintain a log of debris operations issues • Photograph and provide written documentation of any damage to utility components, driveways, road surfaces, private property, vehicles, etc. • Perform other duties as directed by designated debris management personnel	• Remain in constant contact with debris management/dispatch center or field supervisor • Report issues (such as safety concerns, contractor non-compliance, and improper equipment use) to field supervisor

GENERAL DEBRIS MONITORING TIPS AND CONSIDERATIONS
Equipment
• The most common unit of measurement for vegetative and C&D debris is the cubic yard (CY). Debris trucks are evaluated for capacity at the DMS or final disposal sites. Applicants should require contractors to use appropriate equipment to load debris efficiently so that the maximum level of compaction can be achieved to facilitate expeditious removal of debris from the public rights-of-way. • All trucks and trailers will be measured and placarded with the measured capacity of the vehicle. The applicant should photograph all trucks/trailers to ensure that the capacity is not reduced by removing sideboards or tailgates on the truck as the debris removal operation unfolds. • Equipment limitations affect the maximum loading capacity of some vehicles. <i>Hand-loaded trucks and trailers cannot achieve compaction levels comparable to mechanically-loaded vehicles. This effectively reduces the capacity of the hand-loaded truck or trailer compared to a truck or trailer that is loaded mechanically. Therefore, FEMA only reimburses 50 percent of the debris monitor's observed capacity for a hand-loaded truck or trailer. Example: If a hand-loaded truck or trailer appears to be 100 percent full, that load should be recorded at 50 percent. Hand-loading debris in trucks or trailers does not achieve maximum compaction, and as a result, debris removal operations take longer to complete. A hand-loaded truck hauls less debris by weight per CY than a mechanically loaded truck. Refer to FEMA Recovery Fact Sheet RP9523.12, Debris Operations – Hand-Loaded Trucks and Trailers.</i> <i>A truck with no tailgate or no solid tailgate cannot be compacted to its full capacity; therefore, FEMA only considers a maximum of 85 percent of the certified truck capacity for reimbursement purposes.</i>
Monitoring Tips
Monitors should be aware of situations that could impact an applicant's reimbursement under the PA Program. They should look for: • <i>Inaccurate Truck Capacities:</i> Trucks should be measured before operating and load capacities should be documented by truck number. Periodically, the applicant should pull trucks out of operation and re-measure. • <i>Trucks Not Fully Loaded:</i> Do not accept the contention that loads are higher in the middle and if leveled would fill the truck. Monitors should check to see if that statement is valid. • <i>Trucks Lightly Loaded:</i> Trucks may arrive loaded with treetops (or a treetop) with extensive voids in the load. Trucks need to be loaded to their full capacity with front-end loaders or other similar equipment to compress the debris materials and remove any voids. • <i>Trucks Overloaded:</i> Trucks cannot receive credit for more than the measured capacity of the truck or trailer bed, even if material is above the sideboards. If a truck is measured to carry 18 CY, it cannot receive credit for more than 18 CY. However, it can receive credit for less if not fully loaded or lightly loaded as described above. • <i>Changing Truck Numbers:</i> Typically, trucks are listed by an assigned vehicle number and capacity. There have been occasions where truck or trailer numbers with a smaller carrying capacity have been changed to one with a larger capacity. For instance, a 20 CY truck may have a number for a truck that can carry 30 CY. This can be detected if the applicant periodically re-measures the trucks or records actual license plate numbers in addition to a description of the truck. Maintaining truck and trailer certifications with attached photographs at the DMS tower can assist in eliminating such activities. • <i>Reduced Truck Capacity or Increased Truck Weight:</i> On some occasions, trucks have had heavy steel grating welded 2 to 3 feet above the bed after being measured, thus reducing the capacity or inflating the weight of a load. This can be detected by periodically re-measuring the truck bed or recertifying the truck tare weight. • <i>Wet Debris When Paid by Weight:</i> Excessive water added to debris increases the weight of the load. This can be detected during monitoring if there is excessive water dripping from the truck bed or by inspecting the truck bed immediately after unloading. The applicant should periodically recertify the truck tare weight. • <i>Multiple Counting of the Same Load:</i> To prevent reentry with the same load, trucks should not exit the disposal site without unloading. This can be prevented by observing the time of departure and time of arrival recorded on the driver's load ticket. This check may also indicate problems with the applicant's debris monitors at the loading or unloading site. Tower monitors should ensure the load ticket is checked in and compared to the tower log-in sheet to determine if the truck's round-trip time is appropriate. • <i>Picking up Ineligible Debris:</i> Debris monitors should be present at loading sites. Monitors should have a good understanding of eligible debris and any time limits imposed on picking up specific types of debris. Examples of ineligible debris activities include sweeping areas for abandoned cars and white goods; cleaning up illegal dump sites; removing cut trees from subdivisions under development; removing debris from private property; and removing/cutting trees from off rights-of-way in rural areas.

GENERAL DEBRIS MONITORING TIPS AND CONSIDERATIONS (continued)
Debris Challenges
• <i>Vegetative Debris Challenges:</i> Hazardous leaners, stumps, and hangers can be difficult to measure consistently (particularly because monitors must determine if leaners are leaning at least 30 degrees and eligible to be cut). Debris monitors should have a map of all roads and work with the applicant's public works department to determine the length and location of the public right-of-way. • <i>Construction and Demolition Debris Challenges:</i> Debris generated from prior construction work may be comingled with disaster-generated construction and demolition (C&D) debris by citizens. Some citizens may claim that remodeling or renovation work is C&D material too. Many people will choose to remodel a house after a storm instead of demolishing it. The materials from the remodeling are not eligible; these are notable because they look like new materials instead of disaster-damaged materials. A rule of thumb is that no bricks or foundation material would be hauled or considered eligible for FEMA PA reimbursement. • <i>Hazardous Waste Challenges:</i> Health issues, such as headaches and vomiting, can arise at a burning site if the debris stream includes mixed debris and hazardous chemicals. Soil and air contamination can occur at the pick-up location, along the transit route, and at the DMS. Appropriate precautionary measures should be implemented when hazardous materials are identified. Further, the applicant should implement proactive measures to ensure that all hazardous materials are identified. • <i>White Goods Challenge:</i> When debris removal is extended beyond 90-180 days, some residents will try to discard their current appliance for free by claiming it is storm debris. The disposal requirements for white goods should include instruction on how to prepare the white goods, ensuring the materials on the curb do not present a safety hazard.
DEBRIS MONITOR GUIDELINES FOR ESTIMATING QUANTITIES
Monitoring Debris Trucks – Guideline for Estimating Loads in Trucks
• Check the truck number on the placard. • Check that the capacity (size) of the truck written on the ticket matches the size marked on the side of the truck. • Walk around the truck. Make sure that the truck is loaded with disaster debris. Ensure that the truck is not falsely loaded. • When the truck leaves, make sure it is completely empty. • If there is no tailgate on a truck, the truck is not full. The maximum estimate of the capacity of the load is 85 percent full. However, the monitor must use good judgment to determine if the load is really 85 percent. It is more likely that the truck is between 40 percent and 60 percent full. • There are other percentage variations of how a truck can be filled (see illustrations and photographs that follow). • A truck is 100 percent full only when the debris is filled completely to the brim and the truck is heaped above the sideboards. The truck must have a tailgate that secures the entire back end of the truck. Note: It is difficult, though not impossible, for a truck to be 100 percent loaded because woody debris, trees, branches, and rubble cannot be placed in a truck without having air holes. Applicant debris monitors and FEMA Debris Monitoring Specialists typically record estimated volumes in 5 percent increments. FEMA will allow a truck to be recorded as 100 percent full if debris volumes can reasonably (and safely) be estimated to meet or exceed certified truck container capacities.

DEBRIS MONITOR GUIDELINES FOR ESTIMATING QUANTITIES	
	
60 Percent Debris Load in Truck If truck bed measured 20 cubic yards (CY), this 60 percent load would be 12 CY.	75 Percent Debris Load in Truck If truck bed measured 20 CY, this 75 percent load would be 15 CY.
	
85 Percent Debris Load in Truck If truck bed measured 20 CY, this 85 percent load would be 17 CY.	95 Percent Debris Load in Truck If truck bed measured 20 CY, this 95 percent load would be 19 CY.
	
85 Percent Debris Load in Truck w/ No Tailgate This truck has no structural tailgate—the capacity would automatically be reduced from 20 CY to 17 CY (85 percent reduction). Then the debris load itself is 85 percent of fully loaded—14.5 CY.	75 Percent Debris Load in Truck w/ No Tailgate This truck has no structural tailgate—the capacity would automatically be reduced from 20 CY to 17 CY (85 percent reduction). Then the debris load itself is 75 percent of fully loaded—12.8 CY.

DEBRIS MONITOR GUIDELINES FOR ESTIMATING QUANTITIES	
	
Truck without a structural tailgate. Its maximum load is automatically reduced to 85 percent of the rated truck size.	Truck without a tailgate. Its load capacity is automatically reduced to 85 percent. Slat-sided trucks may not be capable of being mechanically compacted. This means the truck capacity should be further reduced.
	
Truck without a tailgate. Its maximum load capacity is reduced to 85 percent. This truck is claimed to be 'fully loaded' with branches sticking above the top and beyond the back of the truck bed—the actual load is only 75 percent.	Truck with branches extending above the top of the truck sides. Although claiming to be 'fully loaded,' the load is filled with air pockets and the actual load is only 70 percent of the rated load capacity.
	
This 20-CY roll-off container has a tailgate (in open position). The load appears to be near top of truck sides and was estimated at 85 percent. The assessment was done from the ground; no monitor tower was used at this DMS (see next photograph).	This is the actual load from the 20-CY container truck shown on left. It measures approximately 4 CY when on the ground.

TYPES OF DEBRIS AND MONITORING CONSIDERATIONS		
Types of Debris	Description of Debris	Considerations for Monitoring Operations
Vegetative	Includes whole trees, tree stumps, tree branches, tree trunks, and other leafy material	- Verify that only eligible debris is counted for reimbursement purposes; keep a map of all roads and rights-of-way for area - Ineligible debris should be identified accordingly - Evaluate the loaded capacities of the trucks/trailers to determine the percentage of the rated capacity - Hand-loaded trucks/trailers are graded at 50 percent of a load because of the low compaction achieved by hand-loading, pursuant to Recovery Policy RP9523.15, <i>Debris Operations – Hand-Loaded Trucks and Trailers</i> - This type of debris may be recyclable or have salvage value; document separation and salvage operations when implemented - For special vegetative debris considerations, please see DAP Fact Sheet 9580.204, <i>Documenting and Validating Hazardous Trees, Limbs, and Stumps</i>
Construction and Demolition (C&D)	Includes, but is not limited to, damaged components of buildings and structures, such as lumber and wood, gypsum wallboard, glass, metal, roofing material, tile, carpeting and floor coverings, pipe, concrete, fully cured asphalt, equipment, furnishings, and fixtures	- To be eligible for Public Assistance funding, C&D debris must present an immediate threat - Must be disaster generated
Hazardous Waste	- Waste that is potentially harmful to human health or the environment that exhibits at least one of the following four characteristics: - Ignitability - Corrosivity - Reactivity - Toxicity	- Hazardous wastes may require segregation and special handling - Document improper segregation - Notify appropriate authorities if unsafe practices are observed during handling and disposal (know required safety procedures for the circumstances) - Monitor processing carefully and regularly to verify the proper precautions are taken and the chain-of-custody is maintained - Verify that hazardous wastes are delivered to an appropriate DMS, as they can require special handling, transportation, and final disposition
Household Hazardous Waste (HHW)	Includes hazardous products and materials used and disposed of by residential consumers, such as some paints, stains, varnishes, solvents, pesticides, and other products or materials containing volatile chemicals that catch fire, react, or explode under certain circumstances or are corrosive or toxic	- Verify and document that HHW is picked up and handled by specialists from the State's Department of Environmental Quality (DEQ) and/or the EPA and managed in designated areas within the DMS - Verify and document that the chain-of-custody is maintained throughout the collection, handling, transport, and disposal of HHW
Electronic Waste (e-waste)	Includes electronics such as cathode ray tubes (computer monitors and televisions) that contain hazardous materials	- Ensure e-waste is segregated - Ensure e-waste is removed intact, collected, and stored at the DMS for later processing - Document separation and salvage activities

TYPES OF DEBRIS AND MONITORING CONSIDERATIONS (continued)		
Types of Debris	Description of Debris	Considerations for Monitoring Operations
White Goods	Includes discarded household appliances such as refrigerators, freezers, air conditioners, heat pumps, ovens, ranges, washing machines, clothes dryers, and water heaters	- Document that white goods are collected separately, cleaned, and processed to remove putrescent debris inside and to remove all oils, solvents, and refrigerants - Verify and document that the DMS has adequate space for processing white goods if collected without being cleaned - Document separation and salvage activities
Soil, Mud, and Sand	Can be deposited on streets, sidewalks, storm and sanitary sewers, water treatment facilities, drainage canals and basins, parks, and public swimming pools	- Document that only disaster-generated silt and soils are removed (must know pre-disaster condition and documented maintenance) - Document any contaminated soil issues to ensure proper handling, processing, and disposition - Verify that any contaminated disaster-generated soils are addressed by specialists from the State's DEQ and/or the EPA and managed appropriately in designated areas
Vehicles and Vessels	- Includes vehicles and vessels meeting one of the following criteria: - Presents a hazard or immediate threat that blocks ingress/egress within a public use area - It is abandoned - Applicant followed local ordinance and State and Federal laws in securing possession - Applicant has verified chain-of-custody for the vehicle or vessel	- Verify that each vehicle or vessel identification number is documented and processed appropriately - Verify that collected vehicles and vessels are transported to a secure collection area - Verify that vehicles are processed to remove all minerals and fluids before processing or destruction - Document separation and salvage activities that are implemented
Putrescent Debris	Includes debris that will decompose or rot, such as animal carcasses	- Document that collection is in accordance with contract specifications or other requirements - Document actual volume of putrescent debris
Infectious Waste	Waste capable of causing infection in humans including contaminated animal waste, human blood and blood products, medical waste, pathological waste, and discarded sharps	- Document that collection and separation is in accordance with prescribed safety and medical practices - Document volume of debris - Verify that infectious waste debris quantities are well documented and chains-of-custody are maintained - Special handling, containerization, and disposal may be required
Chemical, Biological, Radiological, and Nuclear (CBRN)-Contaminated Debris	Includes debris contaminated by CBRN sources	- Ensure CBRN-contaminated debris is cleared by law enforcement officials before removal so as not to undermine integrity of the crime scene (as from a man-made disaster) - Be aware of the types of evidentiary material being sought in case debris is located outside of the identified crime scene - Verify and document the separation, processing, and disposal to ensure it follows the prescribed procedures

TYPES OF DEBRIS AND MONITORING CONSIDERATIONS (continued)	
FEMA References	
• <i>Public Assistance Guide</i> (FEMA 322) • <i>Public Assistance Policy Digest</i> (FEMA 321) • Title 44 of the Code of Federal Regulations • 9500 Series Policies and Fact Sheets • <i>Debris Management Guide</i> (FEMA 325) • <i>Debris Monitor Field Guide</i> (FEMA B-587) • <i>Debris Monitoring Guide</i> (FEMA 327)	

DEBRIS MONITOR RESPONSIBILITIES FOR LOAD TICKETS		
	Monitor Load Ticket Responsibilities	
Load Ticket Information	Loading Monitor	Tower/Site Monitor
Preprinted ticket number	Not Applicable	Not Applicable
Contract number	Contracts may be identified by a number or name	
Prime contractor's name		
Date	X	
Truck number	X	
Truck driver's name	X	
Vegetation	X	
Construction and Demolition Debris	X	
White Goods	X	
Household Hazardous Waste	X	
Other (required to be described applicable)	X	
Load location	X (GPS or address preferred)	
Loading date/time (departure from collection location)	X	
Loading Site Monitor name/signature	X	
Truck capacity in cubic yards or tons		X
Load size, either cubic yards (percent of capacity) or tons		X
Unloading location		X
Unloading date/time (arrival at disposal site)		X
Tower/Site Monitor name/signature		X

TYPES OF DEBRIS REMOVAL CONTRACTS AND MONITORING CONSIDERATIONS		
Contract Type	Description of Debris	Considerations for Monitoring Operations
Unit Price Contract	- Used when individual work tasks are known but the total amount of work cannot be verified - Units of work can be measured in terms of weight, volume, or any other quantifiable measure	- Documentation of the location, eligibility, and quantities of debris is essential because the unit price contract is based on an estimate of debris quantities - Closely monitor pick up, transportation, eligibility determination, segregation, staging, reduction, and final disposition - Maintain management of truck/trailer measurements; certify all trucks before use
Lump-Sum Contract	Used when the scope of work can be identified and quantified; use for a well-defined scope of work with a finite contract period	- Loading monitors must validate that only contract-identified debris is collected - Debris should only be obtained from eligible sources - DMS site monitors should carefully review processing of materials (quantities collected for processing and quantities post-processing) - Document truckloads and debris volumes to make sure final volume matches contract
Time-and-Materials Contract	- Used when the scope of work necessary to achieve an outcome is unknown—contractor is paid for actual time, equipment usage based on hourly rates, and materials used - FEMA typically only provides funding for the first 70 hours of work after a declared disaster using this type of contract; subsequently, applicant should be able to define scope definitely enough to obtain a lump-sum or unit price contract	- Monitoring must be thorough - Inspection reports should be produced every day and should include the following information: - Number of hours worked - Type and quantity of each type of truck/trailer/equipment used - Verification of equipment hours—document active work hours only; “stand-by” time is not eligible for FEMA funding - Verification of labor hours compared to equipment hours - Document weather conditions as they might affect daily work - Monitor production rates for each staging and reduction site - Monitor performance - Check quantities of debris hauled (cubic yards [CY]) - Load tickets can be used as a way of checking contractor efficiency if debris is hauled based on CY

Appendix B: Sample Debris Monitoring Plan and Monitoring Forms

Sample Forms and Tables are intended as guidance and should be modified to meet State and local procurement rules and regulations.

1.0 General

The _____ has entered into a contract with _____ for the purpose of:

- Removing storm-generated debris from _____ rights-of-way and hauling the debris to a temporary debris management site (DMS) for volume reduction and/or to a final disposal site
- Setting up and operating _____ () DMS located at _____
- Hauling chips/mulch from the debris volume reduction site(s) to a location of the Debris Manager's choosing

The Debris Manager will be responsible for monitoring the contractor's debris removal and disposal activities using debris monitoring contractor personnel to prepare debris load tickets and oversee the debris removal and disposal contractor's operations.

2.0 Purpose

The purpose of this plan is to outline the debris monitoring responsibilities of the debris monitoring contractor's personnel. This plan is subject to revision based on changing conditions

3.0 Monitoring Operations

The debris removal and disposal contractor will be responsible for removing all eligible debris from maintained street rights-of-way and hauling the debris to designated DMSs.

Contractor debris monitoring activities will be controlled by the Contractor's Project Manager located at _____. Phone number is _____.

The debris monitor's work day is expected to be from 7 a.m. to 6 p.m., or a maximum of 10 hours per day, 7 days per week.

Debris monitors will be responsible for initiating debris load tickets at contractor debris loading sites and estimating and recording the quantity of debris, in cubic yards (CY) on debris load tickets of all vehicles entering temporary DMSs (Figure B-1).

3.1 Loading Site Monitors

The loading site monitor is responsible for completing the debris load ticket, the Daily Loading Site Monitor Log, and the Daily Debris Issue Log. Each of these is described below.

Load Ticket		Ticket No. 0012345	
Municipality (Applicant)		Prime Contractor	
		Sub-Contractor	
Truck Information			
Truck No		Capacity	
Truck Driver (print legibly)			
Loading Information			
Loading	Time	Date	Inspector/Monitor
Location (Address or Cross Streets)			
When Using GPS Coordinates use Decimal Degrees (N xx.xxxxx)			
N		W	
Unloading Information			
Debris Classification		Estimated %, CYs, or Actual Weight	
☐ Vegetation ☐ C&D ☐ White Goods ☐ HHW ☐ Other* See Below			
Unloading	Time	Date	Inspector/Monitor
DMS Name and Location			
*Other Debris Explanation		Original: Applicant Copy 1: _____ Copy 2: _____ Copy 3: _____	

Figure B-1: Sample Debris Load Ticket

Sample Debris Load Ticket

The loading site monitor will complete Section 1 of the load ticket (Figure B-1) for all contractor debris-hauling vehicles. The monitor will keep one copy and give the original and remaining copies to the truck driver. The monitor's copy will be submitted to the debris monitoring contractor's Data Entry Supervisor or designated representative on a daily basis. Load ticket information will be entered into a database by the monitoring contractor's data entry staff.

The loading site monitor should be responsible for initiating load tickets (Figure B-1) where trucks are loaded and verifying the estimated amount of debris hauled at the temporary storage area or landfill. The applicant monitors must provide a list of the measured truck capacities in CY and license plate number of all trucks to be used to move debris upon award of the debris removal contract.

Once a truck is loaded with debris at the loading site, the loading site monitor should fill out a load ticket. The load tickets issued by the loading site monitors are the basis for debris contractor payment. Each item in the load ticket must be completed or the load ticket will not be considered valid.

Sample Daily Debris Loading Site Monitor Log

The Daily Debris Loading Site Monitor Log (Figure B-2) is used by the applicant and/or FEMA debris loading site monitor to collect data at the debris pick-up sites. The loading site monitor monitors the removal and disposal crews at several loading sites. The number of crews monitored will depend on the geographical area and volume of debris.

It is important for the debris loading site monitor to document the pick-up site locations (using addresses, mile-markers, or GPS readings) to ensure that debris being picked up is eligible and contractors are working where they were assigned. When issues arise, they should be documented on the Daily Issues Log (see next section). Each loading site monitor should provide his or her name and company name on the form. The loading site monitor should record any issues noted for that day and provide comments concerning that day's operation; photographs should also be provided as needed. Photographs should be taken of any safety violations or other unusual events affecting the debris operation. The debris loading site monitor should document the type of debris being removed.

Time	Ticket Number	Truck Number	Full Truck Rated Capacity (CY)	Pickup Location	Vegetative Debris	C & D Debris	White Goods/ Metals	Other	Issues or Comments/ Pictures Disc

Figure B-2: Debris Loading Site Monitor Log

Sample Daily Issue Log

The Daily Issue Log (Figure B-3) is used by the applicant and/or FEMA debris loading site monitor to collect data at the location where any issue of significance should be recorded. When documenting information on the Daily Issue Log, the location, monitoring personnel, truck identification data, and details of the issue being resolved should be recorded. For any eligibility or capacity issues, photographs (identified by corresponding numbers on the log sheet) should accompany this log.

Issue Number	Truck Number	Load Ticket	Pick-Up Location	Contractor/ Sub-contractor	Applicant Monitor	Photo/ Disc	Issue/ Resolution

Figure B-3: Daily Issue Log

3.2 Debris Disposal Tower/Site Monitors

Disposal tower/site monitors will be located at the entrance to the DMS or landfill where the inspection tower is located. They will be responsible for estimating and recording the CY of debris in appropriate location on the lower portion of the load ticket (Figure B-1) for all incoming debris-hauling vehicles. The following procedures will be followed:

- The tower/site monitor will be stationed in the inspection tower and estimate the quantity of debris contained in the truck or trailer in CY. Each truck or trailer will have the measured hauling capacity in CY recorded on the side of the truck or trailer. That number should be validated with the quantity stated in appropriate location on the upper portion of the load ticket (Figure B-1).
- The tower/site monitor will record the name and the arrival time of the truck and confirm the type of debris in the truck.
- The tower/site monitor will record the estimated volume of debris contained within the bed of the truck or trailer, in CY, under “Unloading Information” on the load ticket. The monitor must print and sign his/her name in the designated block on the load ticket.

The tower/site monitor may find it useful to use an estimating table such as shown in Table B-1 and should also refer to the job aid presented in Appendix A: Debris Monitor Guidelines for Estimating Quantities.

Table B-1: Estimating Truck/Trailer Capacity

Truck/Trailer Size - CY	100% CY	90% CY	85% CY	80% CY	75% CY

Note: Truck/trailer without a tailgate is rated at 85 percent of capacity to start.

- The tower/site monitor will retain the original of the load ticket and give the remaining copies to the truck driver. The original load ticket will be submitted to the monitoring contractor’s Data Entry Supervisor or designated representative on a daily basis. Load ticket information will be entered into a database by the monitoring contractor’s data entry staff. Load tickets are controlled forms and cannot be lost since they will be used to verify the amount of money paid to the debris reduction site contractor and to the debris hauling contractor.

Sample Daily Debris Site/Monitoring Tower Log

The Daily Debris Tower Log (Figure B-4) on the following page can be used by the applicant and/or FEMA tower/site monitor to record the truck data, document estimates of the load volumes, and describe what types of debris are being brought into the DMS or landfill. Documenting the tower and pick-up site locations is important so that debris can be correlated and tracked. Each tower/site monitor should provide his or her name and company name on the form. The tower/site monitor should record any issues noted for that day and provide

comments concerning that day's operation; photographs should also be provided as needed. Photographs should be taken of any safety violations or other unusual things affecting the debris operation.

Time	Ticket Number	Truck Number	Full Truck Rated Capacity (CY)	Applicant QA Eligible Capacity (% CY/ Wt)	FEMA Eligible Capacity (% CY/ Wt)	Vegetative Debris	C & D Debris	White Goods/ Metals	Other	Issues or Comments/ Pictures Disc

Figure B-4: Daily Debris Tower/Site Monitoring Log

4.0 Truck Certification Form

The applicant should ensure that every truck and trailer to be used in debris removal operations is measured and documented on a Truck Certification Form (Figure B-5). Knowing the hauling capacity of each truck is necessary because debris, specifically vegetative debris, is often hauled and billed by volume. Accurately capturing all the truck capacity information and driver profile information is important; having a FEMA PA representative present when certifying debris trucks is recommended.

Truck documentation should include all trucks to be used, including City/County trucks and trailers. A Truck Certification Form allows the debris monitor to identify the truck itself and its hauling capacity in a standardized manner. The following information should be documented:

- Capacity of hauling bed (CY)
- License plate number
- Truck identification number assigned by the owner
- Brief physical description of the truck
- Photographs

Determining an accurate capacity for each truck is important. Refer to Truck Certification Form Calculation Instructions (on page B-12) for additional information.

The information on the Truck Certification Form should be entered into a database by the data entry staff. Copies of the Truck Certification Form should be on file with the applicant and kept in the truck throughout the operational period.

Debris monitors may need to be trained to measure truck capacities for certification purposes. Recertification of the hauling trucks on a random and periodic basis should be implemented for contract compliance and reimbursement considerations.

Truck Information			
Make	Year	Color	License
Truck Measurements Performed By: _____ Volume Calculated By: _____ Both Checked By: _____ Date: _____ Date: _____ Date: _____			
Driver Information			
Name: _____ Address: _____ Phone Number: _____			
Owner Information			
Name: _____ Address: _____ Phone Number: _____ Truck Identification: _____ Truck Capacity: _____			
Photo			

Figure B-5: Truck Certification Form

Truck Certification Form Calculation Instructions

Instructions to take the necessary dimensions of corner wedge (refer to Figure B-6):

“a”: Along the side of the bed, measure the distance from the point where the rounded part of the bed starts, to the front corner of the bed.

“b”: Equal to “a.”

“c” and “d”: Along the side of the bed, mark the point where the rounded part of the bed starts, and along the front of the bed, also mark the point where the rounded part of the bed ends. Run a string between the two points and measure the distance between them; half of that distance is “c” and half of the distance is “d” (“c” and “d” are equal).

“e”: Measure the distance from the mid-point of the string that was stretched from the side to the front of the bed in the previous step to the rounded part of the bed.

Extra trailer: The volume calculations for the extra trailer would be simply length x width x height if the extra trailer has a rectangular bed. However, if the extra trailer also has round corners at the front, the volume calculation would be the same as explained above.

Instructions to take the necessary dimensions of round bottom truck (refer to Figure B-6):

“a”: The width of the bed.

“b”: The depth of the vertical portion (the side) of the bed.

“c” and “d”: Both are equal to half the width of the bed.

“e”: Run a string between the lower ends of the vertical portions of the bed (the sides), and measure the distance from the mid-point of the string to the bottom of the bed.

NOTE: All dimensions used in the above formulas must be in feet, with inches converted to fractions of feet, using the following conversions (for example, 8 feet, 5 inches should be written as 8.42 feet):

1 inch = .08 foot	7 inches = .58 foot
2 inches = .17 foot	8 inches = .67 foot
3 inches = .25 foot	9 inches = .75 foot
4 inches = .33 foot	10 inches = .83 foot
5 inches = .42 foot	11 inches = .92 foot
6 inches = .50 foot	

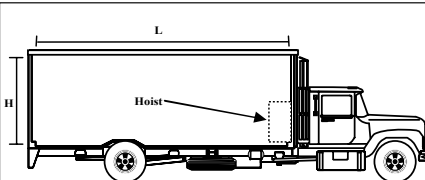
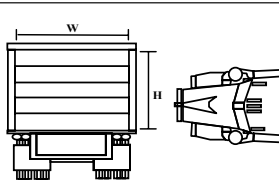
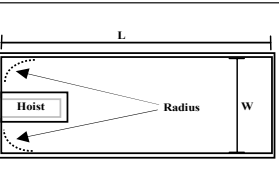
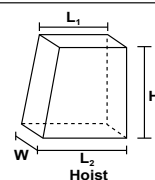
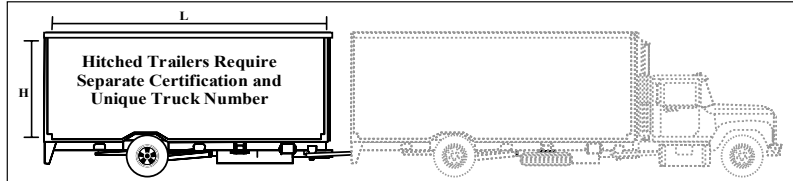
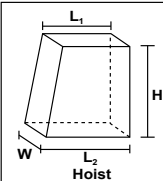
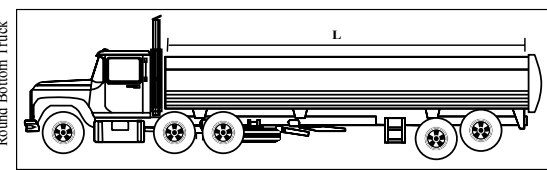
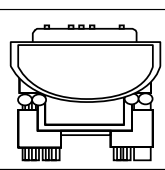
DUMP TRUCK			
Measurements Truck Measurements Length (L) = Width (W) ft = Height (H) ft = Hoist Measurement Length₁ (L₁) ft = Length₂ (L₂) ft = Width_H (W_H) ft = Height_H (H_H) ft = Radius Radius ft = Height (H) =			
Calculations Bed Volume (Basic) Hoist Volume Radius Volume $(L \times W \times H) / 27 =$ $((L_1 + L_2) / 2 \times W_H \times H_H) / 27 =$ $(3.14 \times R^2 \times H) / 27 =$ cyd cyd cyd Total = cyd Cubic Yards			
Truck Measurements    			
EXTRA TRAILER			
Measurements Truck Measurements (Basic) Length (L) = Width (W) ft = Height (H) ft = Hoist Measurement Length₁ (L₁) ft = Length₂ (L₂) ft = Width_H (W_H) ft = Height_H (H_H) ft = Radius Radius ft = Height (H) =			
Calculations Bed Volume (Basic) Hoist Volume Radius Volume $(L \times W \times H) / 27 =$ $((L_1 + L_2) / 2 \times W_H \times H_H) / 27 =$ $(3.14 \times R^2 \times H) / 27 =$ cyd cyd cyd Total = cyd Cubic Yards			
Trailer/Truck Combination  			
ROUND BOTTOM TRUCK			
Measurements Truck Measurements Length (L) ft = Diameter (D) ft =			
Calculations Approx. Volume $(3.14 \times (D/2)^2 \times L) / 27 =$ cyd (round bottom portion only)			
Round Bottom Truck   Cubic Yards			

Figure B-6: Truck Dimensions

5.0 Sample Debris Collection Summary Spreadsheet

The Debris Collection Summary Spreadsheet (Figure B-7) is used to capture the total amount and types of debris removed and disposed of, as well as the cost for each. This information may also be helpful to FEMA to validate any debris prediction models that are run, as well as establishing reasonable costs for debris removal.

CY	Unit Price \$	CY	Unit Price \$	CY	Unit Price \$	CY	Unit Price \$	Average Haul Distance	Primary Disposal Method	CY to Landfill
Vegetative		C & D		HHW		White Goods				

Figure B-7: Debris Data Collection Summary Spreadsheet

Appendix C: Monitoring Contract Process/Documents

Sample Forms and Tables are intended as guidance and should be modified to meet State and local procurement rules and regulations.

Sample Request for Proposal Cover Letter for Debris Monitoring Services

Date:

Subject: Request for Proposals for Disaster Debris Monitoring

The _____ invites qualified firms to respond to this request for proposal (RFP) by providing their qualification and experience for consideration to provide Disaster Debris Monitoring Services on an as-needed basis.

Disaster Debris Monitoring Services

The scope of services shall include, but not be limited, to the following:

The _____ seeks qualified firm(s) to assist in the monitoring of disaster debris collection and disposal operations on behalf of the _____, ensuring compliance with Federal requirements and applicant debris management plans as related to contractor oversight, truck measurements, load ticket preparation and issuing, report preparation, and project administration.

The Debris Monitoring Contractor shall provide personnel to monitor at least _____ debris loading sites and up to _____ personnel to monitor debris management sites (DMS)/disposal sites located in _____. Each site will operate approximately 12 to 14 hours per day, 7 days per week. The exact number and locations of sites will be determined by the Debris Manager.

The Debris Monitoring Contractor's on-site Project Manager shall also assign a field supervisor who will be assigned to provide oversight of up to 10 loading site and tower/site debris monitors.

The Debris Monitoring Contractor shall provide all management, supervision, labor, transportation, and equipment necessary to initiate load tickets at debris loading sites, estimate the volume of debris (in cubic yards,) being delivered by trucks to each DMS/disposal site, and support the operations of the field supervisor(s), debris loading and tower/site monitors, and clerical staff.

Scope of Services for Debris Management to include field supervisors, debris loading monitors, tower/site debris monitors, and clerical staff is at Attachment 1.

The Bid Schedule (Attached) must be completed and submitted with your proposal.

The RFP should be limited to 10 pages and address the following:

- Office location responsible for this project
- Key personnel
- Evidence of satisfactory completion of disaster debris monitoring in the past 5 years at similar jurisdictions
- The scope, project budget, and operational duration (include the firm's contract manager, and phone number and e-mail address for each disaster response or project, if available)
- Summarized past relevant experience for each response should include the following:
 - Type of disaster—hurricane, tropical storm, tornado, etc.
 - Type of jurisdiction—city, county, district, or combination
 - Collection debris monitoring assignments
 - DMS debris monitoring assignments
 - Final disposal debris monitoring functions
 - FEMA reimbursement actions and issue resolution
- List of references
- Knowledge and experience with applicant solid waste regulations and the disaster debris management policies
- Sub-consultant(s)/subcontractors that may be used on this project
- 3-year claims/litigation history and status

Any material received that is not requested may be discarded. Bindery (except removable fasteners) in any form is not preferred, nor is specially prepared covers, dividers, tables of content, organizational charts, reference letters, etc.

The evaluations made as a result of reviewing the above information from each firm will be part of the basis for developing a short list of firms who may be scheduled to make presentations before the Selection/Negotiation Committee (S/NC), and may serve as continuing information for the final ranking.

Selection/Negotiation Process

An S/NC has been appointed by the _____, and will be responsible for recommending the most qualified firm(s) with whom to begin negotiation of an agreement for this project. The process for this procurement is anticipated, but not required, to proceed in the following manner:

Review Of Written Submittals

Each firm should submit documents that provide evidence of capability to provide the Debris Monitoring services required for this project. Each short-listed firm will be contacted via telephone and a follow-up letter advising of date and time for presentations/interviews.

The _____ will not consider oral/written communications, prior to the conclusion of short listing firms, that vary the terms of the submittals.

Presentations/Interviews

The S/NC may provide a list of subject matter for discussion. Each short-listed firm will be given equal time to make presentations, but the question-and-answer time may vary.

All inquiries are to be directed to _____ at _____.

Interested firms should submit four copies of materials that indicate interest and qualifications to:

Submittals MUST BE RECEIVED by the _____ no later than 5:00 p.m. on _____, 20___. Electronically transmitted and late or misdirected submittals will not be accepted.

Signature _____

Attachment 1 – Scope of Services

Attachment 2 – Bid Schedule

This sample is intended as guidance and should be modified to meet state and local procurement rules and regulations.

Sample Scope of Services for Debris Monitoring Services

General

Provide debris monitors and debris monitoring services to assist the City/County with monitoring the operations of the disaster debris removal and disposal contractor(s). The debris monitoring services to be provided are contract compliance supervision and inspection, not professional engineering services. All debris monitoring activities are to be in compliance with current FEMA guidance and local, State, and Federal regulations.

Pre-Event Requirements

Contractor will provide assistance in preparation for disasters through participation in meetings and workshops and the establishment of data management and other integrated systems.

Contractor will, at no cost to the City/County:

- Provide City/County full-time personnel with a half-day debris management training session. Training program must, at a minimum, meet the training requirement for debris monitors as outlined by current FEMA debris management guidance.
- Provide a list of key personnel and subcontractors that may be involved in the disaster debris monitoring activities to include facsimile, cell phone numbers, and e-mail addresses.
- Participate in annual workshops or planning meetings with City/County representative and debris hauling and disposal contractor(s) to establish/review applicable policies and procedures.

Post-Event Requirements

Contractor will assist with load inspections for storm debris cleanup being performed by one or more debris hauling and disposal contractors or City/County agencies.

Contractor shall supply sufficient number of trained debris monitors and trained field supervisors to accommodate the volume of debris to be removed at loading sites and debris management sites or final disposal sites.

Contractor shall supply one field supervisor to oversee no more than 10 loading and tower/site debris monitors.

Contractor shall remove and replace employees immediately upon notice from the City/County Debris Manager for conduct or actions not in keeping with this contract.

Personnel Requirement and Responsibilities

Debris Monitoring Field Supervisor

Consultant will provide one debris monitoring field supervisor for no more than 10 debris loading site debris monitors.

Services include, but are not limited to:

- Overseeing and supervising loading site and disposal site debris monitoring activities
- Scheduling debris monitoring resources and deployment timing
- Communicating and coordinating with City/County personnel
- Providing suggestions to improve the efficiency of collection and removal of debris
- Coordinating daily activities and future planning
- Remaining in contact with debris management/dispatch center or supervisor
- Identifying, addressing, and troubleshooting any questions or problems that could affect work area safety and eligibility
- Supervising the accurate measurement of load hauling compartments and accurately computing volume capacity in cubic yards (CY)
- Documenting and recording measurements and computations
- Documenting truck hauling compartment condition using digital photographs
- Preparing a master log book of all hauling equipment used by the City's debris removal contractor
- Compiling, reconciling, and documenting daily, in an electronic spreadsheet format, all eligible debris hauled by the debris removal contractor(s)

Debris Monitors

Consultant will provide trained debris monitoring personnel to oversee the loading of eligible debris at collection sites and verification of load capacity and documentation at designated temporary debris management or final disposal sites. Services include, but are not limited to:

Debris Loading Site Monitors

Consultant will perform on-site, street-level debris monitoring at all contractor loading sites to verify debris eligibility based on the monitoring contract's requirements and initiate debris removal documentation using load tickets. Services include, but are not limited to:

- Providing trained debris monitoring personnel at designated loading sites to check and verify information on debris removal operations
- Monitoring collection activity of trucks
- Issuing load tickets at loading site for each load
- Checking the area for safety considerations such as downed power lines and children playing in area, and ensuring that traffic control needs are met and trucks and equipment are operated safely
- Ensuring that Freon-containing appliances are sorted and ready for Freon removal on-site or separating transport for Freon removal before final disposal
- Performing a pre-work inspection of areas to identify potential problems such as covered utility meters, transformers, fire hydrants, mail boxes, etc. to mitigate damage from loading equipment

- Documenting damage to utility components, driveways, road surfaces, private property, vehicles, etc., should it occur, with photographs (if possible, collect information about owner, circumstances of the damage [who, what, when, where] and report to field supervisor)
- Ensuring the work area is clear of debris to the specified level before equipment is moved to a new loading area
- Properly monitoring and recording performance and productivity of debris removal crew
- Remaining in regular contact with debris management/dispatch center or supervisor
- Ensuring that loads are contained properly before leaving the loading area
- Ensuring that only eligible debris is collected for loading and hauling
- Ensuring that only debris from approved public areas is loaded for removal
- Performing other duties from time to time as directed by the debris management project manager or designated debris management personnel

Debris Tower/Site Monitors

Consultant will provide debris tower and site monitors to verify estimated quantities of eligible debris hauled by contractor trucks and documented on load tickets. Services include, but are not limited to:

- Providing trained debris monitoring personnel to accurately measure load hauling compartments and accurately compute volume capacity in CY for all contractor trucks and trailers prior to commencement of debris hauling operations
- Documenting measurements and computations
- Completing record of contract haulers' cubic yardage and other recordkeeping as needed on the load ticket
- Initialing each load ticket before permitting trucks to proceed from the check-in area to the tipping area
- Remaining in regular contact with debris management/dispatch center or field supervisor
- Performing other duties as directed by the dispatch/staging operation, debris management project manager, or other designated personnel

Clerical/Data Entry Supervisor

Consultant will provide a clerical/data entry supervisor to coordinate data entry and information management systems. Services include, but are not limited to:

- Supervising the preparation of detailed estimates and submitting them to the City/County debris manager
- Implementing and maintaining a disaster debris management system linking the load ticket and debris management site information, including reconciliation and photographic documentation processes

- Providing daily, weekly, or other periodic reports for the City/County debris manager noting work progress and efficiency, current/revised estimates, project completion, and other schedule forecasts/updates

Clerical Staff/Data Entry Clerk

Consultant will provide clerical staff/data entry clerk(s) as required to enter load ticket information into the contractor's information management systems and to respond to specific directions from the data entry supervisor.

Terms

The work shall begin on notice to proceed and continue for no longer than 60 days, unless extended by the City/County with 10 days written notice.

Deployment

Consultant must be prepared to deploy debris monitors within 24 hours from the notice to proceed. When additional debris monitoring is needed to meet requirements of the monitoring contract, consultant shall be prepared to increase the number of debris monitors for the City/County to use as needed.

This sample is intended as guidance and should be modified as appropriate to address the conditions of the operation.



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