Vulnerable and Loving It(?)

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Which Target Would You Select?

You Cannot Afford Either Option
April 1983 – 63 Deaths

An aerial view of the American Embassy as heavy cranes continue to remove rubble from the upper floors on 21 April, 1983, following the terrorist bombing three days earlier.

Photo courtesy of Claude Salhani / U.S. Marines in Lebanon 1982-1984
History and Museums Division, Headquarters, U.S.M.C., Washington, D.C.
253 Marines – October 1983
1993 – 6 Deaths, 1042 Injuries
19 Deaths – Hundreds Injured

1996
212 Deaths – 4650 Injured

1998
USS Cole – 17 Dead
3600(?) Deaths – Thousands Injured

September 11, 2001
The Response

The Terrorists have won the toss and have elected to receive!
168 Deaths – 400 Injured
The Terrorist Defined

- Foreign
  - Theological
  - Extremist
  - Depends Upon Terror to Make a Statement
  - Targets Large Populations
  - Depends Upon Media Coverage

- Domestic
  - Targets a Specific Group or Icon
  - Extremist
  - Uses Terror to Subdue or Avenge
Basic Conclusions

- Active Defense Fails
  - Police
  - Military
  - Intelligence

- Passive Defense Not Implemented
  - Anti Collapse
  - Controlled Entry

- The Target Will Be Defeated

- Active Defense Will Continue to Fail

- Policy for Passive Defense Will Continue to Lag Events

- No Consideration for Minimizing Collateral Damage
Tactics and Threats

- Vehicles
- Attack
- Stand-Off
- Ballistics
- Entry (Forced/Covert)
- Airborne - Chem/Bio
- Waterborne - Bio

- Threat
  - Minimum (50 #)
  - Low (220#)
  - Medium (500#)
  - High (1000#)
  - Special Case
## Levels of Protection

<table>
<thead>
<tr>
<th>Tactic</th>
<th>Level of Protection</th>
<th>Potential Structure Damage</th>
<th>Potential Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bombing tactics</strong></td>
<td>Minimum</td>
<td>Significant damage, but no progressive collapse</td>
<td>Majority of personnel suffer serious injuries. There are likely to be a limited number of fatalities</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Damaged – unrepairable</td>
<td>Majority of personnel suffer lacerations and blunt trauma injuries from window glazing and non-structural elements</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Damaged - repairable</td>
<td>Mostly minor and some serious lacerations and blunt trauma from window glazing and non-structural elements</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Superficial damage</td>
<td>Only superficial lacerations and blunt trauma from non-structural elements</td>
</tr>
<tr>
<td><strong>Ballistics tactic</strong></td>
<td>Low</td>
<td>Limited - screening</td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Superficial – hardened</td>
<td>None</td>
</tr>
</tbody>
</table>
Stand Off Distance

TNT Equivalent

- 50#
- 220#
- 500#
- 1000#

Feet

Minimum
Low
Medium
High
TNT EQUIVALENCY

73 lb.
C-4
Plastic Explosive

100 lb.
TNT

122 lb.
ANFO
Diesel Fuel & Fertilizer
Relative Explosive Weights

50 lb. charge
AUTOMOBILE: trunk or other location - easily hidden

220 lb. charge
AUTOMOBILE: trunk/passenger compartment - not easily hidden

500 lb. charge
PICKUP: bed filled

1,000 lb. charge
TRUCK: 2-1/2 ton truck & larger back compartment filled
Stand Off Distance

- Car
- Minivan
- SUV
- Truck

Minimum
Low
Medium
High
Conventional Annealed Glass
Glass With Micro Film
Window Retrofits

Catcher Bar Design Curves

Window Width, in.
Elastic Section Modulus, in^3
Catcher Bar Design Curves

12 18 24 30 36 42 48 54 60 66 ... ksi steel

15 mil FRF, fy=35 ksi steel
15 mil FRF, fy=46 ksi steel
12 mil FRF, fy=35 ksi steel
12 mil FRF, fy=46 ksi steel
8 mil FRF, fy=35 ksi steel
8 mil FRF, fy=46 ksi steel
4 mil FRF, fy=35 ksi steel
4 mil FRF, fy=46 ksi steel

Fragment Retention Film Thickness Selection

Standoff, feet
Charge Weight, lbs
Fragment Retention Film Thickness Selection

FRF Thickness
15 mil
12 mil
8 mil
4 mil

Window Width, in.
Elastic Section Modulus, in^3
WINDAS
Organizing for Vulnerability

Passive Defense
- Building Standards

Active Defense
- Police
- Fire Department
- Recovery
- National Guard

Intelligence
- CIA
- NSA
- DSA
- FBI
Organizing for Defense

- Counter Terrorsim
  - Public Relations
  - Risk Analysis
  - Standards
  - Training Education

- Passive Defense
  - Building Standards

- Active Defense
  - Police
  - Fire
  - Recovery
  - Public Health
  - National Guard

- Intelligence
Escaping Vulnerability

- Plan for Passive (Buildings Kill and Injure - Not Bombs)
- Use Active as the interim and not the rule
- Logical Analysis
  - Minimize Cost
  - Maximum Collateral Protection
- Standoff and Delay
  Most Effective - Chance of Discovery

Targets Are Always Defeated
Vulnerability Assessment Tools

- Security Engineering Planning Assistant
- Mil HDBK 1013-10, 12, 14
- WINDAS
- DoD AT/FP Construction Standards
- Protective Structures Automated Design System
Questions

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