Post Disaster Damage Assessment

Building Officials Association of Texas
Disaster Response Team
Building Official Association of Texas

- Non-profit professional organization of Building Officials, building inspectors, code officials and industry professionals from the built environment.
  - Membership of over 300.
- TML Affiliate
  - Over 1100 jurisdictions are TML members.
- State Chapter for the International Code Council.
Presenters

• Jim Olk – Building Official
  – Building Official, City of Garland Texas
  – Past President of BOAT
  – Certified Disaster Response Inspector

• Mike Olson
  – Director of Development Services, City of McGregor, Texas
  – Vice President for BOAT
Disasters in Texas

- Flood – Wimberley, Garland, Irving
- Wild Fire – Bastrop, Amarillo
- Hurricane – Galveston, etc...
- Tornado – Van, Cleburne, Rowlett, Garland, etc...
- Earthquake – Irving 3.4, West Dallas 3.1
- Explosion or Terrorist Attack – West
- Extreme Heat, Drought, Thunderstorms (lighting)
  - Not likely – Volcanoes, Tsunami, Landslide, Extreme Cold
Post Disaster Damage Assessment
Damage Assessment

• FEMA view damage assessment as a means to determine if financial aid is warranted.

• The PRIMARY reason to perform damage assessment is the HEALTH & SAFETY of the public.
  – Can they drive or walk on the streets?
  – Can they drink the water?
  – Can they go in their homes?

• SECONDARY, Collecting damage values and insurance info is important but ... it is secondary to safety.
In the EOC...

• Once search and rescue is substantially complete, damage assessment should begin.
• During the disaster someone should be mapping the calls that come in.
  – House collapsed on Park St.
  – Bridge out on Grand Ave.
  – Building on fire on Main St.
• This info can graphically show where to focus damage assessment.
Damage Assessment

• Lead damage assessment person should determine rough numbers of damaged structures and damaged infrastructure
  – Mapped information
  – Windshield survey.
• Determine number of teams needed to assess damage.
  – Teams for structure damage (IA)
    • Typically building inspectors, etc...
  – Teams for infrastructure damage (PA)
    • Typically engineers or public works personnel
Damage Assessment Teams (PA)

• Teams will deploy into the field to perform damage assessment.

• For public infrastructure there is not a standard form due to the complexity of different infrastructures. Engineers and public works staff can assess damage to streets, bridges, water lines, sewer lines, debris, etc... and determine the integrity of the infrastructure and whether or not it can be used.

• For smaller communities there is a Public Works Response Team here in the north Texas area.
Damage Assessment Teams (IA)

• Teams will deploy in the field to perform damage assessment on structures.
• Normally they will use a standard form developed by Applied Technologies Council (ATC) for damage assessment.
• They will also post each property with a placard to advise the public of the potential hazards at the property.
**RAPID DAMAGE ASSESSMENT AND BUILDING SAFETY EVALUATION FORM**

**Building Information:**
- Address: [ ]
- Suite: [ ]
- Building Name: [ ]
- Estimated building footprint: [ ]
- Number of Stories: [ ]
- Number of residential dwelling units: [ ]
- Occupant info: Name: [ ] Phone #: [ ] Insured (Yes) — [ ] No

**Type of Building:**
- Single or two family dwelling
- Pre-fab or mobile home
- Multiple family (3+ units)
- Low rise non-residential
- Mid-rise or high rise non-residential
- Accessory building
- Other: [ ]

**Primary Occupancy:**
- Dwelling
- Other Residential
- Hospital
- Nursing Home
- Assembly
- Emergency Services
- Government
- Commercial
- Office
- School/Education
- Historic
- Other: [ ]

**Evaluations:**
- Investigate the building for conditions below and check the appropriate column.
- Observed Conditions: Minor/None — Moderate — Severe
  - Collapse, partial collapse, or building off foundation
  - Building out of plumb or in danger of collapse
  - Damage to primary structural members or cracking of walls
  - Falling hazard due to non-structural damage
  - Geotechnical hazards, scours, erosion, slope failure, etc.
  - Electrical lines / fixtures sub-emerged / leaning trees
  - Roofing or water damage in structure
  - Other: [ ]

**Estimated Building Damage (excluding contents):**
- Select point along the line with "X".
  - 0% — 15% — 20% — 40% — 60% — 80% — 90% — 100%

**POSTING:**
- Choose a posting based on the evaluation and field judgment. Severe conditions endangering the overall building are grounds for an unsafe posting. Localized severe and overall moderate conditions may allow a restricted use posting.
  - INSPECTED (Green Placard)
  - RESTRICTED USE (Yellow Placard)
  - UNSAFE (Red Placard)

**Number of residential units posted UNSAFE (Red Placard):** [ ]

**Further Action Recommended:**
- Check the boxes below only if further actions are needed.
  - Specify defect or caution code
  - Detailed evaluation recommended
  - Structural
  - Geotechnical
  - Other: [ ]

**Facility Name and Address:**
- Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

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**UNSAFE**

**DO NOT ENTER OR OCCUPY**

(This placard is not a demolition order)

This structure has been inspected, found to be seriously damaged and is unsafe to occupy as described below.

- Date: [ ]
- Time: [ ]

This facility was inspected under emergency conditions for:
- [ ]
- [ ]
- [ ]

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**RESTRICTED USE**

Caution: This structure has been inspected and found to be damaged as described below.

- Date: [ ]
- Time: [ ]

(Caution: Aftershocks since inspection may increase damage and risk.)

Entry, occupancy, and lawful use are restricted as indicated below:

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**INSPECTED**

LAWFUL OCCUPANCY PERMITTED

This structure has been inspected (as indicated below) and no apparent structural hazard has been found.

- [ ] INSPECTED Exterior Only
- [ ] INSPECTED Exterior and Interior

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**Inspections:**
- Exterior Only
- Interior and Exterior

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**Units:**
- Following services may be reconnected to structure:
  - Electrical
  - Water
  - Gas
  - No Utility Service to Structure

Unsafe conditions exist at time of inspection.
### RAPID DAMAGE ASSESSMENT AND BUILDING SAFETY EVALUATION FORM – Based on the ATC-45

<table>
<thead>
<tr>
<th>Building Information:</th>
<th>Address: ______________________</th>
<th>Suite: __________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Name:</td>
<td>_____________________________</td>
<td>Estimated building footprint: __________ sqft.</td>
</tr>
<tr>
<td>Number of Stories:</td>
<td>________</td>
<td>Number of residential dwelling units: ________</td>
</tr>
<tr>
<td>Occupant info: Name:</td>
<td>_____________________________</td>
<td>Phone # (_<strong><strong>)--</strong></strong>__</td>
</tr>
<tr>
<td>Insured (Yes) --- (No)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Type of Building:**
- [x] Single or two family dwelling
- [ ] Pre-fab or mobile home
- [ ] Multiple family (3+ units)
- [ ] Low rise non-residential
- [ ] Mid-rise or high rise non-residential
- [ ] Accessory building
- [ ] Other ______________________

**Primary Occupancy:**
- [x] Dwelling
- [ ] Hospital
- [ ] Assembly
- [ ] Government
- [ ] Office
- [ ] School/Education
- [ ] Other: ______________________
- [ ] Other Residential
- [ ] Nursing Home
- [ ] Emergency services
- [ ] Commercial
- [ ] Industrial
- [ ] Historic

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This form matches the data collected on the ATC-45 Rapid Evaluation Safety Assessment Form with some minor modifications allowing for rapid field entry, more detailed information regarding flood damage, adding Texas Department of Emergency Management damage scales and utility release information. This form was modified by the Building Officials Association of Texas - Disaster Response Team.
**Evaluation:**

Investigate the building for conditions below and check the appropriate column.

<table>
<thead>
<tr>
<th>Observed Conditions</th>
<th>Minor/None</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collapse, partial collapse, or building off foundation</td>
<td>X</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Building out of plumb or in danger of collapse</td>
<td>0</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Damage to primary structural members or racking of walls</td>
<td>X</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Falling hazard due to non-structural damage</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>Geotechnical hazards, scour, erosion, slope failure, etc.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Electrical lines / fixtures submerged / leaning trees</td>
<td>0</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Flooding or water damage in structure</td>
<td>0</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Other:</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Estimated Building Damage** (excluding contents) – Select point along the line with “X”

0%--------10%--------20%--------30%--------40%--------50%--------60%--------70%--------80%--------90%--------100%

None  Minor  TDEM Scale  Major  Destroyed

**POSTING:**
POSTING:
Choose a posting based on the evaluation and team judgment. Severe conditions endangering the overall building are grounds for an Unsafe posting. Localized severe and overall Moderate conditions may allow a Restricted Use posting.

- □ INSPECTED (Green Placard)
- □ RESTRICTED USE (Yellow Placard)
- ✗ UNSAFE (Red Placard)

Record any use and entry restrictions exactly as written on placard:

Number of residential units posted UNSAFE (Red Placard) ______

Further Action Recommended: Check the boxes below only if further actions are needed:

- □ Barricades or Caution Tape __________________________
- □ Detailed Evaluation recommended: □ Structural □ Geotechnical □ Other: ______________________
- □ Other recommendations __________________________
- □ See reverse side for further comments:

<table>
<thead>
<tr>
<th>Inspection:</th>
<th>Exterior Only</th>
<th>Interior and Exterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>____________________</td>
<td>Time _________________</td>
</tr>
</tbody>
</table>

Inspector(s) ID: _______________________________________

Utilities:
Following Services may be reconnected to structure:
- □ Electrical    - □ Water    - □ Gas

✗ No Utility Service to Structure
Unsafe conditions exist at time of inspection.
Information from Assessment

• Completed forms delivered to EOC and entered into database or spreadsheet.
  – Linked to GIS can provide graphic view of damaged areas and extent of damage.
• If you have square footage and estimated damage you can automatically calculate $ value of damage.
• Damage values of infrastructure damage need to be estimated by Public Works or Engineering.
Information from Assessment

• Forms can be copied and provided to residents prior to re-entry (if re-entry has been prohibited). This will provide information as to safety precautions necessary to remove valuables or reoccupation.

• All this information can be exported in a format acceptable to TDEM and FEMA for the required damage assessment reports.
BOAT Disaster Response Team
Initiating Damage Assessment Response

Local Official
- Establishes Need for Assistance - may be IC or City Official.
- Contact TDEM for large disaster or may contact BOAT directly for smaller disaster where TDEM may not be involved.

TDEM
- TDEM contacts BOAT to request deployment.
- Lead Responder may deploy to area prior to TDEM contact based on size of disaster or contact with local official.

Lead Responder
- Will evaluate damage assessment needs.
- Will activate call tree for needed teams.
- Will be point person to NIMS Section Officer under IC.

Team Leader(s)
- Will lead teams in performing post-disaster evaluations.
- Will insure proper placarding of structures.
- Will submit reports to Lead Responder

NTC COG or PWERT could make request
Working with SEER to include as resource for teams.
Disaster Response Team Distribution

Lead Responder

2nd Lead Responder

Responder

Recovery Responders
* Building Official
* Inspectors
* Permit Techs
Disaster Response Equipment

- **Lead Responder Equipment Locker and/or Trailer**
- **Jobsite trailer** for extended response or post assessment recovery work.
- **Housing trailer** for extended assessment or post assessment recovery.
- **Water/waste water trailer** for extended assessment.
Post Damage Assessment Recovery Assistance

- Local Official
  - Determines need for assistance.
  - Meets with Lead Responder

- Lead Responder
  - Lead Responder determines:
    - Staffing & equipment needs

- Lead Responder
  - Contacts Recovery Responders
  - Arranges equipment and RR team deployment.

- Recovery Team
  - Maintains communication with local official
  - Communicates status to Lead Responder
BOAT’s Goal

• Regardless of the scope of disaster or damage:
  – Provide rapid or detailed evaluation safety assessment of all structures in damaged area. By Certified Disaster Response Inspectors.
    • Condition of the building for re-entry.
      – Unsafe, Restricted Use, or Inspected.
      – Other hazards, environmental or other.
    • Estimated % of damage.
    • Determine if structural engineering analysis is needed.
    • Reconnection of utilities to structures.
  – Provide post-disaster recovery aid in permitting repairs and inspection of repairs or reconstruction.
Questions or Comments