Debris Estimation Field Guide

Indiana Department of Homeland Security

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This field guide has been designed to serve as a quick reference tool to be utilized by teams conducting debris (quantity and cost) estimation for a Public Assistance (PA) damage assessment.

Federal Emergency Management Agency (FEMA) PA Program debris eligibility and quantification methods and tools are listed. Ineligible debris should also be identified, classified and quantified in a debris estimation damage assessment. *It may be eligible under another funding source.*

A hardcopy draft of the Debris Estimation worksheet is available in the PA toolbox (IDHS Recovery Web Page) to document debris team findings of both eligible and ineligible debris. A digital spreadsheet is in process.

SAFETY FIRST!

- Attend the Safety Briefing given by your Safety Officer.

- You are responsible for your personal safety at all times.

- Always wear personal protective equipment in accordance with your agency's safety protocol.

- **Avoid safety risks!**

- If faced with an emergency in the field:
    - Remove yourself from the situation
    - Call 9-1-1 if appropriate
    - Contact your direct supervisor immediately

WHY ARE YOU ESTIMATING DEBRIS?

- To determine if the recovery effort is beyond local and state capabilities

- **Damage assessment for eligibility of FEMA's Public Assistance Program, a cost share reimbursement**

    - ***To meet FEMA State Threshold – approximately $9,000,000.00 of eligible damage (to include debris)***

- Other Federal Government Program funding such as Natural Resources Conservation Service (NRCS)

- Statistical information for government officials and the media

TYPES OF DEBRIS

- Woody/vegetative
- Construction/demolition
- Soil/sand/mud
- Household furnishings (flood debris)
- Household hazardous waste
- Metals

WHAT *IS* ELIGIBLE UNDER THE FEMA PUBLIC ASSISTANCE PROGRAM?

- Public roads/right-of-ways
- The area under bridges
- Grounds of public buildings
- Public parks and recreation areas
- Rural Electric Membership Corporation (REMC) right-of-ways
- Most Not-for-Profit utility right-of-ways
- Household flood debris (with FEMA approval)

WHAT IS *NOT* ELIGIBLE UNDER THE FEMA PUBLIC ASSISTANCE PROGRAM?

Homes (*IA, SBA, INSURANCE)

Businesses (*IA, SBA)

Fields (*NRCS)

Wooded areas

Streams/right-of-ways (*NRCS)

Vehicles (*INSURANCE)

*possible funding source

IA—Individual Assistance Program
SBA— Small Business Administration
NRCS- Natural Resources Conservation Service

DEBRIS ESTIMATION TECHNIQUES

- Visualization techniques
- Ground measurements
- U.S. Army Corps of Engineers (USACE) formulas
- Aerial photography
- Geographic Information Systems (GIS)
- Assessor's records
- Combination of techniques

VISUALIZATION TECHNIQUES

Cubic Yards (CY)

How to Compare:

Porto-Pot = **2 CY**

Tandem-axle Dump Truck (INDOT yellow truck) = **13 CY**

Recycle Roll-off (15' x 6' x 6') = **20 CY**

Dump Trailer (42' x 8.5' x 6') = **84 CY**

GROUND MEASUREMENT TECHNIQUES

- Equipment

  - Measuring wheel
  - Tape measure
  - Vehicle odometer
  - Walk off (measure by stride)
  - Laser
- Estimating aids:
  - Defining debris area
  - Formulas
  - Tables

USACE DEBRIS ESTIMATION FORMULAS

One-story Building

$$\frac{L' \times W' \times H' \times 0.33}{27} = \#CY$$

Mobile Home

$$\frac{L' \times W' \times H'}{27} = \#CY$$

Debris Piles

$$\frac{L' \times W' \times H'}{27} = \#CY$$

USACE FORMULA FOR IN-HOME FLOOD DEBRIS THAT WILL BE MOVED CURBSIDE

This formula is used to calculate the debris quantity from a flood event (only when the structure is not destroyed).

Formula:

Square Footage x 0.02 = CY of Debris

AERIAL PHOTOGRAPHY TECHNIQUE

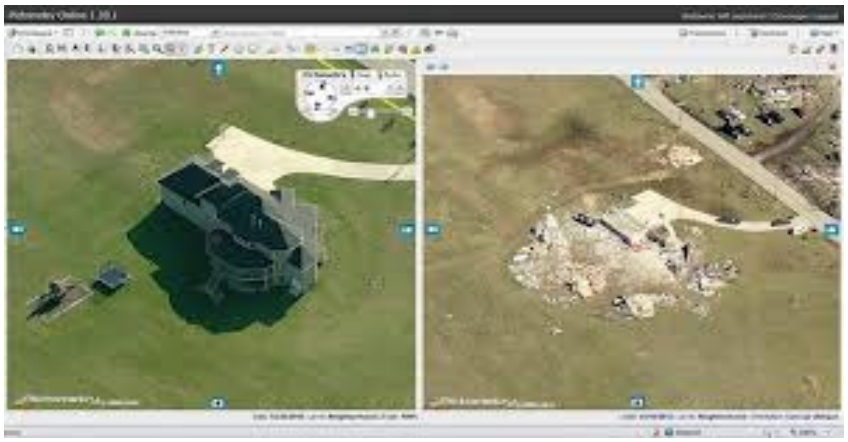
Mobile home park debris estimation:

Typical single-wide = 290 CY

Typical double-wide = 415 CY

NON-FIELD WORK TECHNIQUES

- Geographic Information Systems (GIS)
- Assessor office information (home/ building info)
- Aerial photography (compare before/ after)
- Other estimation or combination techniques



ESTIMATION SHORT CUTS

- One-acre football field (43,560 SF) full of debris piled 10 feet high:

$$\frac{43{,}560\ \text{SF} \times 10\ \text{FT}}{27} = 16{,}133\ \text{CY}$$

- Truck beds are measured and tagged in cubic yards by the manufacturer

USACE/FEMA SHORT CUT FOR PERSONAL PROPERTY PLACED ON A PUBLIC RIGHT-OF-WAY

- Slab-on-grade home: 25 – 30 CY

- Home with a basement: 45 – 50 CY

CONVERSION FACTORS

- Construction and demolition debris
  - 1 ton = 2 CY
- Mixed debris
  - 1 ton = 4 CY
- Vegetative debris
  - Hardwoods: 1 ton = 4 CY
  - Softwoods: 1 ton = 6 CY

Common Measurements	
1 Yard	3 Feet
1 Mile	5,280 Feet
1 Mile	1,760 Yards
1 Acre	43,560 Square Feet
1 Mile Square	3,097,600 Square Yards
1 Mile Square	640 Acres
1 Cubic Yard	27 Cubic Feet
Roads/Right of Way	
Rod	16.5 Feet
Rural Road	2 Rods
Residential ROW (road, sidewalks, etc)	4 Rods

DEBRIS ESTIMATING SPREADSHEET

CRADLE TO GRAVE

PICKUP THROUGH FINAL DISPOSAL

PRICES FOR ESTIMATION ONLY!!!

#	ELIGIBLE FOR FEMA PA PROGRAM
1	PUBLIC RDS/ RIGHT OF WAY 15 FT
2	UNDER BRIDGES
3	PUBLIC BUILDINGS/ GROUNDS
4	PUBLIC PARKS
5	REMC RIGHT OF WAY
6	MOST NFP UTILITY RIGHT OF WAY
7	HOUSEHOLD DEBRIS CURBSIDE

#	NOT ELIGIBLE FOR FEMA PA
8	HOMES (*IA, SBA, INSURANCE)
9	BUSINESSES (*IA, SBA)
10	FIELDS (*NRCS)
11	WOODS
12	STREAMS/RIGHT OF WAYS (*NRCS)
13	VEHICLES (*INSURANCE)

*possible funding source

	TYPES OF DEBRIS	IN HOUSE $ PER CY	CONTRACTED $ PER CY
A	WOODY/VEGETATION	$10	$20
B	CONSTRUCTION/DEMOLITION		$20.25
C	METALS		$0.00
D	SOIL/SAND/MUD		$12.00
E	HOUSEHOLD HAZARDOUS WASTE		$35.00
F	HOUSEHOLD FURNISHINGS		$20.25
G	WHITE GOODS		$42.00
H	WHITE GOODS/FREON		$80.00
I	ELECTRONIC WASTE/TV		$15.00 each
J	ELECTRONIC WASTE/OTHER		$10.00 each
K	MIXED DEBRIS		$21.00

ADDRESS/GPS	#	ELIGIBLE FOR FEMA PA AMOUNT IN CY	#	NOT ELIGIBLE FOR FEMA PA AMOUNT IN CY		TYPE OF DEBRIS	$ PER CY	COST

CONTACT INFORMATION

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