



911

What happened on
September 11, 2001

John Herrick
July 24, 2019

Knowledge

- "Nobody is able to attain an adequate conception of truth, but everybody can make a small contribution to our understanding."
Aristotle (384-322 BCE) (2360 years ago)



“If you’re going to live life, you’ve got to be all in.” Dr. Marian Diamond



(Marian Diamond was a pioneering scientist and educator who is considered one of the founders of modern neuroscience. She and her team were the first to publish evidence that the brain can change with experience and improve with enrichment, what is now called neuroplasticity.)

Good afternoon.

My name is John Herrick. I am a civil engineer.

I am NOT:

-Related to the owner of the World Trade Center

-A conspiracy theorist.

-A scientist

I spent six months working for the insurance companies who insured building 7 of the World Trade Center.



Note: Yardstick demonstration.

My Part – WTC 7

- The building was insured
 - The structure
 - The contents
 - Business interruption
 - Problem: there was no end date - business interruption never ended
 - The insurers hired me to determine how long it would take to rebuild, they would pay business interruption for that amount of time
- World Trade Center Properties and other entities affiliated with developer Larry Silverstein eventually collected about \$4.1 billion from insurers.

The World Trade Center

On September 11, 2001, 19 militants associated with the Islamic extremist group al-Qaeda hijacked four airplanes and carried out suicide attacks against targets in the United States. Two of the planes were flown into the twin towers of the World Trade Center in New York City, a third plane hit the Pentagon just outside Washington, D.C., and the fourth plane crashed in a field in Pennsylvania. Almost 3,000 people were killed during the 9/11 terrorist attacks, which triggered major U.S. initiatives to combat terrorism and defined the presidency of George W. Bush.

- Buildings 1 and 2
- Building 7
- Pentagon

Timeline from the History Channel.

What conspiracy theories have you heard?

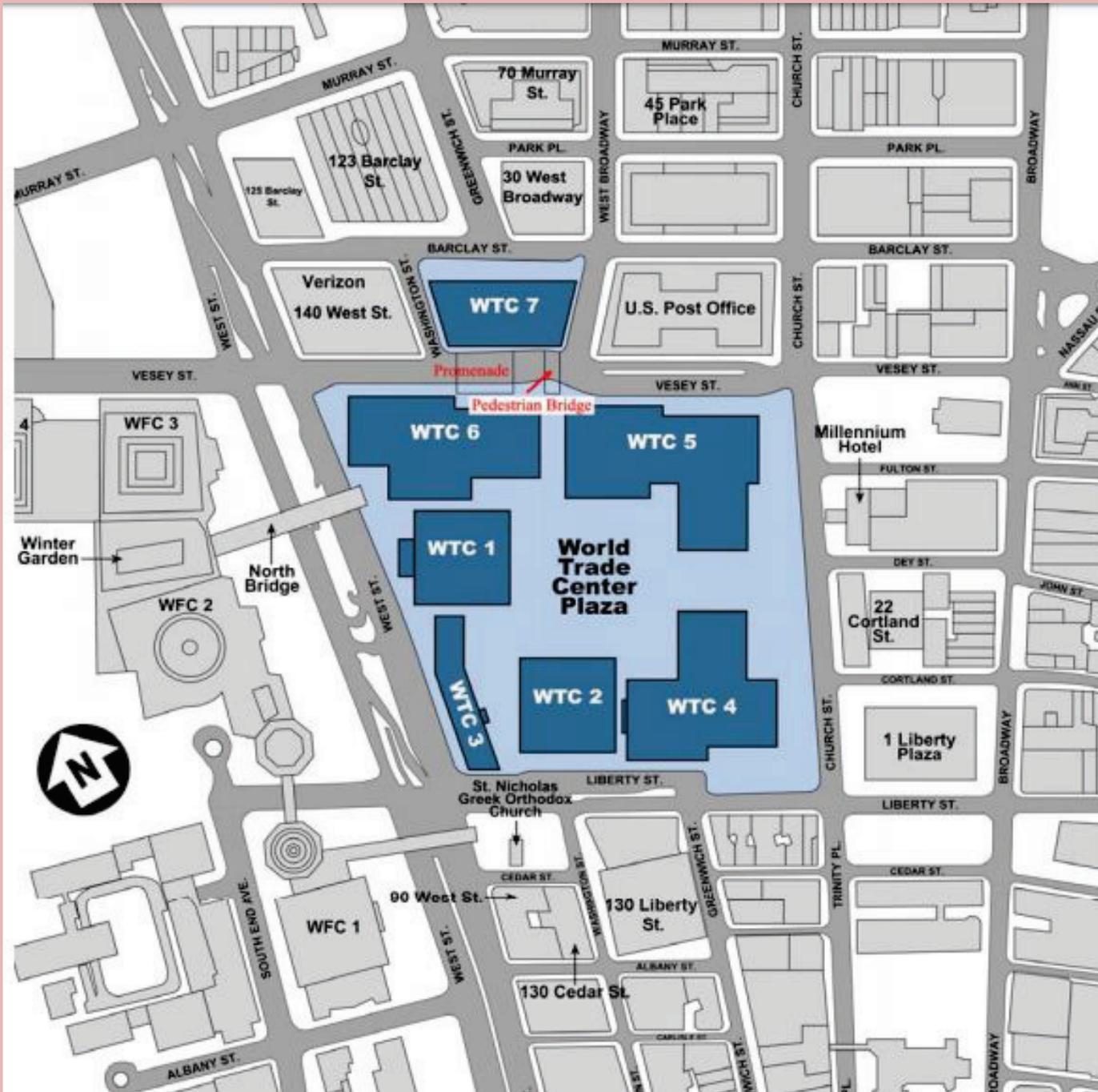
- 1. The government or Silverstein were behind it.
- 2. There were no planes involved.
- 3. There were explosives in the buildings.
- 4. No similar building would ever collapse on its own due to fire.
- 5. No one could have made phone calls from the planes.
- 6. Remote controlled planes were used.
- 7. Many of the "alleged" hijackers are still alive.
- 8. The passengers are safe on an island somewhere.

None of the above is true.

No conspiracy, just an attack

1. The government or Silverstein were behind it. No, **Ramsey Youseff** created the plan in 1995 and had it on his laptop, he and his laptop were captured in the Philippines but his uncle **Khalid Sheikh Mohammed** decided to continue the plan, they had 10 people in the US training to fly planes already. Osama bin Laden paid for the plan.
There were seven targets in the plan. **1. The WTC 2. The CIA building 3. The Pentagon 4. Nuclear facilities 5. Sears Tower 6. Transamerica Pyramid 7. White House.** Later **Khalid Sheikh Mohammed** said that they changed #7 to the US Capitol building. This plan was given in 1995 to the CIA but they had no details as to when.
2. There were no planes involved. (People saw the airplanes, and plane parts were found at each site.)
3. There were explosives in the buildings. (No, no one could have known at what level to have put them. In addition there was no sound of explosives anywhere, where the explosions would have been heard a half mile away.)
4. No building could ever collapsed on its own. (Any building allowed to burn for 8 1/2 hours without someone battling the fires would fall.)
5. No one could have made phone calls from the planes. (I have made such calls myself.)
6. Remote controlled planes. (It would have been a lot easier to hijack.)
7. Many of the "alleged" hijackers are still alive. (Nope.)
8. The passengers are safe on an island somewhere. (Fantasy)

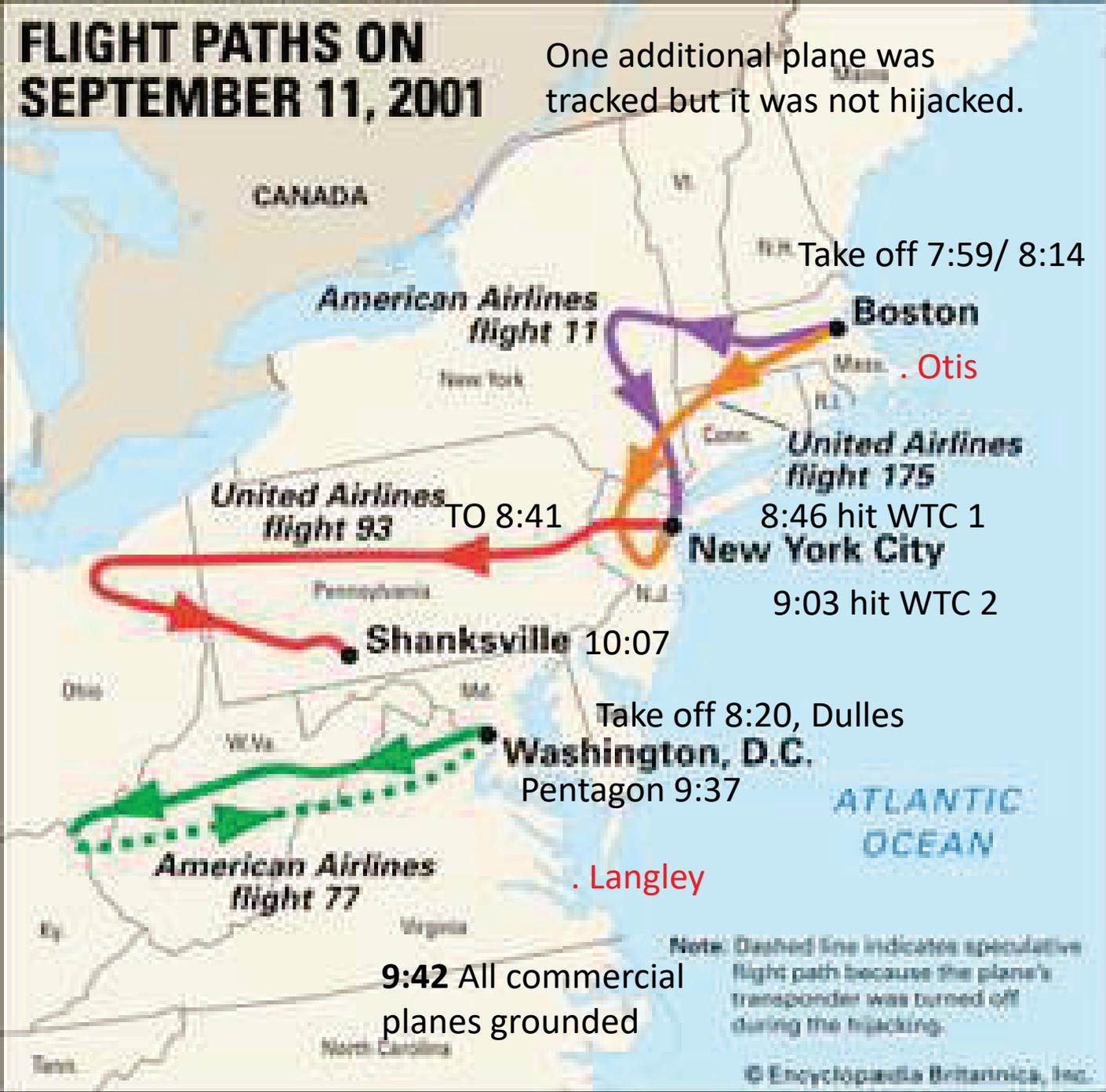
Site Plan



FLIGHT PATHS ON SEPTEMBER 11, 2001

One additional plane was tracked but it was not hijacked.

The plane's transponders show where the planes went (solid lines).



8:40 AM

Two F15 military jets are ordered to depart from Otis Air National Guard Base in Cape Cod, headed the 200 miles to New York toward Flight 11.

9:50

Two military jet planes departed from Langley 100 miles south of the Pentagon but went east out to sea. No one knew where to direct the F-15's. They had been given orders to shoot down the commercial airplanes, but they all were too late.

First Plane

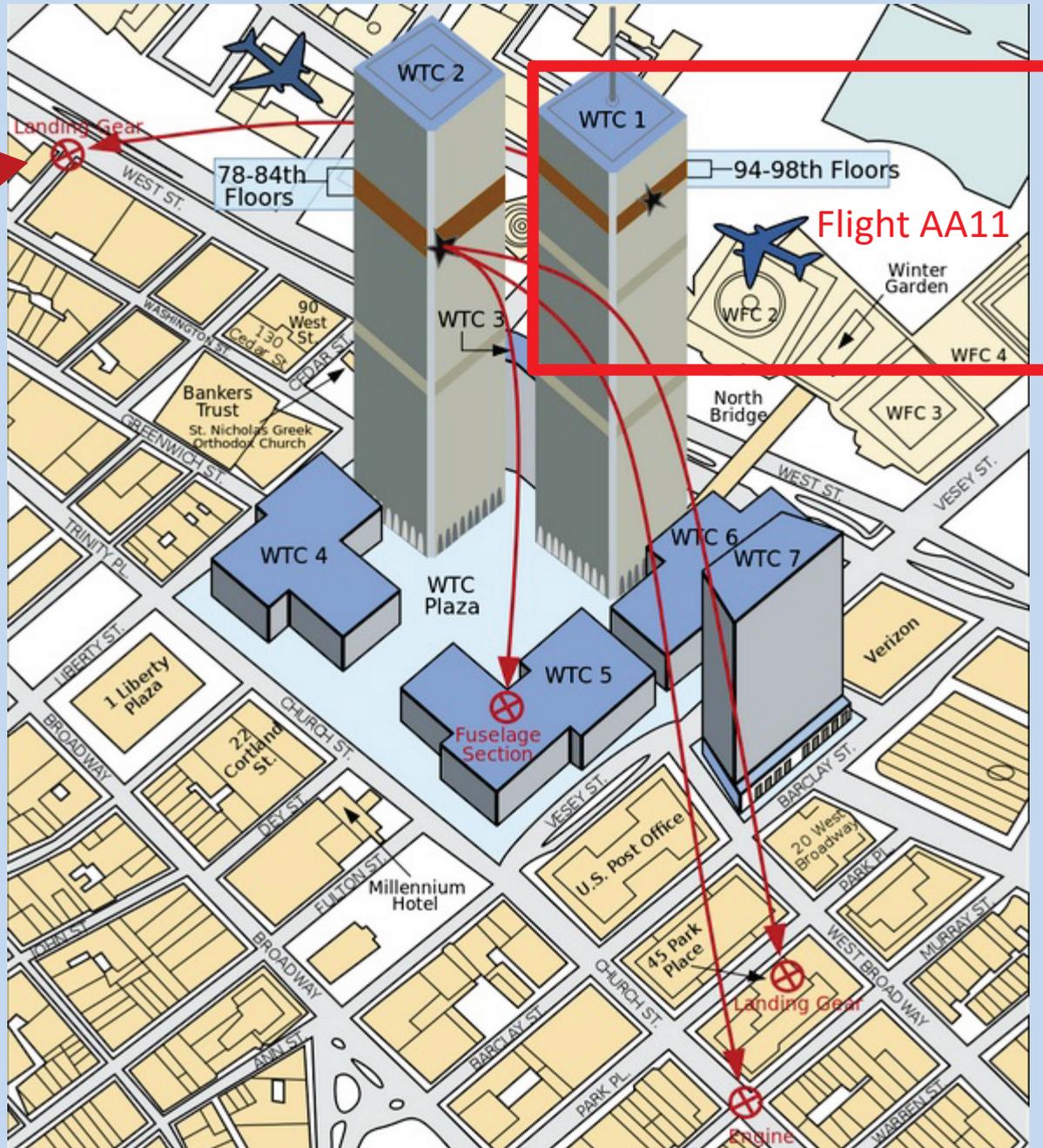
- **American Airlines Flight 11** was a domestic passenger flight that was hijacked by five al-Qaeda members on September 11, 2001. **Mohamed Atta** deliberately crashed the plane into the North Tower of the World Trade Center in New York City, killing all 92 people aboard and an unknown number in the building. The aircraft involved, a **Boeing 767-223ER weighing 225 tons**, was flying American Airlines' daily scheduled morning transcontinental service from Logan International Airport in Boston to Los Angeles International Airport.
- Fifteen minutes into the flight, the hijackers injured at least three people (possibly killing one), sprayed mace to control the passengers, forcibly breached the cockpit, and overpowered the captain and first officer.
- Atta, an al-Qaeda member and licensed commercial pilot, took over the controls. Air-traffic controllers noticed the flight was in distress when the crew was no longer responding. They realized the flight had been hijacked when Mohamed Atta's announcements for passengers were transmitted to air traffic control. On board, flight attendants Amy Sweeney and Betty Ong contacted American Airlines, and provided information about the hijackers and injuries to passengers and crew.
- The aircraft crashed into the North Tower of the World Trade Center at **08:46** local time.

Landing gear



Airplane parts everywhere.

Towers 1 and 2 were 110 stories tall.



Flight AA11

Fuselage Section

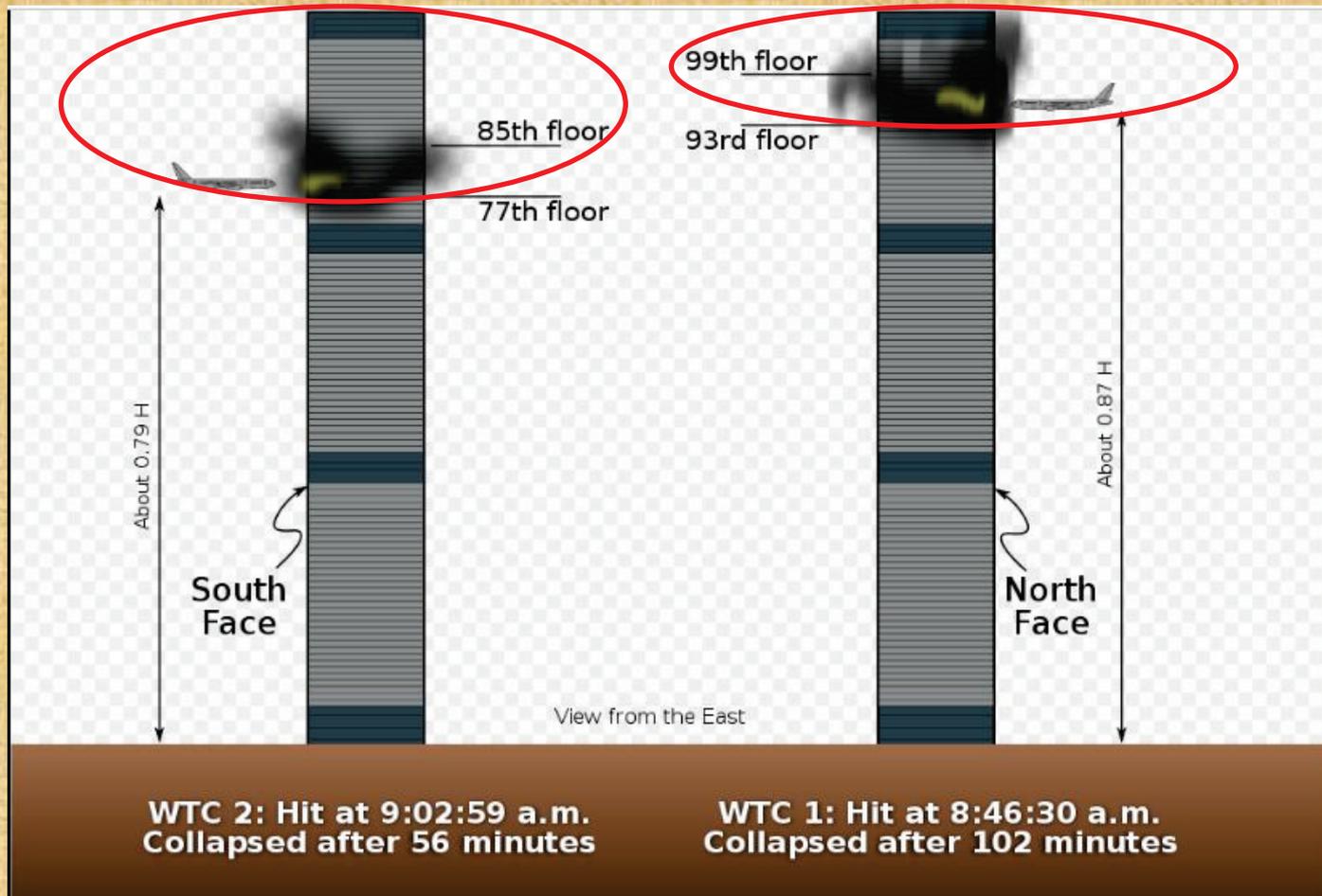
Landing Gear

Engine

The direct hit did not knock over the building.



The Level Hit

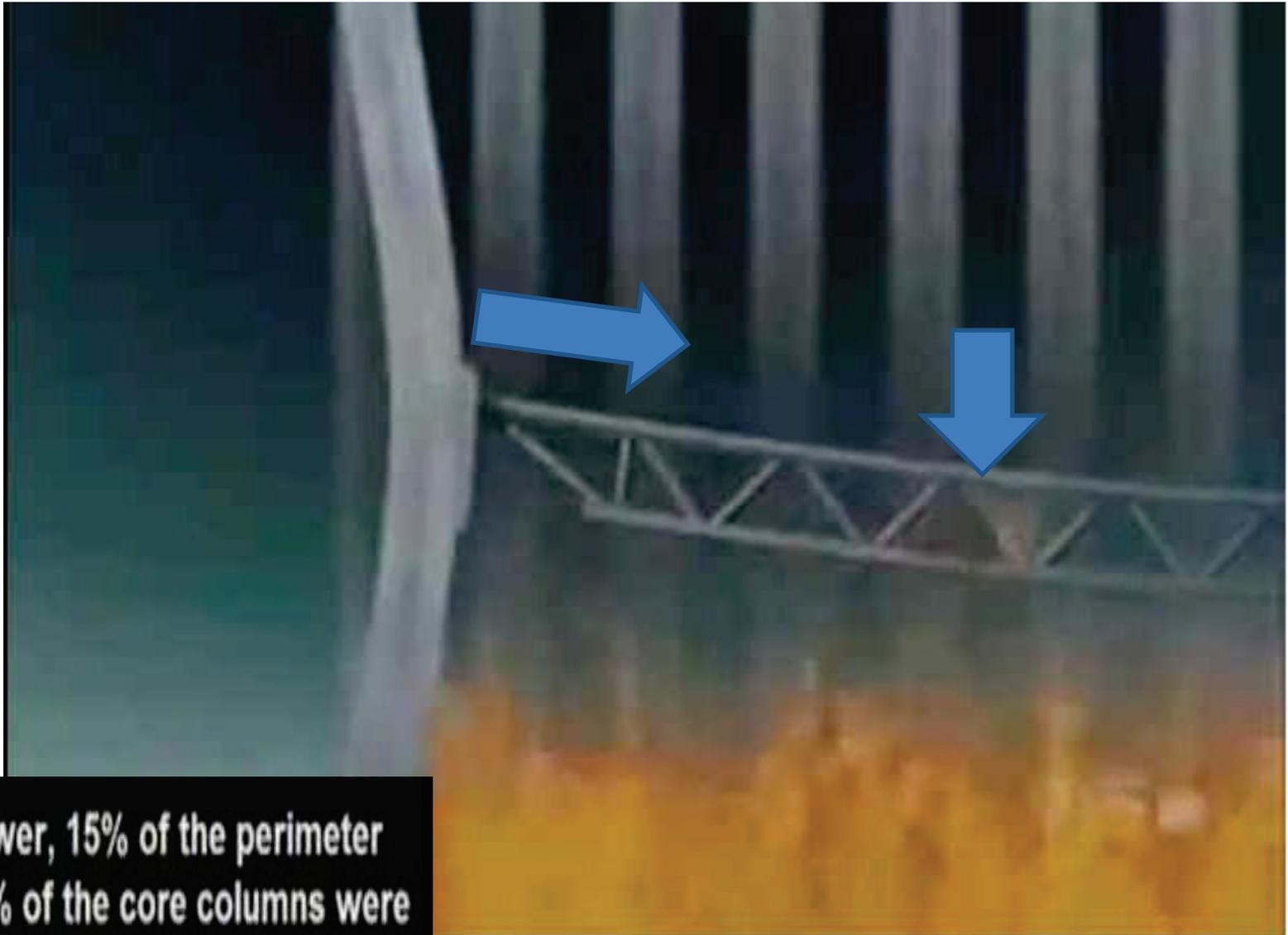


The weight of 33 floors
pressing down

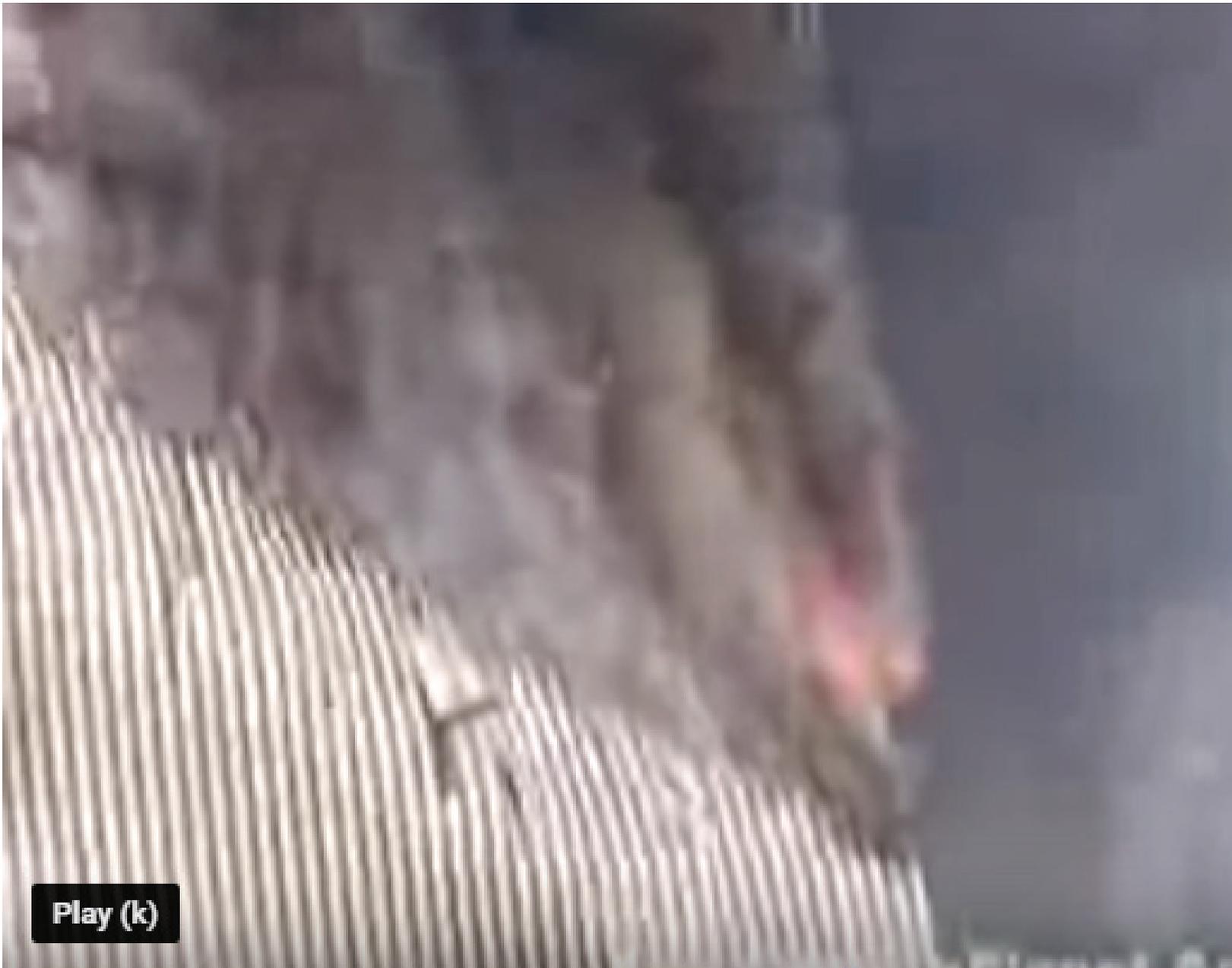
The weight of 17 floors
pressing down

One reason for the collapse of the Tower 1, the exterior wall bulged in due to the sagging floors.

The fires raged unchecked, building up 1,000 degrees temperatures, enough so that steel lost $\frac{1}{2}$ its strength. NO STEEL WAS MELTED.



For the North tower, 15% of the perimeter columns and 13% of the core columns were severed, with many more damaged.



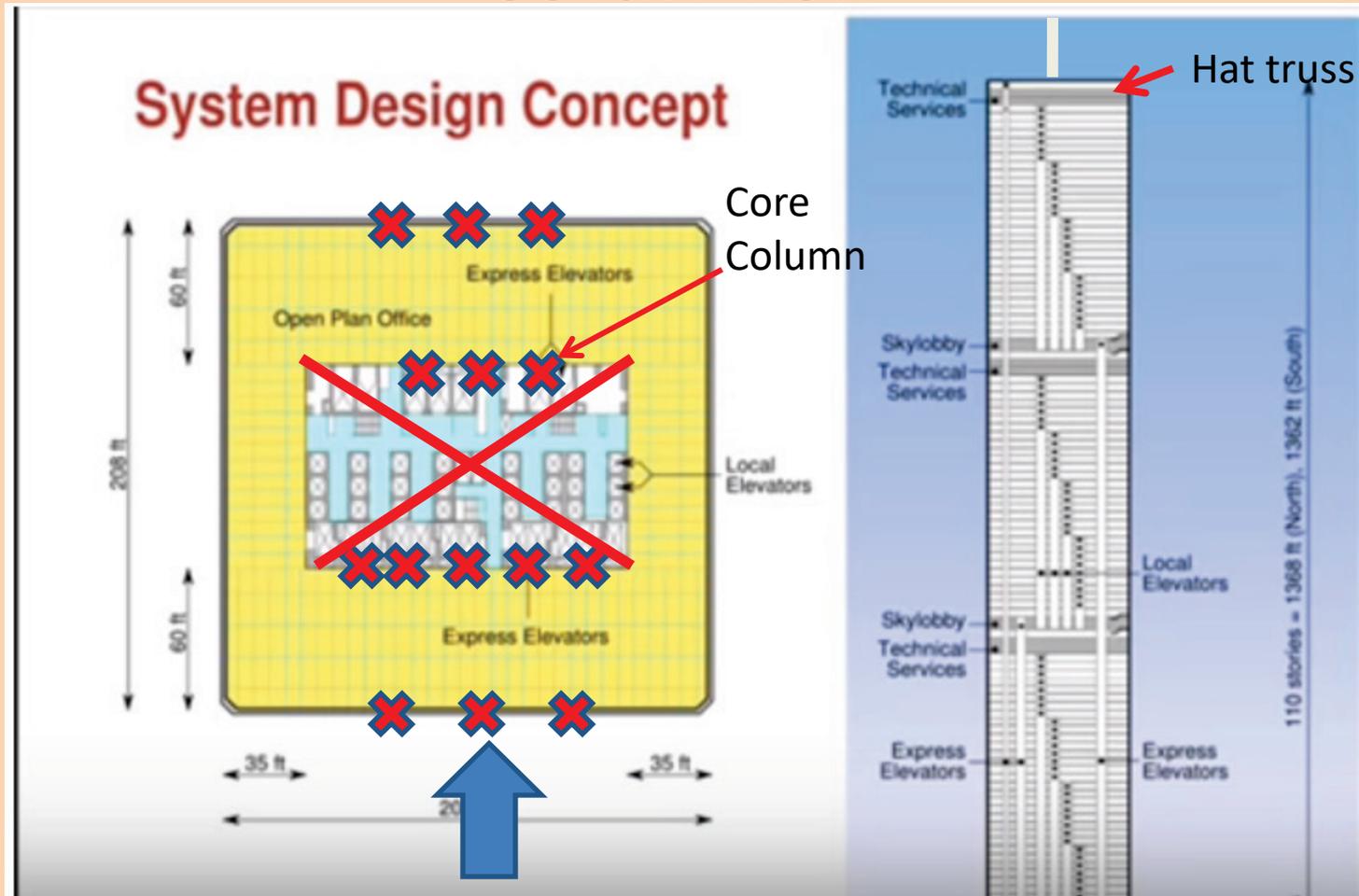
Wall buckling, it was the fires and the floors sagging that pulled in on the walls and brought the towers down

Another factor was the core columns.

The thickness of the steel in the core columns tapered from bottom to top. Near the bottoms of the towers the steel was four inches thick, whereas near the tops it may have been as little as 1/4th inch thick.

Where the first airplane hit (93 to 99th floor), it damaged core columns.

The structure collapsed due to the floors supporting the core and the exterior walls failing, the tower fell at 10:28, an hour and 42 minutes after being hit.

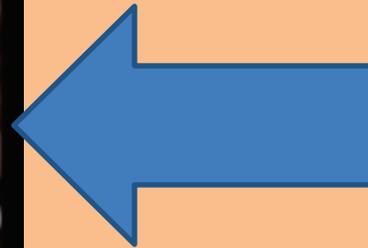


All elevators and stairs cut off. The weight of the communication tower on top of the building and its "hat" truss also had a hand in the failure.

Inner core collapsing, initiating the overall collapse.



Core columns are pulled by the floors.



Second Plane

- **United Airlines Flight 175** was a scheduled domestic passenger flight from Logan International Airport, in Boston, Massachusetts, to Los Angeles International Airport. On September 11, 2001, the **Boeing 767-200 (195 tons)** operating the route was hijacked by five al-Qaeda terrorists and was deliberately crashed into the South Tower of the World Trade Center, killing all 65 people aboard and an unconfirmed number in the building's impact zone.
- Approximately thirty minutes into the flight, the hijackers forcibly breached the cockpit and overpowered the pilot and first officer, allowing lead hijacker and trained pilot **Marwan al-Shehhi** to take over the controls. Passengers were vomiting from the erratic movements.
- The aircraft's transponder was visible on New York Center's radar, and the aircraft deviated from the assigned flight path for four minutes before air traffic controllers noticed these changes at 08:51 EDT. They made several unsuccessful attempts to contact the cockpit. Several passengers and crew aboard made phone calls from the plane to family members and provided information about the hijackers and injuries suffered by passengers and crew.
- In Tower 2 some of the people were told to go back up to their offices.
- The aircraft crashed into Tower Two (the South Tower) of the World Trade Center at **09:03**.

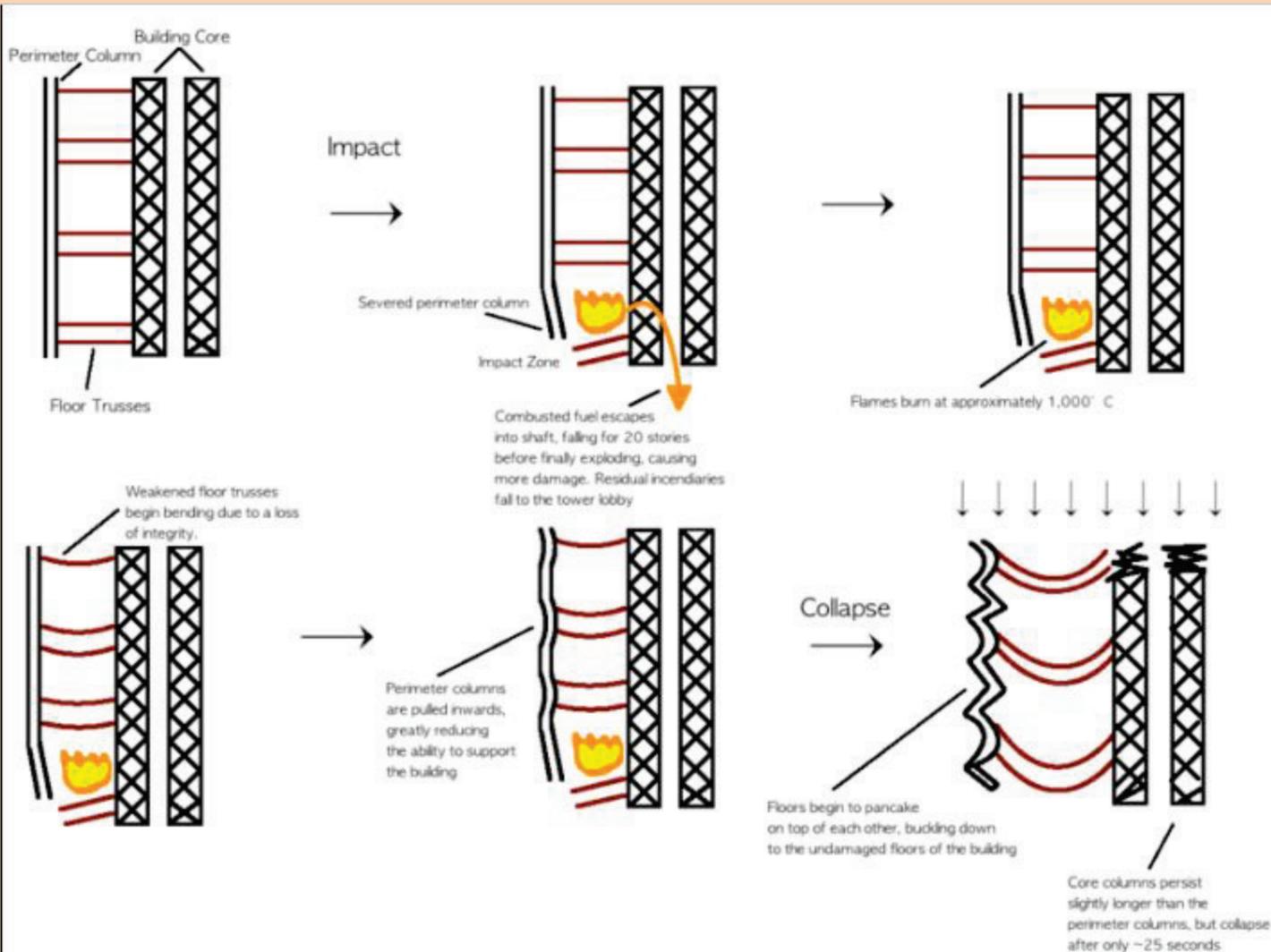
For the South Tower, 14% of the perimeter columns and 21% of the core columns were severed, with many more damaged.

South Tower

In the case of the World Trade Center, the burning jet fuel spread the fire across several floors in a matter of seconds. This massive fire put exceptional strain on the structure at nearly all points on those floors. Additionally, the report suggests that the force of the collision removed much of the fire-resistant material sprayed on the steel, making the structure more susceptible to heat damage.

The heat expanded, twisted and buckled the steel support structure of the exterior, gradually reducing the building's stability. Connections between exterior vertical columns and floor trusses probably broke, dropping sections of floor on lower levels and breaking more connections between the floor and the walls. Every broken connection or buckled length of steel added to the force acting on connected steel segments, until the entire structure was weakened to the point that it couldn't hold the upper section of the building.

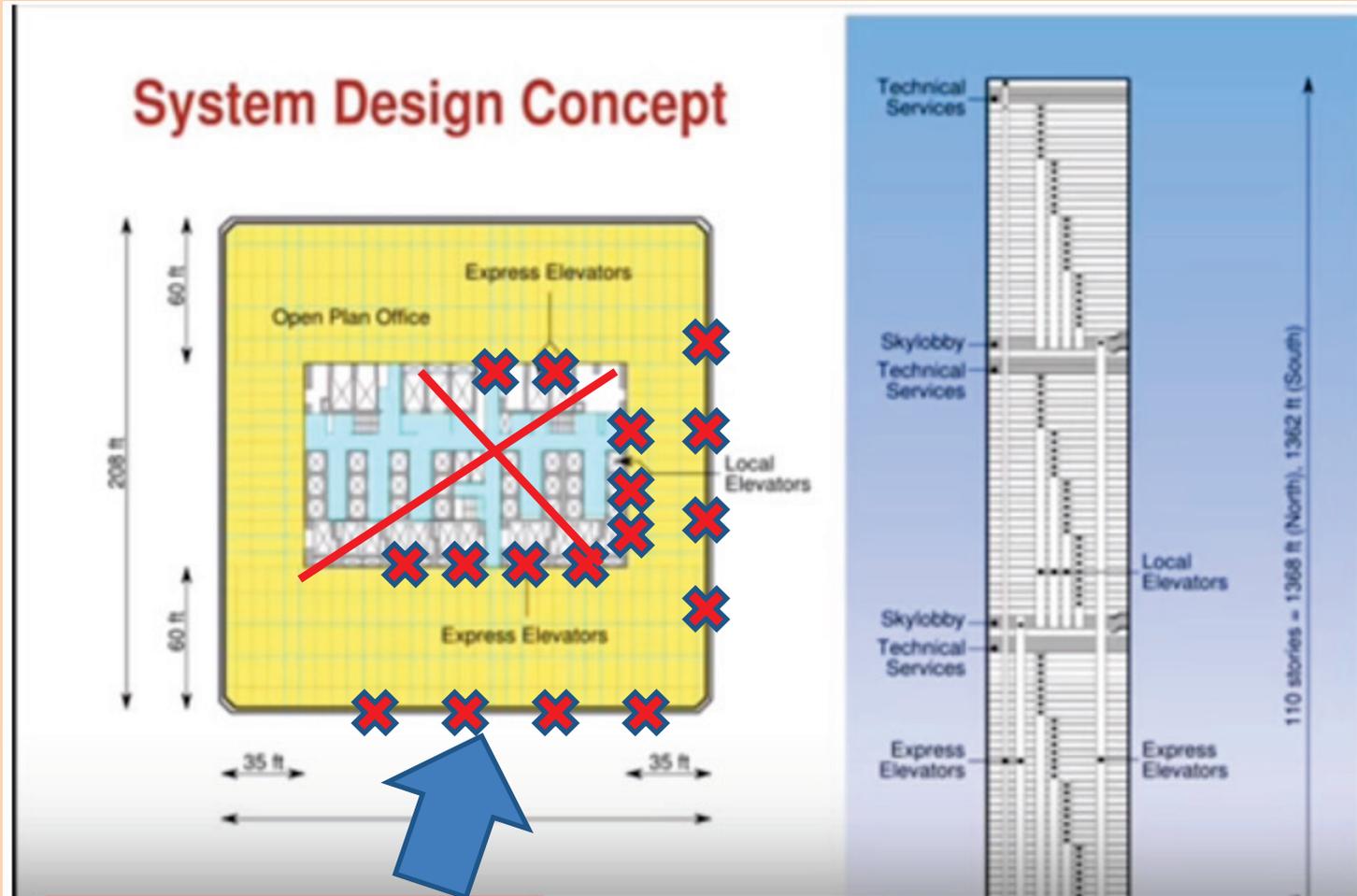
South Tower (WTC 2) Exterior wall collapses



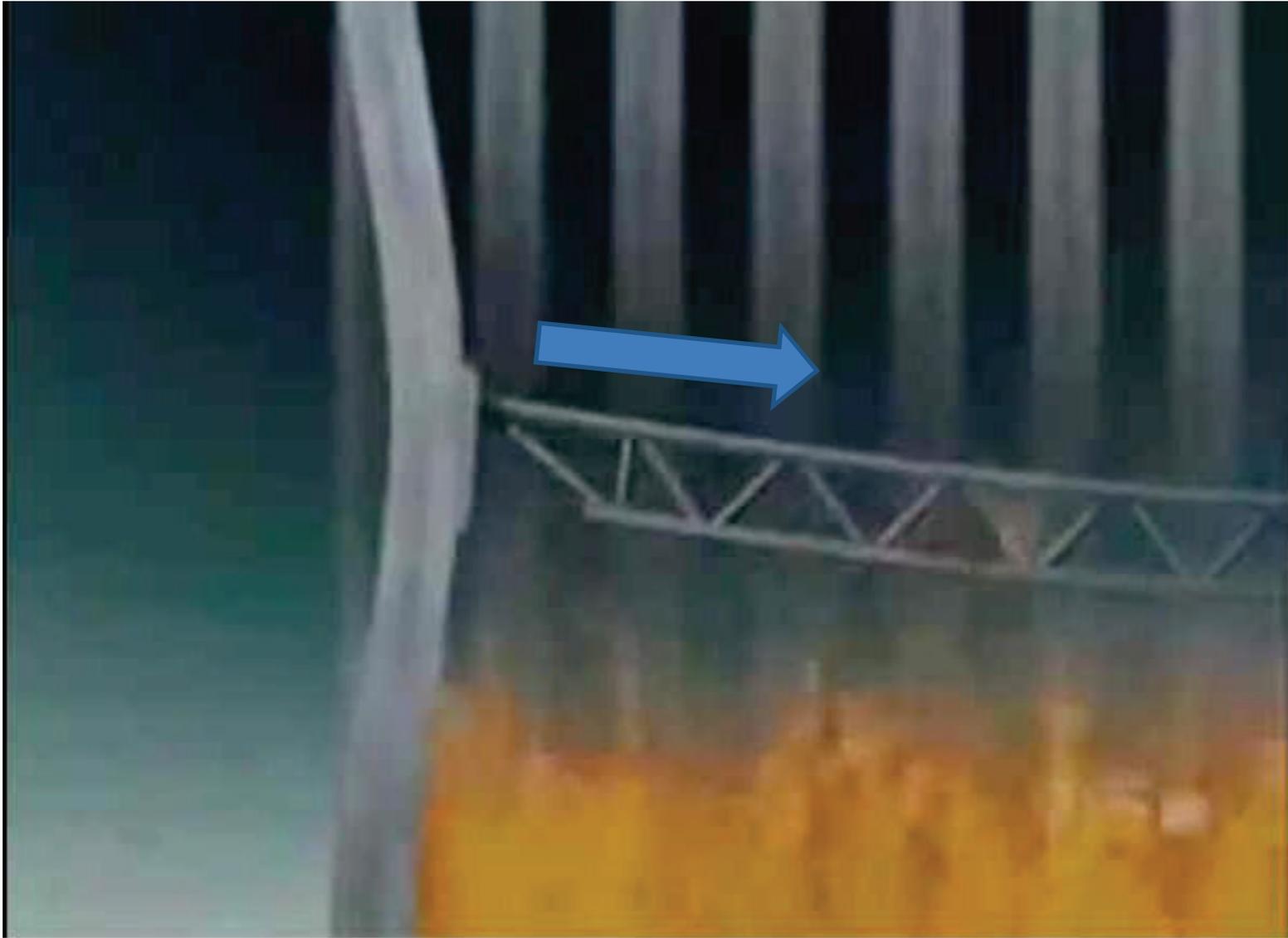
Core Columns

Where the second airplane hit (75 to 85th floor), damaged more of the core (eight floors) than in Tower 1 (six floors).

The structure collapsed due to the floors supporting the exterior columns failing, the tower fell at 9:03, 46 minutes after being hit.



Simulation video of the floors sagging and pulling on exterior walls, reducing the weight carrying capacity of the walls, and collapsing the structure



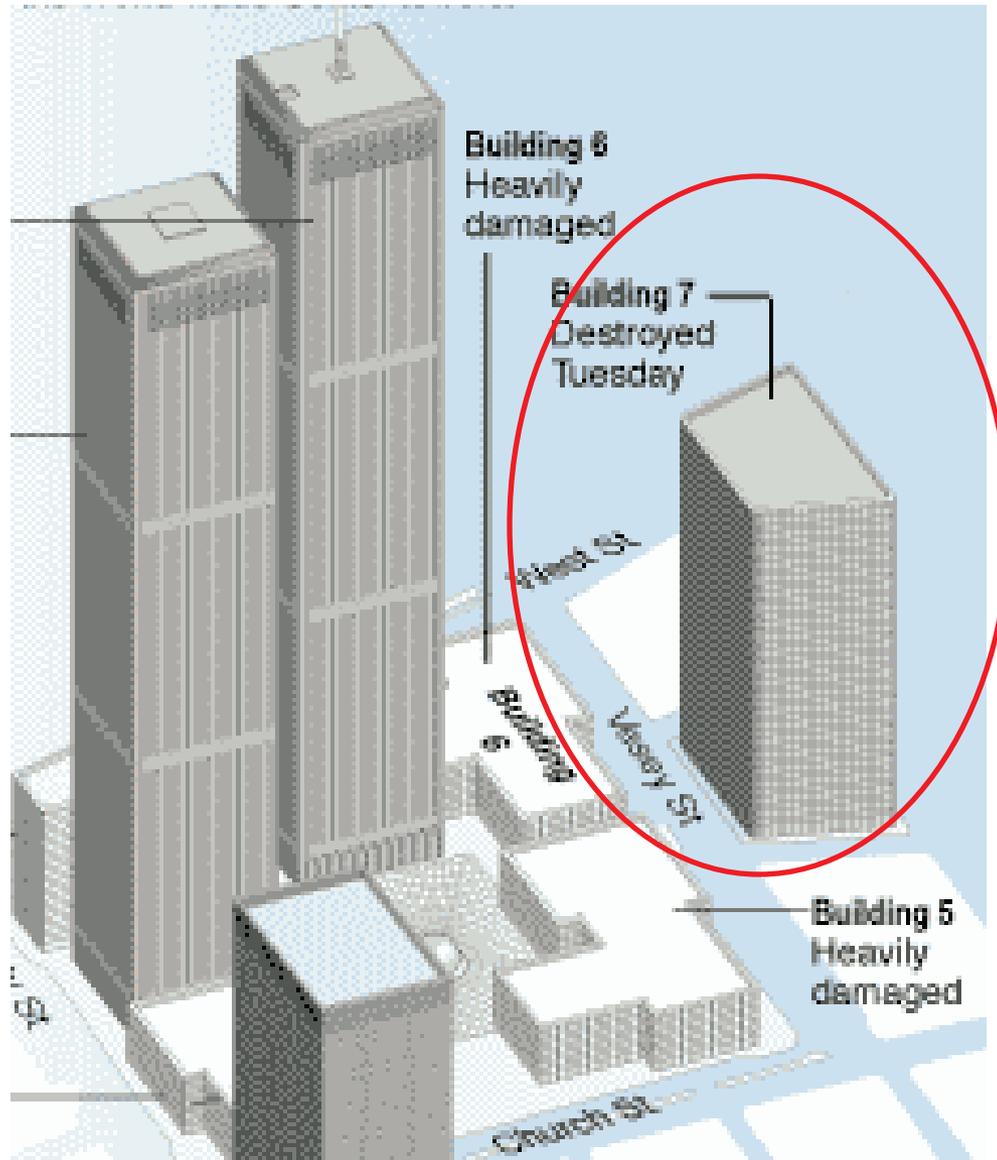
Debunked

- The steel structure of the World Trade Center would not have to melt in order for the buildings to lose their structural integrity. Steel can be soft at 538°C (1,000°F) well below the burning temperature of the fires raging inside the building. Softened steel cannot resist the forces on it.
- As the columns failed, the weight on top crushed the remaining structure, falling and compressing the air in the floors below. The air escaped through ducts in the side of the structure, a feature used by some irresponsibly as some sort of ignition or bombs, it was not. It was just air and dust.
The speed of the descent of the building was as would be expected, not accelerated as some would try to make you believe.

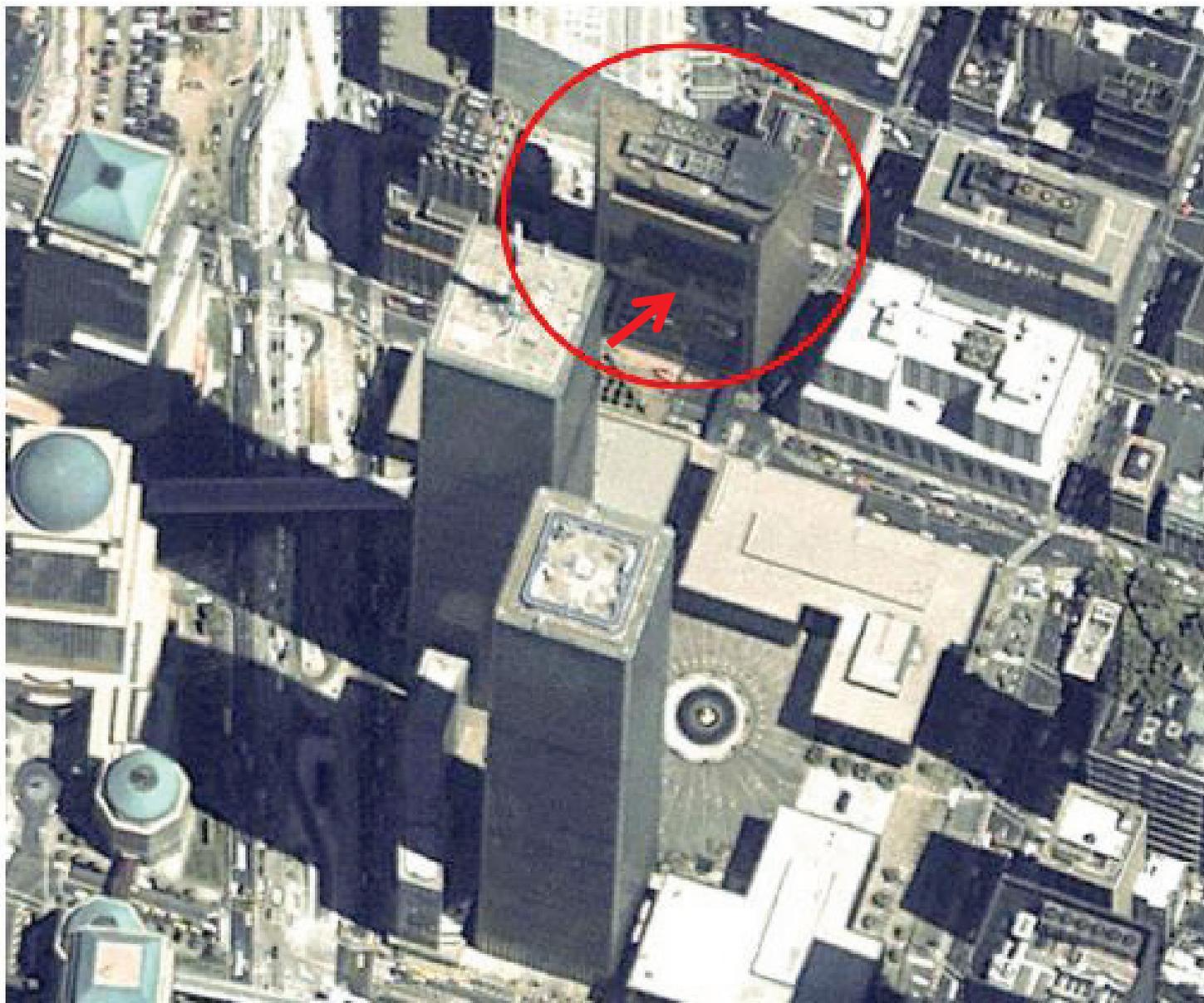
One Result of Tower One Going Down: is Building 7 being hit by debris.

- Building 7, part of the original World Trade Center, was completed in 1987.
- 7 World Trade Center was 47 stories tall, clad in red masonry, and occupied a trapezoidal footprint. The building was situated above a Consolidated Edison power substation and the subway, which imposed unique foundation structural design constraints.
- On September 11, 2001, the structure was damaged by debris when the nearby North Tower of the World Trade Center collapsed. The debris also ignited fires, which continued to burn throughout the afternoon on lower floors of the building. The building's internal fire suppression system lacked water pressure to fight the fires, and the building collapsed completely at 5:20 pm

Building 7



Building 7

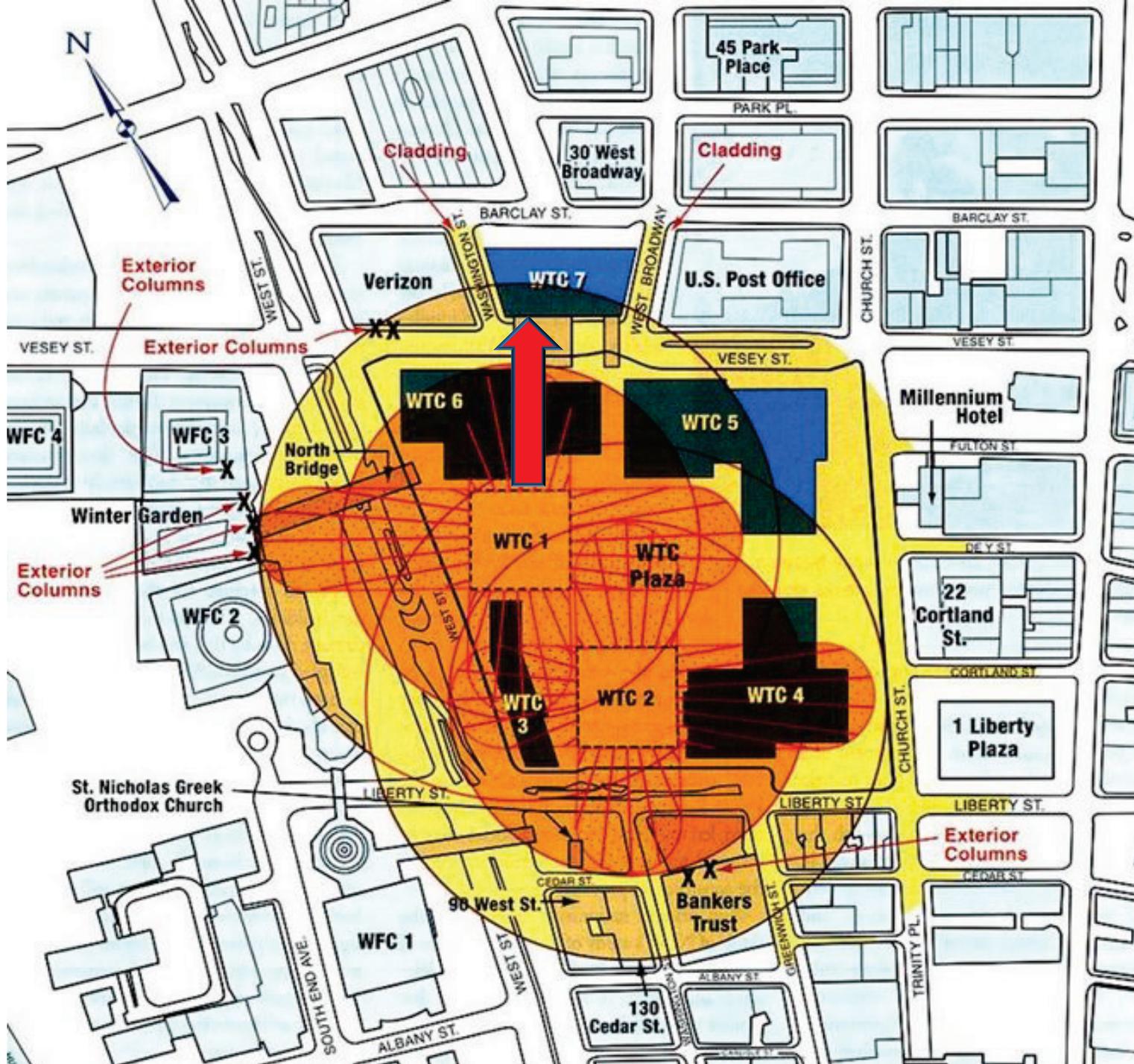




Building 7

WTC 7





Options as to why WTC 7 came down

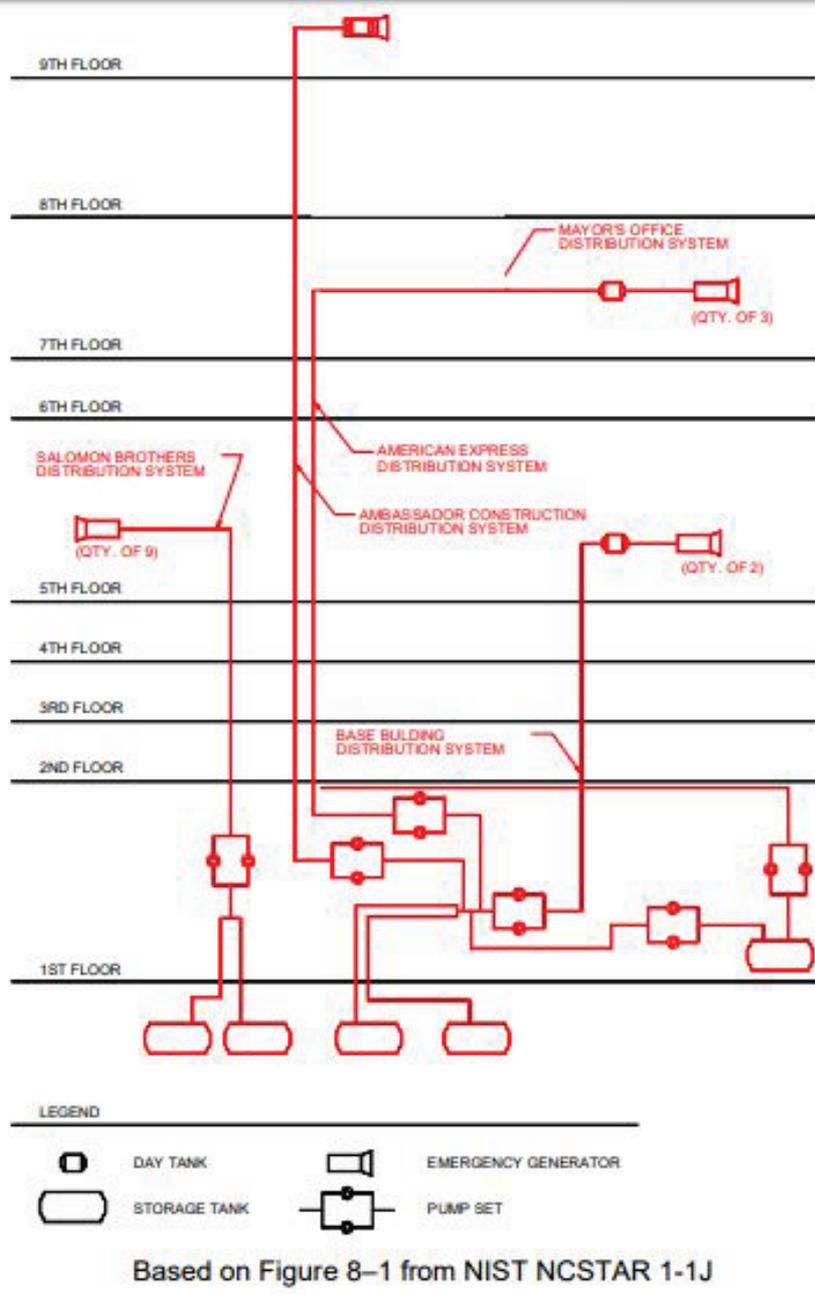
1. Foundation failure
2. Diesel Fuel fires
3. Weight of water in tanks on top
4. Impacts of WTC 1 on the building
5. Explosives placed in the building
6. Structure failed due to fire

2. Diesel Fuel

Table 1-2. Emergency power systems in WTC 7.

	Base Building System	Salomon Brothers System ⁴	Mayor's OEM System
Fuel Storage Tank Capacities	Two 12,000 gal tanks	Two 6,000 gal tanks	Single 6,000 gal tank
Tank Locations	Below the loading dock	Below the loading dock	1 st floor
Locations of Generator(s)	Two on 5 th floor	Nine on the 5 th floor	Three on the 7 th floor
Day Tanks and Locations	Single 275 gal tank on the 5 th floor	None ^a	Single 275 gal day tank on the 7 th floor
Day Tank Pump Locations and Capacities	Two, on the 1 st floor; 4.4 gal/min	Two circulating pumps on 1 st floor, 70 gal/min	Two, on the 1 st floor, 12 gal/min
Ambassador (U.S. Secret Service) Modification	Generator and 50 gal day tank on 9 th floor; two pumps on the 1 st floor, 2.4 gal/min		
American Express Modification	Generator and 275 gal day tank on 8 th floor ^b ; two pumps on the 1 st floor, 2.8 gal/min		

There was lots of fuel, but there were not clouds of black smoke, and the fuel would have burned off well before the failure. Thus this was ruled out.



3. Weight of water in tanks

- The 47 story tower did not fail due to excessive weight, it stood for hours. Excessive weight would have taken it down immediately.

4. Impact of debris

- The tower did not fail due to impact from the debris, it stood for hours. The impact would have taken it down immediately.

5. Demolition charges

- The tower did not fail due to demolition charges. The noise of the C4, dynamite, or any other explosives would have been heard for a half mile. There was no such noise. The idea that people would have had access and were able to cut the foundation to place the explosives is not believable.

6. Fire

The collapse of WTC 7 could not have been prevented without controlling the fires before most of the combustible building contents were consumed. There were two sources of water (gravity fed overhead tanks and the city water main) for the standpipe and automatic sprinkler systems serving Floor 21 and above, and some of the early fires on those upper floors might have actually been controlled in this manner. However, consistent with the NYCBC, both the primary and back-up source of water for the sprinkler system in the lower 20 floors of WTC 7 was the city water main. Since the collapses of the WTC towers had damaged the water main, there was no secondary supply of water available (such as from the gravity-fed overhead tanks that supplied water to Floor 21 and above) to control those fires that eventually led to the building collapse.

Other than initiating the fires in WTC 7, the damage from the debris from WTC 1 had little effect on initiating the collapse of WTC 7. The building withstood debris impact damage that resulted in seven exterior columns being severed and subsequently withstood fires involving typical office combustibles on several floors for almost seven hours. The debris damaged the spray-applied fire resistive material that was applied to the steel columns, girders, and beams, only in the vicinity of the structural damage from the collapse of WTC 1. This was near the west side of the south face of the building and was far removed from the buckled column that initiated the collapse. Even without the structural damage, WTC 7 would have collapsed from fires having the same characteristics as those experienced on September 11, 2001. The transfer elements such as trusses, girders, and cantilever overhangs that were used to support the office building over the Con Edison substation did not play a significant role in the collapse of WTC 7.

Table 1-1. Use of floors in WTC 7.

Floor(s)	Tenant or Function ^a
46, 47	Mechanical space, Citigroup Water tanks - fire protection for floors 21 to roof
26 through 45	Citigroup
25	U.S. Internal Revenue Service, Department of Defense, Central Intelligence Agency
24	U.S. Internal Revenue Service
23	New York City Mayor's Office of Emergency Management (OEM)
22	Federal Home Loan Bank of New York
21	First State Management Group
19 through 21	The Hartford Insurance Company
18	Equal Employment Opportunity Commission, Teleport, Metropolitan Fiber Systems
15 through 17	Citigroup
14	Vacant
13	U.S. Securities and Exchange Commission, Provident Financial Management, American Express
11, 12	U.S. Securities and Exchange Commission Fires
10, 9	U.S. Secret Service
7, 8	American Express Fires
5, 6	Mechanical floors
4	Meeting spaces, cafeteria
1 through 3	Lobbies, conference center Auditorium

^a Among those interviewed by the Investigation Team, there was limited recollection of the organizations occupying some of the floors, especially those occupying smaller spaces, and no one had copies of all the tenant leases.

NE CORNER BUILDING 7



12

11

10

9

8

7

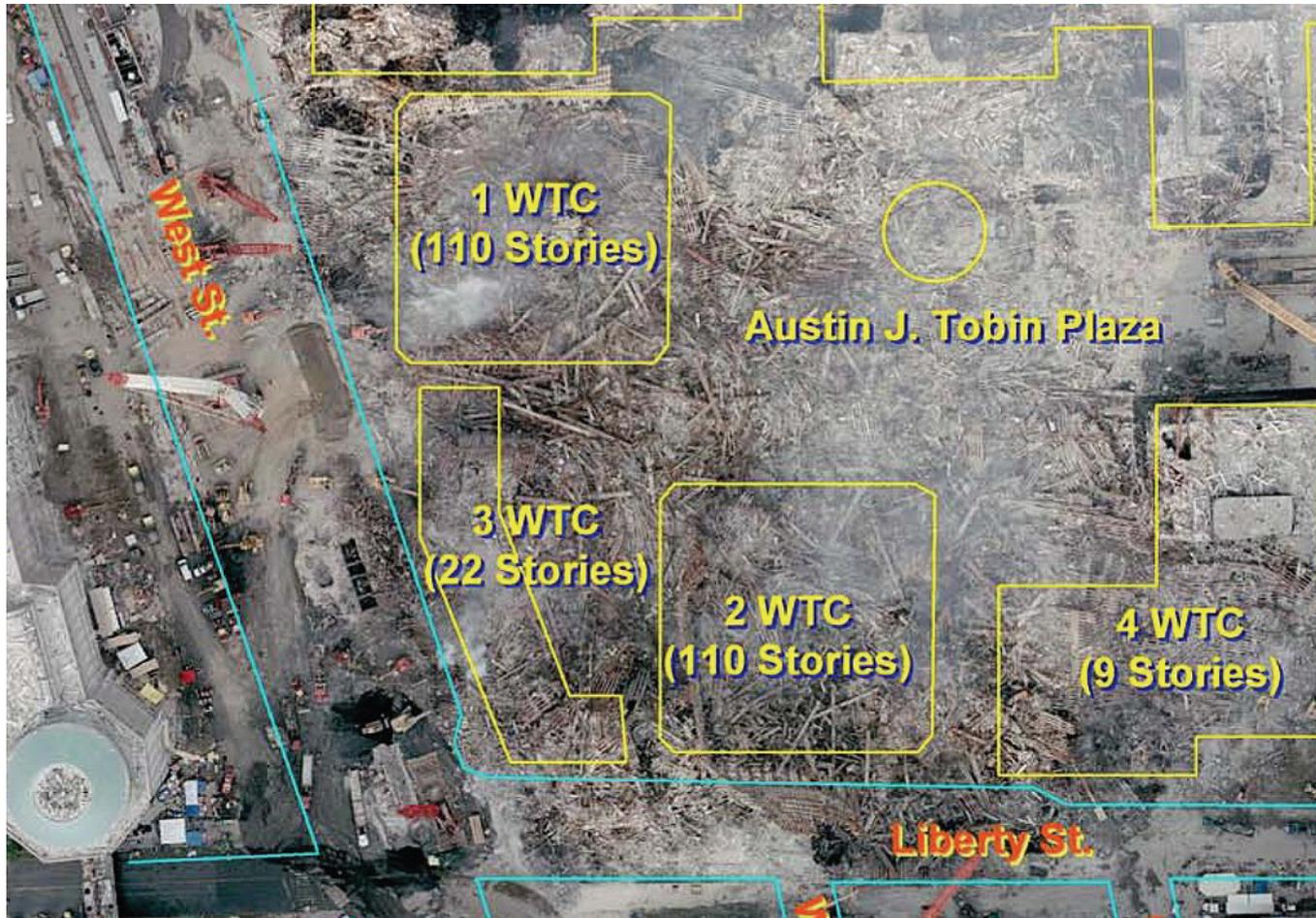
6

5

4

Why did WTC 7's sprinkler systems fail during the fires?

The sprinkler systems did not fail. The collapse of WTC 1 and WTC 2 damaged the city water main. The water main served as both the primary and backup source of water for the sprinkler system in the lower 20 floors. Therefore, the sprinkler system could not function. In contrast, the sprinklers and standpipes on the building's middle levels (21st floor through 39th floor) and upper levels (40th floor through 47th floor) received water from two large overhead storage tanks on the 46th floor, and used the city's water mains as a backup.



This is what the rest of the World Trade Center looked like

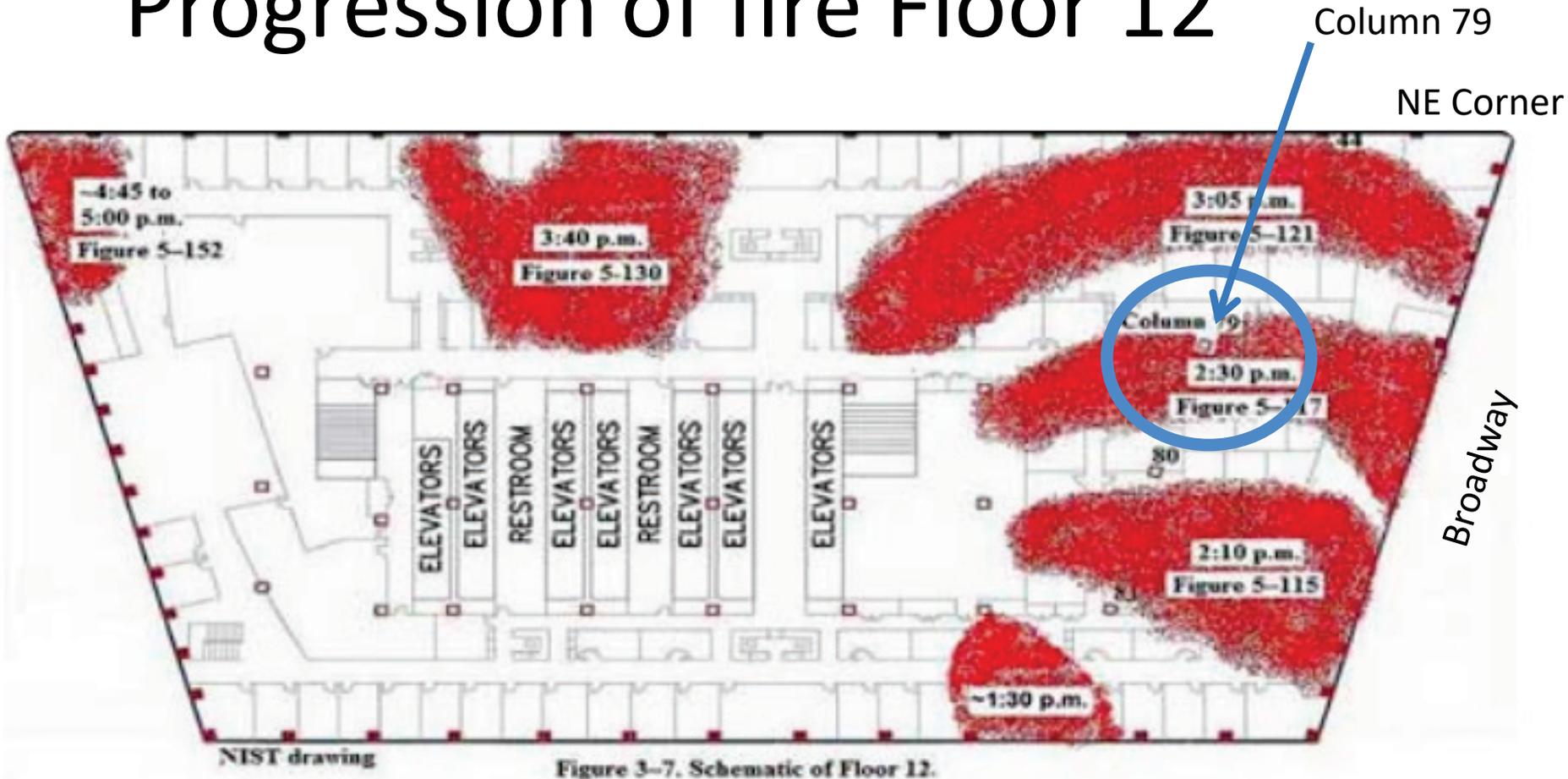
Floor 7 (American Express) engulfed in flames,
upper floors did not burn



NE Corner on Broadway



Progression of fire Floor 12



Approximation of the interior/interior fire front on Floor 12.
Based on the NIST starting point near the center of the south face at noon.
(NCSTAR 1-9 Vol.2 p. 382) and photographs (NCSTAR 1-9 Vol.1 p. 200-237)

Foundation

Restriction to foundation, Con Ed



Source: Con Edison, used with permission. (Photo taken prior to September 11, 2001.)

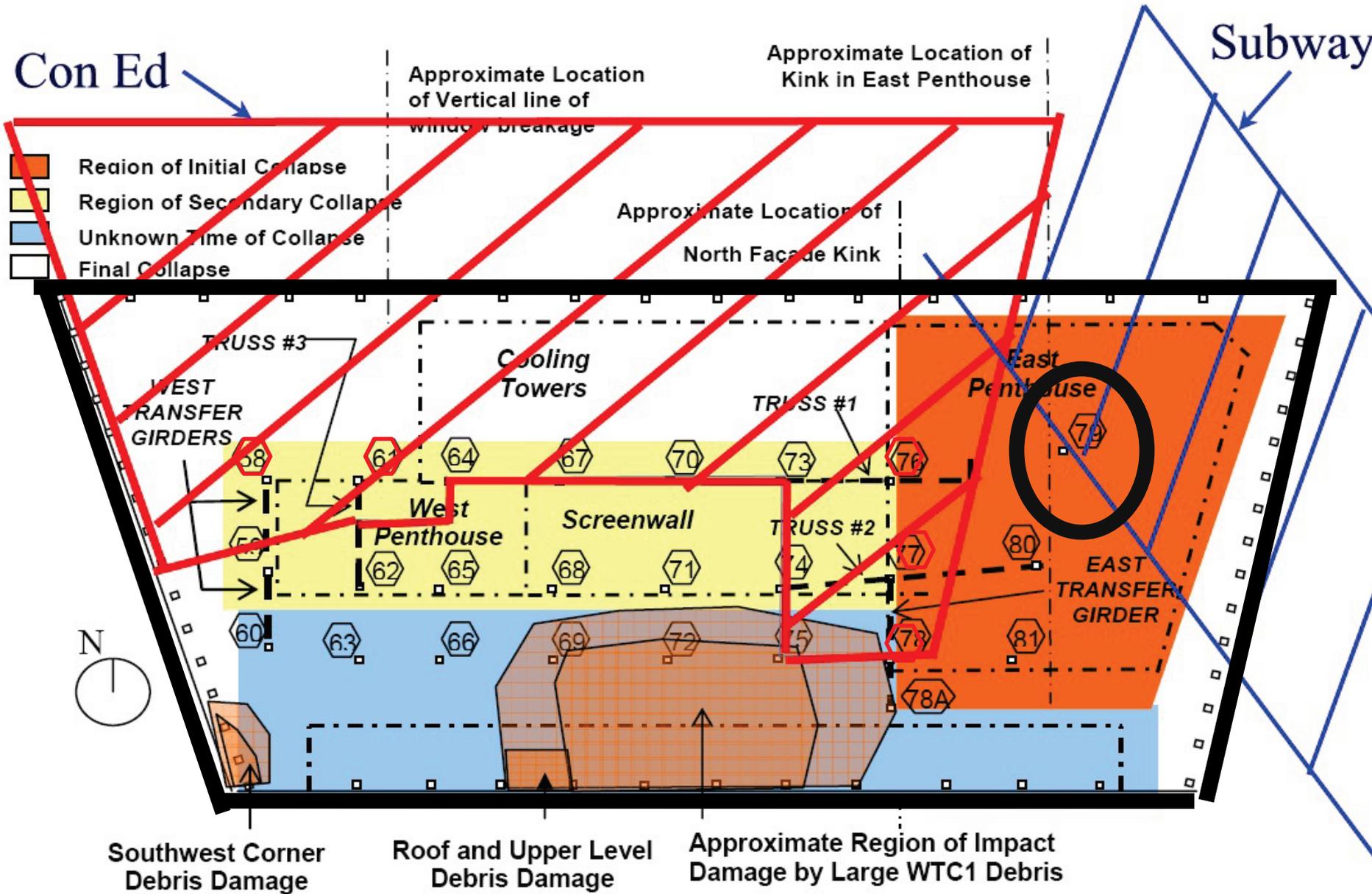
Note: Enhancement by NIST

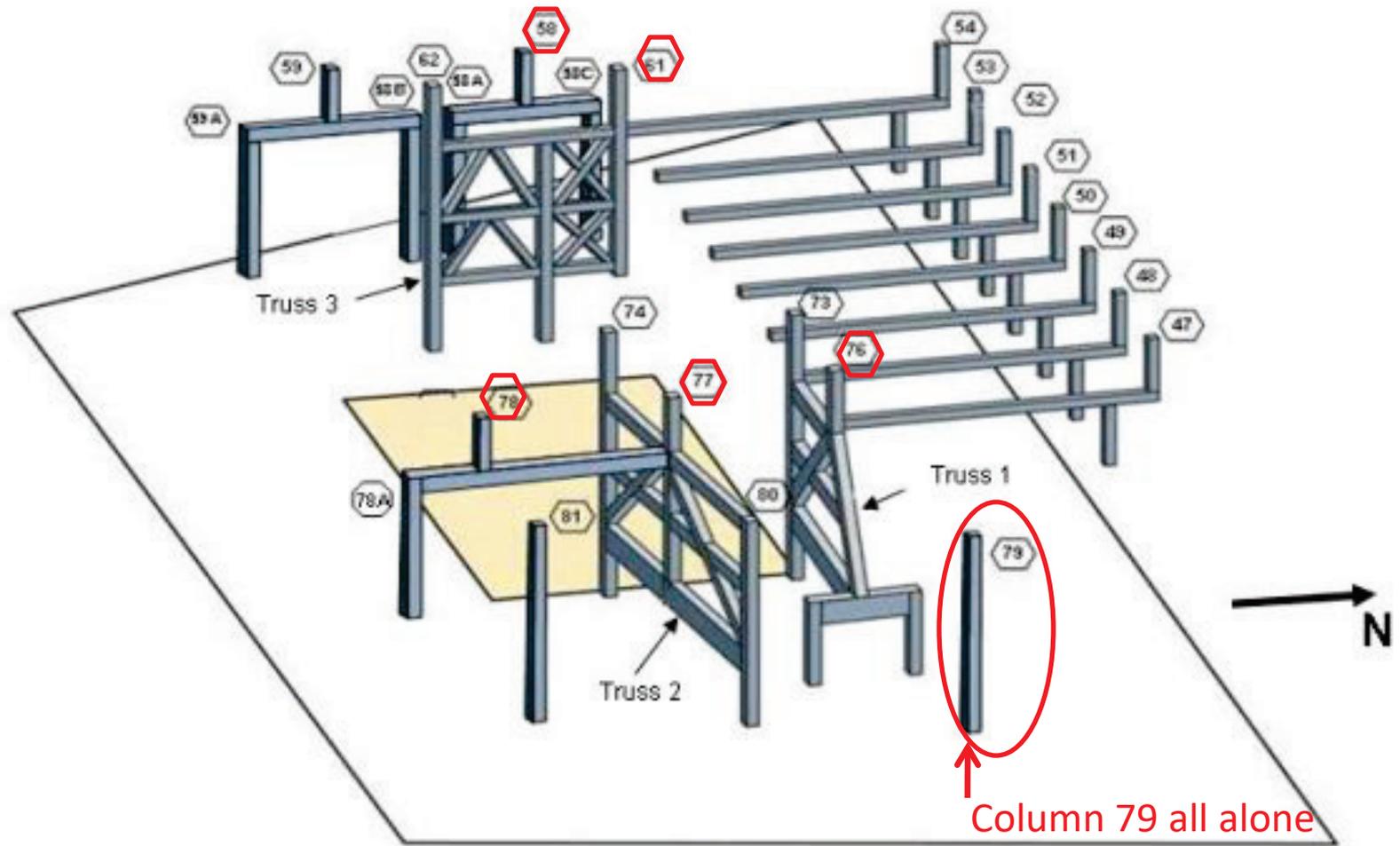
Figure 1–4. Aerial view from the north side of WTC 7, showing the Con Edison substation.

Nomenclature

- Girder
 - Horizontal member, it usually has beams attached to it
- Beam
 - Horizontal member usually holding up the floor, connected to the girder
- Column
 - Vertical member
- Truss
 - Matrix of members, usually to span over something

Limits on foundation

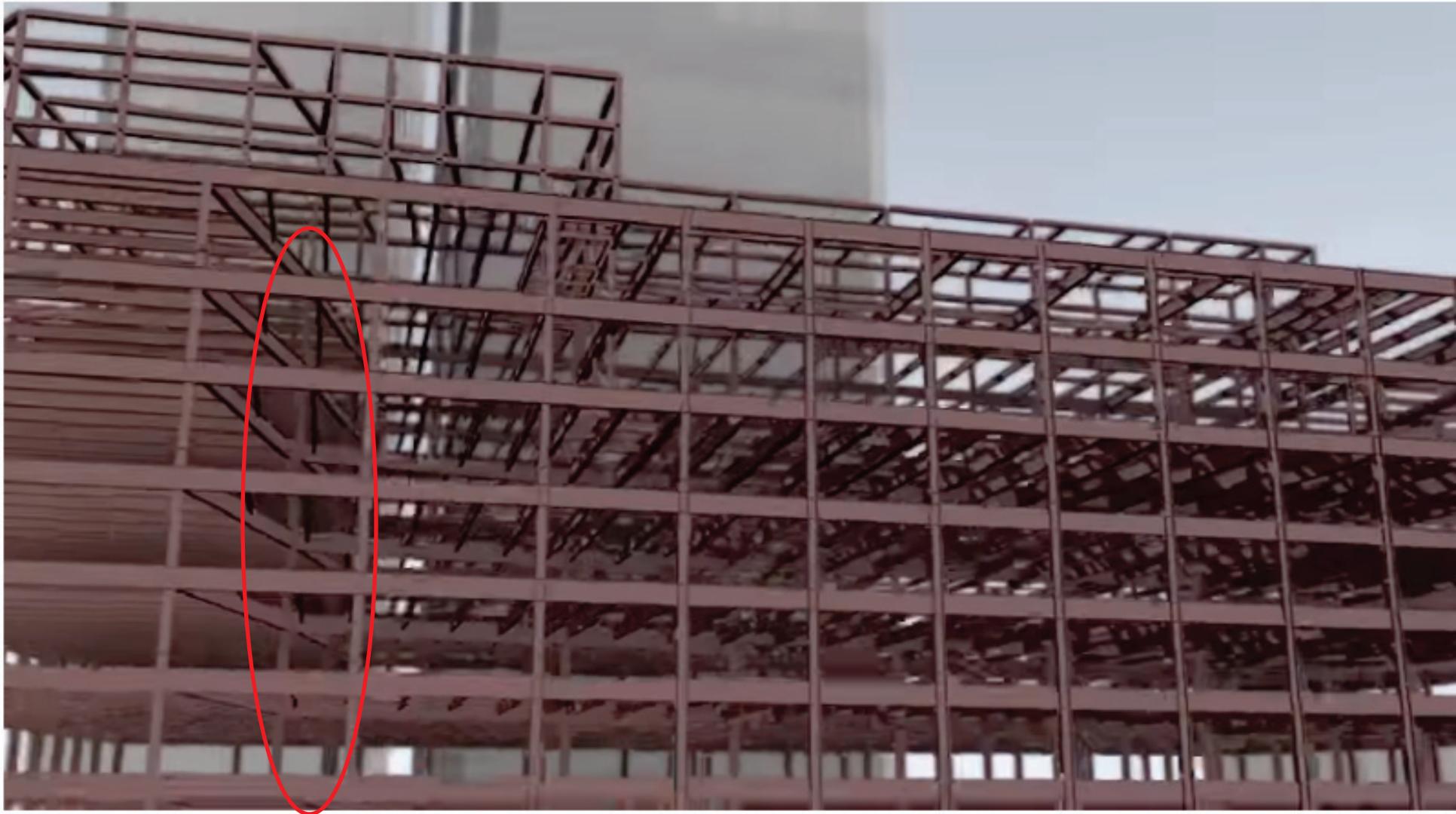




Source: McAllister 2002

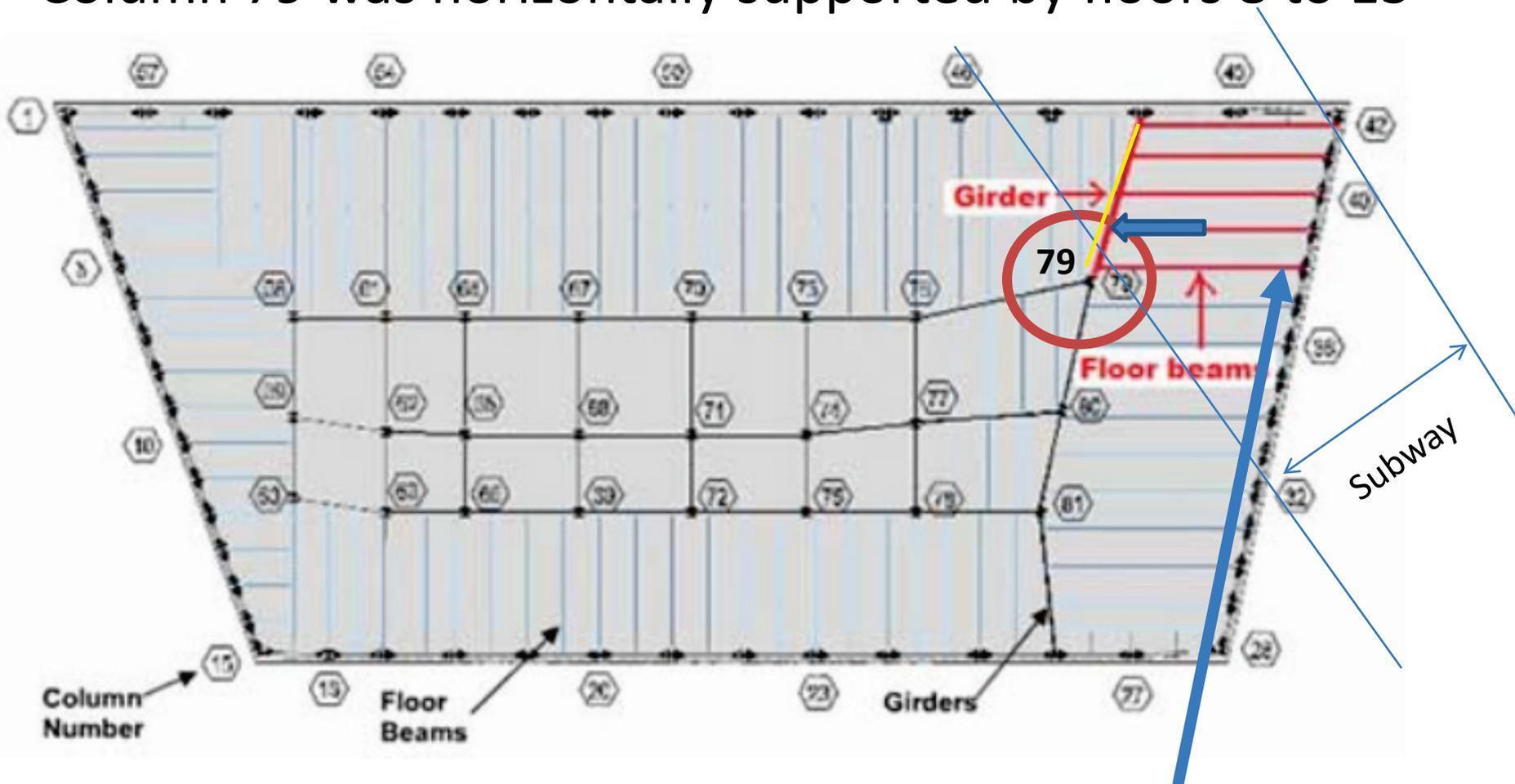
Figure 1–6. 3D schematic view of transfer trusses and girders between Floors 5 and 7.

Column 79



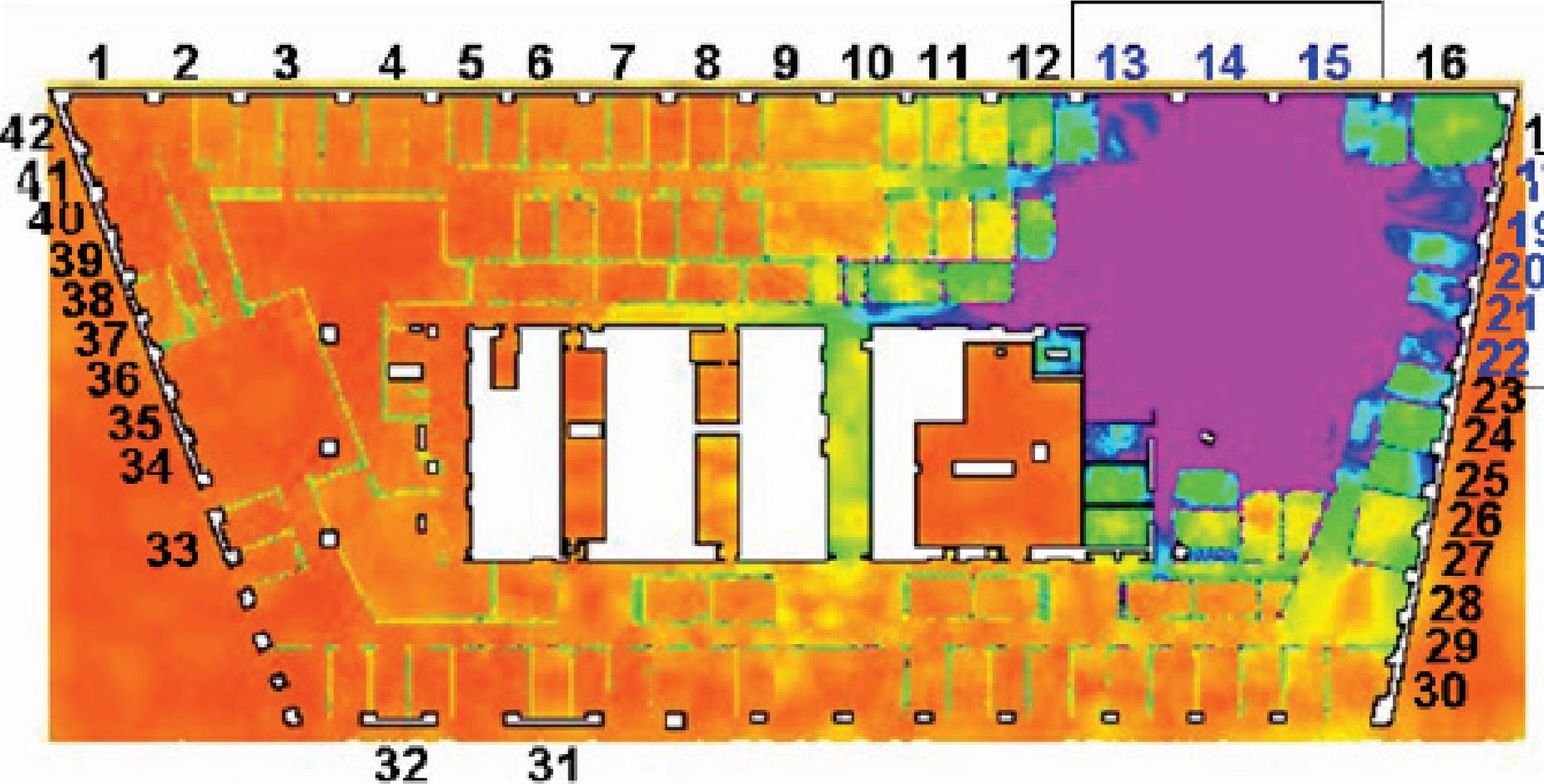
Floor 13

Column 79 was horizontally supported by floors 8 to 13



The fire on floor 12 heated the floor beams (in red) on floor 13. They expanded and pushed the girder (in yellow) attached to column 79 off its support which allowed floor 13 to collapse. This collapsed floor 12 down to 8.

Heat from fires



0.000E+00

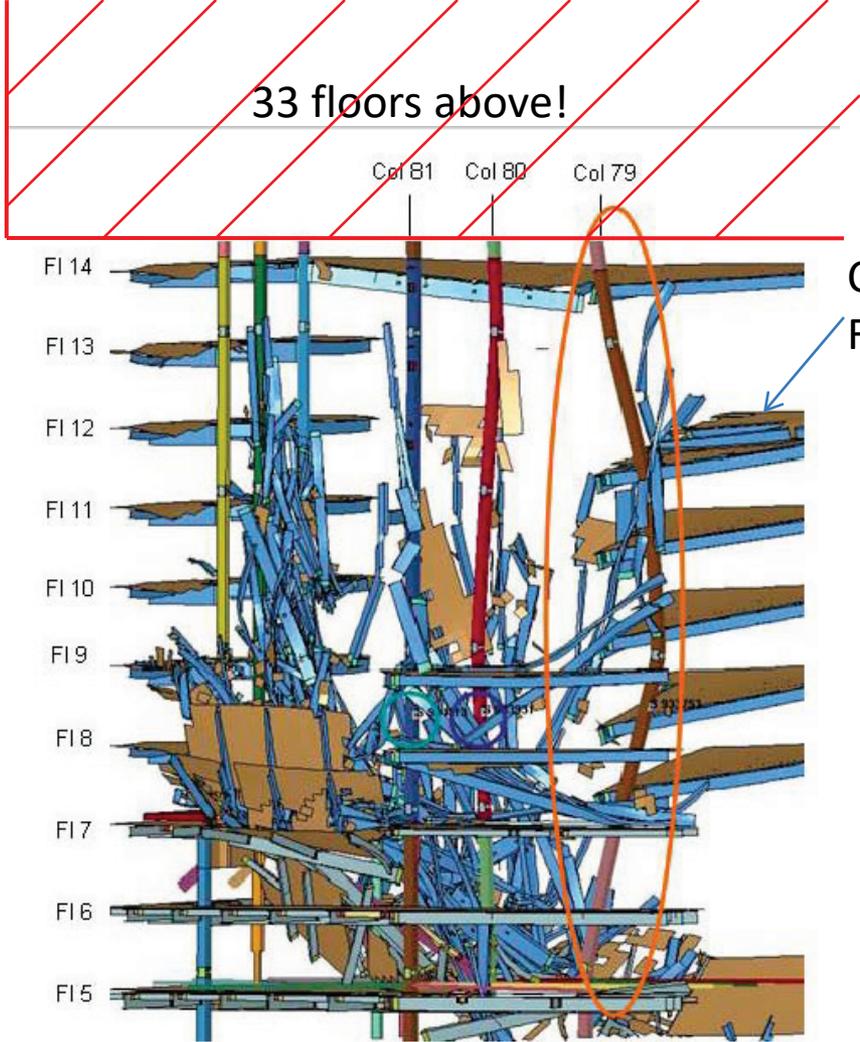
6.579E-01

1.316E+00

1.974E+00

2.500E+00

psi



Column 79 Collapse

The fire spread *internally* through the offices around column 79 and under the beams, which underwent enough thermal expansion to push the girder on floor 13 off its seat causing the floor to collapse. Floor 13 landed on 12 and caused it to collapse.

When floors 8 to 13 collapsed, column 79 bowed and initiated the “global collapse” at 5:20 PM.

Looking west

This was an analysis of unprecedented complexity-an end-to-end computer run on some powerful computers, it took about eight months

Location of "Kink" or Fault
Column 79



Collapse

- At Column 79, heating and expansion of the floor beams in the northeast corner caused the loss of connection between the column and a key girder. Additional factors that contributed to the failure of the critical north-south girder were
 - (1) the absence of shear studs that would have provided lateral restraint and
 - (2) the one-sided framing of the east floor beams that allowed the beams to push laterally on the girders, due to thermal expansion of the beams.
- The fires thermally weakened Floors 8 to 14. As Floor 13 fell onto the floor below, a
- cascade of floor failures continued until the damage reached the massive Floor 5 slab.
- This left Column 79 without lateral support for nine floors. The long unsupported length of Column 79 led to its buckling failure.

Building 7

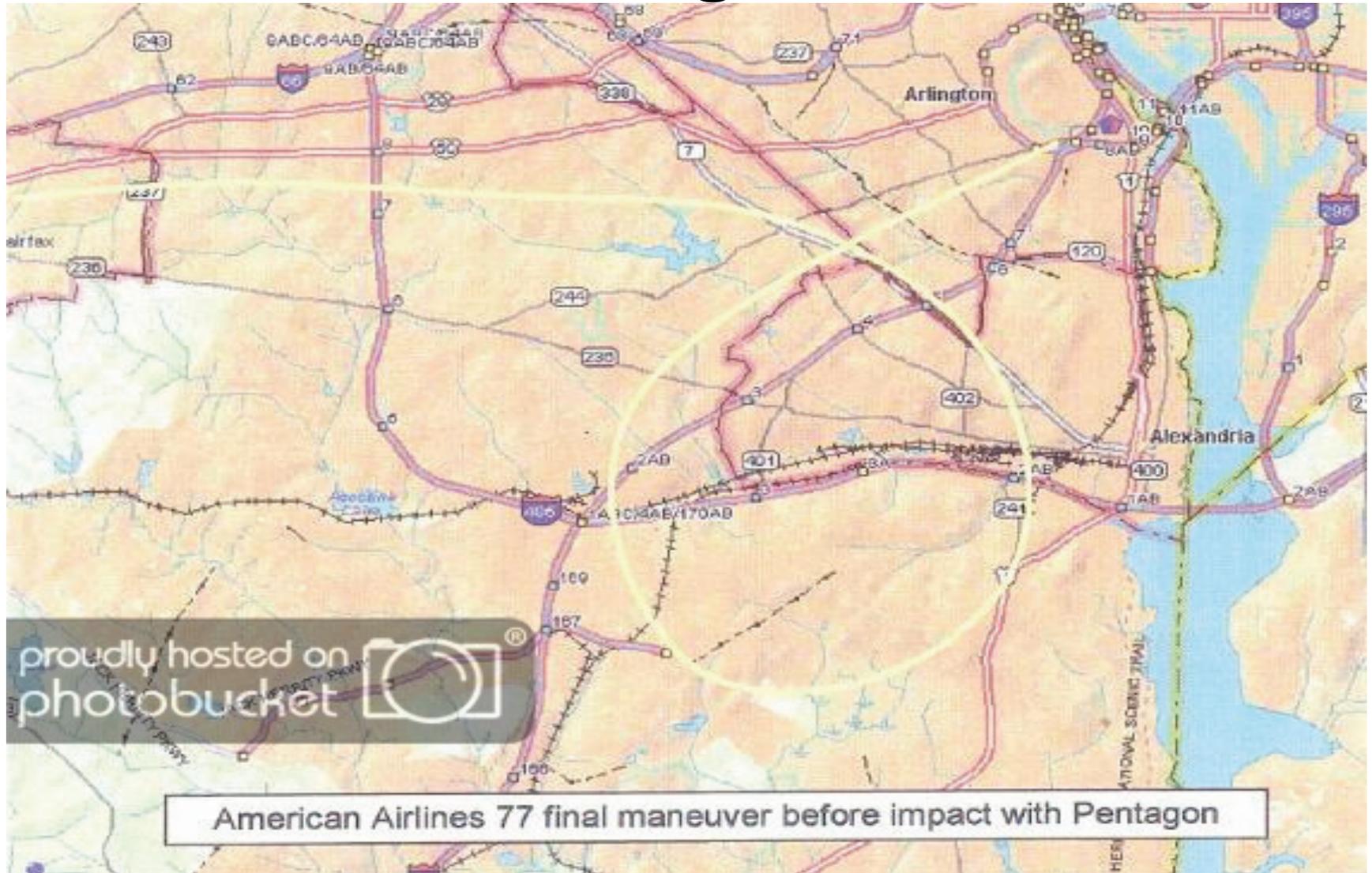


Third Plane



- **American Airlines Flight 77** was a scheduled American Airlines domestic transcontinental passenger flight from Washington Dulles International Airport in Dulles, Virginia, to Los Angeles International. The **Boeing 757-223 aircraft weighing 225 tons** was hijacked by five men affiliated with al-Qaeda on September 11, 2001. They deliberately crashed the plane into the Pentagon in Arlington County, Virginia, near Washington, D.C., killing all 64 people on board, including the five hijackers and six crew, as well as 125 people in the building.
- Less than 35 minutes into the flight, the hijackers stormed the cockpit and forced the passengers, crew, and pilots to the rear of the aircraft. **Hani Hanjour**, one of the hijackers who was trained as a pilot, assumed control of the flight. Passengers aboard made telephone calls to friends and family and relayed information on the hijacking.
- The hijackers crashed the aircraft into the western side of the Pentagon at **09:37** EDT. Many people witnessed the airplane crash, and news sources began reporting on the incident within minutes. The impact severely damaged an area of the Pentagon and caused a large fire. A portion of the building collapsed; firefighters spent days working to fully extinguish the blaze.

Pentagon



9:37:46: Flight 77 crashes into the western side of the Pentagon at 530 mph

Pentagon

- Eyewitnesses affirm large plane impact, and the damage trail establishes the plane path before and after impact. The plane flew low from the southwest straight toward the Pentagon going 530 mph on a path making a 52-degree angle with the Pentagon's west wall. It clipped a tree; downed five light poles; struck a fence, a generator-trailer, and a low concrete wall; and impacted the building at the first and second floors, creating an 18-foot wide hole atop a 96-foot gash in the façade.
- Outside, plane debris was strewn to the north near the Heliport because of the speed and angle of impact. The light poles' damage gives a plane wingspan in the range 100 to 130 feet (a Boeing 757 wingspan is 124 feet 10 inches), while the low concrete wall and generator-trailer damage indicates an engine distance from the fuselage of approximately 43 feet (Boeing 757 engine separation is 42.5 feet).



Pentagon



Pentagon



Airplane debris



ENGINE PARTS

Fourth Plane



- **United Airlines Flight 93** was a domestic scheduled passenger flight that was hijacked by four al-Qaeda terrorists on board. It crashed into a field in Somerset County, Pennsylvania, during an attempt by the passengers and crew to regain control. All 44 people on board were killed, including the four hijackers, but no one on the ground was injured. The aircraft involved, a **Boeing 757-222**, was flying United Airlines' daily scheduled morning flight from Newark International Airport in New Jersey to San Francisco International Airport.
- The hijackers stormed the aircraft's cockpit 46 minutes after the delayed takeoff. The pilot and first officer took measures, such as de-activating the autopilot, to hinder the hijackers. **Ziad Jarrah**, who had trained as a pilot, took control of the aircraft and diverted it back toward the east coast, in the direction of Washington, D.C. **Khalid Sheikh Mohammed** and **Ramzi bin al-Shibh** (considered principal instigators of the attacks) have claimed that *the intended target was the Capitol Building*.
- After the hijackers took control of the plane, several passengers and flight attendants learned from phone calls that suicide attacks had already been made by hijacked airliners on the World Trade Center and the Pentagon in Arlington County, Virginia. Many of the passengers then attempted to regain control of the aircraft from the hijackers using a food cart as a battering ram. During the struggle, the plane crashed into a field near a reclaimed strip mine in Stonycreek Township, near Indian Lake and Shanksville, about 65 miles (105 km) southeast of Pittsburgh and 130 miles (210 km) northwest of Washington, D.C. at **10:07 AM**.
- A few people witnessed the airplane's impact from the ground, and news agencies began reporting the event within an hour.

Shanksville

- Flight 93 had been delayed in take off, thus those passengers learned of the other hijackers flying the airplanes into the towers.
- They decided to storm the cockpit using a fire extinguisher and a food cart as a battering ram .
- The hijacker tried left an right, up and down motions to stop the passengers.
- The airplane hit the soft ground doing over 580 miles per hour.

Flight 93, headed for the White House or Congress, “Lets roll”



United Airlines Flight 93 crash site, Shanksville, Pennsylvania

“I miss September 12.”

- Quote from my neighbor, “I miss how the whole country got together as one on that day.”



What Happened

1. It was a terrorist plot to fly planes into targets valued by the US, the Capital was saved by the brave actions of the passengers.
2. There were four planes involved (but as all planes were grounded, no one knows if more had been in on the plot).
3. There were no explosives in the buildings.
4. Building can collapse on their own if allowed to burn.
5. Phone calls were made and recorded from the planes
6. Remote controlled planes are not yet practical nor are available.
7. None of the hijackers are still alive, the planners Khalid Sheikh Mohammed and Ramzi bin al-Shibh (and others) were captured and provided more details..
8. All 265 passengers and crew died.

THE IMPORTANCE OF SIDE SUPPORT

As I demonstrated with the yardstick, the buildings WTC 1, WTC 2, and WTC 7 all fell because columns lost their sideways support.

- QUESTIONS?

