

A photograph of the New York City skyline, featuring the Twin Towers of the World Trade Center in the center. The image is overlaid with large, bold, yellow text. The background is a clear, bright sky.

**DONALD FRIEDMAN**

**After 9-11**

**An Engineer's Work**

**at the**

**World Trade Center**

1  
00:00:06,170 --> 00:00:04,030

[Music]

2  
00:00:08,780 --> 00:00:06,180

welcome to tales from the rabbit hole

3  
00:00:10,910 --> 00:00:08,790

I'm your host big words my guest today

4  
00:00:12,950 --> 00:00:10,920

is Donald Friedman a licensed

5  
00:00:14,959 --> 00:00:12,960

professional engineer with 30 years of

6  
00:00:17,540 --> 00:00:14,969

experience as a structural engineer and

7  
00:00:19,550 --> 00:00:17,550

also as a forensic engineer Dunn is a

8  
00:00:20,960 --> 00:00:19,560

founder of old structures engineering

9  
00:00:22,640 --> 00:00:20,970

and he's also taught at the Pratt

10  
00:00:25,279 --> 00:00:22,650

Institute and various other places

11  
00:00:27,050 --> 00:00:25,289

including Columbia University he's

12  
00:00:29,150 --> 00:00:27,060

presented at conferences you've authored

13  
00:00:31,669 --> 00:00:29,160

numerous articles and written five books

14

00:00:33,950 --> 00:00:31,679

related to construction renovation and

15

00:00:35,569 --> 00:00:33,960

engineering one of those books is an

16

00:00:38,750 --> 00:00:35,579

engineer's work at the World Trade

17

00:00:40,880 --> 00:00:38,760

Center published in 2002 which tells of

18

00:00:43,910 --> 00:00:40,890

his experience working as an engineer at

19

00:00:46,490 --> 00:00:43,920

the World Trade Center site after 9/11 I

20

00:00:48,229 --> 00:00:46,500

talked with him about how his experience

21

00:00:49,910 --> 00:00:48,239

at the World Trade Center and its

22

00:00:55,939 --> 00:00:49,920

knowledge of engineering intersects with

23

00:00:58,939 --> 00:00:55,949

the world of conspiracy theories okay

24

00:01:01,160 --> 00:00:58,949

right well first of all thanks again for

25

00:01:02,959 --> 00:01:01,170

doing this this is very good thanks for

26

00:01:05,509 --> 00:01:02,969

making the time you're welcome

27

00:01:06,590 --> 00:01:05,519

you are the author of the book an

28

00:01:09,350 --> 00:01:06,600

engineer's work at the World Trade

29

00:01:11,719 --> 00:01:09,360

Center which you published in 2002 which

30

00:01:13,990 --> 00:01:11,729

details your experience working as an

31

00:01:16,640 --> 00:01:14,000

engineer at the World Trade Center site

32

00:01:19,429 --> 00:01:16,650

how did that actually start can you can

33

00:01:21,080 --> 00:01:19,439

you say how you actually got onto the

34

00:01:23,780 --> 00:01:21,090

site like you know what's what happened

35

00:01:25,910 --> 00:01:23,790

in how you were assigned there at that

36

00:01:28,880 --> 00:01:25,920

time I was an employee of Thornton

37

00:01:30,590 --> 00:01:28,890

Thomas SETI engineers I was an associate

38

00:01:33,380 --> 00:01:30,600

and I was the director of historic

39

00:01:35,270 --> 00:01:33,390

preservation for the company and as my

40

00:01:39,170 --> 00:01:35,280

understanding of it is that on the

41

00:01:44,139 --> 00:01:39,180

afternoon of September 11th 2001 New

42

00:01:46,700 --> 00:01:44,149

York City hired Thorton Thomas Eddie to

43

00:01:49,730 --> 00:01:46,710

coordinate the engineering work that

44

00:01:51,289 --> 00:01:49,740

would be required for cleanup basically

45

00:01:53,840 --> 00:01:51,299

the city doesn't have enough structural

46

00:01:57,230 --> 00:01:53,850

engineers to do the job and they all

47

00:01:59,510 --> 00:01:57,240

have their regular work to do so if all

48

00:02:03,139 --> 00:01:59,520

of them were were on site nothing else

49

00:02:04,700 --> 00:02:03,149

would be happening so we were all of the

50

00:02:07,280 --> 00:02:04,710

employees in the Thorton Thomas city New

51  
00:02:11,420 --> 00:02:07,290  
York office were informed that afternoon

52  
00:02:13,670 --> 00:02:11,430  
that if we agreed to it it was

53  
00:02:15,350 --> 00:02:13,680  
voluntarily voluntary

54  
00:02:19,550 --> 00:02:15,360  
we would be going to the site the next

55  
00:02:21,710 --> 00:02:19,560  
day 12th and I volunteered the way it

56  
00:02:24,289 --> 00:02:21,720  
eventually was organized it took a few

57  
00:02:26,839 --> 00:02:24,299  
days for this to solidify was that there

58  
00:02:29,330 --> 00:02:26,849  
were at any given moment five teams on

59  
00:02:31,460 --> 00:02:29,340  
site there was one more or less

60  
00:02:34,369 --> 00:02:31,470  
stationed at each of the four corners of

61  
00:02:38,319 --> 00:02:34,379  
the site which is a slightly skewed

62  
00:02:40,940 --> 00:02:38,329  
trapezoid and my team was roving around

63  
00:02:42,860 --> 00:02:40,950

looking for old buildings so there are a

64

00:02:45,349 --> 00:02:42,870

number of historic landmarks near the

65

00:02:47,420 --> 00:02:45,359

site and build some few buildings that

66

00:02:51,020 --> 00:02:47,430

are not landmarks but are not modern

67

00:02:54,080 --> 00:02:51,030

structure since that's my specialty okay

68

00:02:57,199 --> 00:02:54,090

we were going to be working on that so

69

00:02:59,539 --> 00:02:57,209

starting on the 12th I was down there as

70

00:03:02,210 --> 00:02:59,549

part of that effort I was there for nine

71

00:03:04,550 --> 00:03:02,220

I believe nine days in a row at the

72

00:03:06,679 --> 00:03:04,560

beginning and then every third or fourth

73

00:03:08,660 --> 00:03:06,689

day afterwards into November

74

00:03:11,360 --> 00:03:08,670

yeah my understanding of what engineer

75

00:03:13,490 --> 00:03:11,370

does is basically that you are studying

76

00:03:15,470 --> 00:03:13,500

a structure to determine the loads on

77

00:03:17,479 --> 00:03:15,480

that structure and to make sure that

78

00:03:19,009 --> 00:03:17,489

structure can support the loads and you

79

00:03:22,159 --> 00:03:19,019

know any additional loads that might

80

00:03:25,400 --> 00:03:22,169

come along and then design modifications

81

00:03:27,770 --> 00:03:25,410

or additional structures if needed to

82

00:03:28,970 --> 00:03:27,780

support those loads basically is that

83

00:03:31,460 --> 00:03:28,980

kind of a good kind of over the year

84

00:03:33,530 --> 00:03:31,470

what an engineer does it's certainly a

85

00:03:36,080 --> 00:03:33,540

big piece of it if you work primarily

86

00:03:37,699 --> 00:03:36,090

with existing buildings as I do the

87

00:03:39,589 --> 00:03:37,709

beginning of almost every project is an

88

00:03:42,110 --> 00:03:39,599

investigation of the existing building

89

00:03:44,719 --> 00:03:42,120

if we have drawings we need to see that

90

00:03:45,979 --> 00:03:44,729

they're correct and if we mostly find we

91

00:03:50,110 --> 00:03:45,989

don't have drawings we need to figure

92

00:03:52,550 --> 00:03:50,120

out what the structural systems are and

93

00:03:53,930 --> 00:03:52,560

whether we have drawings or not there's

94

00:03:55,430 --> 00:03:53,940

always the question of well what's the

95

00:03:58,550 --> 00:03:55,440

condition of the existing building

96

00:04:01,129 --> 00:03:58,560

because all materials age and gradually

97

00:04:02,899 --> 00:04:01,139

fall apart so just because the building

98

00:04:04,939 --> 00:04:02,909

is standing doesn't mean that all of the

99

00:04:07,699 --> 00:04:04,949

structure is in good condition right

100

00:04:08,990 --> 00:04:07,709

yeah like yes I know my apartments we

101

00:04:10,819 --> 00:04:09,000

got a lot of termites taking out

102

00:04:14,199 --> 00:04:10,829

structural beams and bringing an

103

00:04:16,969 --> 00:04:14,209

engineer to add on an extra steel beam

104

00:04:19,399 --> 00:04:16,979

you mentioned you do forensic

105

00:04:20,539 --> 00:04:19,409

engineering as well is that kind of like

106

00:04:22,810 --> 00:04:20,549

what you're talking about they're

107

00:04:24,760 --> 00:04:22,820

examining building is there is that like

108

00:04:27,290 --> 00:04:24,770

examining when something collapses

109

00:04:28,820 --> 00:04:27,300

forensic engineer is most often

110

00:04:31,760 --> 00:04:28,830

to figure out that the reason for

111

00:04:36,050 --> 00:04:31,770

collapse and the quartz has been being

112

00:04:37,790 --> 00:04:36,060

what it is who's responsible okay some

113

00:04:39,790 --> 00:04:37,800

things are truly accident some things

114

00:04:42,589 --> 00:04:39,800

are truly unavoidable but very often

115

00:04:44,930 --> 00:04:42,599

somebody has somehow made an error that

116

00:04:46,700 --> 00:04:44,940

led to a collapse so you would do a

117

00:04:49,969 --> 00:04:46,710

study and maybe get cold as an expert

118

00:04:51,649 --> 00:04:49,979

witness in a in litigation yes it's not

119

00:04:53,960 --> 00:04:51,659

the main focus of my work right yeah you

120

00:04:55,430 --> 00:04:53,970

do sometimes yes so when you when you

121

00:04:56,869 --> 00:04:55,440

first arrive there one of the things

122

00:04:59,119 --> 00:04:56,879

that you know struck me in the book I

123

00:05:01,459 --> 00:04:59,129

think struck a lot of people who were at

124

00:05:03,980 --> 00:05:01,469

the site was that the contents of the

125

00:05:06,499 --> 00:05:03,990

building by the air things like desks

126

00:05:09,589 --> 00:05:06,509

and things like that had largely

127

00:05:11,689 --> 00:05:09,599

vanished and you see at least these

128

00:05:14,629 --> 00:05:11,699

large beams and these big chunks of

129

00:05:16,129 --> 00:05:14,639

concrete and lots of dust but you know a

130

00:05:18,559 --> 00:05:16,139

lot of the structure had actually

131

00:05:20,089 --> 00:05:18,569

actually advantaged this is something

132

00:05:21,619 --> 00:05:20,099

that people point to sometimes as being

133

00:05:22,999 --> 00:05:21,629

like evidence of something like there

134

00:05:25,040 --> 00:05:23,009

was have been some kind of explosives in

135

00:05:27,249 --> 00:05:25,050

the building was this something that you

136

00:05:29,570 --> 00:05:27,259

know struck you at the time as being

137

00:05:31,399 --> 00:05:29,580

inexplicable or did it you're gonna make

138

00:05:34,279 --> 00:05:31,409

sense to you at the time it was

139

00:05:36,469 --> 00:05:34,289

surprising but I I'm talking about what

140

00:05:38,930 --> 00:05:36,479

I saw in sight I should or my thoughts

141

00:05:41,360 --> 00:05:38,940

on sight I should mention that you know

142

00:05:44,149 --> 00:05:41,370

I was talking to other engineers that I

143

00:05:45,890 --> 00:05:44,159

know pretty much the whole time so I

144

00:05:48,529 --> 00:05:45,900

can't necessarily say that everything I

145

00:05:49,760 --> 00:05:48,539

say is something I thought of first a

146

00:05:51,230 --> 00:05:49,770

lot of times it's sort of part of a

147

00:05:54,920 --> 00:05:51,240

group conversation they're not just

148

00:05:57,409 --> 00:05:54,930

reporting it to you now okay what became

149

00:06:00,920 --> 00:05:57,419

pretty clear after the first day on site

150

00:06:02,439 --> 00:06:00,930

was that the contents of World Trade

151  
00:06:06,850 --> 00:06:02,449  
Center one and two had been pulverized

152  
00:06:11,570 --> 00:06:06,860  
anything that could break was broken so

153  
00:06:15,110 --> 00:06:11,580  
what survived the collapse the collapses

154  
00:06:18,920 --> 00:06:15,120  
was ductile metal so you saw a pieces of

155  
00:06:21,529 --> 00:06:18,930  
steel you saw I saw wants a huge pile of

156  
00:06:23,749 --> 00:06:21,539  
elevator cable that must have come from

157  
00:06:26,059 --> 00:06:23,759  
one of the upper shafts and what's the

158  
00:06:28,540 --> 00:06:26,069  
other thing survived was paper because

159  
00:06:31,279 --> 00:06:28,550  
if you think about an office building

160  
00:06:35,329 --> 00:06:31,289  
most of the volume of space on the

161  
00:06:37,730 --> 00:06:35,339  
inside is air and as the floors pancake

162  
00:06:39,960 --> 00:06:37,740  
down that air has to go somewhere and it

163  
00:06:41,880 --> 00:06:39,970

goes out so

164

00:06:45,120 --> 00:06:41,890

loose paper that was sitting on

165

00:06:48,660 --> 00:06:45,130

somebody's desk got blown out outwards

166

00:06:50,280 --> 00:06:48,670

as the forced pancake down as a result

167

00:06:52,620 --> 00:06:50,290

there was paper all over the place on

168

00:06:54,900 --> 00:06:52,630

top of this or mixed in with this very

169

00:06:58,650 --> 00:06:54,910

thick layer of dust that was pulverized

170

00:07:02,670 --> 00:06:58,660

concrete and gypsum board ceiling tiles

171

00:07:04,200 --> 00:07:02,680

things like that cubicles yeah um along

172

00:07:08,790 --> 00:07:04,210

with this the other thing that got

173

00:07:11,190 --> 00:07:08,800

pulverized were bodies yeah and I mean

174

00:07:14,850 --> 00:07:11,200

that's why they had to resort to DNA

175

00:07:16,770 --> 00:07:14,860

testing in order to identify bodies

176  
00:07:18,840 --> 00:07:16,780  
because you know something like dental

177  
00:07:21,000 --> 00:07:18,850  
records was was hopeless because well

178  
00:07:23,070 --> 00:07:21,010  
there weren't big enough pieces of

179  
00:07:25,460 --> 00:07:23,080  
bodies intact I don't think anybody's

180  
00:07:28,680 --> 00:07:25,470  
cleaning 3000 people vanished

181  
00:07:31,680 --> 00:07:28,690  
no no it's yeah it's quite amazing to

182  
00:07:33,030 --> 00:07:31,690  
think and when you when you got there

183  
00:07:34,860 --> 00:07:33,040  
when you first got to the site what were

184  
00:07:39,300 --> 00:07:34,870  
the first engineering tasks that needed

185  
00:07:41,340 --> 00:07:39,310  
doing on the site on the 12th so if you

186  
00:07:43,200 --> 00:07:41,350  
think about it everybody knew three

187  
00:07:45,180 --> 00:07:43,210  
large buildings collapsed everybody knew

188  
00:07:48,690 --> 00:07:45,190

a number of smaller buildings were hit

189

00:07:51,480 --> 00:07:48,700

by rubble hit by debris but nobody knew

190

00:07:54,090 --> 00:07:51,490

how you know did debris hit buildings a

191

00:07:57,200 --> 00:07:54,100

block away two blocks away there's no

192

00:08:00,390 --> 00:07:57,210

way to tell so what was the only thing

193

00:08:02,310 --> 00:08:00,400

engineers were doing on the 12th was

194

00:08:04,350 --> 00:08:02,320

looking at the building's sort of the

195

00:08:07,020 --> 00:08:04,360

perimeter of the site and the original

196

00:08:08,850 --> 00:08:07,030

perimeter was quite large it went two

197

00:08:11,880 --> 00:08:08,860

blocks to the east so it went a block

198

00:08:15,659 --> 00:08:11,890

east of Broadway for example at which

199

00:08:17,580 --> 00:08:15,669

point you're I don't know 200 yards from

200

00:08:19,770 --> 00:08:17,590

the site all right but if you think of

201  
00:08:22,800 --> 00:08:19,780  
that that is you know less than the

202  
00:08:24,690 --> 00:08:22,810  
height of the towers yeah so it's not

203  
00:08:27,450 --> 00:08:24,700  
it's not a conceivable something could

204  
00:08:31,950 --> 00:08:27,460  
have gone that far so what we were all

205  
00:08:33,779 --> 00:08:31,960  
doing was investigating we're basically

206  
00:08:35,880 --> 00:08:33,789  
going up on the roofs of the of

207  
00:08:36,930 --> 00:08:35,890  
buildings and we just knew they were I

208  
00:08:38,550 --> 00:08:36,940  
think something like four or five

209  
00:08:41,640 --> 00:08:38,560  
hundred Billy's checked going up on the

210  
00:08:45,540 --> 00:08:41,650  
roof to see if there was any sign that

211  
00:08:47,700 --> 00:08:45,550  
something hit and for example the post

212  
00:08:51,900 --> 00:08:47,710  
office that's north of the of the site

213  
00:08:53,400 --> 00:08:51,910

they found the engine of one an engine

214

00:08:56,400 --> 00:08:53,410

from one of the planes on the roof

215

00:08:59,939 --> 00:08:56,410

host office so obviously debris had

216

00:09:01,590 --> 00:08:59,949

moved around with it and and it you know

217

00:09:03,360 --> 00:09:01,600

if you have enough people do it

218

00:09:06,480 --> 00:09:03,370

methodically we went through a lot of

219

00:09:07,829 --> 00:09:06,490

buildings on the 12th and on the 13th so

220

00:09:10,410 --> 00:09:07,839

that was that was the first engineering

221

00:09:12,509 --> 00:09:10,420

tasks that would there were basically

222

00:09:14,490 --> 00:09:12,519

two groups of people from Thornton town

223

00:09:16,019 --> 00:09:14,500

a city it was one group of doing site

224

00:09:18,329 --> 00:09:16,029

work which is where I was pretty much

225

00:09:21,900 --> 00:09:18,339

the whole time and the other group was

226

00:09:23,910 --> 00:09:21,910

um checking where it was safe to put

227

00:09:25,980 --> 00:09:23,920

cranes because it was obvious the cranes

228

00:09:29,249 --> 00:09:25,990

were going to be needed to lift the

229

00:09:31,110 --> 00:09:29,259

heavier pieces of debris yeah so that

230

00:09:32,579 --> 00:09:31,120

was quite a big part of the well not big

231

00:09:35,100 --> 00:09:32,589

part of the book but you talked about it

232

00:09:37,559 --> 00:09:35,110

a lot like the the unusually large

233

00:09:39,509 --> 00:09:37,569

cranes that they had there now you talk

234

00:09:42,749 --> 00:09:39,519

about kind of going you started at the

235

00:09:46,050 --> 00:09:42,759

perimeter the farthest extent of the

236

00:09:48,360 --> 00:09:46,060

damage how would you characterize like

237

00:09:49,769 --> 00:09:48,370

what was actually at the perimeter in

238

00:09:51,119 --> 00:09:49,779

terms of what was falling you said you

239

00:09:52,410 --> 00:09:51,129

mentioned an engine that's obviously

240

00:09:55,110 --> 00:09:52,420

something that kind of shot out of the

241

00:09:58,829 --> 00:09:55,120

plane shut out so like yeah I'd be like

242

00:10:02,730 --> 00:09:58,839

exterior columns and the cladding of

243

00:10:05,819 --> 00:10:02,740

those columns I I didn't see anything

244

00:10:08,490 --> 00:10:05,829

like that when I saw at the so I only

245

00:10:11,249 --> 00:10:08,500

saw the buildings I checked and I was on

246

00:10:12,780 --> 00:10:11,259

Maiden Lane east of Broadway and some a

247

00:10:15,179 --> 00:10:12,790

couple of blocks close by which are

248

00:10:16,829 --> 00:10:15,189

quite far from the site and I think

249

00:10:20,340 --> 00:10:16,839

perhaps more importantly due to the east

250

00:10:21,900 --> 00:10:20,350

of the site and the planes that hit one

251

00:10:25,230 --> 00:10:21,910

was traveling north one was traveling

252

00:10:27,540 --> 00:10:25,240

south so any debris spread would not be

253

00:10:30,300 --> 00:10:27,550

likely to head east so what I saw on the

254

00:10:32,329 --> 00:10:30,310

roofs was the lightweight debris which

255

00:10:34,559 --> 00:10:32,339

is to say dust a little bit of paper

256

00:10:36,030 --> 00:10:34,569

okay moving further in towards the

257

00:10:38,069 --> 00:10:36,040

middle of the site you would see like

258

00:10:40,710 --> 00:10:38,079

start to see columns and beams and

259

00:10:42,480 --> 00:10:40,720

things noise and one of the things that

260

00:10:43,829 --> 00:10:42,490

really struck me in the bouquet which I

261

00:10:46,259 --> 00:10:43,839

mentioned in the email was your

262

00:10:47,850 --> 00:10:46,269

description of the core columns and how

263

00:10:50,460 --> 00:10:47,860

they had kind of snapped apart at the

264

00:10:53,340 --> 00:10:50,470

seems this is something that yes is

265

00:10:57,090 --> 00:10:53,350

something you observed quite a lot well

266

00:11:00,869 --> 00:10:57,100

yes the the steel from towers one and

267

00:11:02,850 --> 00:11:00,879

two really stayed within the footprint

268

00:11:04,259 --> 00:11:02,860

of the World Trade Center site I mean it

269

00:11:07,139 --> 00:11:04,269

went a little bit onto the surrounding

270

00:11:09,660 --> 00:11:07,149

streets but it's just too heavy

271

00:11:12,090 --> 00:11:09,670

it you know the the force pushing it

272

00:11:14,009 --> 00:11:12,100

outwards was just very small compared to

273

00:11:16,530 --> 00:11:14,019

gravity and therefore it went more or

274

00:11:18,509 --> 00:11:16,540

less straight down so you had to get up

275

00:11:20,670 --> 00:11:18,519

to the site right up to the world the

276

00:11:23,730 --> 00:11:20,680

World Trade Center site itself to see

277

00:11:28,829 --> 00:11:23,740

substantial amounts of Steel the

278

00:11:33,239 --> 00:11:28,839

farthest pieces of steel I saw were the

279

00:11:36,269 --> 00:11:33,249

ones stuck into guess it would be three

280

00:11:39,119 --> 00:11:36,279

World Financial Center and 130 Liberty

281

00:11:41,699 --> 00:11:39,129

Street so they had made it across West

282

00:11:44,220 --> 00:11:41,709

Street and across to the south side of

283

00:11:46,139 --> 00:11:44,230

the site and that's it's not it's not a

284

00:11:50,220 --> 00:11:46,149

negligible distance but that's about the

285

00:11:52,259 --> 00:11:50,230

furthest place Tony's feel ya know like

286

00:11:54,360 --> 00:11:52,269

I think a big part of why we get

287

00:11:56,429 --> 00:11:54,370

conspiracy theories about the collapses

288

00:11:58,559 --> 00:11:56,439

of the World Trade Center is that people

289

00:12:00,329 --> 00:11:58,569

don't understand how it could have

290

00:12:04,199 --> 00:12:00,339

collapsed they think is this incredibly

291

00:12:06,030 --> 00:12:04,209

strong structure and they think it's

292

00:12:07,949 --> 00:12:06,040

just highly implausible that even if

293

00:12:10,710 --> 00:12:07,959

there was damage at the top the

294

00:12:13,319 --> 00:12:10,720

progressive collapse would go all the

295

00:12:15,629 --> 00:12:13,329

way to the bottom is this something that

296

00:12:18,419 --> 00:12:15,639

you know when you used you know as you

297

00:12:21,689 --> 00:12:18,429

saw the original collapses you know on

298

00:12:26,699 --> 00:12:21,699

TV and you were on the site and you saw

299

00:12:29,309 --> 00:12:26,709

the results did you fairly quickly come

300

00:12:32,460 --> 00:12:29,319

to some kind of idea in your mind about

301  
00:12:33,720 --> 00:12:32,470  
how you thought the building collapsed

302  
00:12:39,150 --> 00:12:33,730  
was this something you gave much thought

303  
00:12:41,780 --> 00:12:39,160  
to do I I didn't give all our thoughts

304  
00:12:44,939 --> 00:12:41,790  
who a specific trigger for the collapse

305  
00:12:48,210 --> 00:12:44,949  
what everybody on site knew about the

306  
00:12:50,879 --> 00:12:48,220  
the towers 1 & 2 was that they had a

307  
00:12:53,819 --> 00:12:50,889  
relatively rigid exterior tube structure

308  
00:12:56,850 --> 00:12:53,829  
a bunch of columns and sort of normal

309  
00:12:59,939 --> 00:12:56,860  
floors in the core and in between were

310  
00:13:01,410 --> 00:12:59,949  
very long span trusses which are much

311  
00:13:04,319 --> 00:13:01,420  
lighter weight than the beams that might

312  
00:13:06,419 --> 00:13:04,329  
ordinarily be used all of the lateral

313  
00:13:10,230 --> 00:13:06,429

rigidity is buildings was in the

314

00:13:12,090 --> 00:13:10,240

exterior so it's easy and it's in the

315

00:13:14,879 --> 00:13:12,100

case like that to see that once that no

316

00:13:17,069 --> 00:13:14,889

longer functions for whatever reason one

317

00:13:20,369 --> 00:13:17,079

reason being a big gaping hole where a

318

00:13:20,910 --> 00:13:20,379

plane hit the building that the interior

319

00:13:22,259 --> 00:13:20,920

of the building

320

00:13:26,370 --> 00:13:22,269

is not going to be strong enough to

321

00:13:28,290 --> 00:13:26,380

stand up if you had the plane impact

322

00:13:30,900 --> 00:13:28,300

with no fire if you can picture such a

323

00:13:32,670 --> 00:13:30,910

thing the towers would have stood up but

324

00:13:35,850 --> 00:13:32,680

they would have been extremely weak for

325

00:13:37,199 --> 00:13:35,860

lateral loading so that a 30 or 40 mile

326

00:13:40,650 --> 00:13:37,209

an hour wind might have been enough to

327

00:13:41,970 --> 00:13:40,660

bring them down because again the

328

00:13:44,550 --> 00:13:41,980

lateral system of the building was

329

00:13:48,900 --> 00:13:44,560

compromised by having a big section of

330

00:13:50,730 --> 00:13:48,910

it forcibly removed the floor trusses

331

00:13:52,889 --> 00:13:50,740

were for the most part unrecognizable

332

00:13:55,160 --> 00:13:52,899

they were just too weak and they

333

00:13:59,009 --> 00:13:55,170

crumpled up as the buildings collapsed

334

00:14:00,720 --> 00:13:59,019

the exterior columns are what made for

335

00:14:04,100 --> 00:14:00,730

other of the dramatic pictures that you

336

00:14:07,170 --> 00:14:04,110

saw in the news because they were

337

00:14:09,870 --> 00:14:07,180

assembled in sections and for the most

338

00:14:11,460 --> 00:14:09,880

part they they failed at the joints

339

00:14:14,460 --> 00:14:11,470  
between sections and a section would be

340

00:14:17,610 --> 00:14:14,470  
three columns so you see if you look at

341

00:14:19,530 --> 00:14:17,620  
the original photographs afterwards you

342

00:14:21,600 --> 00:14:19,540  
see a lot of three columns in a row

343

00:14:23,370 --> 00:14:21,610  
that's the section of the original

344

00:14:26,850 --> 00:14:23,380  
exterior and it broke apart at the

345

00:14:29,220 --> 00:14:26,860  
splices well we're joined B where it

346

00:14:30,329 --> 00:14:29,230  
joined the neighbouring sections it's

347

00:14:33,150 --> 00:14:30,339  
interesting you mentioned like you know

348

00:14:35,870 --> 00:14:33,160  
the lateral load is all on the exterior

349

00:14:38,100 --> 00:14:35,880  
is that just talking about the wind load

350

00:14:40,560 --> 00:14:38,110  
for the building I suppose in seismic

351  
00:14:43,319 --> 00:14:40,570  
loads but buildings were built before in

352  
00:14:46,650 --> 00:14:43,329  
New York City had earthquake load as

353  
00:14:49,530 --> 00:14:46,660  
part of its requirements so it didn't

354  
00:14:52,319 --> 00:14:49,540  
come in until 1996 so they were designed

355  
00:14:55,860 --> 00:14:52,329  
for wind they were designed for wind

356  
00:14:57,329 --> 00:14:55,870  
under the 1968 actually I think under

357  
00:14:58,350 --> 00:14:57,339  
the 68 Building Code the business

358  
00:15:00,300 --> 00:14:58,360  
they're old enough they may have been

359  
00:15:01,650 --> 00:15:00,310  
designed in 1938 don't think oh but I

360  
00:15:04,079 --> 00:15:01,660  
don't think so believe they were

361  
00:15:05,639 --> 00:15:04,089  
designed under the 68 opening code the

362  
00:15:09,319 --> 00:15:05,649  
wind loads are somewhat lower than would

363  
00:15:12,240 --> 00:15:09,329

be required today not drastically so

364

00:15:13,290 --> 00:15:12,250

yeah I'm just want to make sure I

365

00:15:16,920 --> 00:15:13,300

understand like when you're talking

366

00:15:19,829 --> 00:15:16,930

about lateral loads like like say if you

367

00:15:22,650 --> 00:15:19,839

were to remove it delicately remove the

368

00:15:25,800 --> 00:15:22,660

exterior and the floors and you were

369

00:15:28,019 --> 00:15:25,810

just left with the core would that core

370

00:15:31,590 --> 00:15:28,029

column be able to the core of the

371

00:15:33,150 --> 00:15:31,600

building be self-supporting it would be

372

00:15:34,840 --> 00:15:33,160

self-supporting for gravity but it would

373

00:15:38,129 --> 00:15:34,850

basically be a house of cards

374

00:15:41,139 --> 00:15:38,139

very little lateral rigidity wow so a

375

00:15:45,039 --> 00:15:41,149

wind load much less than the code

376

00:15:48,099 --> 00:15:45,049

required wind vote in 1968 or now would

377

00:15:50,859 --> 00:15:48,109

that would be enough to destroy that so

378

00:15:52,989 --> 00:15:50,869

yeah it's what's called a tube structure

379

00:15:55,029 --> 00:15:52,999

it was invented in the 60s where you

380

00:15:56,499 --> 00:15:55,039

have closely spaced columns and beams

381

00:15:59,699 --> 00:15:56,509

would be at the exterior of the building

382

00:16:02,229 --> 00:15:59,709

and that serves as your lateral bracing

383

00:16:05,199 --> 00:16:02,239

John Hancock in Chicago is a tube

384

00:16:08,109 --> 00:16:05,209

structure there are any number from here

385

00:16:09,269 --> 00:16:08,119

in New York so it's it's a it was for a

386

00:16:12,400 --> 00:16:09,279

while

387

00:16:14,409 --> 00:16:12,410

sort of the the in vogue method of

388

00:16:16,449 --> 00:16:14,419

structural design for tall buildings

389

00:16:18,369 --> 00:16:16,459

yeah and that can make sense now like

390

00:16:19,809 --> 00:16:18,379

when when you think about how it

391

00:16:22,329 --> 00:16:19,819

collapsed like you talked about the

392

00:16:23,889 --> 00:16:22,339

floor trusses being all mangled

393

00:16:26,229 --> 00:16:23,899

like you there weren't very many

394

00:16:28,059 --> 00:16:26,239

recognizable floor trusses in the de

395

00:16:30,639 --> 00:16:28,069

rêve pile and they essentially would

396

00:16:32,799 --> 00:16:30,649

have been stripped away by the falling

397

00:16:35,919 --> 00:16:32,809

the falling mass of the building above

398

00:16:37,929 --> 00:16:35,929

in a very chaotic manner and then just

399

00:16:41,169 --> 00:16:37,939

reduced to rubble as they they went down

400

00:16:43,509 --> 00:16:41,179

yeah they were just crushed some people

401

00:16:46,149 --> 00:16:43,519

think of the floors kind of pancaking

402

00:16:47,889 --> 00:16:46,159

and then kind of neatly coming down like

403

00:16:49,659 --> 00:16:47,899

like a like a I don't know a like a

404

00:16:52,299 --> 00:16:49,669

house of cards just go and Bam Bam and

405

00:16:53,799 --> 00:16:52,309

then yeah stacking up but you're talking

406

00:16:57,639 --> 00:16:53,809

about the trusses being all just this

407

00:16:59,919 --> 00:16:57,649

mangled mess no not really stacked on

408

00:17:02,469 --> 00:16:59,929

top of each other it depends where you

409

00:17:06,100 --> 00:17:02,479

are in the building um so if you think

410

00:17:09,549 --> 00:17:06,110

about it the collapse did not begin with

411

00:17:11,019 --> 00:17:09,559

the uppermost floors it began at the

412

00:17:14,129 --> 00:17:11,029

floors that were most heavily weakened

413

00:17:16,899 --> 00:17:14,139

by fire which were somewhat lower and

414

00:17:19,629 --> 00:17:16,909

the top of the building sort of came

415

00:17:22,569 --> 00:17:19,639

down with the collapse and then itself

416

00:17:26,740 --> 00:17:22,579

sort of impacted the ground impacted the

417

00:17:28,600 --> 00:17:26,750

rubble below each floor down once the

418

00:17:30,999 --> 00:17:28,610

collapse starts is getting a heavier

419

00:17:34,299 --> 00:17:31,009

impact than the one before so by the

420

00:17:35,980 --> 00:17:34,309

time the second floor collapses it's got

421

00:17:37,990 --> 00:17:35,990

the weight of a hundred floors on its

422

00:17:40,779 --> 00:17:38,000

back that's that's why things were so

423

00:17:43,419 --> 00:17:40,789

badly pulverized because it it's just at

424

00:17:46,629 --> 00:17:43,429

the effect adds up as you come down the

425

00:17:48,360 --> 00:17:46,639

building I did a incredibly crude

426

00:17:51,409 --> 00:17:48,370

calculation on this

427

00:17:55,049 --> 00:17:51,419

just looking at the average floor height

428

00:17:57,269 --> 00:17:55,059

and falling to the ground never minding

429

00:18:00,180 --> 00:17:57,279

the affected fire you know just if you

430

00:18:02,159 --> 00:18:00,190

just had 110 floors at the elevation

431

00:18:05,460 --> 00:18:02,169

there at and you let them fall and that

432

00:18:08,039 --> 00:18:05,470

very crude calculation gave me a kinetic

433

00:18:12,450 --> 00:18:08,049

energy that is about 10% of the

434

00:18:15,390 --> 00:18:12,460

Hiroshima bomb oh yeah so yeah things

435

00:18:17,880 --> 00:18:15,400

got destroyed yeah yeah it's a lot of

436

00:18:19,740 --> 00:18:17,890

energy did you do have similar thoughts

437

00:18:21,330 --> 00:18:19,750

about building seven there was even kind

438

00:18:25,560 --> 00:18:21,340

of in your on your radar in terms of

439

00:18:27,210 --> 00:18:25,570

like you know how is it collapsed yes it

440

00:18:28,889 --> 00:18:27,220

was on my radar because it was a road

441

00:18:31,100 --> 00:18:28,899

block that I had to walk around all the

442

00:18:36,060 --> 00:18:34,139

the thing is I didn't think a great deal

443

00:18:38,940 --> 00:18:36,070

about it because I knew one thing that

444

00:18:41,820 --> 00:18:38,950

had become public knowledge on the 11th

445

00:18:44,430 --> 00:18:41,830

or on the 12th which was that that

446

00:18:48,049 --> 00:18:44,440

building caught fire when North Tower

447

00:18:50,430 --> 00:18:48,059

collapsed when the North Tower collapsed

448

00:18:53,669 --> 00:18:50,440

the fire department was very badly

449

00:18:56,130 --> 00:18:53,679

disorganized a large number large number

450

00:18:58,560 --> 00:18:56,140

of firefighters were dead a large number

451  
00:19:00,450 --> 00:18:58,570  
of officers were dead as well and the

452  
00:19:05,630 --> 00:19:00,460  
dust in the air prevented their radios

453  
00:19:09,029 --> 00:19:05,640  
from working so the fire department

454  
00:19:10,799 --> 00:19:09,039  
upper-upper officers made the decision

455  
00:19:13,440 --> 00:19:10,809  
to not attempt to fight the fire in

456  
00:19:14,940 --> 00:19:13,450  
number seven because they believed that

457  
00:19:16,289 --> 00:19:14,950  
they would not be able to put it out and

458  
00:19:18,029 --> 00:19:16,299  
what it would do is get a couple of more

459  
00:19:21,600 --> 00:19:18,039  
a couple hundred more firefighters

460  
00:19:22,919 --> 00:19:21,610  
killed for nothing yeah I think it was

461  
00:19:24,360 --> 00:19:22,929  
the correct decision everyone I've

462  
00:19:26,789 --> 00:19:24,370  
spoken to thinks it was the correct

463  
00:19:30,779 --> 00:19:26,799

decision but what that means is what you

464

00:19:32,490 --> 00:19:30,789

have is an uncontrolled fire in a forty

465

00:19:34,529 --> 00:19:32,500

swiss forty five forty seven storey

466

00:19:38,210 --> 00:19:34,539

building which is not something you see

467

00:19:41,100 --> 00:19:38,220

very often and you took about like

468

00:19:42,539 --> 00:19:41,110

examining they debris pile or like you

469

00:19:43,919 --> 00:19:42,549

should experience of being that by the

470

00:19:46,799 --> 00:19:43,929

debate pylons one thing you mentioned

471

00:19:48,810 --> 00:19:46,809

was the fires and this is another thing

472

00:19:53,760 --> 00:19:48,820

that people gets kind of suspicious

473

00:19:55,710 --> 00:19:53,770

about and you know you talk about how

474

00:19:58,500 --> 00:19:55,720

much how much actually flammable

475

00:20:00,960 --> 00:19:58,510

material there was in the building you

476  
00:20:01,919 --> 00:20:00,970  
know people say flammable material you

477  
00:20:03,690 --> 00:20:01,929  
know I'm looking around

478  
00:20:05,759 --> 00:20:03,700  
office people think flammable material

479  
00:20:08,009 --> 00:20:05,769  
is paper and books and things like that

480  
00:20:13,200 --> 00:20:08,019  
the plastic that's used for furniture

481  
00:20:15,570 --> 00:20:13,210  
will burn carpeting burns um there's a

482  
00:20:17,249 --> 00:20:15,580  
lot of there's a lot of things that will

483  
00:20:19,590 --> 00:20:17,259  
burn in an office if you get them hot

484  
00:20:22,139 --> 00:20:19,600  
enough and most of them are poisonous

485  
00:20:23,609 --> 00:20:22,149  
when they burn you really don't want to

486  
00:20:27,930 --> 00:20:23,619  
be around burning plastic if you can

487  
00:20:30,690 --> 00:20:27,940  
avoid it so when all that stuff gets

488  
00:20:32,580 --> 00:20:30,700

trapped in a confined space it's like

489

00:20:35,519 --> 00:20:32,590

you know an underground tire fire it

490

00:20:38,190 --> 00:20:35,529

just there's not enough oxygen for it to

491

00:20:40,409 --> 00:20:38,200

get burned hot and just burn itself out

492

00:20:43,470 --> 00:20:40,419

so it just serves smoulders for a very

493

00:20:45,060 --> 00:20:43,480

long time and it was a couple of months

494

00:20:47,519 --> 00:20:45,070

before the fires were finding me out

495

00:20:50,070 --> 00:20:47,529

because there was all of this flammable

496

00:20:52,859 --> 00:20:50,080

material down in the cellar hole of the

497

00:20:55,379 --> 00:20:52,869

entire complex being fed a little bit of

498

00:20:57,419 --> 00:20:55,389

oxygen so the fire just kept going and

499

00:20:59,730 --> 00:20:57,429

then it would occasionally flare if I

500

00:21:04,440 --> 00:20:59,740

guess when it was exposed to oxygen when

501  
00:21:05,970 --> 00:21:04,450  
their base Kotik uncovered yes and there

502  
00:21:09,899 --> 00:21:05,980  
were hoses with the sight to deal with

503  
00:21:12,869 --> 00:21:09,909  
that right you know a big big like kind

504  
00:21:14,960 --> 00:21:12,879  
of conspiracy thing there is this they

505  
00:21:19,320 --> 00:21:14,970  
claimed that there was molten steel

506  
00:21:22,830 --> 00:21:19,330  
liquid molten steel on the site in the

507  
00:21:24,659 --> 00:21:22,840  
in the fires did you ever hear of

508  
00:21:25,850 --> 00:21:24,669  
anything like that or see anything like

509  
00:21:29,430 --> 00:21:25,860  
that

510  
00:21:32,190 --> 00:21:29,440  
nope the only place I ever saw anything

511  
00:21:34,769 --> 00:21:32,200  
looked remotely like that was some of

512  
00:21:37,109 --> 00:21:34,779  
the video on before the collapses and it

513  
00:21:40,019 --> 00:21:37,119

was pretty clear that the that the

514

00:21:43,409 --> 00:21:40,029

molten material was aluminum from the

515

00:21:46,590 --> 00:21:43,419

facade which melts with much lower

516

00:21:48,029 --> 00:21:46,600

temperature than steel I never I never

517

00:21:49,680 --> 00:21:48,039

heard anybody talking about anything

518

00:21:52,230 --> 00:21:49,690

like molten steel on site I never saw

519

00:21:55,080 --> 00:21:52,240

anything I never saw any metal that

520

00:21:56,909 --> 00:21:55,090

showed signs of having melted I saw

521

00:21:58,350 --> 00:21:56,919

metal that was twisted and bent in all

522

00:22:00,749 --> 00:21:58,360

sorts of different shapes but never

523

00:22:03,389 --> 00:22:00,759

anything that could melt to different

524

00:22:05,669 --> 00:22:03,399

appearance yeah and you you've been in

525

00:22:08,460 --> 00:22:05,679

you know all parts of the the site like

526

00:22:09,869 --> 00:22:08,470

I think you you went down a hole in the

527

00:22:12,930 --> 00:22:09,879

street that would have been like kind of

528

00:22:14,550 --> 00:22:12,940

next building seven so you would have

529

00:22:18,780 --> 00:22:14,560

seen basically the

530

00:22:20,790 --> 00:22:18,790

the bottom of the pile as it was well

531

00:22:23,610 --> 00:22:20,800

actually that hole led to a garage that

532

00:22:26,700 --> 00:22:23,620

um the area that we were in was almost

533

00:22:29,190 --> 00:22:26,710

untouched want the the south end of it

534

00:22:32,670 --> 00:22:29,200

was crushed but the port part where we

535

00:22:33,960 --> 00:22:32,680

went down the hole it was on I that was

536

00:22:36,960 --> 00:22:33,970

November already by the time that

537

00:22:38,310 --> 00:22:36,970

happened and it was you know here here's

538

00:22:41,730 --> 00:22:38,320

where people park their cars in the

539

00:22:44,960 --> 00:22:41,740

morning at the of the 11th but no I I

540

00:22:48,660 --> 00:22:44,970

was all over immediately adjacent to

541

00:22:53,370 --> 00:22:48,670

collapsed steel and I never saw anything

542

00:22:56,400 --> 00:22:53,380

like that yeah and you I mean I imagine

543

00:22:59,580 --> 00:22:56,410

you wouldn't have seen things that looks

544

00:23:00,510 --> 00:22:59,590

like like evidence of explosive

545

00:23:03,090 --> 00:23:00,520

something like I feel kind of silly

546

00:23:06,660 --> 00:23:03,100

asking an expert like is this something

547

00:23:09,210 --> 00:23:06,670

that was even on anybody's radar at the

548

00:23:13,230 --> 00:23:09,220

time were they thinking like that that

549

00:23:15,150 --> 00:23:13,240

they would look at evidence well I mean

550

00:23:16,740 --> 00:23:15,160

I think the conspiracy theory starts

551  
00:23:17,850 --> 00:23:16,750  
pretty quickly I remember hearing people

552  
00:23:20,370 --> 00:23:17,860  
saying boy that was just like a

553  
00:23:23,670 --> 00:23:20,380  
controlled demolition while I was still

554  
00:23:27,090 --> 00:23:23,680  
on site I I don't I would not have

555  
00:23:28,710 --> 00:23:27,100  
recognized any anything like that I

556  
00:23:29,580 --> 00:23:28,720  
don't think I I don't think anybody

557  
00:23:31,680 --> 00:23:29,590  
would have been able to tell the

558  
00:23:39,870 --> 00:23:31,690  
difference necessarily unless they were

559  
00:23:43,710 --> 00:23:39,880  
a specialist in bomb explosions you know

560  
00:23:45,390 --> 00:23:43,720  
it's funny we as one of the people at

561  
00:23:48,540 --> 00:23:45,400  
the authority time study was worked on

562  
00:23:50,310 --> 00:23:48,550  
this they got involved later on with a

563  
00:23:51,750 --> 00:23:50,320

lot of the litigation work and I wasn't

564

00:23:53,430 --> 00:23:51,760

particularly involved with that but I

565

00:23:55,140 --> 00:23:53,440

had been on site so I was asked to

566

00:23:58,650 --> 00:23:55,150

review certain photographs and certain

567

00:24:01,440 --> 00:23:58,660

videos from my recollection to those

568

00:24:03,690 --> 00:24:01,450

areas and I remember people saying that

569

00:24:05,970 --> 00:24:03,700

the way that you saw debris and smoke

570

00:24:07,980 --> 00:24:05,980

moving outwards during the collapses was

571

00:24:09,900 --> 00:24:07,990

evidence of controlled demolition and

572

00:24:12,630 --> 00:24:09,910

that's what the effect I was talking to

573

00:24:15,030 --> 00:24:12,640

you about before where the air inside

574

00:24:18,480 --> 00:24:15,040

between two floors has nowhere to go but

575

00:24:21,390 --> 00:24:18,490

out radially outwards as the building

576

00:24:23,370 --> 00:24:21,400

pancakes so you know something that was

577

00:24:25,800 --> 00:24:23,380

pointed to his evidence of explosion of

578

00:24:27,390 --> 00:24:25,810

an explosion had a much simpler

579

00:24:29,070 --> 00:24:27,400

explanation

580

00:24:32,190 --> 00:24:29,080

I've seen that before they described it

581

00:24:34,770 --> 00:24:32,200

as a pyroclastic flow because of you get

582

00:24:36,420 --> 00:24:34,780

similar dust clouds and volcanic

583

00:24:38,070 --> 00:24:36,430

explosions and they think there's

584

00:24:40,230 --> 00:24:38,080

somehow indicates that must have been an

585

00:24:41,490 --> 00:24:40,240

explosion but if you look at you know

586

00:24:43,680 --> 00:24:41,500

building collapses

587

00:24:45,630 --> 00:24:43,690

they just collapsed by by you know

588

00:24:47,850 --> 00:24:45,640

without explosives you get this kind of

589

00:24:49,320 --> 00:24:47,860

similar dust cloud or things like rock

590

00:24:51,330 --> 00:24:49,330

falls and things like that you get the

591

00:24:55,080 --> 00:24:51,340

exact same cloud of dust because as you

592

00:24:57,150 --> 00:24:55,090

say is the air being displaced yeah yeah

593

00:25:00,060 --> 00:24:57,160

and another thing that people point to

594

00:25:04,110 --> 00:25:00,070

is the columns that were cut

595

00:25:06,090 --> 00:25:04,120

after the during the cleanup they did a

596

00:25:07,290 --> 00:25:06,100

lot of removal of you know the columns

597

00:25:10,500 --> 00:25:07,300

that were still standing so they had to

598

00:25:13,110 --> 00:25:10,510

cut them and sometimes they they would

599

00:25:14,700 --> 00:25:13,120

cut them at an angle and people claimed

600

00:25:18,240 --> 00:25:14,710

that you would never cut a column as an

601  
00:25:20,669 --> 00:25:18,250  
angle do you have any thoughts about

602  
00:25:23,340 --> 00:25:20,679  
here why why the columns were cut at an

603  
00:25:27,900 --> 00:25:23,350  
angle during cleanup because because of

604  
00:25:31,470 --> 00:25:27,910  
the pile of debris I want to emphasize

605  
00:25:35,310 --> 00:25:31,480  
that as of the 11th as of the evening of

606  
00:25:37,110 --> 00:25:35,320  
the 11th there was nothing left of one

607  
00:25:38,220 --> 00:25:37,120  
and two that resemble the building in

608  
00:25:40,169 --> 00:25:38,230  
any way it's not like there was a

609  
00:25:42,210 --> 00:25:40,179  
building with a big pile of stuff on top

610  
00:25:44,940 --> 00:25:42,220  
of it there was nothing left that looked

611  
00:25:47,040 --> 00:25:44,950  
like a building I the description that

612  
00:25:51,030 --> 00:25:47,050  
I've used for this is pick up sticks it

613  
00:25:52,590 --> 00:25:51,040

was just this random distribution of the

614

00:25:55,799 --> 00:25:52,600

columns that had survived some of them

615

00:25:57,419 --> 00:25:55,809

were straight some of them were not and

616

00:26:01,640 --> 00:25:57,429

they were in every pointing in every

617

00:26:03,570 --> 00:26:01,650

possible direction they were cut in

618

00:26:06,120 --> 00:26:03,580

Ankara meter trying to pick up these

619

00:26:08,160 --> 00:26:06,130

pieces of steel that are tangled in with

620

00:26:10,440 --> 00:26:08,170

each other and there are all different

621

00:26:12,330 --> 00:26:10,450

angles and they cut them wherever they

622

00:26:16,169 --> 00:26:12,340

needed to cut them to get a piece free

623

00:26:17,850 --> 00:26:16,179

to move it out all right those if you're

624

00:26:19,740 --> 00:26:17,860

demolishing a building you would never

625

00:26:22,110 --> 00:26:19,750

cut a column in an angle because it's

626

00:26:24,000 --> 00:26:22,120

you're taking a building down and you

627

00:26:26,940 --> 00:26:24,010

want to have things continue to function

628

00:26:28,860 --> 00:26:26,950

as you come down four by four when

629

00:26:32,400 --> 00:26:28,870

you're dealing with a pile of debris

630

00:26:34,200 --> 00:26:32,410

it's a different situation you you you

631

00:26:36,120 --> 00:26:34,210

looked a lot of the other damage to

632

00:26:39,210 --> 00:26:36,130

other buildings like in particular like

633

00:26:40,950 --> 00:26:39,220

one that stands out is 130 Liberty which

634

00:26:42,870 --> 00:26:40,960

had this huge gash

635

00:26:45,150 --> 00:26:42,880

in the front of it with a very large

636

00:26:49,650 --> 00:26:45,160

piece of the the facade I believe at the

637

00:26:51,360 --> 00:26:49,660

South Tower in it yes and that would

638

00:26:54,150 --> 00:26:51,370

play a bit of structural damage to it

639

00:26:57,930 --> 00:26:54,160

was there was there any danger of

640

00:27:01,590 --> 00:26:57,940

collapse do you think from the top that

641

00:27:05,220 --> 00:27:01,600

building was ever in danger the building

642

00:27:08,820 --> 00:27:05,230

is the hole no it wasn't 130 Liberty was

643

00:27:10,470 --> 00:27:08,830

was a structurally anomalous in the

644

00:27:12,840 --> 00:27:10,480

opposite way of the World Trade Center

645

00:27:16,470 --> 00:27:12,850

it was heavier than it needed to be my

646

00:27:20,070 --> 00:27:16,480

understanding had been built by Irving

647

00:27:23,730 --> 00:27:20,080

Trust Bank originally which is long con

648

00:27:27,030 --> 00:27:23,740

now as a place where they would have

649

00:27:28,650 --> 00:27:27,040

trading floors and they didn't know how

650

00:27:30,030 --> 00:27:28,660

many trading floors they would have were

651  
00:27:31,320 --> 00:27:30,040  
they going to rent out space the people

652  
00:27:33,780 --> 00:27:31,330  
who would put in trading floors and

653  
00:27:36,030 --> 00:27:33,790  
trading floors in terms of structural

654  
00:27:38,640 --> 00:27:36,040  
design are heavier than normal or office

655  
00:27:41,010 --> 00:27:38,650  
space so what they did was they designed

656  
00:27:42,750 --> 00:27:41,020  
the whole building for literally twice

657  
00:27:44,850 --> 00:27:42,760  
to the live load of a normal office

658  
00:27:46,680 --> 00:27:44,860  
building that gave them maximum

659  
00:27:49,560 --> 00:27:46,690  
flexibility of what to do with it and it

660  
00:27:52,800 --> 00:27:49,570  
had a traditional lateral load system it

661  
00:27:55,920 --> 00:27:52,810  
didn't have a tube system so the having

662  
00:27:58,080 --> 00:27:55,930  
the gash on the North Face did not

663  
00:28:01,890 --> 00:27:58,090

significantly reduce its lateral

664

00:28:05,090 --> 00:28:01,900

stability so the building was dangerous

665

00:28:08,430 --> 00:28:05,100

because every single window was smashed

666

00:28:11,040 --> 00:28:08,440

pieces of the metal facade panels were

667

00:28:13,530 --> 00:28:11,050

loose so it could kill somebody walking

668

00:28:15,450 --> 00:28:13,540

by just dropping five pounds of

669

00:28:19,200 --> 00:28:15,460

debris onto them yeah but the building

670

00:28:21,870 --> 00:28:19,210

as a whole was not unstable so I guess

671

00:28:24,390 --> 00:28:21,880

we'll trace enter 7 was a similar

672

00:28:26,670 --> 00:28:24,400

distance away from the towers as 130

673

00:28:29,880 --> 00:28:26,680

Liberty not entirely sure but you know

674

00:28:33,030 --> 00:28:29,890

some distance away so it's suffered

675

00:28:34,830 --> 00:28:33,040

similar kinds of damage would there have

676

00:28:37,260 --> 00:28:34,840

been differences in the effects of the

677

00:28:40,790 --> 00:28:37,270

damage on building 7 because of its

678

00:28:43,260 --> 00:28:40,800

different design this is 130 Liberty

679

00:28:45,660 --> 00:28:43,270

Isis I don't know is the fact I suspect

680

00:28:48,690 --> 00:28:45,670

130 Liberty was a stronger building than

681

00:28:51,720 --> 00:28:48,700

7 the biggest difference between them is

682

00:28:54,120 --> 00:28:51,730

as far as I know there was not there was

683

00:28:54,690 --> 00:28:54,130

very little fire spread in 130 Liberty

684

00:28:57,119 --> 00:28:54,700

on it

685

00:29:02,460 --> 00:28:57,129

the debris that's hid it wasn't on fire

686

00:29:04,379 --> 00:29:02,470

and for example at 7:00 the fires at the

687

00:29:06,269 --> 00:29:04,389

top floors were rather small and

688

00:29:08,070 --> 00:29:06,279

basically extinguished themselves

689

00:29:10,889 --> 00:29:08,080

because they didn't spread so they ran

690

00:29:12,989 --> 00:29:10,899

out of fuel so fires the lower floors

691

00:29:14,879 --> 00:29:12,999

that spread so there may have been some

692

00:29:18,810 --> 00:29:14,889

small fires at 1:30 Liberty but they

693

00:29:20,129 --> 00:29:18,820

didn't continue to burn yeah that's the

694

00:29:22,430 --> 00:29:20,139

big difference I believe between the two

695

00:29:24,749 --> 00:29:22,440

yeah definitely well yeah you could see

696

00:29:28,499 --> 00:29:24,759

huge amounts of fire in World Trade

697

00:29:31,229 --> 00:29:28,509

Center seven yeah another building is

698

00:29:33,330 --> 00:29:31,239

one Liberty Plaza and it was interesting

699

00:29:35,460 --> 00:29:33,340

you wrote about this in the book is that

700

00:29:37,859 --> 00:29:35,470

there were a lot of rumors going around

701  
00:29:40,499 --> 00:29:37,869  
that one Liberty Plaza was going to

702  
00:29:43,859 --> 00:29:40,509  
collapse and you went and looked at it

703  
00:29:46,950 --> 00:29:43,869  
and you saw that it wasn't and then you

704  
00:29:52,529 --> 00:29:46,960  
kind of tried to tamp down the rumors by

705  
00:29:54,899 --> 00:29:52,539  
spreading what you called yeah that was

706  
00:29:59,729 --> 00:29:54,909  
spreading the counter rumor was probably

707  
00:30:04,710 --> 00:29:59,739  
me being at that time sort of on edge

708  
00:30:06,539 --> 00:30:04,720  
and and very tired there's an optical

709  
00:30:08,190 --> 00:30:06,549  
illusion that anybody can perform with

710  
00:30:10,229 --> 00:30:08,200  
you need a building about ten stories or

711  
00:30:12,419 --> 00:30:10,239  
more at all and what you do is you walk

712  
00:30:14,820 --> 00:30:12,429  
right up to the building get your belly

713  
00:30:16,109 --> 00:30:14,830

touching it and look up and if you do

714

00:30:17,970 --> 00:30:16,119

that it looks like the building is

715

00:30:19,379 --> 00:30:17,980

leaning over you hmm

716

00:30:23,399 --> 00:30:19,389

something to do with the way our eyes

717

00:30:27,570 --> 00:30:23,409

and brain function and people were very

718

00:30:28,830 --> 00:30:27,580

on edge I think in part because of seven

719

00:30:31,889 --> 00:30:28,840

World Trade Center more than the other

720

00:30:35,279 --> 00:30:31,899

two because seven were given the

721

00:30:37,799 --> 00:30:35,289

expensive plane damage it was shocking

722

00:30:41,159 --> 00:30:37,809

but not exactly unexpected that one and

723

00:30:43,769 --> 00:30:41,169

two would collapse seven didn't have

724

00:30:45,749 --> 00:30:43,779

that and it was I think it was served in

725

00:30:49,109 --> 00:30:45,759

people's heads here's the building that

726

00:30:51,060 --> 00:30:49,119

didn't look so bad in a collapsed so

727

00:30:55,200 --> 00:30:51,070

every little thing got every little

728

00:30:56,879 --> 00:30:55,210

thing got followed up and I think people

729

00:31:00,090 --> 00:30:56,889

from Thornton time the city went up to

730

00:31:02,239 --> 00:31:00,100

the top of this using spares of one

731

00:31:04,769 --> 00:31:02,249

Liberty I don't know four or five times

732

00:31:07,440 --> 00:31:04,779

looking for damage because somebody said

733

00:31:08,840 --> 00:31:07,450

you know it doesn't look right and there

734

00:31:11,640 --> 00:31:08,850

was nothing wrong with the

735

00:31:15,240 --> 00:31:11,650

literally nothing wrong yeah

736

00:31:17,549 --> 00:31:15,250

so you know it was its to me evidence

737

00:31:22,260 --> 00:31:17,559

that even people who deal with the stuff

738

00:31:24,299 --> 00:31:22,270

for a living get spooked and they you

739

00:31:24,899 --> 00:31:24,309

know you see a pattern even when it's

740

00:31:26,700 --> 00:31:24,909

not there

741

00:31:27,930 --> 00:31:26,710

so the pattern was the building was near

742

00:31:30,180 --> 00:31:27,940

the site it's a tall building a

743

00:31:32,760 --> 00:31:30,190

collapsed maybe one Liberty's gonna

744

00:31:35,450 --> 00:31:32,770

collect collapse next yes only I mean

745

00:31:37,649 --> 00:31:35,460

yeah it's like all bets are off for

746

00:31:39,120 --> 00:31:37,659

after you've seen what you've seen that

747

00:31:40,460 --> 00:31:39,130

day because it's something no one's

748

00:31:44,630 --> 00:31:40,470

experienced before

749

00:31:47,010 --> 00:31:44,640

you know much in your mind it goes wild

750

00:31:49,830 --> 00:31:47,020

let's let's talk a little bit about the

751  
00:31:51,690 --> 00:31:49,840  
yeah I sent you the the whole C report

752  
00:31:54,840 --> 00:31:51,700  
which is this report done by the

753  
00:31:56,520 --> 00:31:54,850  
University of Alaska and I kind of yeah

754  
00:31:59,520 --> 00:31:56,530  
I ask you for your your general

755  
00:32:01,560 --> 00:31:59,530  
impression of it how do you kind of

756  
00:32:05,730 --> 00:32:01,570  
characterize like what you've what

757  
00:32:07,529 --> 00:32:05,740  
you've seen a bit so far well I didn't

758  
00:32:11,730 --> 00:32:07,539  
find it very convincing as I guess the

759  
00:32:13,740 --> 00:32:11,740  
the best way to put it I feel like they

760  
00:32:17,370 --> 00:32:13,750  
made a bunch of assumptions some of

761  
00:32:20,370 --> 00:32:17,380  
which are not very well thought out they

762  
00:32:22,620 --> 00:32:20,380  
begin by saying that you know they're

763  
00:32:25,799 --> 00:32:22,630

not sure about the expenses of the of

764

00:32:27,600 --> 00:32:25,809

the temperatures that were inside again

765

00:32:30,450 --> 00:32:27,610

this is a building that was on fire with

766

00:32:33,299 --> 00:32:30,460

no real attempt to put out the fire

767

00:32:36,169 --> 00:32:33,309

no no attempt to fight it no sign that

768

00:32:39,240 --> 00:32:36,179

the sprinklers functioned properly

769

00:32:40,799 --> 00:32:39,250

fires get extremely hot it's the reason

770

00:32:44,010 --> 00:32:40,809

that you know you taught to stay at the

771

00:32:47,159 --> 00:32:44,020

floor the fire at the ceiling in an in a

772

00:32:49,590 --> 00:32:47,169

in a case like this is going to be

773

00:32:53,130 --> 00:32:49,600

somewhere above 2,000 degrees Fahrenheit

774

00:32:56,190 --> 00:32:53,140

and that is enough to basically destroy

775

00:32:59,430 --> 00:32:56,200

structure it doesn't melt this deal it

776

00:33:02,100 --> 00:32:59,440

weakens it and when this deal is weak it

777

00:33:04,409 --> 00:33:02,110

will start to collapse and in that

778

00:33:07,470 --> 00:33:04,419

report they extensively modeled the

779

00:33:12,120 --> 00:33:07,480

building but they're assuming that all

780

00:33:14,490 --> 00:33:12,130

the members are present and if fires a

781

00:33:17,220 --> 00:33:14,500

couple of floors away from the area

782

00:33:18,750 --> 00:33:17,230

they're looking had weakened beams that

783

00:33:20,430 --> 00:33:18,760

are bracing columns then the frame

784

00:33:23,490 --> 00:33:20,440

wouldn't function the way that their

785

00:33:28,020 --> 00:33:23,500

model assumes functions

786

00:33:30,000 --> 00:33:28,030

so I I just they did not seem to take

787

00:33:31,770 --> 00:33:30,010

this into account and maybe they did and

788

00:33:35,370 --> 00:33:31,780

it's not written up very well I can't I

789

00:33:36,690 --> 00:33:35,380

can't say for certain but any time I see

790

00:33:39,380 --> 00:33:36,700

that they're modeling the whole frame

791

00:33:41,850 --> 00:33:39,390

but they're only talking about the

792

00:33:44,520 --> 00:33:41,860

effective temperature at the specific

793

00:33:47,150 --> 00:33:44,530

column they're looking at I'm not so

794

00:33:49,860 --> 00:33:47,160

sure I that that makes much sense yeah

795

00:33:51,870 --> 00:33:49,870

yeah definitely I think they they didn't

796

00:33:53,550 --> 00:33:51,880

really account for that and when they

797

00:33:55,800 --> 00:33:53,560

were doing simulations it seemed like

798

00:33:58,320 --> 00:33:55,810

they were just simply removing a section

799

00:34:02,940 --> 00:33:58,330

of a column and leaving the rest of the

800

00:34:05,490 --> 00:34:02,950

building untouched that method has

801  
00:34:07,890 --> 00:34:05,500  
actually has a long history to it that

802  
00:34:10,950 --> 00:34:07,900  
method has been used in other countries

803  
00:34:14,880 --> 00:34:10,960  
and particularly in the UK as a form of

804  
00:34:17,220 --> 00:34:14,890  
modeling for bomb blasts at least the

805  
00:34:18,690 --> 00:34:17,230  
80s and maybe earlier than that and it's

806  
00:34:20,820 --> 00:34:18,700  
actually in the New York City Building

807  
00:34:22,980 --> 00:34:20,830  
Code now in terms of resilience as one

808  
00:34:24,630 --> 00:34:22,990  
of the methods to check on the

809  
00:34:27,840 --> 00:34:24,640  
building's resilience is to remove key

810  
00:34:29,700 --> 00:34:27,850  
members so that method makes sense but

811  
00:34:32,700 --> 00:34:29,710  
it's not a model of a specific event

812  
00:34:34,320 --> 00:34:32,710  
that you're trying to recreate yeah it

813  
00:34:37,580 --> 00:34:34,330

would make sense if you were modeling a

814

00:34:41,430 --> 00:34:37,590

bomb like the 1993 World Trade Center

815

00:34:42,900 --> 00:34:41,440

attacks yes well just a bomb of one

816

00:34:44,940 --> 00:34:42,910

column even then I suppose there would

817

00:34:47,880 --> 00:34:44,950

have been a lot of force blast force on

818

00:34:50,430 --> 00:34:47,890

the floors and beams around the column

819

00:34:51,870 --> 00:34:50,440

as well so it's still not getting in any

820

00:34:54,300 --> 00:34:51,880

tally accurate thing but it gives you a

821

00:34:58,110 --> 00:34:54,310

baseline of you know if this column is

822

00:35:01,440 --> 00:34:58,120

taken out what will happen but but not

823

00:35:04,470 --> 00:35:01,450

entirely accurate did you look at the

824

00:35:08,820 --> 00:35:04,480

the video I made kind of like looking

825

00:35:11,310 --> 00:35:08,830

into the static versus dynamic modeling

826

00:35:14,730 --> 00:35:11,320

that they did no I did not another

827

00:35:17,580 --> 00:35:14,740

factor that yeah no it's just that it

828

00:35:20,760 --> 00:35:17,590

seems like they they modeled it using a

829

00:35:22,320 --> 00:35:20,770

using static analysis and correct me if

830

00:35:26,580 --> 00:35:22,330

I'm wrong with a static analysis would

831

00:35:28,530 --> 00:35:26,590

be where you're just measuring kind of

832

00:35:31,380 --> 00:35:28,540

the defamation of a building under a

833

00:35:34,680 --> 00:35:31,390

load like you how much the the members

834

00:35:36,120 --> 00:35:34,690

will will deflect and it's not really

835

00:35:40,140 --> 00:35:36,130

your something you would do for

836

00:35:43,170 --> 00:35:40,150

an actual in process collapse it can be

837

00:35:46,140 --> 00:35:43,180

part of that analysis but yeah you're

838

00:35:50,460 --> 00:35:46,150

correct that it's not sufficient for up

839

00:35:52,680 --> 00:35:50,470

until the 1960s tall building design was

840

00:35:54,809 --> 00:35:52,690

typically done only statically mm-hmm

841

00:35:58,319 --> 00:35:54,819

because it's a great deal of computation

842

00:35:59,999 --> 00:35:58,329

to do dynamic analysis tall buildings

843

00:36:03,359 --> 00:36:00,009

and particularly slender tall buildings

844

00:36:06,420 --> 00:36:03,369

now regularly get dynamic analysis as

845

00:36:08,579 --> 00:36:06,430

per their original design I suspect

846

00:36:11,160 --> 00:36:08,589

there was some dynamic analysis at the

847

00:36:14,160 --> 00:36:11,170

World Trade Center but I don't know I've

848

00:36:17,299 --> 00:36:14,170

read various interviews with Wes

849

00:36:20,190 --> 00:36:17,309

Robertson took place after the 11th and

850

00:36:23,309 --> 00:36:20,200

it seems that it was a very thorough

851  
00:36:27,539 --> 00:36:23,319  
design they did not make any decisions

852  
00:36:29,870 --> 00:36:27,549  
lightly but you can do you can do a lot

853  
00:36:32,729 --> 00:36:29,880  
with spec analysis but it has its limits

854  
00:36:34,920 --> 00:36:32,739  
yeah they they push the static analysis

855  
00:36:37,049 --> 00:36:34,930  
to the extent that they show the

856  
00:36:40,769 --> 00:36:37,059  
building tipping over and it's at about

857  
00:36:44,069 --> 00:36:40,779  
30 40 degrees and it seems like that's

858  
00:36:46,079 --> 00:36:44,079  
kind of to me like an inappropriate use

859  
00:36:48,299 --> 00:36:46,089  
of static analysis because the building

860  
00:36:52,170 --> 00:36:48,309  
is actually moving at that point if a

861  
00:36:55,469 --> 00:36:52,180  
building is tipped over 40 degrees then

862  
00:36:58,670 --> 00:36:55,479  
you can you still say that static

863  
00:37:01,469 --> 00:36:58,680

analysis is valid for those situation

864

00:37:03,239 --> 00:37:01,479

well I don't think it's a realistic

865

00:37:05,190 --> 00:37:03,249

model if you tip one of these buildings

866

00:37:08,849 --> 00:37:05,200

40 degrees you're gonna have all sorts

867

00:37:11,910 --> 00:37:08,859

of secondary effects that are not part

868

00:37:13,950 --> 00:37:11,920

of a normal static analysis I mean if a

869

00:37:17,729 --> 00:37:13,960

building is tipping over like that then

870

00:37:19,680 --> 00:37:17,739

gravity load is causing bending in the

871

00:37:22,079 --> 00:37:19,690

building in a way that it doesn't when

872

00:37:23,219 --> 00:37:22,089

the building is vertical I don't know

873

00:37:24,870 --> 00:37:23,229

how you're going to take that into

874

00:37:27,120 --> 00:37:24,880

account in a static analysis unless you

875

00:37:30,690 --> 00:37:27,130

do a series of such analyses at sort of

876

00:37:33,120 --> 00:37:30,700

every angle of tilt which seems to not

877

00:37:34,589 --> 00:37:33,130

be what they did yeah I mean static

878

00:37:39,120 --> 00:37:34,599

analysis kind of ignores the time

879

00:37:41,130 --> 00:37:39,130

component yes and impact yeah yeah so

880

00:37:43,950 --> 00:37:41,140

let the momentum of things and things

881

00:37:45,089 --> 00:37:43,960

hitting other things and you know the

882

00:37:47,219 --> 00:37:45,099

building starts to tip it's going to

883

00:37:48,700 --> 00:37:47,229

continue to tip it's not just a static

884

00:37:50,560 --> 00:37:48,710

force

885

00:37:52,930 --> 00:37:50,570

I think that they did they try to

886

00:37:55,780 --> 00:37:52,940

replicate NIST's analysis and they did

887

00:37:57,490 --> 00:37:55,790

it by removing a line of three columns

888

00:38:00,520 --> 00:37:57,500

and then removing another set of three

889

00:38:02,740 --> 00:38:00,530

columns and then things started to fail

890

00:38:03,880 --> 00:38:02,750

progressively like all the columns the

891

00:38:06,670 --> 00:38:03,890

loads were transferred to the other

892

00:38:09,760 --> 00:38:06,680

columns and they failed but they kind of

893

00:38:11,980 --> 00:38:09,770

used this to make it seem like the the

894

00:38:13,720 --> 00:38:11,990

building would actually tip over and I

895

00:38:16,660 --> 00:38:13,730

think to do that they would have to know

896

00:38:18,850 --> 00:38:16,670

at what time the columns failed because

897

00:38:20,830 --> 00:38:18,860

if they all failed within half a second

898

00:38:22,120 --> 00:38:20,840

or within two or three seconds the

899

00:38:24,790 --> 00:38:22,130

building wouldn't actually have the time

900

00:38:28,210 --> 00:38:24,800

to tip over so you couldn't really say

901  
00:38:29,890 --> 00:38:28,220  
it had tipped over but I think there's a

902  
00:38:32,470 --> 00:38:29,900  
lot of questions around around their

903  
00:38:35,860 --> 00:38:32,480  
report and that type of thing a quick

904  
00:38:37,750 --> 00:38:35,870  
question like in professor holsters

905  
00:38:41,860 --> 00:38:37,760  
presentation that he gave he mentioned

906  
00:38:46,210 --> 00:38:41,870  
that the the building had been evacuated

907  
00:38:47,950 --> 00:38:46,220  
and there wouldn't be a live load of the

908  
00:38:52,240 --> 00:38:47,960  
people within the building

909  
00:38:54,640 --> 00:38:52,250  
and that would make a difference to the

910  
00:38:55,750 --> 00:38:54,650  
calculations do you think that would

911  
00:38:57,670 --> 00:38:55,760  
actually make a significant difference

912  
00:39:01,930 --> 00:38:57,680  
the people being evacuated out of the

913  
00:39:06,400 --> 00:39:01,940

building normal office space people are

914

00:39:09,880 --> 00:39:06,410

a real but part of the load but well

915

00:39:14,080 --> 00:39:09,890

under half normal office space furniture

916

00:39:18,550 --> 00:39:14,090

and papers and contents weighs more than

917

00:39:19,840 --> 00:39:18,560

people yeah so I you know yes the

918

00:39:21,430 --> 00:39:19,850

building was somewhat lighter because

919

00:39:24,850 --> 00:39:21,440

the loads were somewhat lighter because

920

00:39:27,400 --> 00:39:24,860

of that yes it's getting into the

921

00:39:30,370 --> 00:39:27,410

details of the analysis and and I'm not

922

00:39:32,940 --> 00:39:30,380

sure either he knows or that I know

923

00:39:36,520 --> 00:39:32,950

exactly what this did in their analysis

924

00:39:39,100 --> 00:39:36,530

yeah yeah I don't think I don't remember

925

00:39:41,260 --> 00:39:39,110

the live load being mentioned in in this

926  
00:39:42,850 --> 00:39:41,270  
analysis no it's not just the people

927  
00:39:46,090 --> 00:39:42,860  
it's the floors themselves which are the

928  
00:39:47,500 --> 00:39:46,100  
the mass of the building but they're not

929  
00:39:51,390 --> 00:39:47,510  
they're not live load they're just

930  
00:39:55,960 --> 00:39:51,400  
they're dead load but they're not yeah

931  
00:40:00,870 --> 00:39:55,970  
so you know a general thing kind of

932  
00:40:03,309 --> 00:40:00,880  
closing up here like it's it's very hard

933  
00:40:05,589 --> 00:40:03,319  
to get people to talk about this type of

934  
00:40:06,880 --> 00:40:05,599  
thing your you're an engineer you're an

935  
00:40:09,490 --> 00:40:06,890  
expert on it and this this type of

936  
00:40:10,599 --> 00:40:09,500  
things and you you were on the site so

937  
00:40:13,289 --> 00:40:10,609  
it's great you have this really great

938  
00:40:16,480 --> 00:40:13,299

perspective I but I find it very hard to

939

00:40:20,260 --> 00:40:16,490

get people like engineers or scientists

940

00:40:23,289 --> 00:40:20,270

to talk about conspiracy theories what's

941

00:40:25,720 --> 00:40:23,299

what's your sense about how 9/11

942

00:40:30,849 --> 00:40:25,730

conspiracy theories are viewed within

943

00:40:33,430 --> 00:40:30,859

the engineering community I've never met

944

00:40:34,870 --> 00:40:33,440

a structural engineer of a practicing

945

00:40:36,549 --> 00:40:34,880

structural engineer who believes them

946

00:40:39,579 --> 00:40:36,559

that doesn't mean that those such people

947

00:40:43,210 --> 00:40:39,589

don't exist I'm sure they do but you

948

00:40:45,039 --> 00:40:43,220

would think that if there was something

949

00:40:47,079 --> 00:40:45,049

funny about what happened here that

950

00:40:51,309 --> 00:40:47,089

engineers in New York would be aware of

951  
00:40:54,670 --> 00:40:51,319  
it and there's really no sign that

952  
00:40:57,760 --> 00:40:54,680  
anybody here believes believes that kind

953  
00:41:02,770 --> 00:40:57,770  
of theory it is sort of fascinating to

954  
00:41:05,559 --> 00:41:02,780  
me that so much of the the conspiracy

955  
00:41:10,089 --> 00:41:05,569  
theory comes from people who are quite

956  
00:41:12,490 --> 00:41:10,099  
far away and not necessarily spend a lot

957  
00:41:14,170 --> 00:41:12,500  
of time dealing with with tall buildings

958  
00:41:16,480 --> 00:41:14,180  
and don't miss an actual call though

959  
00:41:17,829 --> 00:41:16,490  
because about this theory and don't

960  
00:41:21,250 --> 00:41:17,839  
necessarily spend a lot of time dealing

961  
00:41:25,539 --> 00:41:21,260  
with tall buildings that have real-life

962  
00:41:27,460 --> 00:41:25,549  
problems for example the World Trade

963  
00:41:31,870 --> 00:41:27,470

Center was built with asbestos

964

00:41:35,039 --> 00:41:31,880

fireproofing and not not number seven

965

00:41:37,359 --> 00:41:35,049

numbers one and two and that was

966

00:41:39,880 --> 00:41:37,369

outlawed not very long after the

967

00:41:41,260 --> 00:41:39,890

buildings were completed and the way

968

00:41:43,059 --> 00:41:41,270

that the Port Authority which owned the

969

00:41:44,890 --> 00:41:43,069

buildings was dealing with it was when a

970

00:41:47,109 --> 00:41:44,900

floor came empty they stripped it out

971

00:41:49,359 --> 00:41:47,119

and it was considered to be you know

972

00:41:50,920 --> 00:41:49,369

it's it's not people are not being

973

00:41:54,069 --> 00:41:50,930

exposed if it's hidden in the ceiling

974

00:41:55,870 --> 00:41:54,079

space but anytime there was going to be

975

00:42:00,730 --> 00:41:55,880

demolition work then the whole floor was

976  
00:42:03,640 --> 00:42:00,740  
was was abated and the new fire proofing

977  
00:42:06,730 --> 00:42:03,650  
that was used in the late 70s and the

978  
00:42:11,980 --> 00:42:06,740  
80s turns out had a problem with

979  
00:42:12,500 --> 00:42:11,990  
adhering to steel so they had the

980  
00:42:14,510 --> 00:42:12,510  
asbestos

981  
00:42:18,440 --> 00:42:14,520  
may have been pretty close to 100% gone

982  
00:42:22,670 --> 00:42:18,450  
by 2001 but there were a number of

983  
00:42:25,300 --> 00:42:22,680  
floors that had fire proofing that

984  
00:42:27,320 --> 00:42:25,310  
worked great if everything was static

985  
00:42:29,210 --> 00:42:27,330  
but of course the impact of the

986  
00:42:31,000 --> 00:42:29,220  
building's caused the impact of the

987  
00:42:33,650 --> 00:42:31,010  
airplanes cause both buildings to move

988  
00:42:35,450 --> 00:42:33,660

much more than normal movement and it

989

00:42:40,220 --> 00:42:35,460

came suddenly it's not like a wind

990

00:42:42,620 --> 00:42:40,230

builds up it was a sharp impact and it's

991

00:42:44,660 --> 00:42:42,630

quite likely that a lot of fire proofing

992

00:42:48,470 --> 00:42:44,670

simply fell off of the floor trusses

993

00:42:51,410 --> 00:42:48,480

when that happened which is something

994

00:42:52,850 --> 00:42:51,420

that you know this problem is known no

995

00:42:55,100 --> 00:42:52,860

way to ever know the extent of what

996

00:42:56,390 --> 00:42:55,110

actually happened right yeah somebody

997

00:42:58,250 --> 00:42:56,400

would have to inspect the building in

998

00:42:59,960 --> 00:42:58,260

between the impact and the collapse know

999

00:43:03,770 --> 00:42:59,970

exactly what happened

1000

00:43:05,600 --> 00:43:03,780

so the ability of the buildings to

1001  
00:43:09,380 --> 00:43:05,610  
withstand fire may have been

1002  
00:43:13,550 --> 00:43:09,390  
significantly reduced but we don't know

1003  
00:43:15,080 --> 00:43:13,560  
how much and when people say oh how

1004  
00:43:19,550 --> 00:43:15,090  
could this happen well this is a

1005  
00:43:22,250 --> 00:43:19,560  
real-life kind of problem in a computer

1006  
00:43:24,680 --> 00:43:22,260  
frame analysis you say okay the

1007  
00:43:26,210 --> 00:43:24,690  
temperature is this you know it's going

1008  
00:43:28,490 --> 00:43:26,220  
to temperature curve is going to look

1009  
00:43:29,600 --> 00:43:28,500  
like this is the steel heats up but

1010  
00:43:34,150 --> 00:43:29,610  
maybe that's not accurate

1011  
00:43:36,740 --> 00:43:34,160  
and it doesn't take that much

1012  
00:43:38,470 --> 00:43:36,750  
unprotected steel failing in the fire to

1013  
00:43:41,000 --> 00:43:38,480

cause a failure in a building like this

1014

00:43:43,310 --> 00:43:41,010

because again all the lateral resistance

1015

00:43:47,870 --> 00:43:43,320

was in the perimeter and the floors were

1016

00:43:51,610 --> 00:43:47,880

lightweight trusses so you could easily

1017

00:43:56,720 --> 00:43:51,620

have a sort of a combination of effects

1018

00:43:58,190 --> 00:43:56,730

not foreseen conspiracy theories had to

1019

00:44:01,040 --> 00:43:58,200

happen because something happens that

1020

00:44:03,550 --> 00:44:01,050

people don't expect and they don't they

1021

00:44:05,720 --> 00:44:03,560

don't they don't want to accept that

1022

00:44:08,390 --> 00:44:05,730

something could happen that no one

1023

00:44:10,820 --> 00:44:08,400

predicted I don't know again the

1024

00:44:11,930 --> 00:44:10,830

engineers I know not a single one of us

1025

00:44:16,790 --> 00:44:11,940

said that these buildings we're going to

1026

00:44:20,150 --> 00:44:16,800

pancake but in retrospect it's not very

1027

00:44:21,920 --> 00:44:20,160

surprising so people don't like that

1028

00:44:24,700 --> 00:44:21,930

combination something that's unexpected

1029

00:44:27,160 --> 00:44:24,710

and horrible yeah

1030

00:44:30,549 --> 00:44:27,170

do you do you ever meet conspiracy

1031

00:44:32,530 --> 00:44:30,559

theorists like in real life and yeah

1032

00:44:35,170 --> 00:44:32,540

have to explain things stuff in person

1033

00:44:37,240 --> 00:44:35,180

though in person though I have

1034

00:44:39,549 --> 00:44:37,250

occasionally come across them online and

1035

00:44:41,890 --> 00:44:39,559

I simply walk away alright I'm not

1036

00:44:45,609 --> 00:44:41,900

interested in it what i always recommend

1037

00:44:47,380 --> 00:44:45,619

it had friends say you know i this guy

1038

00:44:48,490 --> 00:44:47,390

is talking telling me this about the

1039

00:44:50,650 --> 00:44:48,500

World Trade Center what should I tell

1040

00:44:53,170 --> 00:44:50,660

him and actually one of the best

1041

00:44:54,819 --> 00:44:53,180

debunking zuv the conspiracy theory was

1042

00:44:58,930 --> 00:44:54,829

from Popular Mechanics they put out a

1043

00:45:00,760 --> 00:44:58,940

very nice little book explaining why all

1044

00:45:03,059 --> 00:45:00,770

of the common conspiracy theories were

1045

00:45:05,920 --> 00:45:03,069

wrong and I recommend that to people

1046

00:45:07,990 --> 00:45:05,930

yeah yeah me too it's a good book

1047

00:45:10,569 --> 00:45:08,000

although of course they've got excuses

1048

00:45:14,260 --> 00:45:10,579

around that now so it just keeps going

1049

00:45:15,970 --> 00:45:14,270

on yeah yeah all right well I want to

1050

00:45:17,500 --> 00:45:15,980

thank you very much for for talking to

1051  
00:45:19,140 --> 00:45:17,510  
me I mean a year you say like you you

1052  
00:45:22,030 --> 00:45:19,150  
wouldn't talk to conspiracy theorists

1053  
00:45:23,950 --> 00:45:22,040  
but you know this this topic I think you

1054  
00:45:26,200 --> 00:45:23,960  
know I really appreciate getting your

1055  
00:45:29,470 --> 00:45:26,210  
perspective on it and I wish I could get

1056  
00:45:31,359 --> 00:45:29,480  
more engineers to kind of weigh in on

1057  
00:45:32,890 --> 00:45:31,369  
what they think about the whole whole

1058  
00:45:34,420 --> 00:45:32,900  
topic even if it's just to say that they

1059  
00:45:35,829 --> 00:45:34,430  
think it's ridiculous because I think

1060  
00:45:38,049 --> 00:45:35,839  
there's this idea that all these

1061  
00:45:39,670 --> 00:45:38,059  
engineers are cowering in the wings

1062  
00:45:41,650 --> 00:45:39,680  
because they don't want to talk about it

1063  
00:45:43,120 --> 00:45:41,660

because it's too scary well I think

1064

00:45:44,710 --> 00:45:43,130

really is more like they don't want to

1065

00:45:47,740 --> 00:45:44,720

talk about it cuz it's it's because it's

1066

00:45:50,829 --> 00:45:47,750

so ridiculous I think that's more likely

1067

00:45:53,770 --> 00:45:50,839

yeah yeah all right well that's that's

1068

00:45:55,270 --> 00:45:53,780

great that was very very interesting do

1069

00:45:56,170 --> 00:45:55,280

you have any anything you want to add

1070

00:46:04,839 --> 00:45:56,180

any final words

1071

00:46:06,640 --> 00:46:04,849

oh you know I building code bodies the

1072

00:46:08,140 --> 00:46:06,650

IB the ICC which Rights the

1073

00:46:10,620 --> 00:46:08,150

International Building Code which is the

1074

00:46:13,210 --> 00:46:10,630

base building code for the whole country

1075

00:46:15,270 --> 00:46:13,220

the committee's here in New York that

1076

00:46:17,799 --> 00:46:15,280

write to New York version of the IBC

1077

00:46:22,329 --> 00:46:17,809

really has taken this stuff into account

1078

00:46:25,089 --> 00:46:22,339

over the last 18 years and it's sort of

1079

00:46:27,849 --> 00:46:25,099

it's frustrating that the engineering

1080

00:46:32,289 --> 00:46:27,859

community is trying to learn from what

1081

00:46:34,420 --> 00:46:32,299

failed and there are people you know the

1082

00:46:35,859 --> 00:46:34,430

conspiracy theorists who are basically

1083

00:46:37,780 --> 00:46:35,869

saying well that lesson doesn't mean

1084

00:46:38,380 --> 00:46:37,790

anything because that's not what

1085

00:46:41,440 --> 00:46:38,390

happened

1086

00:46:44,440 --> 00:46:41,450

and your engineering advances by

1087

00:46:46,210 --> 00:46:44,450

studying failure but that's that's been

1088

00:46:48,370 --> 00:46:46,220

true since structural engineering has

1089

00:46:51,280 --> 00:46:48,380

existed you look at what went wrong last

1090

00:46:54,010 --> 00:46:51,290

time and you try to improve on it that's

1091

00:46:56,560 --> 00:46:54,020

what engineers are doing right now yeah

1092

00:47:00,790 --> 00:46:56,570

and the you know basing it on the

1093

00:47:04,840 --> 00:47:00,800

reality of the situation rather than the

1094

00:47:07,760 --> 00:47:04,850

conspiracy theories all right yeah well