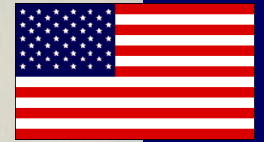
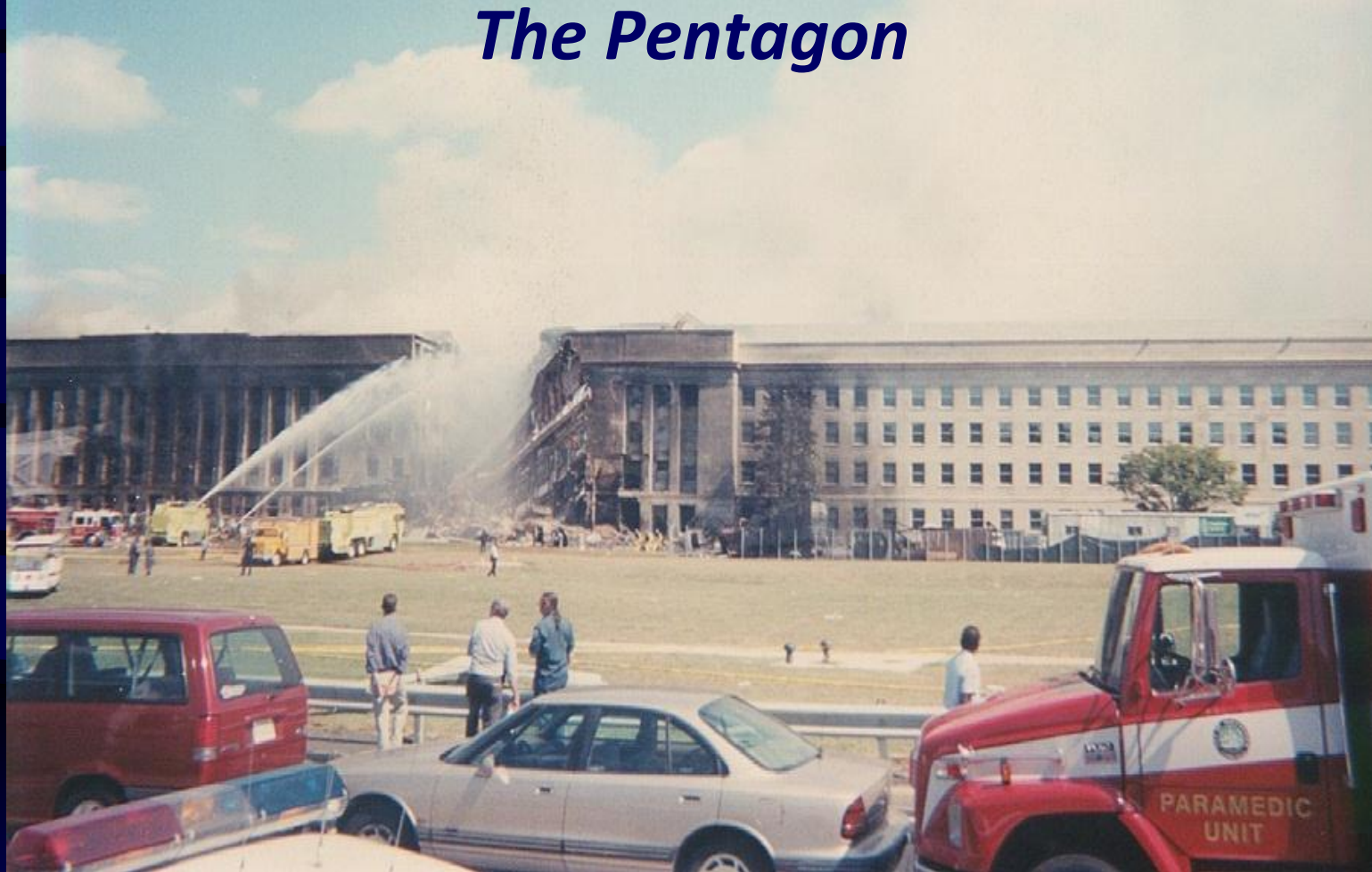


September 11, 2001



The Pentagon



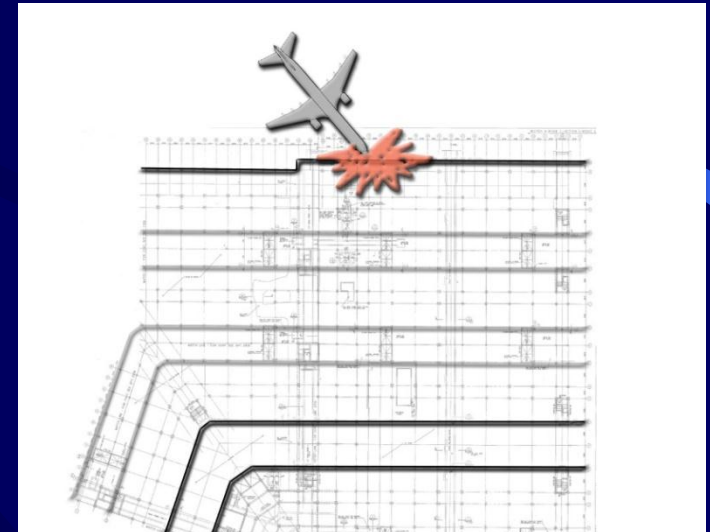
Presented by Leo J. Titus, Jr., P.E.
October 8, 2011

OBJECTIVES

**Overview of FEMA US&R
Response System**



**Review attack and
general description of damage**



Discuss US&R mission objectives

- *Reconnaissance*
- *Shoring*
- *Recovery*
- *Monitoring*
- *Demolition*



Review daily Task Force activities



Review of Project Phoenix



FEMA Urban Search and Rescue (US&R) Response System



28 Teams specializing in Urban Search and Rescue in the U.S.

Specialists serve on a team in four major functional elements:

- Search
- Rescue
- Technical
- Medical



VIRGINIA TASK FORCE ONE (VA-TF1)



- Comprised of civilian and career members
- 70,000+ pounds of tools, equipment and supplies
- Ready for world-wide deployment within 6 hours
- Self-sufficient for 72 hours domestic and 10 days international

TASK FORCE LDR
RED : TAMMILLOW
BLUE : BRINKLEY

OPERATIONS
RED : ROUSSILLON
BLUE : BICKHAM

MEDICAL UNIT LEADER
RED : ROPPOLO
BLUE : HANFLING
BLUE : BURKHAMMER

HAZMAT SPEC.
RED : BRULEY
BLUE : IANNELLI

RED SQUAD 1
OFC WATTS
1 DABNEY
2 WALMER
3 EVANS
4 MASON
5 REEDY
MED MORAVITZ

RED SQUAD 2
OFC CONRAD
1 OBRIEN
2 MCGEE
3 STRICKLAND
4 LUCAS
5 WARNER
MED MERRITT

STRUCTURAL SPEC
RED : BEALE / WILLEY
BLUE : TITUS

HEAVY RIGGING
RED : BUNCH, GARY
BLUE : SHUGART

BLUE SQUAD 3
OFC MAYERS
1 DAVIS
2 TOBALSKE
3 MCKINNY
4 FEASTER
5 LEATHERMAN
6 WILLIAMS, CHUCK
MED WILLIAMS, JEROME

BLUE SQUAD 4
OFC ZOLDOS
1 PLUNKETT
2 VACCHIO
3 BERNAZANI
4 BEST
5 BERTOVICH
MED SACRA

SEARCH TEAM MGR
RED : TEAL / DYER
BLUE : REGAN

TECH SEARCH SPEC
RED : GRIFFIN
BLUE : MATSOS

CANINE SPEC
RED : HOLLEYMAN
RED : ARWE
RED :
BLUE : WINN
BLUE : KREITLER
BLUE :

SAFETY
RED : TOLSON
BLUE : DIAMANTES

PLANNING
RED : LUECKE
BLUE : GALVEZ

TECH INFO
RED : TORPEY
BLUE : ROATCH

LOGISTICS CHIEF
RED : POTTER
BLUE : BOOTH

LOGISTICS SPEC
RED : MORRISON
RED : CHABEL
BLUE : ANDERSON
BLUE : BASTIN

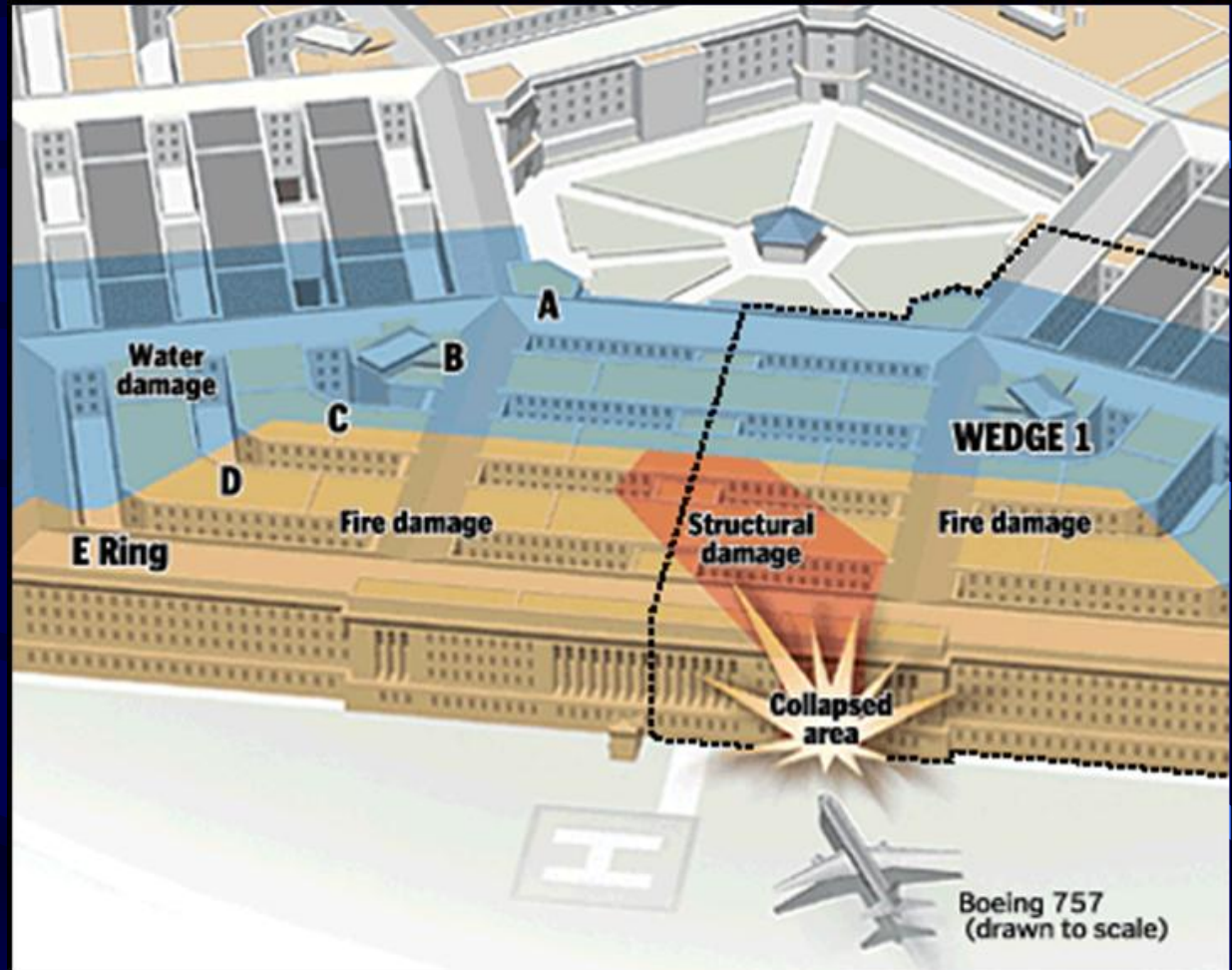
COMMUNICATIONS
RED : BUNCH, GREG
BLUE : SCHMIDT
CLOYED

DRIVERS
TRACTOR : ALLEN
SERV 1 : KEELER

ACTIVATION NAME : PENTAGON INCIDENT
NOTES : (UPDATED 9/13/01 18:40 HRS
SLEMP TRANSFERRED TO ARL CO LOGISTICS
OTHER PERSONNEL: BARKER, DUBE, DONALDSON, TILLS
ALL SHIFTS WORKING 1900-0700

9-11... THE ATTACK

- Boeing 757
- 30,000 pounds of fuel
- Recently renovated
- Plane strikes first floor
- Building collapses 19 minutes after impact
- 189 people killed





FEMA

SEARCH & RESCUE OPERATIONS

The Pentagon - September 11th, 2001

4 FEMA Teams on site:

- VA-TF1 (Fairfax Co., VA) 1:00 p.m.
- MD-TF1(Montgomery Co., MD) – 3:00 p.m.
- VA-TF2 (VA Beach) - 8:00 p.m.
- TN-TF1 - Wednesday morning
- Military District of Washington - Army Search & Rescue



MISSION #1: RECON



RECON Objectives:

- Search for potential live victims
- Evaluate rescue hazards
- Evaluate Structural Damage



- Significant internal damage on all floors.
- Fire, smoke, heat, debris, water: all obstacles for recon team.
- Floors too hot for canine teams.















Overview of Structural Damage



Front view at 1pm, 9/11



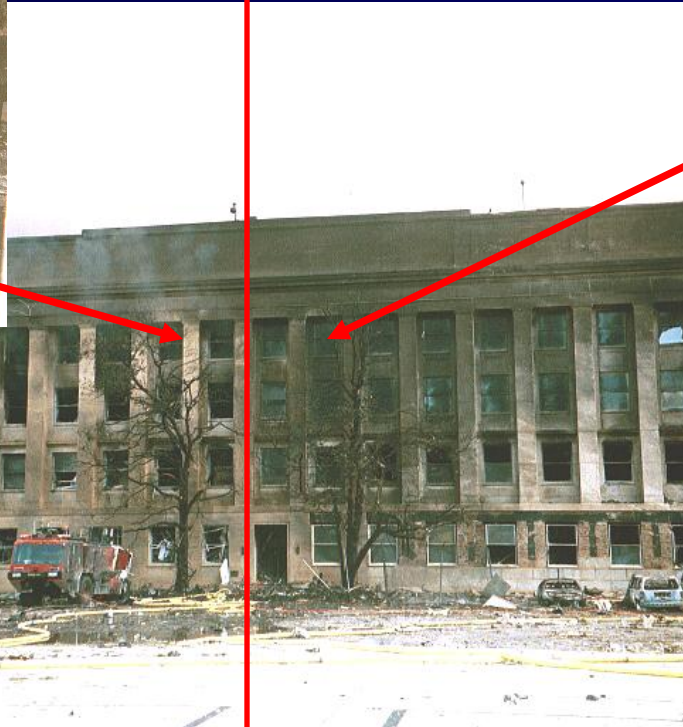
Corridor 5

Wedge 2

Wedge 1

Corridor 4

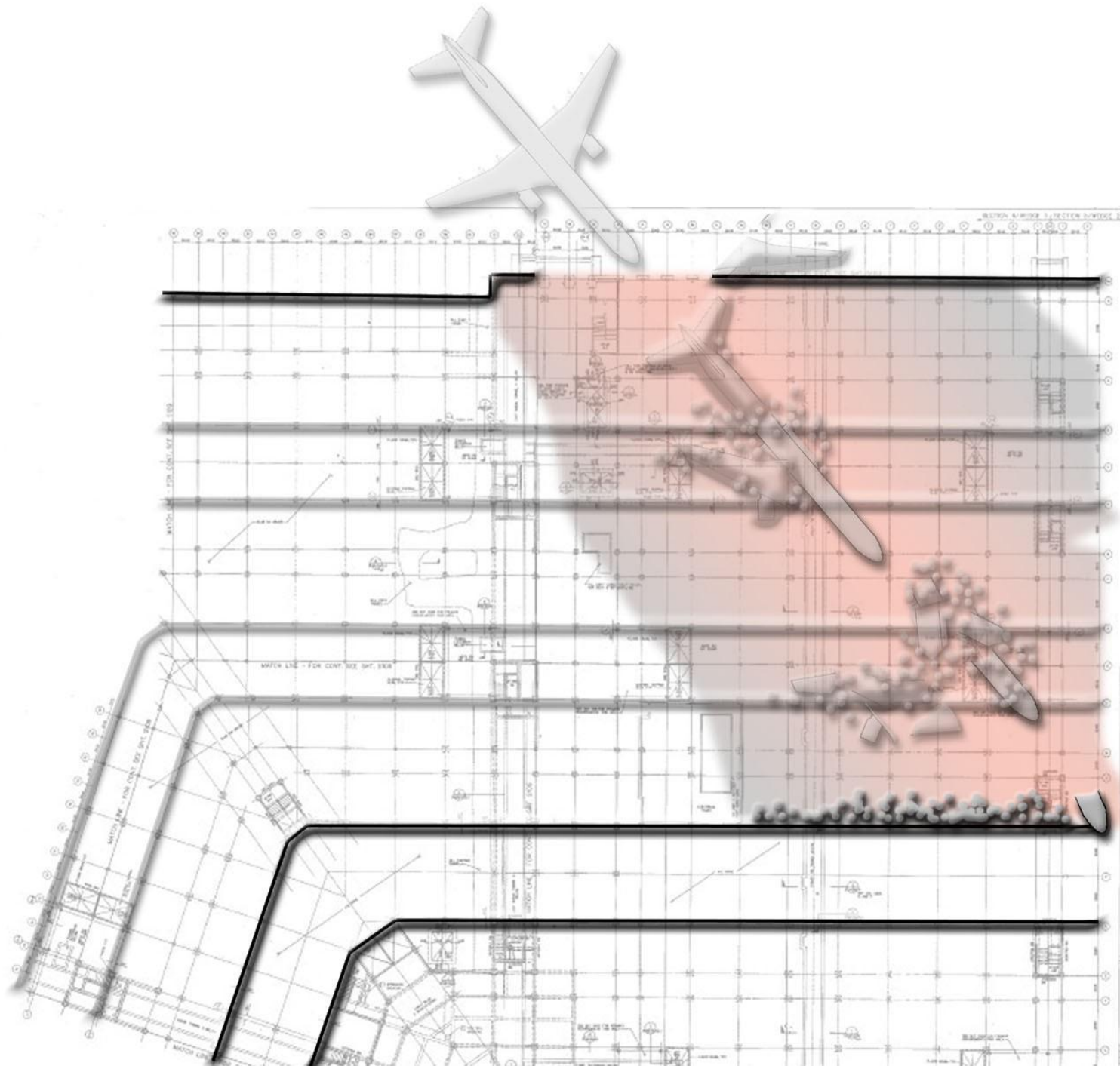
Blast Design Benefits



Not Renovated
Wedge 2




Blast Renovated
Wedge 1

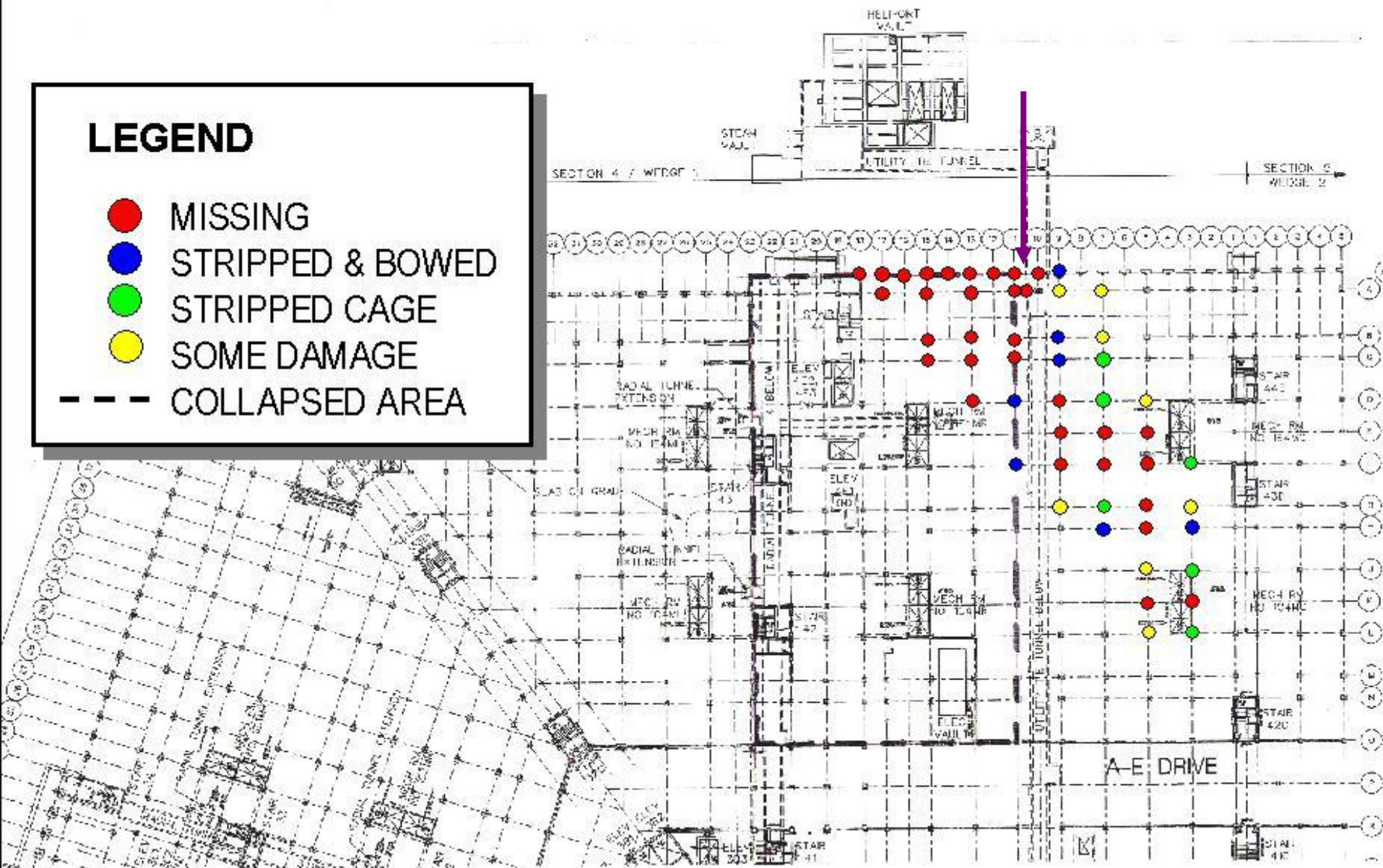
Impact
site



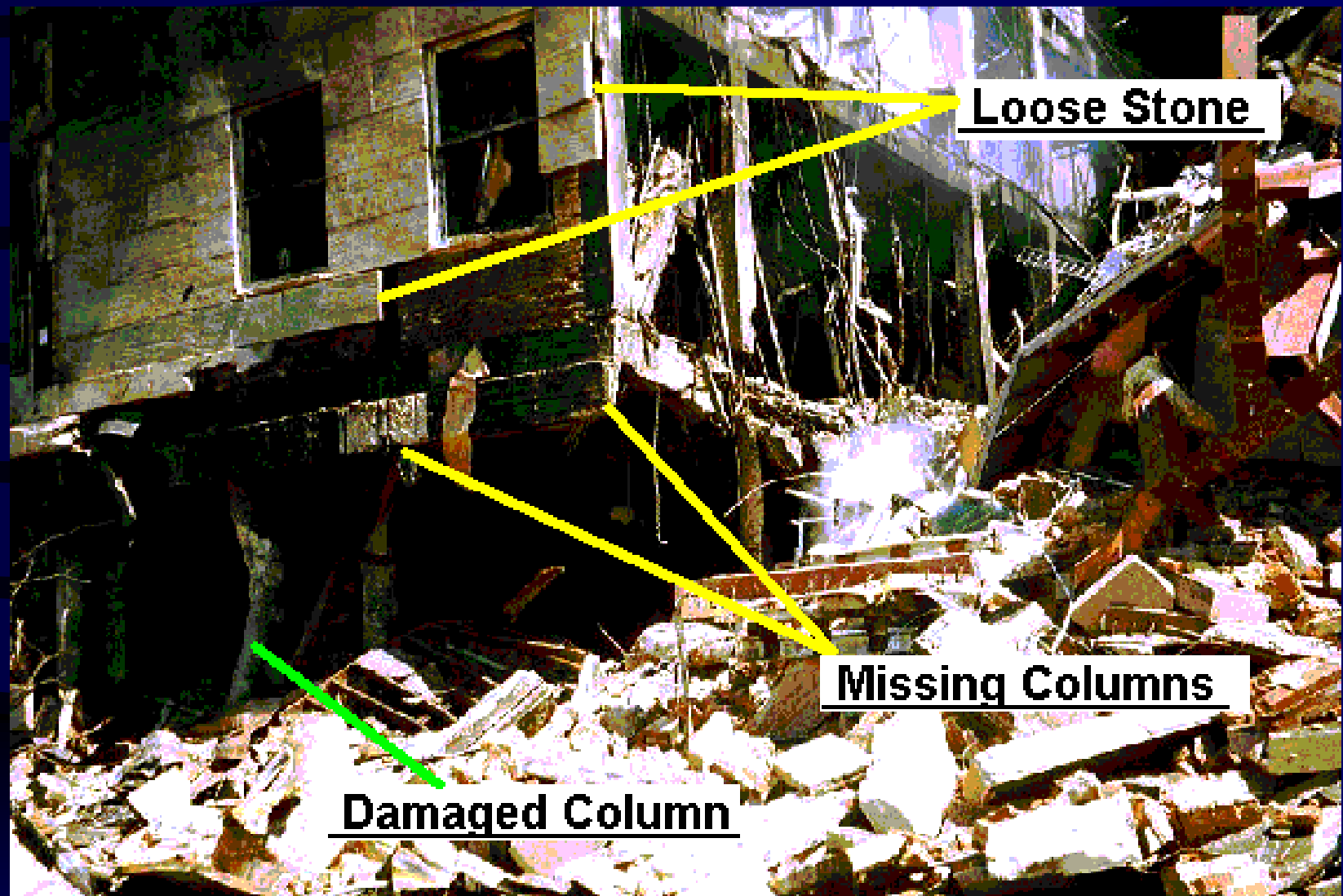
STRUCTURAL INTEGRITY

LEGEND

-  MISSING
 STRIPPED & BOWED
 STRIPPED CAGE
 SOME DAMAGE
 - - - COLLAPSED AREA







Corner of building left of collapse

MISSION #2: SHORING



Logistical Issues Before Shoring Could Begin

- Debris & Hazards
- Lumber
- Victims & Evidence
- Lighting



- PREPARED PRIOR TO AND/OR DURING CONSTRUCTION. IF THE CONTRACTOR DOES NOT AGREE WITH THOSE DIMENSIONS, THE CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS TO DIMENSIONS TO ENSURE THAT THE CONSTRUCTION PROPERLY FITS ON THE EXISTING STRUCTURE.
- REF. EL. = 11798 (U.S.G.S.) AND IS THE SLAB ON GRADE EL. @ FIRST FLOOR.
 - EXIST. CONC. SLAB ON GRADE EL. = 11798 (U.S.G.S.) AND IS THE THICK, NORMAL WEIGHT CONCRETE SLAB PL. THICK VAPOR BARRIER OVER 152 THICK LA WATER BARRIER ON COMPACTED APPROVED G NEW SLAB SHALL MATCH TOP OF SURROUND!
 - SLAB W/2, ETC. INDICATES WALL PLATES STEEL FRAMING TO EXISTING CONCRETE FR. GIRDER, COLUMN, WALLS).
 - FOR OTHER INFO, SEE DEMOLITION PLANS THRU SD111.

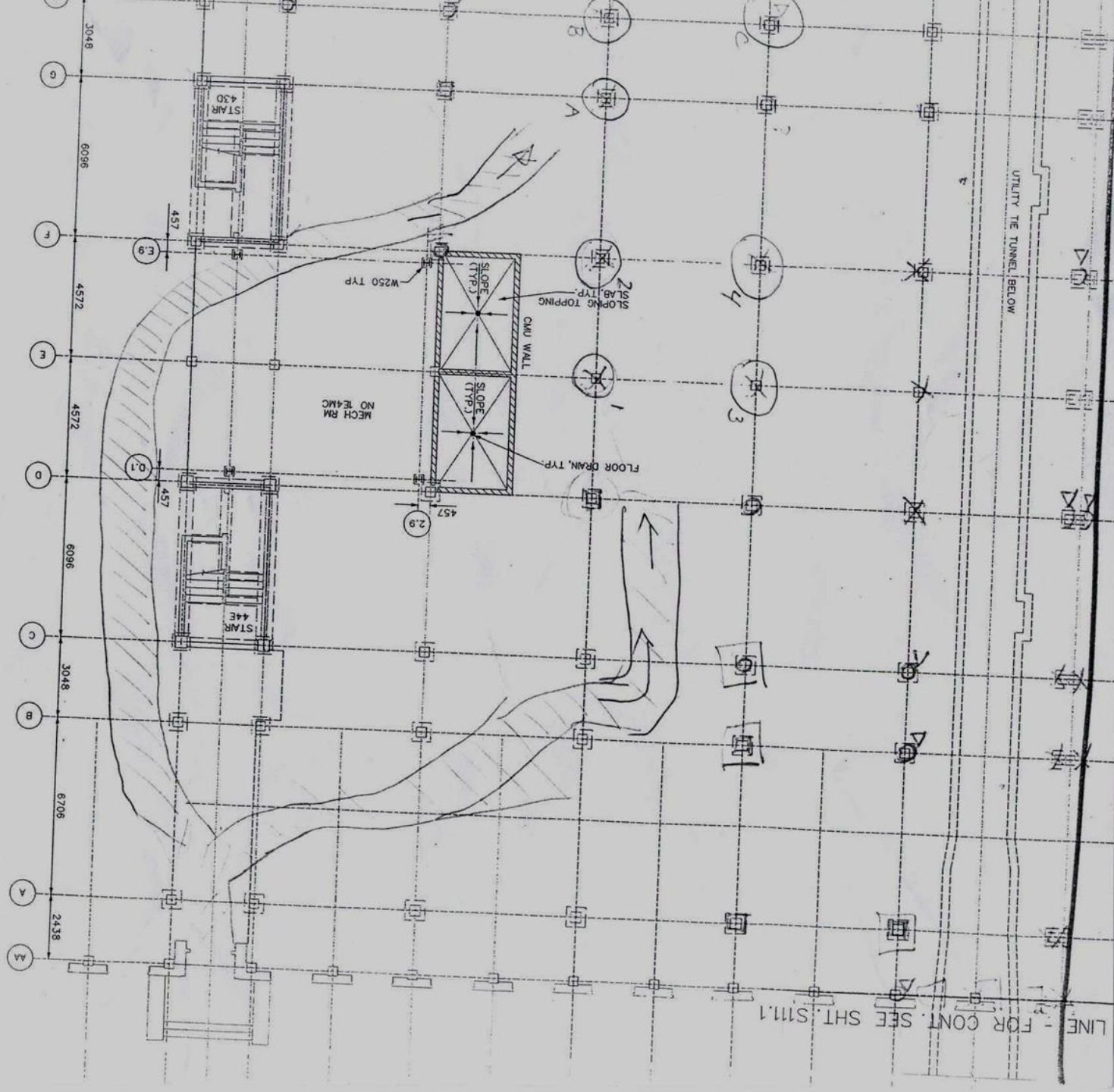
X Missing

O = stripped

Δ = stripped

□ = same as

X-9-point



LINE - FOR CONT. SEE SHT. S111.1



Over 42 Columns Required Shoring on the 1st Floor

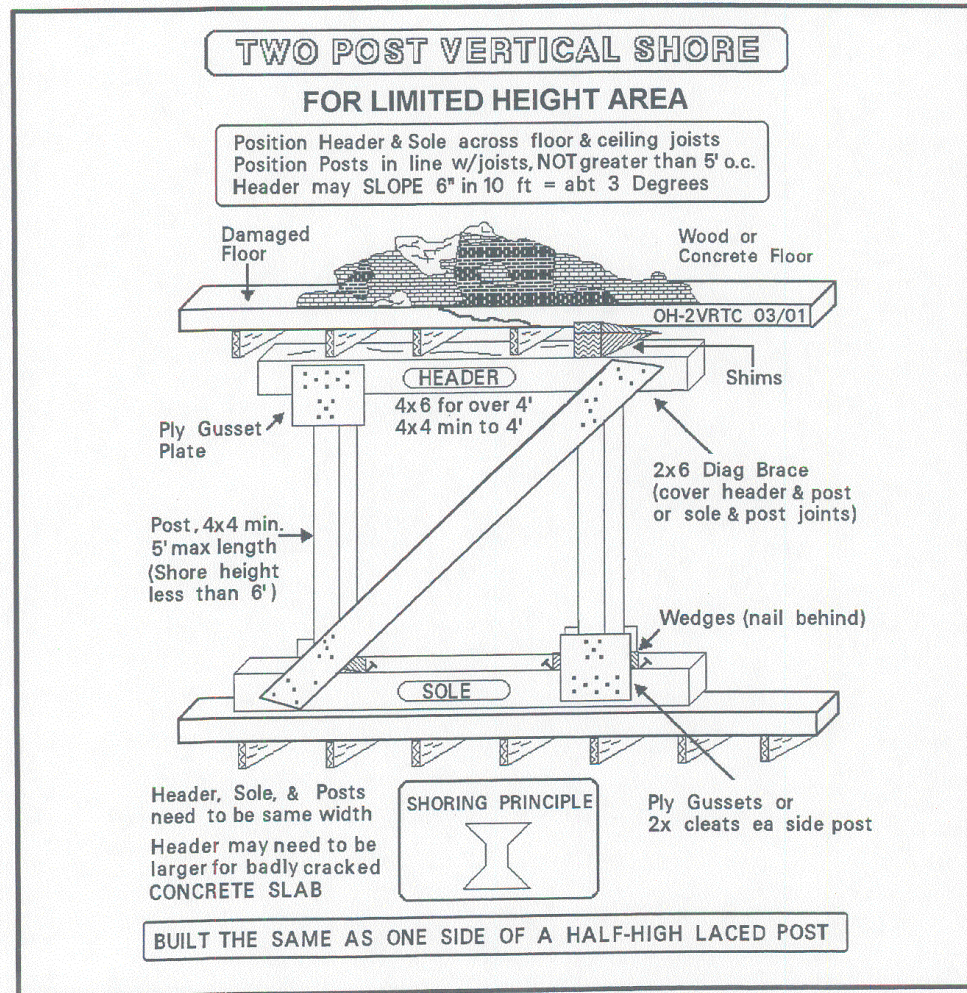
Three types of shores used:

- Vertical Crib Shores
- Vertical Post Shores
- Raker Shores for lateral support

SECTION 2.3 US&R SHORING CONSTRUCTION

TWO POST VERTICAL SHORES

- The Limited Height Area, Two Post Vertical Shore is constructed the same as a Half High, Single Side of a Laced Post Shore
- The Full height Two Post Vertical Shore is constructed the same as the Single Side of a Laced Post Shore





- 3 vertical crib shores used on front corner
- 6"x6" lumber used for cribbing





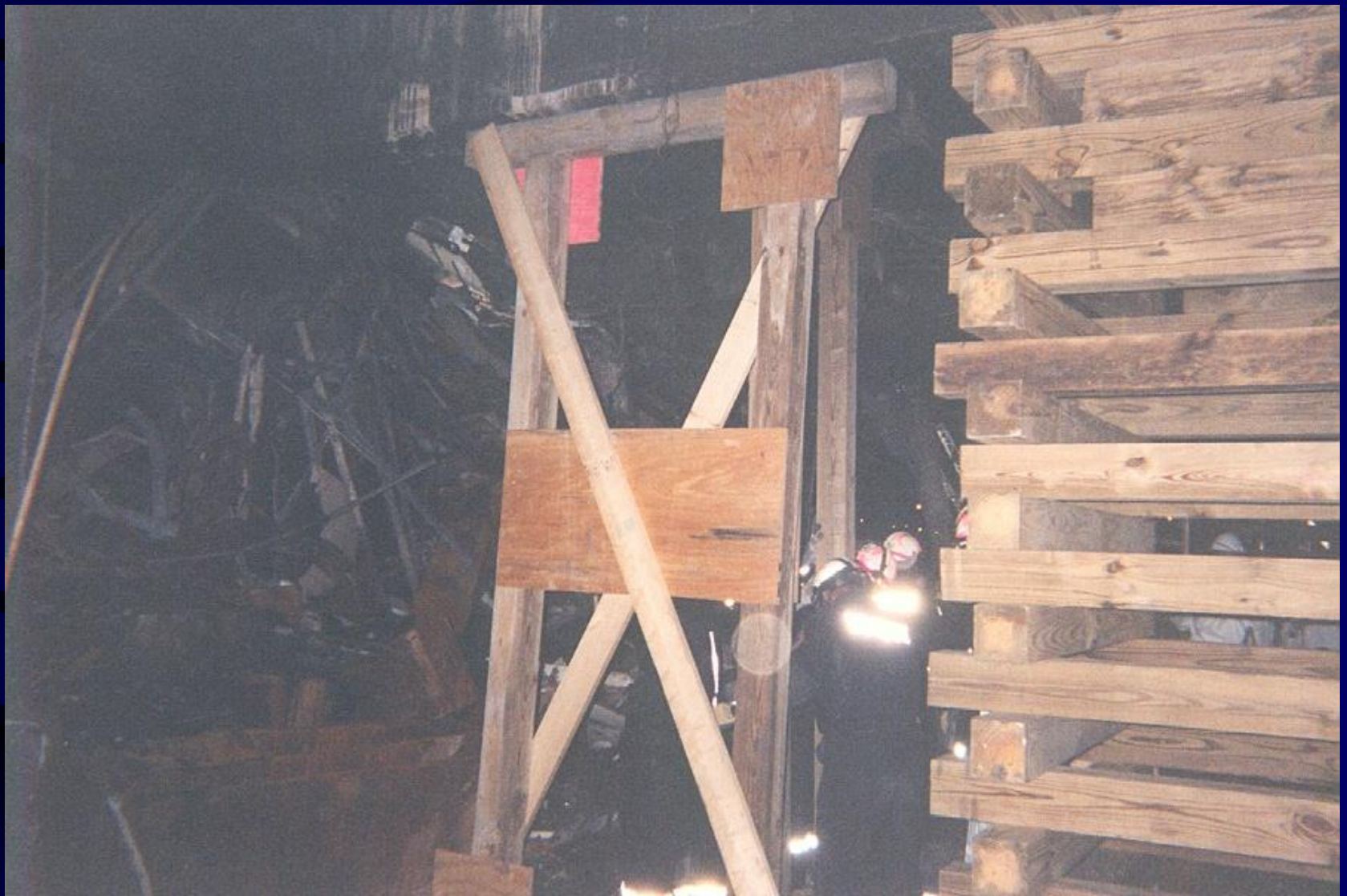
9 point crib



4 point crib







Vertical Shores used to support damaged beams and joists

- Raker Shore constructed for lateral support
- Knocked off “Widowmakers”



MISSION #3: RECOVERY



2nd night: "A&E Drive"

- Plane punched out into alley
- Escorted FBI for body and evidence recovery.







- Canine Teams Search for Victims



MISSION #4: MONITORING



Monitoring building movement

2 points monitored
all week with
transits

- Cantilevered corner
- Hanging concrete parapet



Equipment Used:

- 3 Transits
- Binoculars
- Air Horn
- Monitoring Log

Building Stability Monitoring Log

Page of

Site ID: PENTAGON

Event:

Search Grid:

Team: BLUEDate: 9/11/01Monitoring Station: LEFT SIDE OF COLLAPSEStart time: 22:50

TIME	✓	Notes	TIME	✓	Notes	TIME	✓	Notes
23:00	✓	No Mov	04:00	✓	N/C	:00	□	
23:15	✓	No Mov	04:15	✓	N/C	:15	□	
23:30	✓	N/C	04:30	✓	N/C	:30	□	
23:45	✓	N/C SHOULDER BEGAN	04:45	✓	N/C	:45	□	
00:00	✓	N/C	05:00	✓	N/C	:00	□	
00:15	✓	N/C	05:15	✓	N/C	:15	□	
00:30	✓	N/C	05:30	✓	N/C	:30	□	
00:45	✓	N/C	05:45	✓	N/C FINISHED SHOOTING	:45	□	
01:00	✓	N/C SHIMMING 1ST CRIB (LEFT)	:00	□		:00	□	
01:15	✓	N/C	:15	□		:15	□	
01:30	✓	N/C	:30	□		:30	□	
01:45	✓	N/C	:45	□		:45	□	
02:00	✓	N/C	:00	□		:00	□	
02:15	✓	N/C	:15	□		:15	□	
02:30	✓	N/C	:30	□		:30	□	
02:45	✓	N/C	:45	□		:45	□	
03:00	✓	N/C	:00	□		:00	□	
03:15	✓	N/C	:15	□		:15	□	
03:30	✓	N/C	:30	□		:30	□	
03:45	✓	N/C	:45	□		:45	□	

CHECK BOX IF NO CHANGE

StructuresFieldGuideForms.xls, Monitoring Log

Field logs were kept to keep records of any building movement.

Man Basket Operations

- Watching for victims
- Monitoring building movement
- 2 hour shifts



Arlington, VA, September 17, 2001 -- FEMA Urban Search and Rescue workers inspect the Pentagon crash site from a crane.

Photo by Jocelyn Augustino/ **FEMA News Photo**

3rd Night FIRE!







MISSION #5: DEMOLITION



4th Day - Demolition Begins

“Pulverizer” used to break up concrete safely.





OPERATIONS





- VATF-1 & VATF-2: Night Shift 6:00 p.m. to 6:00 a.m.
- MDTF-1 & TNTF-1: Day Shift



FEMA - IST (Incident Support Team)

Daily transitional meetings 6:30 a.m., 6:30 p.m.



Other Agencies On Site Involved With Search & Rescue:

- Arlington County Fire Department
- Fairfax County Fire Dept
- US Army
- FBI
- NTSB
- ATF



Personal Protective Equipment (PPE)



- Flash Gear
- Helmet
- Respirator
- Tyvex
- Boots/Gloves
- Eye Protection



“Decon”

VATF-1 BOO

(Base Of Operations)









Arriving at
Anacostia base
for rehab...

... Sleeping
quarters in a
classroom



FANTASTIC SUPPORT !!

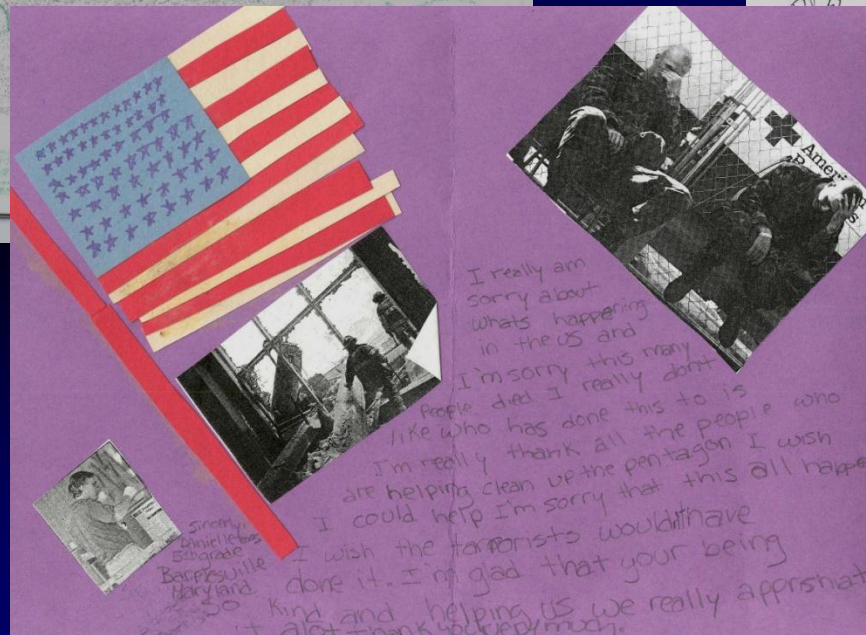
- American Red Cross
- Salvation Army
- Local Contractors & Businesses



- Food
- Clothing
- Services
- Letters/Cards/Flowers








Thanks to all
 Liz & Doug Johnson
 Bless You
 Brenda
 Thanks
 Shelby
 Cherry
 I love you
 Dan
 Can't leave
 it is better because
 of Bob's love
 I thank you &
 Debbie for
 for Dan
 for

you are my heroes
 Joanne Jordan
 Bless You
 Mike & Pats Carst

Love & Obedience
 Mike


 Memorial
 United Methodist Church
 Poolesville, Maryland

Colleen
 Snyder

Stephanie Boulter

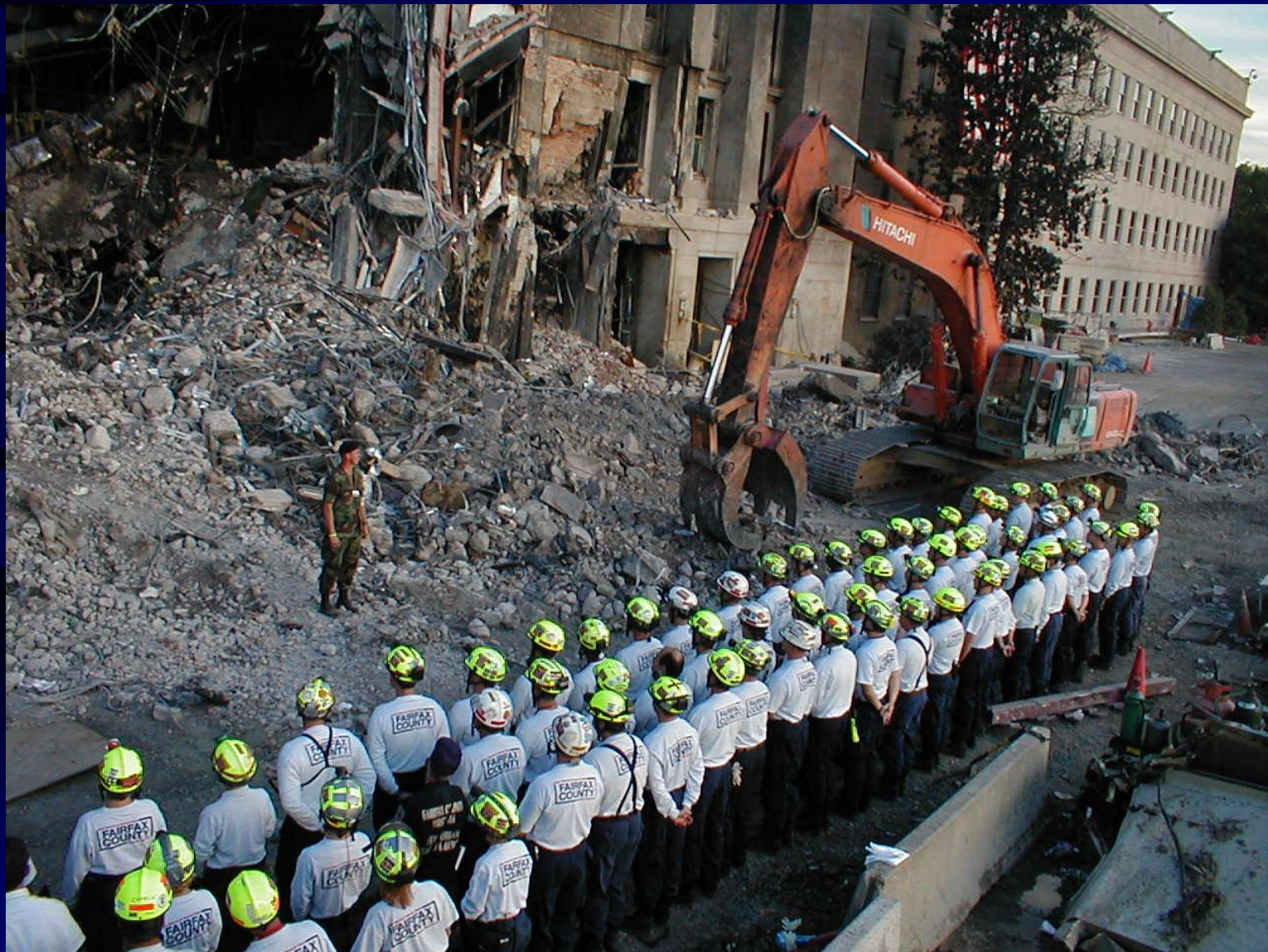
"...There is a friend that sticketh
 closer than a brother."
 PROVERBS 18:24 KJV



Special Visitors

- President Bush
- VP Cheney
- Governor Gilmore
- Sec. Defense Rumsfeld
- Congressmen

VA-TF1 Goodbye - Sept. 18th 2001





HOMECOMING





- Team and families addressed by several dignitaries.
- Pictures, lunch and HOME!



Cakes full of fun/D1

THE JOURNAL

FAIRFAX
The daily newspaper of Fairfax, Virginia

Vol. 63, No. 219

Wednesday, September 19, 2001

25 cents

One week later, taking next steps

Search and recovery scaled back

By CERRIL HOLLY
Associated Press

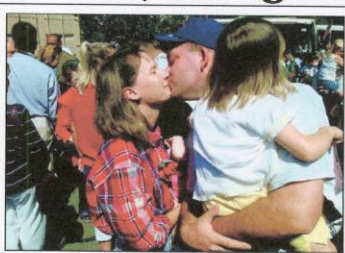
One week after a Boeing 757 crash site showed back the search and recovery effort, the effort to find the wreckage of the plane that crashed on Tuesday.

About 100 civilian workers head of home to nearby Fairfax County and Manassas County, Md., as contractors continued to dig through the wreckage of the plane.

The area that collapsed is a parking garage for the Pentagon. It was hit by a missile on Tuesday.

INSIDE

The latest set of debris from the crash was found on Tuesday.



Leo Titus is reunited with his wife, Jennifer, and his daughters, Allison and Laura, after spending a week at the Pentagon searching for survivors of the Sept. 11 terrorist attack.

Staggered airport reopening considered

By SAM HANDEL
Journal staff writer

Deloitte & Touche, led by Bruce W. Wines and George F. Allen, met with Federal Aviation Administration officials on Tuesday to discuss the possibility of a staggered reopening of the nation's airports.

The meeting represents the next step in the effort to get the nation's airports back to normal after the Sept. 11 attacks.

The meeting was held at the Pentagon. It was the first time since the Sept. 11 attacks that the Pentagon has held a meeting with the FAA.

Rescuers return to families

No survivors found after a week at Pentagon

By CHRISTINE C. WAN

Rescue workers who spent a week at the Pentagon searching for survivors of the Sept. 11 terrorist attack returned to their families on Tuesday.

The workers, who were on duty from Sept. 11 to Sept. 18, returned to their homes on Tuesday.

The workers, who were on duty from Sept. 11 to Sept. 18, returned to their homes on Tuesday.

The workers, who were on duty from Sept. 11 to Sept. 18, returned to their homes on Tuesday.



Fairfax County Fire and Rescue members are greeted with support Tuesday.

Garden provides escape

Refuge salutes emergency crews

By JASON FORNEY
Journal staff writer

The Williams-Walker Garden is a great place for Northern Virginia families to enjoy the outdoors and escape the stress of their daily lives.

The garden, which is located in the heart of the Pentagon City neighborhood, is a great place for families to enjoy the outdoors and escape the stress of their daily lives.

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The garden, which is located in the heart of the Pentagon City neighborhood, is a great place for families to enjoy the outdoors and escape the stress of their daily lives.



Northern Virginia families take time to enjoy the newly installed landscaping garden and take a break from the stress of their daily lives.

Woodley Hills Ele to receive nation:

Program on character spurs

By ANDREW BLANKLEY
Journal staff writer

Four years ago, leaders at Woodley Hills Elementary School in the Mount Vernon section of Fairfax County, started a program to help students develop good character.

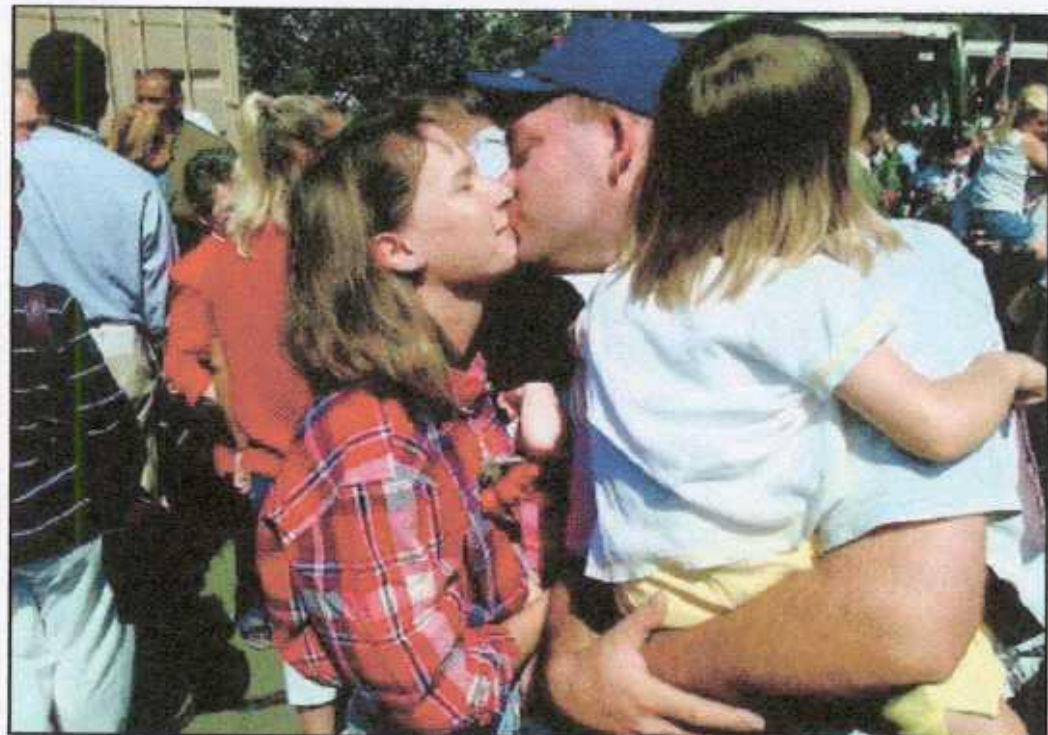
The program, which is called the Woodley Hills Character Program, is a great way for students to learn about good character.

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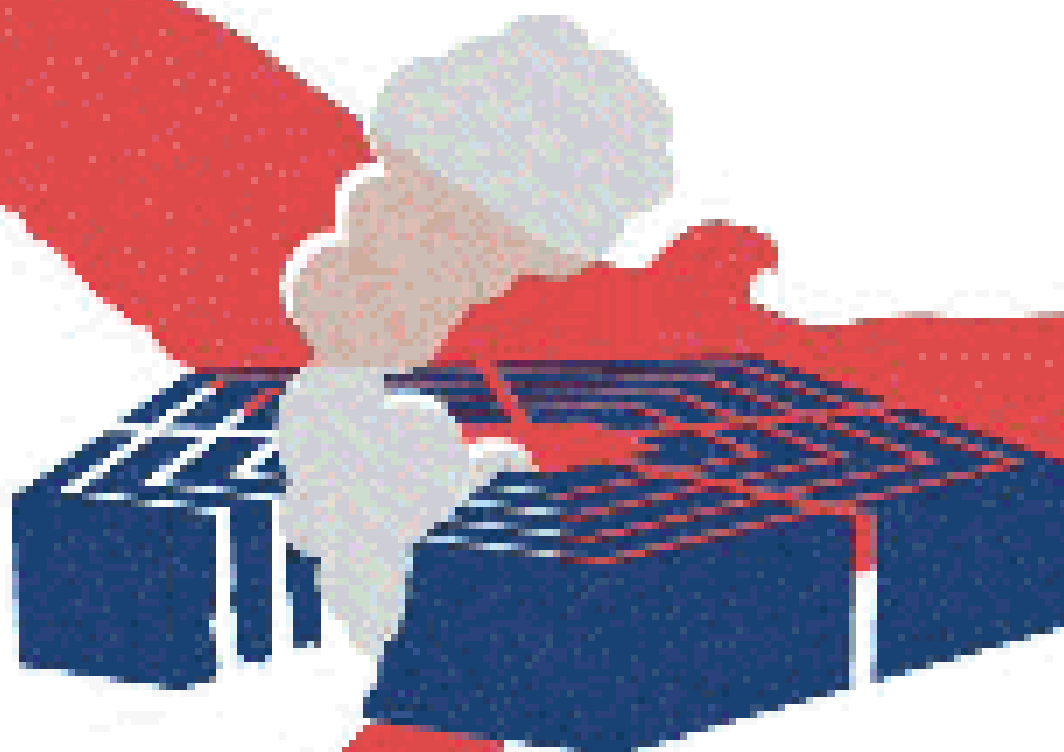
Photographs by Jeff Menke/Journal

Leo Titus is reunited with his wife, Jennifer, and his daughters, Allison and Laura, after spending a week at the Pentagon searching for survivors of the Sept. 11 terrorist attack.

TOMORROW: Showers possible, highs near 80, lows in the mid-60s.

Business	2A	Class Ad	2A	Options	2A
Classified	2A	Classified	2A	Classified	2A
Classified	2A	Classified	2A	Classified	2A
Classified	2A	Classified	2A	Classified	2A

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THE PHOENIX PROJECT

"LET'S ROLL"



Sampling Concrete



Helical Anchor Piles



Pile Load Test in Collapse Area



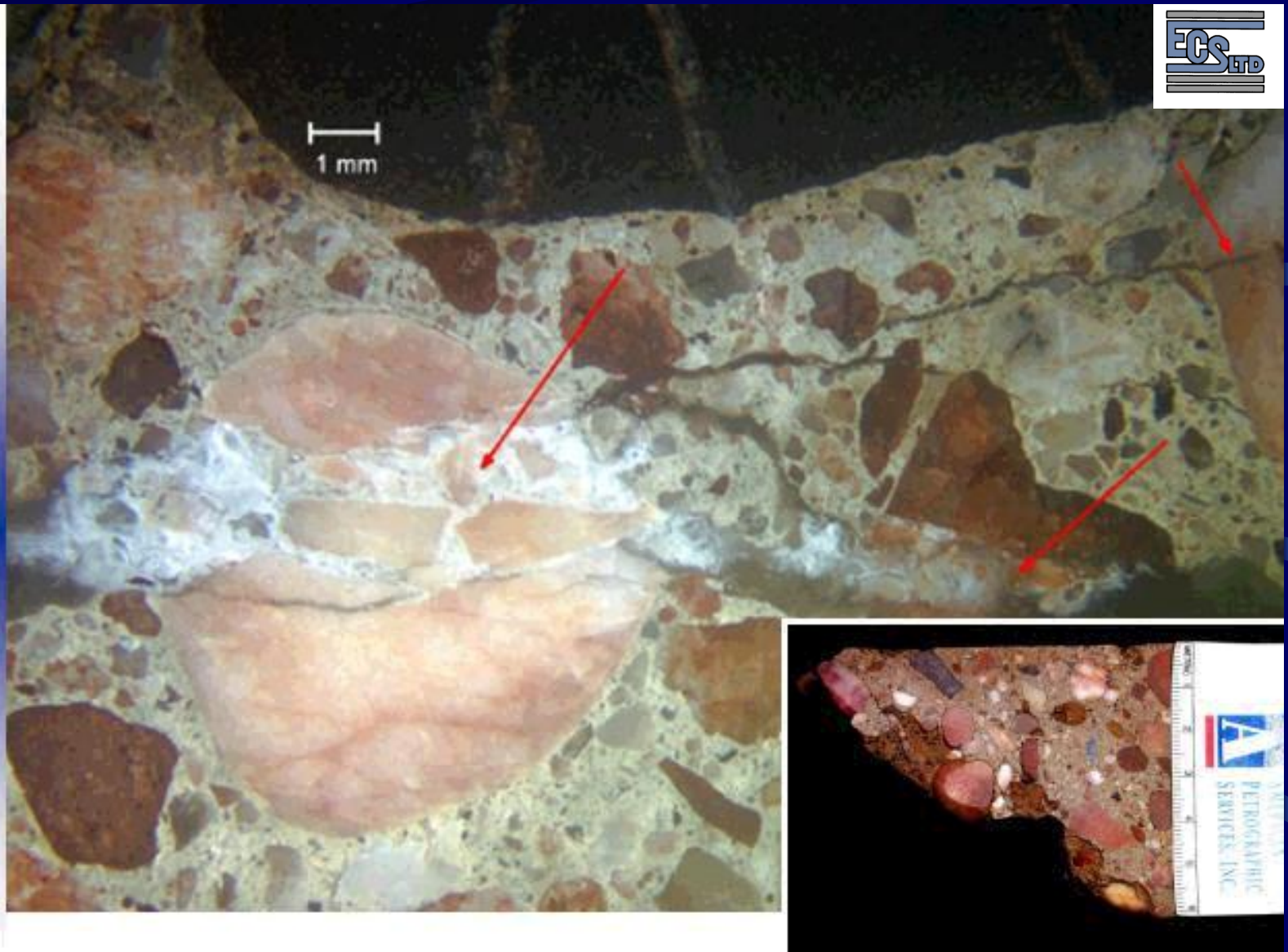
Stabilize
Analyze
Demolish
Rebuild







Stabilize
Analyze
Demolish
Rebuild



Saw-cut cross section of concrete from the support columns showed numerous micro-fractures.



September 11th, 2001...





Stabilize
Analyze
Demolish
Rebuild



Photo date: 11/27/01

**Demolition completed Nov 19, 2001.
Four weeks ahead of most aggressive schedule.**

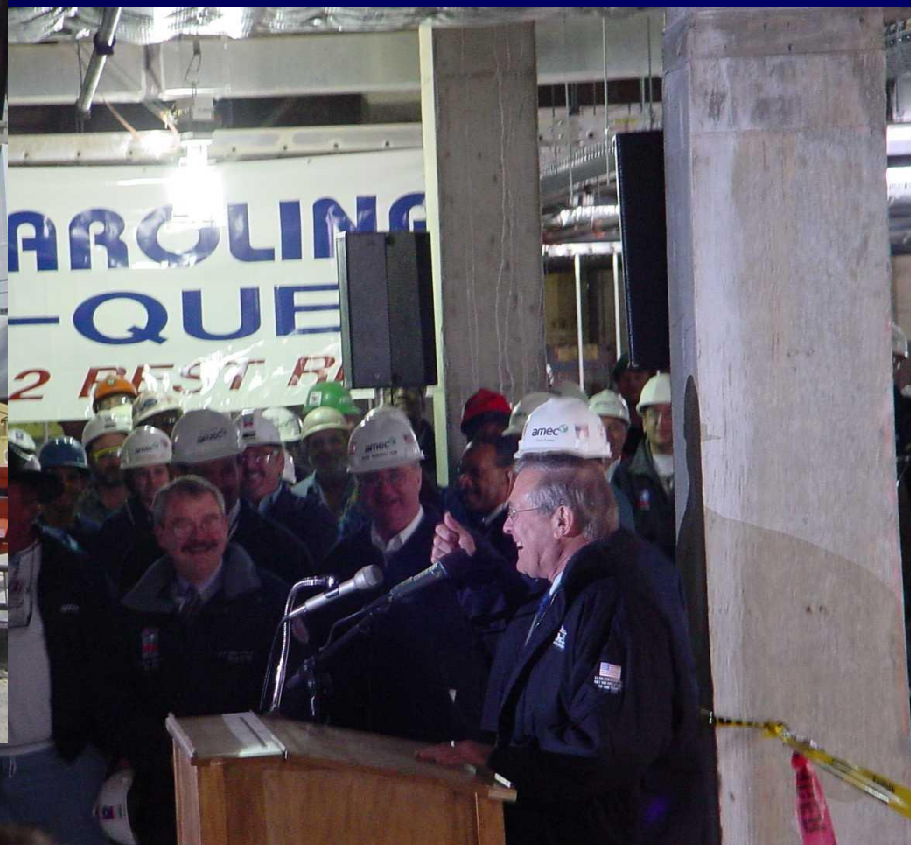






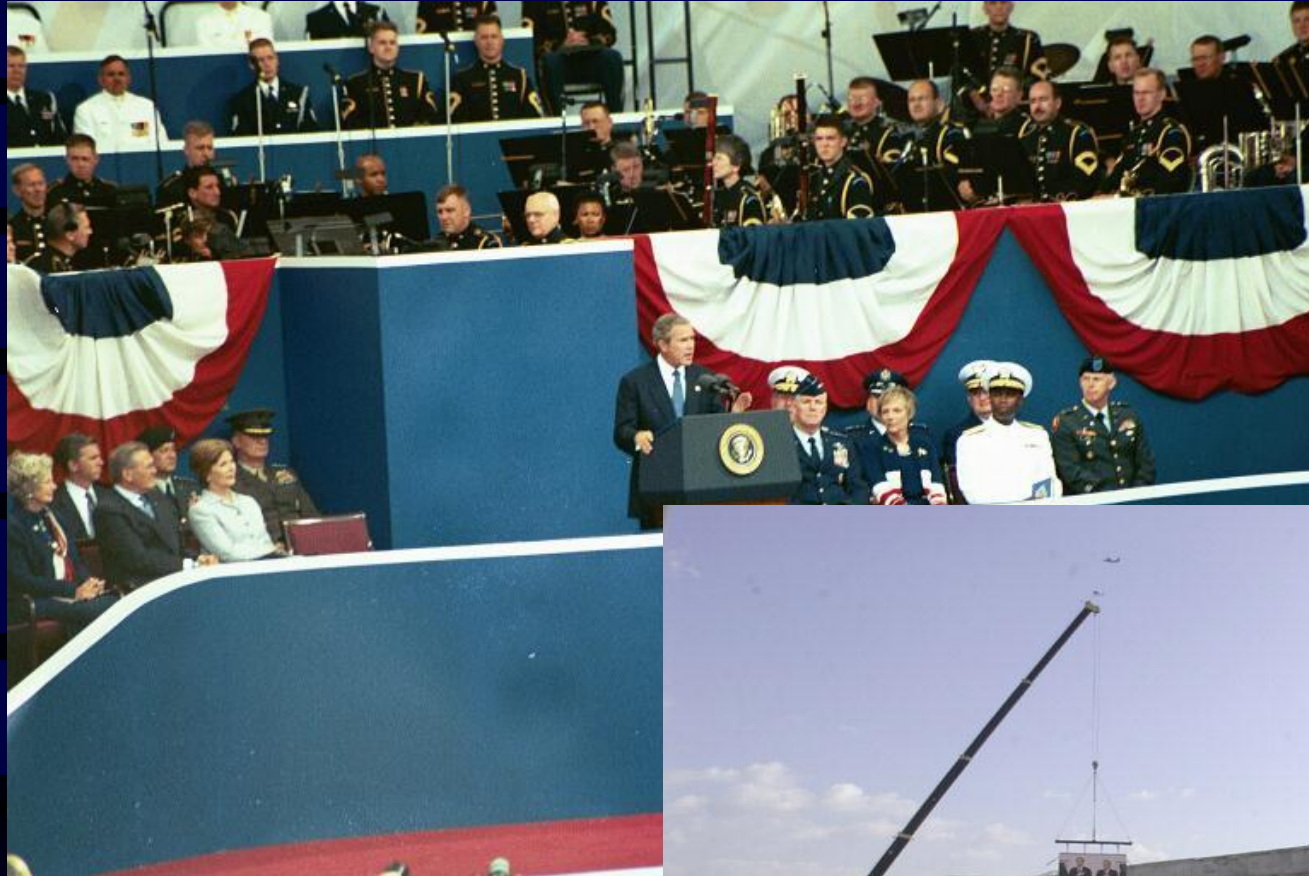


**Topped Out
April 5th, 2002!**





September 11, 2002







<http://www.firefightthebook.com>

