Government of Saint Lucia

Guidelines for Debris Management in a Disaster

Document of the Saint Lucia National Emergency Management Plan

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Developed by the Saint Lucia Solid Waste Management Authority and based on the Sample Debris Management Plan of the Louisiana Office of Homeland Security and Emergency Preparedness (LHLS & EP)
http://www.ohsep.louisiana.gov/disrecovery/debrismgtsampleplan.htm

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Recommended by *[Solid Waste Management Authority]*	*Approved by* *[NEMAC]*
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[Date of Approval]	*[Date of Approval]*


Cap Pt.
Pigeon I.
Rodney Bay
Gros Islet
CASTRIES
Grande Cul de Sac Bay
Babonneau
Anse la Raye
Roseau
La Caye
Canaries
Dennery
Mt. Gimie
Praslin
Soufrière
Micoud
Canelles
Desruisseaux
St. Lucia I.
Choiseul
Laborie
Hewanorra Int'l. Airport
Vieux Fort
Maria Is.

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DEFINITIONS OF TERMS

C&D – Construction and Demolition

Disaster - A situation where a person's normal means of support for life with dignity has failed as a result of natural or human-made catastrophe.

Debris - the remains of something that has been destroyed or broken up

DEBRIS CLASSIFICATION

To facilitate the debris management process, debris will be segregated by type. Debris removed will consist of two broad categories (clean wood debris and construction and demolition debris. Most common hurricane-generated debris will consist of 30% clean woody material and 70% C&D. Of the 70% mixed C&D it is estimated 42% will be burnable but require sorting, 5% will be soil, 15% will be metals, and 38% landfill.

Definitions of classifications of debris are as follows:

Burnable Materials: Burnable materials will be of two types with separate burn locations:

Burnable Debris: Burnable debris includes, but is not limited to, damaged and disturbed trees; bushes and shrubs; broken, partially broken and severed tree limbs; and bushes. Burnable debris consists predominately of trees and vegetation. Burnable debris does not include garbage or construction and demolition material debris.

Burnable Construction Debris: Burnable construction and demolition debris consists of non creosote structural timber, wood products, and other materials designated by the Saint Lucia Solid Waste Management Authority.

Non burnable Debris: Non burnable construction and demolition debris includes, but is not limited to, creosote timber, plastic, glass, rubber and metal products, sheet rock, roofing shingles, carpet, tires, and other materials as may be designated by the coordinating agency. Garbage will be considered non burnable debris.

Ineligible Debris: Ineligible debris to remain in place includes, but is not limited to, chemicals, petroleum products, paint products, asbestos, and power transformers.

Solid Waste -- Solid waste is any material, solid or liquid discarded by the owner of the material, whether or not the material is in the same form as it was when it came to be in the possession of the owner, **this** includes derelict vehicles.

Any material that is found to be classified as hazardous or toxic waste (HTW) shall be reported immediately to the Saint Lucia Solid Waste Management Authority. This material shall be segregated from the remaining debris in such a way as to allow the remaining debris to be loaded and transported.

Should there be an incident of a spill of HTW, then the Hazardous Material [HazMat] Response team should be called in. [9-1-1 or 9-9-9]

Standing broken utility poles, damaged and downed utility poles and appurtenances, transformers and other electrical material will be reported to **LUCELEC.** Emergency workers shall exercise due caution with existing overhead and underground utilities and above ground appurtenances, and advise the appropriate authorities of any situation that poses a health or safety risk to workers on site or to the general population.

Objective:

To facilitate and coordinate the removal, collection, and disposal of debris following a disaster, to mitigate against any potential threat to the health, safety, and welfare of the impacted citizens, and expedite recovery efforts in the impacted area, and address any threat of significant damage to improve public or private property.

SITUATION

Natural and man made disasters precipitate a variety of debris that includes, but is not limited to, such things as trees, sand, gravel, building/construction materials, vehicles, **household items,** etc.

The quantity and type of debris generated from any particular disaster is a function of the location and kind of event experienced, as well as its magnitude, duration, and intensity.

The quantity and type of debris generated, its location, and the size of the area over which it is dispersed, directly impacts the type of collection and disposal methods used to address the debris problem, associated costs incurred, and the speed with which the problem can be addressed.

In a major or catastrophic disaster, National Emergency Management Organization (NEMO) may have difficulty in locating staff, equipment, and funds to devote to debris removal, in the short as well as long term.

Private contractors and owners of heavy equipment play a significant role in the debris removal, collection, reduction, and disposal process.

The debris management program implemented by the various stakeholders will be based on the waste management approach of reduction, reuse, reclamation, resource recovery, autoclaving, and land filling as appropriate.

ORGANIZATION AND CONCEPT OF OPERATIONS

The Ministry of Communications, Work, Transport and Public Utilities (MCW&T) is responsible for the debris removal function.

The Ministry of Works will work in conjunction with designated support agencies, utility companies, waste management firms, trucking companies and heavy equipment operators, to facilitate the debris clearance, collection, transportation, reduction, and disposal needs following a disaster.

The Ministry of Works will be responsible for removing debris from the public right-of-way. **Only when it is deemed in the public interest will Ministry of Works, remove debris from private property**

Because of limited quantity of resources and service commitments following the disaster, the MCW&T will be relying heavily on private contractors to remove, collect, and manage debris for reuse, resource recovery, reduction, and disposal.

Ministry of Works and the Ministry of the Environment will also develop and maintain a list of approved contractors who have the capability to provide debris removal, collection, and disposal in a cost effective, expeditious, and environmentally sound manner following a disaster.

AGENCY RESPONSIBILITIES

The **SLSWMA** is responsible for developing a debris management plan and shall select a "Debris Manager" to supervise a "Debris Management Team". The staff shall be comprised of personnel to perform the following functions:

1. Administration: National Emergency Management Organization (NEMO)	Function: Coordination
2. Administration: Ministry of Works	Function: Housekeeping, supplies, equipment, funding, accounting.
3. Ministry of Finance	Function: Funding
4. Engineering: Ministry of Works	Function: Detailed damage assessment, identification of project tasks, assignments of tasks, preparation of estimates, plans, specifications, and recommendation of contract award. Supervision of government and contract resources and overall project management.
5. Legal: Attorney General's Chambers	Function: Contract review, right of entry permits, community liability, condemnation of buildings, insurance.
6. Legal: Commissioner of Crown Lands – Acquisition of land	Function: Land acquisition for temporary staging and reduction sites, land acquisition for disposal sites, insurance.
7. Legal: Ministry of Physical Development.	Function: Contract review, right of entry permits, community liability condemnation of buildings.

8. Operations: SLSWMA.	Function: Management of Debris at landfills, staging and reduction sites. Identification of debris management sites, waste reduction and reuse options.
9. Contracting and Procurement: Ministry of Works	Function; Bidding requirements, forms, advertisements for bids, and instructions to bidders, contract development. Hiring of Contractors
10 Public Information Specialist: [GIS]	Function: Coordinate press releases, contacts with local organizations, individuals, and media; and public notices for debris removal and disposal contracts.
11. Solid Waste Management Authority	Function: Assist with press releases, contacts with local organizations, individuals, and media; and public notices for debris removal and disposal contracts.
12. Cultural Agencies: • Archaeological and Historical Society • Folk Research Center • Saint Lucia National Archives • Saint Lucia National Trust	Function: Provide guidance in the sifting, categorizing and storage of debris that may be of National / Historic / Cultural importance.

Agencies shall ensure that they conduct the following actions:

1. **Convening the development of** a Debris Management Plan. [NEMO]
2. Developing an analysis and debris management capability [SLSWMA]

3. **Developing an analysis and debris management capability of matter of National / Historic / Cultural importance. [Cultural Agencies]**
4. Develop public information and education programs. [GIS/SLSWMA]
5. **Train personnel in debris management techniques. [SWMA]**
6. Maintain pre-disaster maps, blueprints, photos and other documents. [MoW]
7. Make a list of critical facilities (streets, roads, and bridges) requiring debris clearance. [MoW]
8. Identify non-government groups that could assist. [NEMO/SLWMA]

CONTRACT AND COOPERATIVE AGREEMENTS

Sample contracts with a menu of services and generic scopes of work will be developed by the **MCW& T prior to the disaster** to allow the Ministry of Works to tailor its contracts to its needs more efficiently as well as expedite their implementation in a prompt and effective manner.

The **MCW&T** will be responsible for managing the debris contract from project inception to completion. Managing the debris contract includes such things as monitoring of performance, contract modifications, inspections, acceptance, payment, and closing out of activities. The Ministry of Works will enter into cooperative agreements with other agencies to maximize public assets.

The three types of contracts required are the:

1. Time and Materials Contract. This will be limited to the first 100 hours of operation. The price for equipment applies only when the equipment is operating; the Ministry of Works can terminate the contract at its convenience, and does not guarantee a minimum number of hours.

2. Lump Sum Contract. The price of the work is fixed unless there is a change in the scope of work to be performed.

   Lump sum contracts will be calculated on either the "area" method or the "pass" method. The lump sum contract shall only be used when the scope of work is clearly defined and the areas of work can be specifically quantified.

3. The Unit Price Contract. Is the most accurate account of actual quantities removed and requires field inspectors to eliminate contractor fraud. All

contractor trucks must be measured. Requires load tickets identifying truck number, contract number, contractor's name, date, time departed site, and estimated volume.

The Attorney's Office will draw-up sample contracts and these contracts are attached to this plan as Annex 2

The Ministry of Works will keep a data base of contractors.

SITE SELECTION

Debris storage and reduction sites will be identified and evaluated by interagency site selection teams comprised of a representative from the following agencies:

- Town and Village Councils (TVC)
- National Emergency Management Organization Secretariat (NEMO-Sec)
- Ministry of Health (MoH)
- Ministry of Works (MoW)
- Ministry of the Environment (MoE)
- Saint Lucia Solid Waste Management Authority (SWMA)
- Ministry of Social Transformation (MoST)

Initially, debris will be placed in temporary holding sites, determined before the onset of the disaster, until such time as a detailed plan of debris collection and disposal is prepared. Temporary debris collection sites should be readily accessible by recovery equipment and should not require extensive preparation or coordination for use. Collection sites will be on public property when feasible to facilitate the implementation of the mission and mitigate against any potential liability requirements.

Activation of sites will be under the control of the Chief Engineer (MCW&T) and will be coordinated with other recovery efforts.

Site selection criteria will be developed into a checklist format for use by these teams to facilitate identification and assessment of potential sites. Criteria will include such factors of ownership of property, size of parcel, surrounding land uses and environmental conditions, and transportation facilities that serve the site.

A list of temporary holding sites in each district will be prepared and attached as Annex 3 to this plan.

DEBRIS REMOVAL PRIORITIES

The debris removal process must be initiated promptly and conducted in an orderly, effective manner in order to protect public health and safety following a major or catastrophic event. To achieve this objective, the **first priority** will be to clear debris from key roads, in order to provide access for emergency vehicles and resources into the impacted area.

The need and demand for critical services will be increased significantly following a disaster. Therefore, the **second priority** that debris removal resources will be assigned is providing access to critical facilities pre identified by the Debris Management Team.

Critical facilities have been identified as:

1. Hospitals
2. Health Centres
3. Police Stations
4. Fire Stations
5. Schools
6. Airports
7. Water treatment facilities
8. Hotels
9. Emergency Shelters
10. Prisons
11. Homes for the Aged

The **third priority** for the debris removal teams to address will be the elimination of debris related threats to public health and safety. This will include such things as the repair, demolition, or barricading of heavily damaged and structurally unstable buildings, systems, or facilities that pose a danger to the public. Any actions taken to mitigate or eliminate the threat to the public health and safety must be closely coordinated with the owner or responsible party. If access to the area can be controlled, the necessary actions can be deferred.

The exceptions to these priorities shall be:

1. **If the site is a crime scene. Thus clean up must await release of the site by the Police.**
2. **If the site is one of National / Historic / Cultural importance and thus clearance must be conducted under the guidance of the relevant Cultural Authority. [E.g. National Archives for Documents, A&H Society for Archaeological Sites.]**

ESTIMATING DEBRIS QUANTITIES

Debris Disposal and Reduction

Once the debris is removed from the damage sites, it will be taken to the temporary holding sites. The three methods of disposal are burning, recycling, and grinding/chipping.

Grinding and chipping will be utilized as a viable reduction method. Grinding and chipping reduces the volume on a 4 to 1 ratio. For grinding and chipping to be feasible, 25% of volume remaining must have some benefit or use.

The two primary burning methods are open burning and pit burning. Controlled open burning is a cost-effective method for reducing clean woody debris in rural areas. Burning reduces the volume by 95%, leaving only ash residue to be disposed of.

Metals, wood, and soils are prime candidates for recycling; wherever feasible wood would be utilized for use of charcoal. Most of the non-ferrous metals are suitable for recycling. Contractors are free to bid on disposal of debris by recycling if it is well sorted.

As much as possible a management system to minimize the volume of waste transported to the disposal sites should be instituted.

SITE CLOSEOUT PROCEDURES

Each temporary debris staging and reduction site will eventually be emptied of all material and be restored to its previous condition and use.

Before activities begin, a report detailing site conditions will be prepared (including photos).

At closeout a final testing of soil, water, and air quality will be undertaken and compared to original conditions. All ash will be removed and any remediation actions will be taken. The site will then be restored to its original state.

Standing Operating Procedures for Agencies (SOPs)
Debris Management Plan

DEBRIS MANAGEMENT TEAM

MAIN

- **Chief Engineer - Ministry of Works (MOW)**

Secondary:

- **General Manager - Solid Waste Management Authority**

MEMBERSHIP

- Office of the National Emergency Management Organisation / Emergency Operations Center (National)
- Solid Waste Management Authority
- Saint Lucia Fire Service
- Ministry of Health/Office of the Chief Medical Officer
- Ministry of Health/Department of Public and Environmental Health
- Ministry of Works/Engineering
- Ministry of Works/Contracts Department
- Ministry of Physical Development/Survey and Mapping
- Ministry of Finance
- Attorney General Chambers

1. Normal Operations

   a. Develop Local and National resource list of contractors who can assist in all phases of debris management.

   b. Develop sample contracts with generic scopes of work to expedite the implementation of their debris management strategies.

   c. Identify and pre designate potential debris storage sites for the type and quantity of debris anticipated following a catastrophic event.

   d. Develop site selection criteria checklists to assist in identifying potential debris storage sites.

e. Identify and coordinate with appropriate regulatory agencies regarding potential regulatory issues and emergency response needs.

f. Develop the necessary right of entry and hold harmless agreements indemnifying **the Government and its agents** against any potential claims.

g. Establish debris assessment process to define scope of problem.

h. Develop and coordinate pre scripted announcements with the Government Information Service (GIS)] regarding debris removal process, collection times, temporary storage sites use of private contractors, environmental and health issues, etc.

2. Increased Readiness (A natural or man made disaster is threatening)

   a. Review and update plans, standard operating procedures, generic contracts, and checklists relating to debris removal, storage, reduction, and disposal process.

   b. Alert and ensure that personnel, facilities, and equipment are ready and available for emergency use.

   c. Relocate personnel and resources out of harm's way, and stage in areas where they can be effectively mobilized.

   d. Review potential local and debris staging and reduction sites that may be used in the response and recovery phases in the context of the impeding threat.

   e. Review resource listing of private contractors who may assist in debris removal process. Make necessary arrangements to ensure the availability of these resources in the event of the disaster.

3. Response

   a. Activate debris management plan, coordinate with Damage Assessment and Needs Analysis Committee [DANA]

   b. Begin documenting costs.

c. Coordinate and track resources (public and private).

d. Establish priorities regarding allocation and use of available resources.

e. Identify and establish debris temporary storage and disposal sites.

f. Address any legal, environmental, and health issues relating to the debris removal process.

g. Continue to keep public informed through the PSAs.

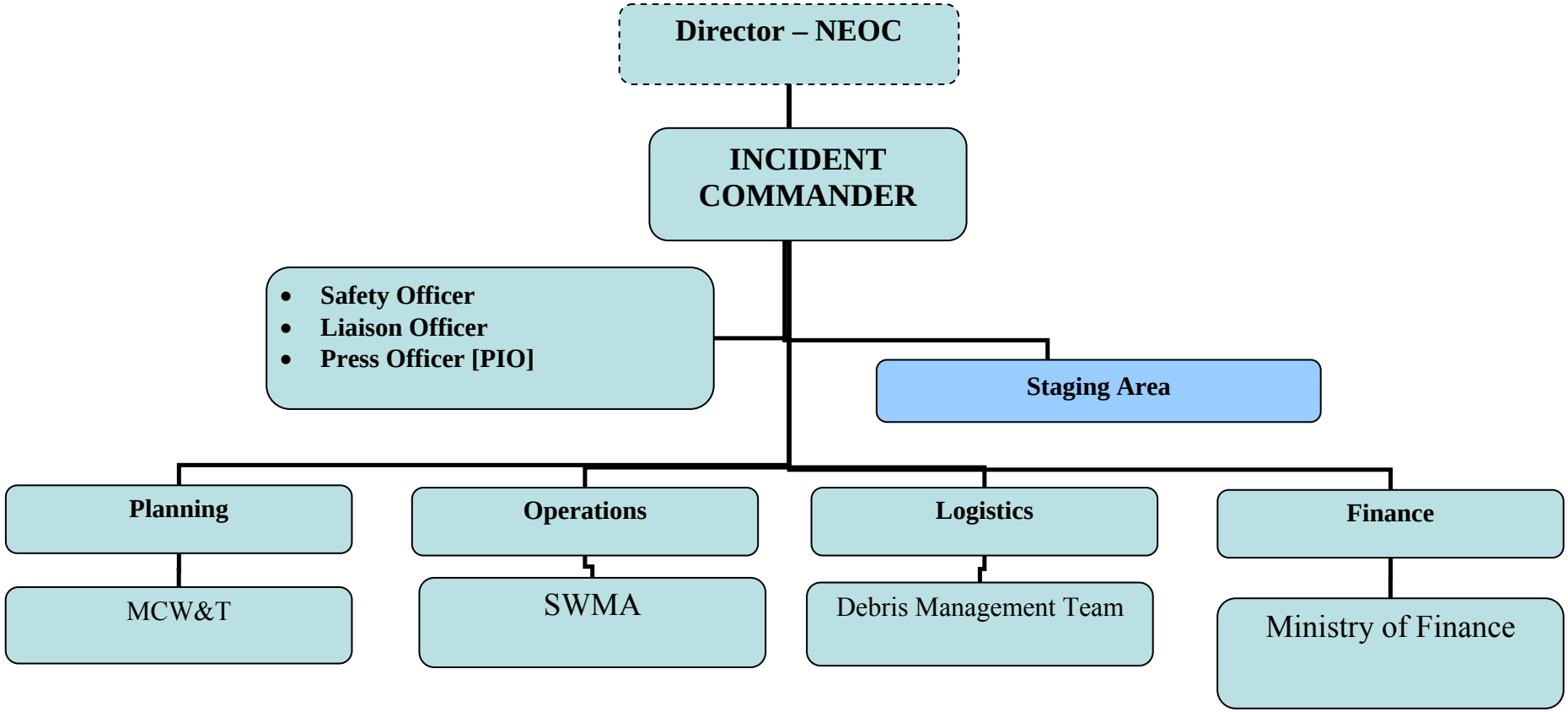
4. Recovery

a. Continue to collect, store, reduce, and dispose of debris generated from the event in a cost-effective and environmentally responsible manner.

b. Continue to document costs.

c. Upon completion of debris removal mission, close out debris storage and reduction sites by developing and implementing the necessary site restoration actions.

d. Perform necessary audits of operation and submit claim for assistance.


Director – NEOC
INCIDENT COMMANDER
Safety Officer
Liaison Officer
Press Officer [PIO]
Staging Area
Planning
Operations
Logistics
Finance
MCW&T
SWMA
Debris Management Team
Ministry of Finance

APPENDIX 1 - Terms Of Reference

Incident Commander / Debris Manager

The Debris Manager has overall responsibility for the planning and logistics of the debris management activities.

Public Information Officer

The SLSWMA shall designate a person to serve the Public Information Officer is responsible for providing information and guidance to the public regarding debris management activities. The Public Information Officer's duties include development of informational bulletins, hotline responses, radio and television announcements, handbills and door hangers, and newspaper notices. Information that can help to expedite the cleanup process **such as:**

1. • Segregating hazardous waste.
2. • Placing debris at the curbside.
3. • Keeping debris piles away from fire hydrants and valves.
4. • Reporting illegal dumping.
5. • Segregating recyclable materials.
6. •Composting of green waste

The PIO shall endeavor to inform the Public on debris removal activities, such as:

1. • Debris pick-up schedules.
2. • Location of TDSR's.
3. • Disposal methods and compliance with Health and Environmental Legislations.
4. • Restrictions and penalties for illegal dumps.

END OF PROCEDURE

Operations Officer

The SWMA shall designate a person to serve as the Operations Officer who will work with other agencies to coordinate resources for debris removal activities. The operations section manages the Department of Public Works, Solid Waste Management Authority and contracted services. Functions of the Operations Officer include but are not limited to:

1. Monitoring operations at the TDSR's.
2. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.

Contractor roles include but are not limited to:

1. Removing debris from public/private property.
2. Transporting debris to TDSR's.
3. Operating **temporary** debris reduction sites.
4. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.

END OF PROCEDURE

Planning

The Planning Section **of MOCW&T** is responsible for gathering information about the incident, maintaining equipment logs, tracking use of personnel, and providing information to the Debris Manager. Designate a planning officer who will ensure that these responsibilities are carried out. The planning section manages the Engineering Department, Legal Department, and Environmental Compliance staff.

The responsibilities include but are not limited to:

1. Conducting debris assessments.
2. Developing cost estimates and scopes of work for public employees and contractors.
3. Evaluating options for recycling/reducing/disposing debris.
4. Evaluating/selecting locations for TDSR's.

The MCW &T's planning responsibilities include but are not limited to:

1. Developing and reviewing all contracts.
2. Securing all authorizations necessary for debris removal activities.
3. Ensuring compliance with all environmental and historical preservation laws/regulations/policies.
4. Reviewing rights-of-entry and hold harmless agreements.
5. Reviewing private property insurance information and other assets to ensure benefits and resources are fully utilized.

The MCW &T's planning responsibilities include but are not limited to:

1. Coordinating with Government and local agencies, such as the Archeological & Historical Society and Saint Lucia National Trust to ensure compliance with environmental and historic preservation laws/regulations/policies.
2. Determining environmental monitoring and reporting requirements for TDSR's.
3. Maintaining waste records for historical purposes.

END OF PROCEDURE

Logistics

MOCW&T is responsible for establishing and maintaining any facilities designated for debris management activities. This includes food, office supplies, communication devices, equipment, personnel, and any other supplies necessary for debris management activities. Designate a logistics officer who will coordinate procurement of needed supplies.

END OF PROCEDURE

Finance

The Ministry of Finance is responsible for ensuring that funds are available for equipment, supplies, and all other expenses. Designate a finance officer to oversee all financial issues resulting from debris management activities. Under the finance section is the Contract and Procurement Department and Fiscal Administration.

The Contract and Procurement Department duties include but are not limited to:

1. Setting bidding requirements.
2. Developing forms.
3. Advertising for bids.
4. Instructing bidders.
5. Developing contracts.
6. Documenting all costs for debris removal activities.

END OF PROCEDURE

APPENDIX 2 - Roles and Responsibilities

The purpose of this section is to give an overview of the roles and responsibilities for operations before, during, and after a debris-generating event.

Normal Operations

During normal operations (before a disaster), the country must be aware that the following issues must be addressed to ensure preparedness for debris generating events. The responsibilities for normal operations include but are not limited to:

MCW&T

1. Evaluating options for recycling/reducing/disposing debris.
2. Evaluating/selecting locations for TDSR's.
3. Developing and reviewing all contracts.
4. Reviewing rights-of-entry and hold harmless agreements.
5. Developing forms for use in debris removal operations.
6. Developing contracts.

Increased Readiness

In the event there is a warning that a disaster may occur, the considerations for actions listed earlier in this document need to be addressed. These actions include notifying personnel, reviewing the debris management plan, and reviewing waste management actions.

Response [merge with recovery]

The magnitude of the event will determine the degree to which recycling/reduction/disposal actions take place in either the response or recovery phase. The responsibilities of each department during the response phase include but are not limited to:

Public Information Officer

1. Giving the public information about:
   a. Segregating hazardous waste.
   b. Placing debris at the curbside.
   c. Keeping debris piles away from fire hydrants and valves.
   d. Reporting illegal dumping.
   e. Segregating recyclable materials.
   f. Debris pick-up schedules.
   g. Location of TDSR's.

Ministry of Communication Works Transport & Public Utilities

1. Implementing the debris management plan.
2. Deploying supplies and tracking of equipment.
3. Estimating supplies needed.
4. Developing strategies for debris removal.
5. Developing debris removal priorities.
6. Removing debris from public property
7. Transporting debris to TDSR's
8. Conducting debris assessments.
9. Developing cost estimates and scopes of work for public employees and contractors.

Saint Lucia Solid Waste Management Authority

1. Monitoring operations at the TDSR's.
2. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.
3. Evaluating options for recycling/reducing/disposing debris.
4. Evaluating/selecting locations for TDSR's.
5. Removing debris from public property.
6. Transporting debris to TDSR's.
7. Monitoring operations at the TDSR's.
8. Operating debris reduction sites.
9. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.

Contractor

1. Removing debris from public/private property.
2. Transporting debris to TDSR's.
3. Operating debris reduction sites.
4. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.
5. Removing debris from public/private property.
6. Transporting debris to TDSR's.
7. Operating debris reduction sites.
8. Ensuring all debris is transported to the appropriate TDSR's or regulated waste facility.

Ministry of Physical Development

1. Coordinating with Ministry of Heath and the Archeological & Historic Society to ensure compliance with environmental and historic preservation laws/regulations/policies.
2. Determining environmental monitoring and reporting requirements for TDSR's.
3. Maintaining records for historical purposes.

Ministry of Physical Development Legal Department

1. Developing and reviewing all contracts.
2. Securing all authorizations necessary for debris removal activities.
3. Ensuring compliance with all environmental and historic preservation laws/regulations/policies.
4. Reviewing rights-of-entry and hold harmless agreements.
5. Reviewing private property insurance information and other assets to ensure benefits and resources are fully utilized.
6. Coordinating with Government Ministries and Historical, Cultural organizations to ensure compliance with laws/ regulations/policies
7. Determining environmental monitoring and reporting requirements for TDSRs.
8. Maintaining records for historical purposes
9. Ensuring compliance with all environmental and historic preservation laws/regulations/policies.
10. Reviewing private property insurance information and other assets to ensure benefits and resources are fully utilized.

Ministry of Communication Works Transport & Public Utilities

1. Setting bidding requirements.
2. Advertising for bids.
3. Instructing bidders.
4. Developing contracts.
5. Documenting all costs for debris removal activities.
6. Evaluating options for recycling/reducing/disposing debris.
7. Evaluating/selecting locations for TDSR's.

Ministry of Finance

1. Keeping records of financial transactions for reimbursement of debris removal activities.
2. Funding of debris removal activities.

APPENDIX 3 - TEMPORARY DEBRIS SITES

SITE EVALUATION

1. **Site Ownership**:

a) Use public lands to avoid costly leases and trespassing allegations. Use private land only if public sites are unavailable.

2. **Site Location**:

a) Consider impact of noise, dust and traffic;
b) Consider pre-existing site conditions;
c) Look for good ingress/egress at site(s);
d) Consider impact on ground water;
e) Consider site size based on:
    (1) Expected volume of debris to be collected;
    (2) Planned volume reduction methods;
f) Avoid environmentally sensitive areas, such as:
    (1) Wetlands;
    (2) Rare and critical animals or plant species;
    (3) Well and surface water supplies;
    (4) Historical/archaeological sites;
    (5) Sites near residential areas, schools, churches, hospitals and other sensitive areas.
g) Perform recordation of site chosen (pictures, videos).

3. **Site Operations**:

a) Use portable containers;
b) Separate types of waste as operations continue;
c) Monitor site at all times;
d) Perform on-going volume reduction (on site or removal for disposal/reduction);
e) Provide nuisance management (dust, noise, etc.);
f) Provide vector control (rats, insects, etc);
g) Provide special handling for hazardous materials;
h) Provide security (limit access);
i) Ensure appropriate equipment is available for site operations.

4. **Site Closeout**:
a) Remove all remaining debris to authorized locations;
b) Restore site to pre-use condition;
c) Perform recordation of site (pictures, videos).

APPENDIX 4 - CONTRACTING

MOCW&T OFFICE RESPONSIBILITIES

1. Determine the type of contracting needed to satisfy specific debris clearance, removal and disposal requirements of an unusual and compelling urgency.

2. Solicit bids, evaluate offers, award contracts, issue notices to proceed with all contract assignments.

3. Supervise the full acquisition process for service and supply contracts and the oversight of contract actions to ensure conformance to regulatory requirements.

4. Coordinate with the NEMO and the Saint Lucia Solid Waste Management Authority.

5. Consult with legal counsel. The contracting office must take care to avoid the solicitation of assistance from the general public and giving the impression that compensation will be provided for such assistance. In general, assistance from the public should be regarded as volunteer assistance.

TYPES OF DEBRIS CONTRACTS

1. Time and Materials Contracts may be used for short periods of time immediately after the disaster to mobilize contractors for emergency removal efforts. They must have a dollar ceiling or a not-to-exceed limit for hours (or both), and should be terminated immediately when this limit is reached. The contract should state that:

(a) The price for equipment applies only when equipment is operating,
(b) The hourly rate includes operator, fuel, maintenance, and repair,
(c) The MOCW&T reserves the right to terminate the contract at its convenience and
(d) The MOCW&T does not guarantee a minimum number of hours.

2. Unit Price Contracts are based on weights (tons) or volume (cubic yards) of debris hauled, and should be used when the scope of work is not well defined. They require **close monitoring** of pick-up, hauling and dumping to ensure that quantities are accurate. Unit price contracts may be complicated by the need to segregate debris for disposal.

3. Lump Sum Contracts establish the total contract price using a one-item bid from the contractor. They should be used only when the scope of work is clearly defined, with areas of work and quantities of material clearly identified. Lump sum contracts can be defined in one of two ways: Area Method where the scope of work is based on a one-time clearance of a specified area; and Pass Method where the scope of work is based on a certain number of passes through a specified area, such as a given distance along a right-of-way.

CONTRACT MONITORING

The debris staff member should monitor the contractor's activities to ensure satisfactory performance. Monitoring includes: verification that all debris picked up is a direct result of the disaster; measurement and inspection of trucks to ensure they are fully loaded; on-site inspection of pick-up areas, debris traffic routes, temporary storage sites, and disposal areas; verification that the contractor is working in its assigned contract areas; verification that all debris reduction and disposal sites have access control and security.

General Work Eligibility: Determination of eligibility is a NEMO responsibility. Removal and disposal of debris that is a result of the disaster, and is on public property, is eligible for NEMO's assistance. Public property includes roads, streets, and publicly-owned facilities. Removal of debris from parks and recreation areas is eligible when it affects public health and safety or limits the use of those facilities.

Debris Removal from Private Property: Costs incurred by local governments to remove debris from private property may be reimbursed by NEMO if pre-approved by NEMO's Manager; is a public health and safety hazard, and the work is performed by an eligible applicant, such as a local government **agency**. The cost of debris removal by private individuals is not eligible.

Use of Contractors: If an applicant decides to award contracts for debris removal, MOCW&T **advises** the following:

- Do not allow contractors to make eligibility determinations; they have no authority to do so;
- Utilize pre-negotiated contracts, if available;
- Consider using qualified local contractors because of their familiarity with the area;
- Request copies of references, licenses and financial records from unknown contractors;
- Document procedures used to obtain contractors;
- Do not accept contractor-provided contracts without close review. SWMA can provide technical assistance on contracts and contract procedures, if requested to do so by local officials.

Appendix 5

Attachment 5.1
Example Mutual Aid Agreement

THIS AGREEMENT, entered into this day of by the participating parties hereto:

WHEREAS, each of the parties hereto desires to furnish mutual aid to each other in the event of a disaster, for which neither party might have sufficient equipment or personnel to cope, and,

WHEREAS, such a mutual aid agreements are authorized by Agency.

NOW THEREFORE, the parties do mutually agree as follows:

ARTICLE I TERM

This agreement shall commence at 12:01 a.m. on _____, and continue through _____, subject to the right of each party to terminate sooner as provided herein.

ARTICLE II Services

A. In the event of a disaster that requires aid of equipment and personnel beyond that which each party is able to provide for itself, all parties hereto agree that at the request of any party the other will loan such equipment and personnel as the respective officials of the lending jurisdiction, in their discretion, shall determine can be reasonably spared at the time without placing their own community in jeopardy.

B. Since time is of the essence during emergencies as herein referred to, the authority to dispatch equipment and personnel or call for in accordance with the terms and conditions of this agreement shall be delegated specifically to the chief official or acting chief official of the parties hereto.

C. The lending party shall be responsible for the delivery of said equipment and personnel to the location specified by the requesting party.

D. Upon arrival at said location, the officer in charge of the said equipment and personnel shall report to the officer in charge at the location of the disaster, who shall assume full charge of all operations at a disaster or emergency location.

E. All equipment and personnel loaned hereunder shall be returned upon demand of the lending party or when released by the requesting party upon the cessation of the emergency.

ARTICLE III PAYMENT

No charge shall be assessed for services rendered by any party hereto.

ARTICLE IV WAIVER OF CLAIMS

Each party hereto hereby waives all claims against the other for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of **their duty by** their agents, or employees hereunder.

ARTICLE V TERMINATION

This Agreement may be terminated by either party upon at least thirty days prior written notice to the other.

ARTICLE VI INTEGRATION

This Agreement contains the entire understanding between the parties, and there are no understandings or representations not set forth or incorporated by reference herein. No subsequent modifications of this Agreement shall **come into** force or effect unless **written and signed** by the parties.

ARTICLE VII COMPLIANCE WITH LAWS

In the performance of this Agreement, each party shall comply with all applicable Saint Lucia laws, rules, and regulations.

SIGNATURES OF AGREEING OFFICIALS

_____ _____

_____ _____

Attachment 5.2
Right of Entry Agreement Example

I/We, _____the owner(s) of the property commonly identified as, _____ _____ , of Saint Lucia

(Street) Village/Town

do hereby grant and give freely and without coercion, the right of access and entry to said property in the District of _____, its agencies, contractors, and subcontractors thereof, for the purpose of removing and clearing any or all storm-generated debris of whatever nature from the above described property.

It is fully understood that this permit is not an obligation to perform debris clearance. The undersigned agrees and warrants to hold harmless the _____ of Saint Lucia, its agencies, contractors, and subcontractors, for damage of any type, whatsoever, either to the above described property or persons situated thereon and hereby release, discharge, and waive any action, either legal or equitable that might arise out of any activities on the above described property. The property owner(s) will mark any storm damaged sewer lines, water lines, and other utility lines located on the described.

I/We (have _____, have not _____) (will _____ , will not _____) receive any compensation for debris removal from any other sources. I will report for this property any insurance settlements to me or my family for debris removal that has been performed at government expense. For the considerations and purposes set forth herein, I set my hand this day _____ of _____, 20___.

_____

_____

Witness

Owner

_____

Owner

_____

Telephone Number and Address

Attachment 5.3
Example Time and Materials Contract

ARTICLE 1:
Agreement Between Parties

This contract is entered into on this _____ day of _____ _____, 20 ____, by and between the village/town of hereinafter called the ENTITY and _____, hereinafter called the CONTRACTOR.

ARTICLE 2:
Scope of Work

This contract is issued pursuant to the Solicitation and Procurement on _____ _____, 20 _____, for the removal of debris caused by the sudden natural or manmade disaster of _____ to, _____ 20 ___ . It is the intent of this contract to provide equipment and manpower to remove all hazards to life and property in the affected communities. Clean up, demolition, and removal will be limited to 1) that which is determined to be in the interest of public safety and 2) that which is considered essential to the economic recovery of the affected area.

ARTICLE 3:
Schedule of Work

Time is of the essence for this debris removal contract.

Notice to proceed with Work: The work under this contact will commence on _____, 20 _____. The equipment shall be used for (recommended not to exceed 70) hours, unless the ENTITY initiates additions or deletions by written change order. Based upon unit prices of equipment and labor, no minimum or maximum number of hours is guaranteed.

ARTICLE 4:
Contract Price

The hourly rates for performing the work stipulated in the contract, documents, which have been transposed from the low bidder’s bid schedule, are as follows:

Equipment/Machine/Operator
Mobilization/Hourly Rate
Demobilization Cost

Manufacturer, Model Total unit rate shall be given which includes maintenance, fuel, overhead, profit, and other associated cost with the equipment. Estimated Cost per unit of material. Only actual invoice amounts will be paid.

Labor man-hours Protective clothing, fringe benefits, hand tools, supervision, transportation, and any other costs.

ARTICLE 5:
Payment

The ENTITY shall pay the Contractor for mobilization and demobilization if the Notice to
Proceed is issued and will pay for only the Time that the equipment and manpower is actually being used in accomplishing the work. The Contractor shall be paid within _____ days of the receipt of a pay estimate and verification of work by the inspector.

ARTICLE 6:
Claims

Not Applicable

ARTICLE 7:
Contractor's Obligations

The Contractor shall supervise accomplishment of the work effort directed by labor and proper equipment for all tasks. Safety of the Contractor's personnel and equipment is the responsibility of the Contractor. Additionally, the Contractor shall pay for all materials, personnel, liability insurance, taxes, and fees necessary to perform under the terms of the contract. Caution and care must be exercised by the Contractor not to cause any additional damage to sidewalks, roads, buildings, and other permanent fixtures.

ARTICLE 8:
Insurance and Bonds

The Entity's representative(s) shall furnish all information necessary for commencement of the Work and direct the Work effort. Costs of construction permits, disposal sites and authority approvals will be borne by the Entity. **The Representative shall be responsible for** inspection of the work and answering any on-site questions. This representative shall **also** furnish the MOCW&T daily inspection reports including work accomplished and certification of hours worked.

The Entity shall designate the public and private property areas where the work is to be performed. Copies of complete "Right of Entry" forms, where they are required by law for private property shall be furnished to the contractor by the Entity. The Entity shall hold harmless and indemnify the Contractor and his employees against any liability for any and all claims, suits, judgments, and awards alleged to have been caused by services rendered under this contract for disaster relief work unless such claims are the result of negligence on the part of the Contractor.

The Entity will terminate the contract for failure to perform or default by the Contractor.

ARTICLE 9:
Insurance and Bonds

The Contractor shall furnish proof of Worker's Compensation Coverage, Automobile Liability Coverage, and Comprehensive General Liability Insurance (Premises-Operations, Personnel Injury, etc, as deemed necessary by the Entity).

Surety: The Contractor shall deliver to the Entity fully executed Performance and Payment Bonds in the amount of 100% of the contract amount, if required by the specifications, general or special conditions of the contract. The Entity will reimburse the Contractor for the costs of the bonds, the costs of which will be included in the base bid.

ARTICLE 10:
Contractor Qualifications

THIS CONTRACT IS DULY SIGNED BY ALL PARTIES HERETO:

_____

_____
Entity (City, Village, Town, Etc)

By _____ Seal by _____Seal
Principal of the firm

_____
Contractor (Include address, City, State)

Attachment 5.4
Example Lump Sum Contract for Debris Removal

ARTICLE 1:
Agreement Between Parties

This contract is made and entered into on this _____ day of _____, 20 _____, by and between the _____ of, hereinafter called the ENTITY and, hereinafter called the CONTRACTOR.

ARTICLE 2:
Scope of Work

This contract is issued pursuant to the Solicitation and Procurement on _____,
20 _____, for the removal of debris caused by the sudden natural or man made disaster of _____ to _____, 20 _____. It is the intent of this contract to provide equipment and manpower to remove all hazards to life and property in the affected communities. Clean up, demolition, public safety and 2) that which is considered essential to the economic recovery of the affected area.

ARTICLE 3:
Schedule of Work

Time is of the essence for this debris removal contract.

Notice to proceed with the Work: The Work under this contract will commence on _____, 20 _____. Maximum allowable time for completion will be _____ Calendar days, unless the Entity initiates additions or deletions by written change order. If the Contractor does not complete Work within the allotted time, liquidated damages will be assessed in the amount of _____ per day.

ARTICLE 4:

Contract Price

The lump sum price for performing the work stipulated in the contract document is: $ _____.

ARTICLE 5:

Payment

The Contractor shall submit certified pay requests for completed work. The Entity shall have 10 calendar days to approve or disapprove the pay request. The Entity shall pay the Contractor for his/her performance under the contract within _____ days of approval of the pay estimate. On contracts over 30 days in duration, the Entity shall pay the Contractor a pro-rata percentage of the contract amount on a monthly basis, based on the amount of work completed and approved in that month. The Entity will remunerate the Contractor within 30 days of the approved application for payment. Retainer shall be released upon substantial completion of the work.

ARTICLE 6:
Change Orders

If the scope of work is changed by the Entity, the change in price and contract time will be promptly negotiated by the parties, prior to commencement of work.

ARTICLE 7:
Contractor's Obligations

The Contractor shall supervise and direct the Work, using skillful labor and proper equipment for all tasks. Safety of the Contractor's personnel and equipment is the responsibility of the Contractor. Additionally, the Contractor shall pay for all materials, equipment, personnel, taxes, and fees necessary to perform under the terms of the contract.

Any unusual, concealed, or changed conditions are to be immediately reported to the Entity. The Contractor shall be responsible for the protection of existing utilities, sidewalks, roads, building, and other permanent fixtures. Any unnecessary damage will be repaired at the Contractor's expense.

ARTICLE 8:

Entity's Obligations

The Entity's representative(s) shall furnish all information, documents, and utility locations, necessary for commencement of Work. Costs of construction permits and authority approvals will be borne by the Entity. A representative will be designated by the Entity for inspecting the work and answering on-site questions.

The Entity shall designate the public and private property areas where the disaster mitigation work is to be performed. Copies of complete "Right of Entry" forms, where they are required by law for private property, shall be furnished to the Contractor by the Entity. The Entity shall hold harmless and indemnify the Contractor **from** judgments and awards alleged to have been caused by services rendered under this contract for disaster relief work unless such claims are caused by the gross negligence of the Contractor, his subcontractors or his employees.

ARTICLE 9:
Claims

If the Contractor wishes to make a claim for additional compensation, for work or materials **that** is not clearly covered in the contract, or nor ordered by the Entity as a modification to the contract, he/she shall notify the Entity in writing. The Contractor and the Entity will negotiate the amount of adjustment promptly; however, if no agreement is reached, a binding settlement will be determined by a third party **[Arbitrator]** acceptable to both Entity and Contractor under the sections of applicable State law.

ARTICLE 10:
Insurance and Bonds

The contractor shall furnish proof of Worker's Compensation Coverage, Automobile Liability Coverage, and Comprehensive General Liability Insurance (Premises-Operations, Personal injury, etc. as deemed necessary by the Entity).

Surety: The Contractor shall deliver to the Entity fully executed Performance and Payment Bonds in the amount 100% of the contract amount, if required by the specifications, or general or special conditions of the contract. The Entity will reimburse the Contractor for the costs of the bonds, the cost of which will be included in the base bid.

ARTICLE 11:
Contractor Qualifications

THIS CONTRACT IS DULY SIGNED BY ALL PARTIES HERETO:

_____
Entity (City, Town, Etc.)

By _____ Seal

_____
Contractor (Include Address)

By _____ Seal
Principal of the Firm

Attachment 5.5
Example Unit Price Contract for Debris Removal

ARTICLE 1:
Agreement between Parties

This contract is made and entered into on this _____ the _____ , 20 _____ , by and between the _____ of Saint Lucia, hereinafter called the ENTITY and _____ , hereinafter called the CONTRACTOR.

ARTICLE 2:
Scope of Work

This contract is issued pursuant to the Solicitation and Procurement on _____, 20 _____, for the removal of debris caused by the sudden natural or man-made-disaster of _____ , 20 ___ . It is the intent of this contract to provide equipment and manpower to remove all hazards to life and property in the affected communities. Clean up, demolition, and removal will be limited to 1) that which is determined to be in the interest of public safety and 2) that which is considered essential to the economic recovery of the affected area.

ARTICLE 3:
Schedule of Work

Time is of the essence for this debris removal contract.

Notice to proceed with the Work: The work under this contract will commence on _____, 20 _____ . Maximum allowable time for the completion will be _____ calendar days unless the Entity initiates additions or deletions by written charge order.

Subsequent changes in cost and completion time will be equitably negotiated by **both parties pursuant to applicable Laws governing the State.** Liquidated damages shall be assessed at $ _____ /calendar day for any days over the approved contract amount.

ARTICLE 4:
Contract Price

The unit prices for performing the work stipulated in the contract documents, which have been transposed from the low bidder's bid schedule are as follows:

Quantity	Unit of Measure	Description	Unit Cost	Total

Subtotal _____
Cost of Bond _____
Grand Total _____

*Debris shall be classified as one of the following units: cubic yards, each, square foot, linear foot, gallon, or an approved unit measure applicable to the specific material to be removed.

ARTICLE 5:
Payment

The Contractor shall submit certified pay request for completed work. The Entity shall have 10 calendar days to approve or disapprove the pay request. The Entity shall pay the Contractor for his performance under the contract within 20 days of approval of the pay estimate. On contracts over 30 days in duration, the Entity shall pay the Contractor a pro-rata percentage of the contract amount on a monthly basis based on the amount of work completed and approved in the month. The Entity will remunerate the Contractor within 30 days of the approved application for payment.

Payments shall be subject to a retainer of _____% on each payment. Retainer shall be released upon _____ % completion of the work.

Funding for this contract is authorized pursuant to the Law of the Saint Lucia _____ and _____.

ARTICLE 6:
Claims

If the Contractor wishes to make a claim for additional compensation, for work or materials not clearly covered in the contract, or not ordered by the Entity as a modification to the contract, he/she shall notify the Entity in writing. The Contractor and the Entity will negotiate the amount of adjustment promptly; however, if no agreement is reached a binding settlement will be determined by a third party acceptable to both Entity and Contractor under the auspices of applicable Saint Lucian law.

ARTICLE 7:
Contractors Obligations

The Contractor shall supervise and direct the Work, using skillful labor and proper equipment for all tasks. Safety of the Contractor's personnel and equipment is the responsibility of the Contractor. Additionally, the Contractor shall pay for all materials, equipment, personnel, taxes, and fees necessary to perform under the terms of the contract.

Any unusual, concealed, or changed conditions are to be immediately reported to the Entity. The Contractor shall be responsible for the protection of existing utilities, sidewalks, roads, buildings, and other permanent fixtures. Any unnecessary damage will be repaired at the Contractor's expense.

ARTICLE 8:
Entity's Obligations

The Entity's representative(s) shall furnish all information, documents, and utility locations necessary for commencement of work. Costs of construction permits and authority approvals will be borne by the Entity. A representative will be designated by the Entity for inspecting the work and answering on-site questions.

The Entity shall designate the public and private property areas where the disaster mitigation work is to performed. Copies of "Right of Entry" forms, as required by laws of Saint Lucia for private property, shall be furnished to the Contractor by the Entity. The Entity shall hold harmless and indemnify the Contractor **from** judgments and awards alleged to have been caused by services rendered under this

contract for disaster relief work unless such claims are caused by the gross negligence of the Contractor, his/her subcontractors, or his/her employees. The Entity will terminate this contract for failure to perform as specified, or for default by the Contractor.

ARTICLE 9:
Insurance and Bonds

The contractor shall furnish proof of Worker's Compensation Coverage, Automobile Liability Coverage, and Comprehensive General Liability Insurance (Premises-Operations, Personal Injury, etc. as deemed necessary by the Entity).

Surety: The contractor shall deliver to the Entity fully executed Performance and Payment Bonds in the amount of 100% of the contract amount, if required by the specifications, or general or special conditions of the contract. The Entity will reimburse the Contractor for the costs of the bonds, the cost of which will be included in the base bid.

ARTICLE 10:
Contractor Qualifications

The contractor must be fully licensed in the State of Ohio.

THIS CONTRACT IS DULY SIGNED BY ALL PARTIES HERETO:

_____
Entity (City, Town Village

By_____Seal
Contractor, Address

By _____Seal
Principal of the firm

APPENDIX 6 - Private Property Utilities Checklist

The following checklist identifies key tasks that local officials should address before the structure is approved for demolition. To expedite the overall effort, many of the tasks can be conducted concurrently.

√ Locate, mark, turn off, and disconnect all water and sewer lines.

√ Locate, mark, turn off, and disconnect electrical, telephone, and cable televisions services.

√ Provide executed right of entry agreements that have been signed by the owner and by renter. If rented, Right of Entry should indicate any known owner intent to rebuild to ensure foundation and utilities are not damaged.

√ Use radio, public meetings, and newspaper ads to give notice to property owners and their renters to remove personal property in advance of demolition.

√ Document the name of the owner on the title, the complete address, and legal description of the property, and the source of this information. Document name of renter, if available.

√ Ensure property will be vacated by demolition date.

√ Provide written notice to property owners that clearly and completely describe the structures designated for demolition. Additionally, provide a list that also identifies relates structures, trees, shrubs, fences, and other items to remain on the respective property.

√ Notify mortgagor of record.

√ Provide the property owner the opportunity to participate in decision on whether the property can be repaired.

√ Determine the existence and amount of insurance on the property prior to demolition.

√ Specify procedures to determine when cleanup of property is completed.

APPENDIX 7 - Navigational Hazard Checklist

Introduction

Coordinate with Saint Lucia Air & Seaports Authority (SLASPA), Marine Police and government agencies, legal counsel, contractors specializing in marine salvage operations, commercial divers, and certified surveyors to ensure that navigational hazards are removed safely and efficiently.

Checklist

The following checklist should be used to ensure that all aspects of removing navigational hazards are considered.

√ Coordinate with the SLASPA/Marine Police/Fisheries Department and local government and legal counsel.

√ Inspect marinas by helicopter, boat, side scan sonar, or by diving in order to locate debris.

√ Use Global Position System survey methods or some type of flotation marker to pinpoint location of sunken debris.

√ Keep a log that reflects an accurate count of debris items with corresponding locations.

√ Record the vessel registration number and photograph the wreckage.

√ Provide notification by certified letter to private owners of impeding vessel removal. This should be performed in accordance with legal constraints.

√ Provide the owner an opportunity to remove the vessel prior to Government initiation of debris removal.

√ Provide public notice in local newspapers.

√ Generate scopes of work based on items to be removed or time and materials.

√ Maintain flexibility to allow for problems caused by tidal conditions. Problems can also occur as a result of wreckage removal by others prior to issuance of contract notice to proceed.

√ Maintain continuous communication with local authorities.

√ Continually verify the number and locations of sunken vessels and ensure that accurate records are maintained.

APPENDIX 8 - Debris Reduction Information

Reduction by burning

Uncontrolled open burning is the least desirable method of debris reduction because of the lack of environmental control. In some cases this method may be used if Fire Department gives a permit.

Controlled burning is a cost-effective way of reducing debris. Controlled open burning is used when there is clean wood tree debris. The controlled burning allows the remaining material left over to be a soil additive if the Department of Agriculture determines it can be reused. However, treated lumber, poles, nails, bolts, tin, aluminum sheeting, or other building materials must not enter the burning material operations because of the possible hazards associated with the burning of such materials.

Environmental Controls

1. Maintain at least 100 feet between the burn pile and the debris piles. Also, maintain at least 100 feet between burn piles and buildings.

2. Extinguish the fire two [2] hours before removal of ashes. Remove the ashes when they reach two inches below the top of the burn pit.

3. Establish a burn area of no wider than eight feet and between nine and fourteen feet deep.

4. Construct burn-pit with soil, ash or dirt to four feet tall then fasten with anchors or wire mesh to support loaders.

5. Seal the ends of the pits with dirt or ash to 4 feet tall.

6. Construct a twelve-inch dirt seal on the lip of the pit to seal the blower nozzle. Place the nozzle three to six inches from the end of the pit.

7. Construct one-foot high, unburnable stops along the edge of the pit.

8. Never place any hazardous chemicals or materials within the incineration pit.

Reduction by grinding and chipping

1. Strong winds and tornadoes present opportunity for a big grinding and chipping operation as the method of debris reduction. The resulting product of the chipping and grinding operation may be used as a landfill product, used as topsoil, or used for residential applications.

2. Chipping operations are suitable in areas where streets are narrow or in groves of trees where it is cheaper to reduce the vegetation to mulch and then return it to affected areas.

3. The debris management team should work with local environmental and agricultural groups to see if there is any market for mulch.

4. When contracting a mulching project the most important consideration is the specification of the size of the mulch. The mulch also must remain free of paper and plastic if it is to be used for agricultural purposes.

   The following information is for the use of mulch as an agricultural product:

   Size: Average size of wood chips is not to exceed four inches in length and one half inch in diameter. The debris reduction rate for moderately contaminated debris is 100 to 150 cubic yards per hour and when the debris is relatively clean it is 200 to 250 cubic yards per hour.

   Contaminants: The contamination rate for material other than wood products should be less then ten percent of the mulch. Eliminate plastics completely. Use rake loaders to pick up debris because normal loaders pick up earth, which is part of the contaminant list and harms the chipper.

5. Chippers are best used in residential areas. Trees present a problem if they are pushed to the side of the public right-of-way because of cost associated with transportation.

6. Grinders are ideal for use at debris staging and reduction sites due to high volume capacity. Due to high capacity of debris a large storage area is needed

for a large grinding operation. Sound protection also becomes a very important issue.

Reduction by recycling

1. Recycling offers an option to reduce debris before it is hauled to the landfill. Recycling is a function that has economic values for the recovered materials. Metals, wood, and soils are commonly recyclable. A drawback is the impact of recycling on the environment. In areas of agriculture there may be a large amount of fertilizer use. Therefore, use of soil may be limited due to contamination.

2. Recycling, when chosen, should be by a contractor who specializes in sorting debris. Contract monitoring is a part of a recycling operation because the contractors must comply with relevant environmental regulations.

3. Recycling should be given consideration early in a disaster because it may reduce cost of debris removal. The materials capable of being recycled include:

    a. Metals- Most metals are able to be recycled

    b. Soil- Soil recycling operations use large pieces of equipment to pick up soil. The soil is transported to a staging area and reduction sites where it is combined with organic material that will decompose. Large amounts of soil can be recovered if the material is put through a screen system. The resulting soil can be given back to the agricultural community. The soil also may be used at landfills as cover materials.

    c. Wood- Wood debris can be ground or chipped into mulch.

    d. Construction material- Concrete or other building materials can be used for other purposes if there is a need for them. The materials also may be shredder to reduce volume then used as a cover for landfills.

    e. Residue material- Residue material that cannot be recycled, such as cloth, rugs, and trash, can be sent to landfills for disposal.

APPENDIX 9

Temporary Debris Storage and Reduction (TDSR) Site Closeout Checklist

The following is a recommended TDSR site closeout checklist.

√ Site Number and Location

√ Date closure complete

√ Household Hazardous Waste removed

√ Contractor equipment removed

√ Contractor petroleum and other toxic spills cleaned up

√ Ash piles removed

√ Compare baseline information of the temporary site conditions after the contractor vacates the site.

APPENDIX 10

TDSR Closeout Issues

Environmental Restoration
Stockpiled debris will be a mix of woody vegetation,
construction material,
household items, and
yard waste.

Household hazardous waste and medical wastes should be segregated and removed prior to being stockpiled.

Activities done at the temporary debris storage and reduction site will include:
stockpiling,
sorting,
recycling,
incineration,
grinding, and chipping.

Incineration operations will occur in air curtain pits and only woody debris will be incinerated. Due to operations occurring contamination from petroleum spills or runoff from incineration and debris piles may occur. Therefore close monitoring of the environmental conditions is a coordinated effort.

Site Remediation During the debris removal process and after the material is removed from the debris sites environmental monitoring will need to be conducted. This is to ensure no long-term environmental effects occur. Environmental monitoring is needed for the following areas:

• Ash- Monitoring consists of chemical testing to determine suitability of material for landfill placement.

• Soils- Monitoring consists of using portable meters to determine if soils are contaminated by volatile hydrocarbons. Contractors do monitoring if there has been a determination that chemicals such as oil or diesel has spilled on site.

• Groundwater- Monitoring is done on selected sites to determine effects of rainfall leaching (leaking) through ash areas or stockpile areas.

Develop a checklist for site close out procedures. A sample checklist is included in this document.

APPENDIX 11

SAMPLE LAYOUT FOR TDSR SITE