THE WORLD TRADE CENTER DEMOLITION.

On the 11th September, 2001, three steel framed skyscrapers, World Trade Center One, World Trade Center Two and World Trade Center Seven, collapsed entirely. Other than structures bought down in controlled demolitions, these three buildings are the only steel framed skyscrapers, in the entire history of high rise buildings, to have suffered total collapse. World Trade Centers 3, 4, 5 and 6 also suffered significant damage, but none of these suffered the total collapse seen in World Trade Centers 1, 2 and 7 (in fact, these other buildings showed amazing survivability given that they were repeatedly hit by hundreds of tons of pieces of World Trade Centers 1 and 2, which on impact were traveling at well over 100 miles per hour).

On the 23rd July, 2001, just seven weeks previous, the Port Authority of New York and New Jersey signed a deal with a consortium led by Larry Silverstein for a 99 year lease of the World Trade Center complex. The leased buildings included WTCs One, Two, Four, Five and 400,000 square feet of retail space. The Marriott Hotel (WTC 3), U.S. Customs building (WTC 6) and Silverstein's own 47-story office building (WTC 7) were already under lease. Silverstein is seeking $7.2 billion from insurers for the destruction of the center. One would estimate that the chances of the insurers paying out anything at all, are close to zero.

It should be emphasized that World Trade Center Seven suffered total collapse. World Trade Center Seven was neither hit by an aircraft nor by falling debris from the twin towers. If the claim that it was destroyed by fire were true (it is not) then it would be the only steel framed skyscraper ever to have collapsed exclusively due to fire. Although the WTC Seven collapse warrants the writing of a book, we will deal only with the collapses of WTCs One and Two.

THE WTC WAS DESIGNED TO SURVIVE THE IMPACT OF A BOEING 767.

Fact. The twin towers were designed to withstand a collision with a Boeing 707.

In the early 1970's the World Trade Center's chief structural engineer, Leslie Robertson, calculated the effect of the impact of a Boeing 707 with the World Trade Center towers. His results were reported in the New York Times where it was claimed that Robertson's study proved the towers would withstand the impact of a Boeing 707 moving at 600 miles an hour. Little did he know that decades later, two aircraft, almost identical to the Boeing 707, would impact the towers.

The maximum takeoff weight for a Boeing 707-320B is 336,000 pounds.
The maximum takeoff weight for a Boeing 767-200ER is 395,000 pounds.

The wingspan of a Boeing 707 is 146 feet.
The wingspan of a Boeing 767 is 156 feet.

The length of a Boeing 707 is 153 feet.
The length of a Boeing 767 is 159 feet.

The Boeing 707 could carry 23,000 gallons of fuel.
The Boeing 767 could carry 23,980 gallons of fuel.

However, the actual aircraft involved in the World Trade Center impacts were only flying from Boston to Los Angeles, and consequently, would have been nowhere near fully fueled on takeoff (the Boeing 767 has a maximum range of 7,600 miles (12,220 km)). The aircraft would have carried just enough fuel for the trip together with some safety factor. Remember, that carrying excess fuel means higher fuel bills and less paying passengers. The aircraft would have also burnt some fuel between Boston and New York.

Government sources estimate that each of the Boeing 767's had approximately 10,000 gallons of unused fuel on board at the times of impact.

To give you some idea how much jet fuel this is, an 11 foot by 11 foot by 11 foot tank contains 10,000 gallons

(1 US gallon = 0.13368 cubic feet). So a novel way of destroying high-rise buildings is to load an 11 foot by 11 foot by 11 foot glass tank of jet fuel into a Ryder truck, drive it into the ground floor lobby, break the glass, set light to the fuel and walk away, the high-rise should collapse in about an hour (after all, 12,000 gallons of diesel was all it took to bring down WTC 7). Look mom, no explosives needed.

Since, the Boeing 767 is much more fuel-efficient than the 707, a Boeing 707 traveling the same route would carry significantly more fuel and would therefore be a much greater danger from the perspective of a jet fuel fire.

Thus the quantity of fuel that burnt on September 11 would have been envisaged by those who designed the towers. In fact, the towers were designed to survive much more serious fires than those of September 11. Over the years, a number of other high-rise buildings have suffered significantly more serious fires, but none have collapsed (not one). Before September 11, no steel framed skyscraper had ever collapsed due to fire. However, on September 11, it is claimed that three steel framed skyscrapers collapsed mainly, or totally, due to fire.

See this article for proof that the jet fuel fires can be ruled out as the cause of the World Trade Center collapses.

The cruise speed of a Boeing 707 is 607 mph = 890 ft/s,
The cruise speed of a Boeing 767 is 530 mph = 777 ft/s.

So, the Boeing 707 and 767 are very similar aircraft, with the main differences being that the 767 is slightly heavier and more fuel-efficient, and the 707 is faster.

The thrust to weight ratio for a Boeing 707 is 4 x 18,000/336,000 = 0.214286.

The thrust to weight ratio for a Boeing 767 is 2 x 31,500/395,000 = 0.159494.

Since the Boeing 707 had a higher thrust to weight ratio, it would be traveling faster on take-off and on landing.

And, since the Boeing 707 would have started from a faster cruise speed, it would be traveling faster in a dive. So in all the likely variations of an accidental impact with the WTC, the Boeing 707 would be traveling faster. In terms of impact damage, this higher speed would more than compensate for the slightly lower weight of the Boeing 707.

To illustrate this point we calculate the energy that the planes would impart to the towers in any accidental collision at their cruise speed.

The kinetic energy released by the impact of a Boeing 707 at cruise speed is
$= 0.5 \times 336{,}000 \times (890)^2/32.174$
= 4.136 billion ft lbs force (5,607,720 Kilojoules).

The kinetic energy released by the impact of a Boeing 767 at cruise speed is
$= 0.5 \times 395{,}000 \times (777)^2/32.174$
= 3.706 billion ft lbs force (5,024,650 Kilojoules).

From this, we see that at cruise speed, a Boeing 707 would smash into the WTC with about 10 percent more energy than would the slightly heavier Boeing 767. That is, under normal flying conditions, a Boeing 707 would do more damage than a Boeing 767.

In conclusion we can say that if the towers were designed to survive the impact of a Boeing 707, then they were necessarily designed to survive the impact of a Boeing 767.

So what can be said about the actual impacts?

The speed of impact of AA Flight 11 has been estimated to be 470 mph = 689 ft/s.
The speed of impact of UA Flight 175 has been estimated to be 590 mph = 865 ft/s.

The kinetic energy released by the impact of AA Flight 11 was
$= 0.5 \times 395{,}000 \times (689)^2/32.174$
= 2.914 billion ft lbs force (3,950,950 Kilojoules).

This is well within limits that the towers were built to survive. So why did the North tower fall?

The kinetic energy released by the impact of UA Flight 175 was
$= 0.5 \times 395{,}000 \times (865)^2/32.174$

= 4.593 billion ft lbs force (6,227,270 Kilojoules).

This is within 10 percent of the energy released by the impact of a Boeing 707 at cruise speed. So, it is also a surprise that the 767 impact caused the South tower to fall.

Note that the speed of a projectile determines whether the impact damage is localized or spread across a large area. The faster the projectile, the more localized the damage. Common examples illustrating this effect are, the driving of a nail through a piece of wood, and the firing a bullet through a fencepost. Both are done at speed and thus do only local damage. In both of these examples, the wood just a centimeter or two from the impact point, is essentially undamaged. Similarly, the aircraft impacts were at great speed and the damage localized. This effect is

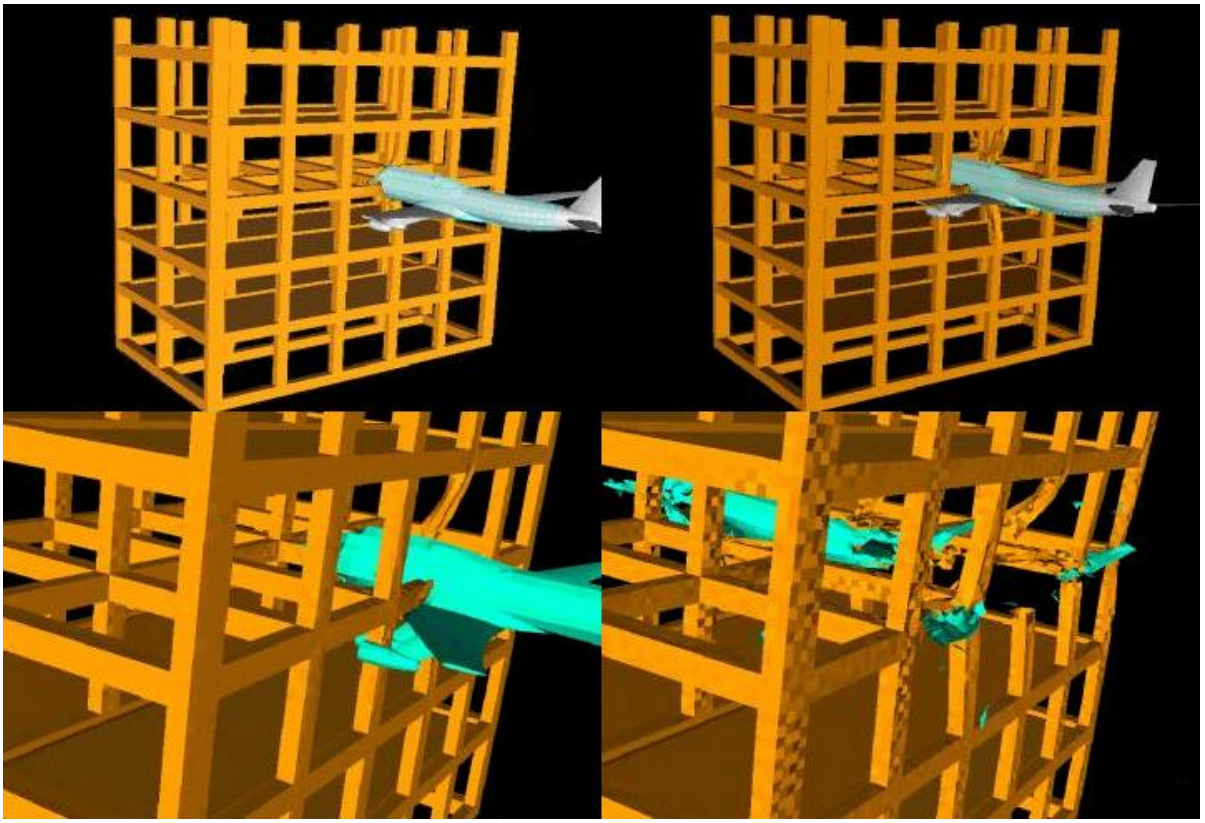


Figure 5. Results of simulation analysis of impact of a 747 jetliner crashing into a steel structure. Notice fracture of the steel column and breaking of the plane due to dynamic stresses (Graphics and analysis by MSC Software Corporation).

illustrated in the above graphic from the simulation of the crash of a Boeing 747 (maximum takeoff weight 875,000 lb, unloaded weight 670,200 lb, fuel capacity 57,285 gallons) with a steel framed building.

We are told that the "hijackers" wanted to cause maximum death and destruction, then why didn't they hijack Boeing 747s? Boeing 747s weigh more than twice as much, they can carry more than twice the fuel and travel faster than the Boeing 767. Consequently, Boeing 747s would have caused much more death and destruction than the 767s.

Also, why did the hijackers choose to hijack aircraft leaving Boston, when they could have just as easily hijacked aircraft from one of the New York city airports (LaGuardia, Newark or JFK). Hijacking aircraft from Boston, meant that they had to deviate from their designated routes, while still a long way from Manhattan. Of course, as is usual, all sorts of alarm bells would be set off as soon as the aircraft deviated substantially from their prescribed routes. Not only that, the US Air Force specialist quick response unit, the Air National Guard, would almost certainly intercept them before they reached their target (and would have assuredly shoot down the second 767, after seeing what happened to the first).

It is often claimed that the WTC was designed only to withstand the collision of a Boeing 707 that was seeking to land at one of the nearby airports, and that since such aircraft would be low on fuel, only small jet fuel fires were envisaged. However, this is an obvious lie. Why is it an obvious lie? Well, because if you take into consideration planes that are landing at an airport, then you must consider planes that are taking off, and such

planes are potentially fully laden with fuel.

Since the WTC towers were designed to handle extreme wind loading (140 mph hurricane force winds) they would survive the impact of a Boeing 707 (even one that was traveling at full speed) without adding any extra features to the design (above those already necessary to handle the wind loading). All that the designers would have to consider, is effect of a jet fuel fire from a fully fueled jet that crashed into one of the towers shortly after taking off from one of the local airports.

Overall, it comes as a great surprise that the impact of a Boeing 767 bought down either tower. Indeed, many experts are on record as saying that the towers would survive the impact of the much larger and faster Boeing 747. In this regard, see professor Astaneh-Asl's simulation of the crash of the much, much larger and heavier Boeing 747 with the World Trade Center. Professor Astaneh-Asl teaches at the University of California, Berkeley.

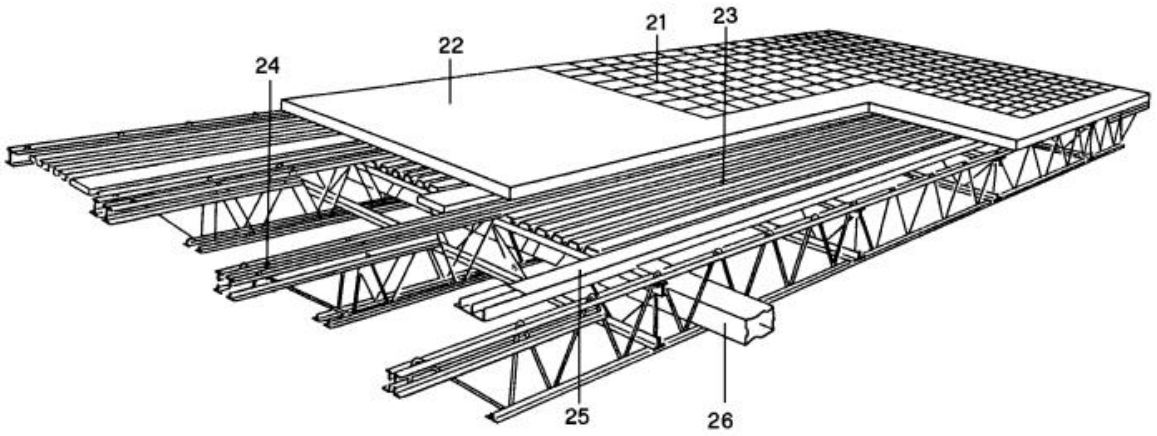
THE BAR JOISTS (TRUSSES).

The following is a critique of an article I wrote some time ago. The original article concerned certain structural components of the World Trade Center, called trusses. Although the media has generally given them this title, the word truss refers to the diagonal reinforcement of a rectangular frame, and so can be applied to a variety of structures. The trusses referred to here, are more correctly called "open web joists" or "bar joists". The original article is in black, comment is in red.

According to the "official" story, there is no significant lateral support for the walls (against wind loading) between the ground and top floors. This is like a bridge with a 1,300 foot span between supports. Even though the tube structure of the perimeter wall was designed for maximum rigidity (within the given weight specifications) the 1,300 foot span between supporting pillars, meant that even this very rigid design would sag in the midsection under wind loading, just like a bridge with such a span. In a typical steel framed building the span between pillars is only 12 feet (one floor) and such a problem does not arise.

Actually, the "official" story is silent about intermediate lateral support (implicitly implying that there is no such support). Godfrey's book [1] states

Composite floors comprise 900mm deep bar joists (spaced at 2.04 m centres and braced transversely by secondary joists) and a 10 cm thick lightweight concrete slab laid on steel trough decking as permanent formwork. Composite action between the concrete and the steelwork is ensured by extending the diagonal web members of the joists through the steel decking and embedding them in the slab. Dead weight of floor 50 kg/in^2, imposed load 488 kg/in^2.



Each upper floor comprises 32 prefabricated units spanning between core and external columns. These units are of two sizes: 18.3 x 6.0 m along the longitudinal faces of the core and 10.7 x 4.0 m along the transverse faces. Additional beams are provided to strengthen the four corner bays.

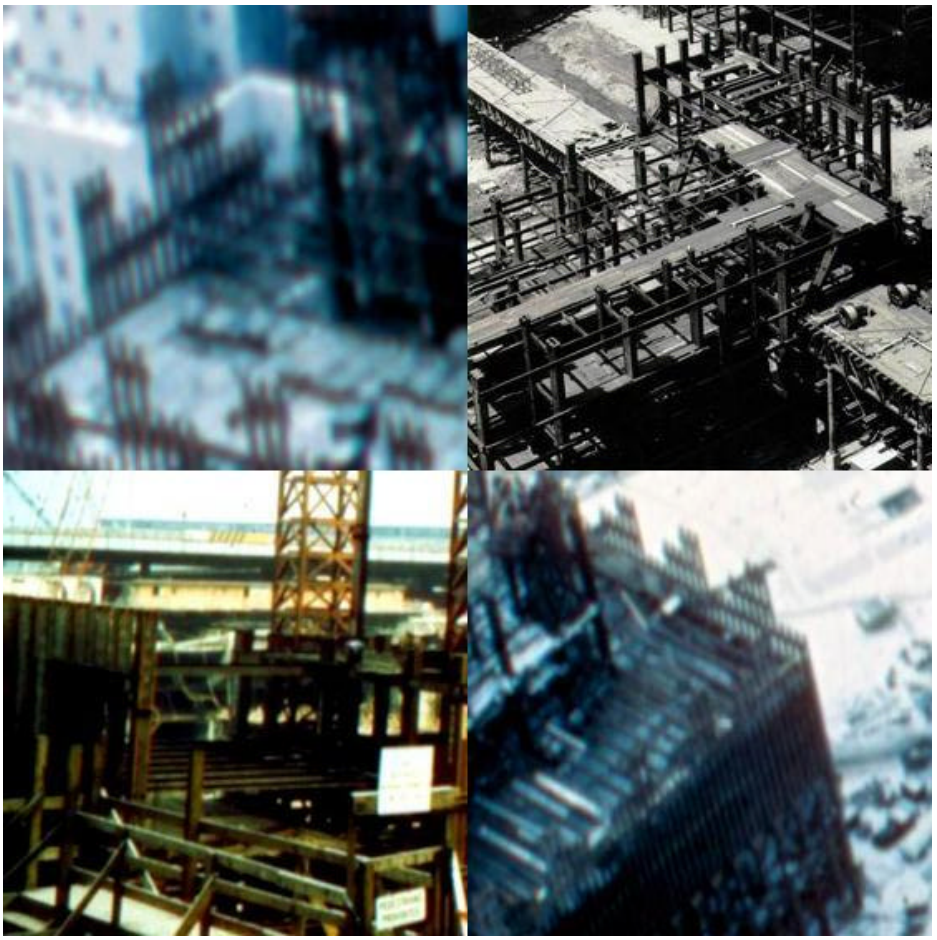
It is not clear exactly what the phrase "each upper floor" means in this instance. It turns out that 18 floors have heavy steel beams instead of trusses. Consider the following quote from Engineering News-Record, January 1, 1970.

On the 41st and 42nd floors, both towers will house mechanical equipment. To accommodate the heavy loads,

the floors are designed as structural steel frame slabs. All other floors from the ninth to the top (except for 75 and 76, which will also carry mechanical equipment) have typical truss floor joists and steel decking.

Typical office floors have 4-in. thick slabs of composite construction using top chord knuckles of the joists (trusses), which extend into the slab, as shear connectors. On mechanical floors, composite action is provided by welded stud shear connectors.

So the first 8 + 6 = 14 stories, and the 41st, 42nd, 75th and 76th floors, used solid steel beams in place of trusses. Interestingly, the FEMA report into the collapse of the towers just "forgets" to mention this (however, they did remember to point out similar specially reinforced floors in their report on WTC 7). Also, the top stories had special steel reinforcing diagonals called outrigger trusses (these were nothing like the bar joists that have also been labeled trusses).

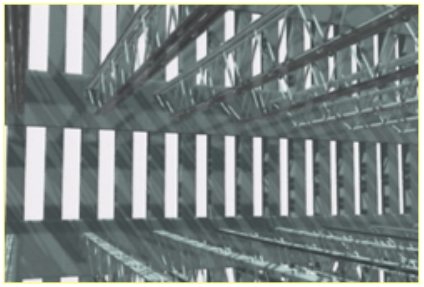


The above photos provide "solid" evidence that the 8th, 41st and a number of sub-plaza stories, have solid steel beams, rather than trusses, supporting the floor slabs between the core and perimeter wall.

The World Trade Center towers were like huge sails in the wind. These sails had to be able to resist the 140 mile per hour winds of a hurricane. Such hurricane force winds exerted a large (some 6000 tons) lateral force on the building. This lateral force is called the wind loading (or force of the wind) on the building. According to the "official" story, the only possible lateral support comes from the flimsy trusses and the lightweight concrete floors. The WTC was designed to survive a 45 pounds per square foot (220 kg per square meter), wind loading. This translates to a 12 x 207 x 45/2000 = 56 ton force on each of the floor segments. What this 56 ton force on each floor segment means, is that if one was to lay the World Trade Center on its side and use the pull of gravity as a substitute for the push of the wind, then each of the 110 floors would need to be loaded with a 56 ton block of steel. So the entire wall would have to support 110 such blocks of steel, that is, 110 x 56 = 6160 tons in total. Using the metric system, this is (220 x 417 x 63 x 9.8)/1000 = 56,640 kN.

The intermediate lateral support by itself does not explain the World Trade Center's ability to handle the above mentioned wind-loading. Laying the building on its side and using the bridge analogy, the intermediate support reduces the span between bridge supports to around 400 feet, but even this reduced span is problematic.

The "secret" of the World Trade Center's ability to handle wind-loading is composite flooring. The media coverage of the WTC collapse portrayed the concrete slabs as, just sitting on the bar joists (trusses), and stated, or implied, that these bar joists could just fall away from the slabs, if say, weakened by fire. However, if the media tells you something, that doesn't mean that it is true. A typical example of this disinformation is the Nova interview with Thomas Eagar of MIT. Here is an animated graphic from the article (the whole interview with comment can be found here) which vividly illustrates the main lie (among the many) of the Nova article.



Composite flooring is the name given to floors where studs (called shear studs or shear connectors) are welded to the supporting joists/trusses and then concrete is poured around them, setting them solidly in the concrete slab. The joist-concrete composite slab is significantly stronger than a non-composite slab. In the case of the WTC the main double trusses used their top knuckles as shear connectors. Ordinary shear studs were used along the transverse trusses. We have the following quote from Godfrey:

"Composite action between the concrete and the steelwork is ensured by extending the diagonal web members of the joists (trusses) through the steel decking and embedding them in the (concrete) slab."

The picture on the left shows a construction worker welding studs to the floor joists (through holes in the corrugated decking). The second picture shows typical shear studs, slab reinforcing steel and (rusty) corrugated steel decking. The third picture shows construction workers pouring the concrete slab (around the shear studs, a row of which can still be seen toward the right of the photo).

For more information on composite flooring, see the article Sixty State Street - A Case Study.

The fact that the tubular structure of the walls is very rigid, does not stop the central core from needing to bend when the walls bend. This means that the walls have to transmit the full force of the wind to the core, so that the core will flex to the same extent as the walls (this is obvious, otherwise if the walls flex while the core does not, the floor slabs would, by definition, be crushed). Again, it is important to note that the rigidity of the walls does not protect the central core from the full force of the wind, what it does, is it limits the distance that the walls (and hence the whole structure) can bend. The more rigid the design the less it tilts in the wind.

In Robertson [2] we find information concerning the World Trade Center when subjected to a 95 mph (153 kph) wind. It turns out that the static deflection is 45 inches (114 cm) from the vertical and that the building then oscillates some 33 inches (84 cms) either side of the point of static deflection (with a period of eleven seconds). Thus a 95 mph (153 kph) wind induces a maximum deflection of 78 inches (198 cms) from the vertical.

In strong winds the midsection of the windward wall will be pushed several feet towards the core. In a typical steel framed building of WTC type design, heavy steel beams transmit the wind loading to the core, which then bends together with the walls. However, in the WTC (as described in the "truss theory") the trusses and floor slabs are too weak to transmit this force to the core without buckling, so the core will stay in its original position as the wall advances to it. This will crush the trusses and floor slabs, leading to the collapse of many floors. Since this did not occur during the 30 years in which the buildings stood, we must assume that the "official" story is false. To see how utterly ridiculous the "official" story is, lets calculate the lateral loading (wind loading) that each one of these trusses was expected to resist. Consider, a one floor segment. Here, we have 30 trusses and a slab of concrete supporting 56 tons. That is about 2 tons per truss and piece of slab. If you balanced a 2 ton block of steel on top of one of these flimsy 60 foot long trusses and (a 60 foot long by 6 foot 8 inches wide by 4 inches thick) slab of concrete, we all know what would happen - the truss and slab would buckle and collapse.

Apparently, the intermediate lateral support and composite flooring was sufficient to keep the World Trade Center towers standing for the 30 years that the buildings stood.

Another point to consider, is that if the walls alone handle lateral loading, then the pressure on the windward wall must be transmitted via the corners to the remaining walls (this transmission of loading to the other walls is what gave the WTC its rigidity) but the corners are far too weak to handle this task alone.

Although the "truss theory" is ludicrous, it has been pushed by many "experts". It should be noted that it is inconceivable that these experts did not know that it was false.

The confusion over the role of the trusses in the original version of this article, was bought about by the medias ommission of information concerning composite flooring and the existence of intermediate lateral support. Although deliberately omitted (or downplayed in the very rare cases when it was mentioned), the existence of intermediate lateral support was clearly predicted by arguments like this one. Since the number of floors providing intermediate lateral support turned out to be quite small, some other form of lateral bracing was also predicted. This turned out to be composite flooring.

THE 1975 WORLD TRADE CENTER TOWER FIRE.

This 110-story steel-framed office building suffered a fire on the 11th floor on February 23, 1975. The loss was estimated at over $2,000,000. The building is one of a pair of towers, 412 m in height. The fire started at approximately 11:45 P.M. in a furnished office on the 11th floor and spread through the corridors toward the main open office area. A porter saw flames under the door and sounded the alarm. It was later that the smoke detector in the air-conditioning plenum on the 11th floor was activated. The delay was probably because the air-conditioning system was turned off at night. The building engineers placed the ventilation system in the purge mode, to blow fresh air into the core area and to draw air from all the offices on the 11th floor so as to prevent further smoke spread. The fire department on arrival found a very intense fire. It was not immediately known that the fire was spreading vertically from floor to floor through openings in the floor slab. These 300-mm x 450-mm (12-in. x 18-in.) openings in the slab provided access for telephone cables. Subsidiary fires on the 9th to the 19th floors were discovered and readily extinguished. The only occupants of the building at the time of fire were cleaning and service personnel. They were evacuated without any fatalities. However, there were 125 firemen involved in fighting this fire and 28 sustained injuries from the intense heat and smoke. The cause of the fire is unknown.

THE 2001 WORLD TRADE CENTER TOWER FIRES.

Videos of the towers indicate fires about as, or less severe, than your typical office fire. Much was learned from the 1975 WTC fire. In particular, the fact that the fire had not been contained to a single floor but spread to many floors, caused much concern. The points of entry of the fire to other floors were identified and the floors of each building were modified to make sure that this would never happen again. For some strange reason, the modifications failed to preform on September 11, 2001 and the fires spread easily and rapidly to floors above, and below, the impact floors. It is likely that the fires above, and below, the impact floors, were deliberately ignited.

Some thoughts about the World Trade Center Tower fires (from various sources).

(1) One complaint is that much of the jet fuel burnt outside the buildings. This was particularly true in the case of the south tower. After the impact nearly all of the jet fuel would have been spread throughout the area as a flammable mist. When this mist ignited it would have emptied the building of almost the entire fuel load, which then "exploded" outside the building. This is exactly what was seen in the videos of the impacts.

(2) If any quantity of liquid jet fuel did manage to accumulate in the building, then its volatility would lead to large amounts of it being evaporated and not burnt (pyrolysed) in the interior of the building. This evaporated fuel would burn on exiting the building, when it finally found sufficient oxygen.

(3) The jet fuel fires were brief. Most of the jet fuel would have burnt off or evaporated within 30 seconds, and all of it within 2-3 minutes (if all 10,000 gallons of fuel were evenly spread across a single building floor as a pool, it would be consumed by fire in less than 5 minutes). The energy, from the jet fuel, not absorbed by the concrete and steel within this brief period, would have been vented to the outside world.

This means that the jet fuel fire did not heat the concrete slabs or fire protected steel appreciably. Large columns such as the core columns would also not heat appreciably, even if they had lost all their fire-protection. Unprotected trusses may have experienced a more sizeable temperature increase. The jet fuel fire was so brief that the concrete and steel simply could not absorb the heat fast enough, and consequently, most of the heat was lost to the atmosphere through the smoke plume.

(4) Even if the fire-rated suspended ceilings and spray on fire-protection from the trusses was removed by the impacts and the trusses were heated till they had lost most of their room temperature strength, we know from the Cardington tests and real fires like Broadgate, that the relatively cold concrete slab will supply strength to the structural system, and collapse will not occur. Remember, that at Broadgate and Cardington, the beams/trusses were not fire-protected. Consider this quote: *After the Broadgate Phase 8 fire and the Cardington frame tests there were benchmarks to test composite frame models. Research intensified because almost all the tests had unprotected steel beams (no fire rated suspended ceiling and no spray-on fire retardant) but collapse was not seen [3].*

(5) Since the jet fuel fire was brief, and the building still stood, we know that the composite floor slab survived and continued to function as designed (until the buildings were demolished one or two hours later). After the jet fuel fire was over, burning desks, books, plastic, carpets, etc, contributed to the fire. So now we have a typical office fire. The fact that the trusses received some advanced heating will be of little consequence. After some minutes the fires would have been indistinguishable from a typical office fire, and we know that the truss-slab combination will survive such fires, because they did so in the 1975.

(6) Of course, most of the weight of the building was supported by the central core columns. There is no indication as to how these 47 massive columns might have failed (at least in the case of the north tower, some of these columns, perhaps two or three, would have been displaced by the impacts). We know that the jet fuel fire was too brief to heat them appreciably. Since the central core area contained only lift shafts and stairwells, it contained very little flammable material. This meant that the core columns could only have been heated by the office fire burning in the adjacent region. Consequently, the core columns would have never got hot enough to fail. But we already know this because they did not fail in the 1975 WTC office fire.

(7) Also, the building engineers placed the ventilation system in "purge mode." This forced fresh (cool) air into the core area keeping it free of smoke and hot gases.

(8) You should consider that it has been calculated that if the entire 10,000 gallons of jet fuel from the aircraft was injected into just one floor of the World Trade Center, that the jet fuel burnt with the perfect efficency, that no hot gases left this floor and that no heat escaped this floor by conduction, then the jet fuel could have only raised the temperature of this floor to, at the very most, 536°F (280°C). You can find the calculation here.

(9) Another reason that we know the fires were not serious enough to cause structural failure, is that witnesses

tell us this. The impact floors of the south tower were 78-84. Here are a few words from some of the witnesses:

Stanley Praimnath was on the 81st floor of the south tower: *The plane impacts. I try to get up and then I realize that I'm covered up to my shoulder in debris. And when I'm digging through under all this rubble, I can see the bottom wing starting to burn, and that wing is wedged 20 feet in my office doorway.*

Donovan Cowan was in an open elevator at the 78th floor sky-lobby: *We went into the elevator. As soon as I hit the button, that's when there was a big boom. We both got knocked down. I remember feeling this intense heat. The doors were still open. The heat lasted for maybe 15 to 20 seconds I guess. Then it stopped.*

Ling Young was in her 78th floor office: *Only in my area were people alive, and the people alive were from my office. I figured that out later because I sat around in there for 10 or 15 minutes. That's how I got so burned.*

Eagar claims temperatures were hot enough to cause the trusses of the south tower to fail, but here we have eye-witnesses stating that temperatures were cool enough for them to walk away.

Interestingly, a tape of radio conversations between firefighters exists (but only relatives of the dead men have been allowed to hear it). Kevin Flynn, of the New York Times, reported:

Chief Orio Palmer says from an upper floor of the badly damaged south tower at the World Trade Center. Just two hose lines to attack two isolated pockets of fire. "We should be able to knock it down with two lines," he tells the firefighters of Ladder Co. 15 who were following him up the stairs of the doomed tower. Lt. Joseph G. Leavey is heard responding: "Orio, we're on 78 but we're in the B stairway. Trapped in here. We got to put some fire out to get to you." The time was 9:56 a.m.

So now we know that, just a few minutes before the collapse of the south tower, firefighters did not consider the fires to be that serious, and were in fact able to get right into the impact region without being killed by the heat that was (according to Eagar) so intense that the trusses glowed red-hot and failed.

(10) When fully developed fire conditions (temperatures of over 700°C) are reached, this results in the breaking of window glass. For example, the 1988 First Interstate Bank fire in Los Angeles, which showed greater heating effects over larger regions than those observed in either tower, rained broken window glass down on the streets below, presenting a considerable hazard to those on the ground. The First Interstate Bank did not collapse.

(11) If the temperatures inside large regions of the towers were of the order of 700°C, then these regions would have been glowing red hot and there would have been visible signs of this from the outside. Even pictures taken from the air looking horizontally into the impact region show little sign of this.

(12) Another reason the fire would not have been as hot as your typical office fire (at least on the impact floors) is that cross ventilation would have cooled it somewhat. Consider the quote: *Cross ventilation resulting from (broken) windows present in opposite walls causes a high intake of air and cooling effects [3].*

(13) If there had been severe fires burning in the core region this would have made the stairwells impassible. However the stairwells below the impact region on the North Tower were sufficiently clear to allow some occupants close to the impacted floors to escape and to allow firemen to reach at least the floors around the 70th level. In the South Tower, at least one stairwell remained operable as there were survivors from above the impact region.

OTHER HIGHRISE FIRES.

Here is a list of the fire duration of various fire incidents in steel-frame buildings:

Building	Date	Fire Duration (hours)
World Trade Center North Tower	February 23, 1975	3 to 4
World Trade Center North Tower	September 11, 2001	1¾ *
World Trade Center South Tower	September 11, 2001	1 *
World Trade Center Seven	September 11, 2001	**
1st Interstate Bank Building	May 4-5, 1988	3.5

Broadgate Phase 8	June 23rd, 1990	4.5
1 New York Plaza Fire	August 5, 1970	6
One Meridian Plaza	February 23-24, 1991	19 (11 uncontrolled)

* The time after which the towers collapsed. Before September 11, 2001 no high-rise has ever collapsed due to fire.
** It is claimed that WTC Seven collapsed due to fire. Fire duation is unknown. Fire severity is unknown. Photos of small localized fires exist. No evidence of a large fire at WTC 7 exists. Though hundreds of photographers were taking photos of the ruins of the twin towers, none bothered to photograph the "raging" fire across the street (Vesey St) at World Trade Center Seven. I guess that a "raging" fire in a 47-story building, is such a commonplace occurrence in New York, that the photographers just ignored it, even though it was only a few hundred feet away from them. Just couldn't see a good story in it.

SOME REFERENCES. (edited by 9-11 Research)

One Meridian Plaza, Philadelphia Fire Films, 1991
High-rise Office Building Fire One Meridian Plaza
One Meridien Plaza
High-rise Office Building Fire One Meridian Plaza Philadelphia, Pennsylvania
First Interstate Bank Fire
Interstate Bank Building Fire Los Angeles, California (May 4, 1988)
U.S. Report on Trade Center Echoes Lessons of Past Disasters, New York Times, April 2, 2002
Testimony of Dr. Abolhassan Astaneh-Asl before the Committee on Science of the U.S. House of Representatives, April, 2002.
Microsoft software used to simulate the crash of a Boeing 747 into the World Trade Centre.
Article on the World Trade Center collapse from Scientific American.
http://www.house.gov/science/hot/wtc/wtcreport.htm
http://serendipity.magnet.ch/wtc.html
http://serendipity.magnet.ch/wot/psyopnews2.htm
http://www.911review.com/articles/jm/mslp_1.htm
http://www.tms.org/pubs/journals/JOM/0112/Eagar/Eagar-0112.html
http://www.tenlinks.com/NEWS/special/wtc/index.htm
http://www.civil.usyd.edu.au/wtc.htm
http://serendipity.magnet.ch/wot/psyopnews1.htm
http://www.hera.org.nz/PDF Files/World Trade Centre.pdf (local copy here).
http://www.hera.org.nz/PDF Files/Elaboration on WTC Paper.PDF (local copy here).
html-version of the above HERA article.