



1
00:00:07,849 --> 00:00:04,539
so what I've got here is a steel bar and

2
00:00:11,120 --> 00:00:07,859
to wait about ten pounds each I think

3
00:00:13,940 --> 00:00:11,130
and they're attached to these columns

4
00:00:17,480 --> 00:00:13,950
here and they're actually nails in a

5
00:00:20,330 --> 00:00:17,490
square around on both sides well I'm

6
00:00:22,070 --> 00:00:20,340
gonna do is heat up the bar in the

7
00:00:23,990 --> 00:00:22,080
middle here and what I anticipate

8
00:00:26,179 --> 00:00:24,000
happening is perhaps a slight expansion

9
00:00:29,150 --> 00:00:26,189
you might not be noticeable you might

10
00:00:31,550 --> 00:00:29,160
see the bar expand and you probably see

11
00:00:34,100 --> 00:00:31,560
some paint burning off and then you

12
00:00:36,860 --> 00:00:34,110
should see it's safe now what I've tried

13
00:00:41,209 --> 00:00:36,870

to explain here is why a sagging beam

14

00:00:44,690 --> 00:00:41,219

pulls in the column to do that and right

15

00:00:48,229 --> 00:00:44,700

now the beam is step so this weight is

16

00:00:51,110 --> 00:00:48,239

been transferred straight down here when

17

00:00:52,639 --> 00:00:51,120

the beam bends the beam is no longer

18

00:00:55,760 --> 00:00:52,649

stiff so it can't resist anything

19

00:00:58,369 --> 00:00:55,770

pulling or pushing in from the sides the

20

00:01:00,349 --> 00:00:58,379

angle of this will may be the fourth go

21

00:01:04,189 --> 00:01:00,359

down that way we should make the two

22

00:01:06,679 --> 00:01:04,199

columns go in from the side so let's see

23

00:01:08,570 --> 00:01:06,689

what happens I've got two torches I'm

24

00:01:11,109 --> 00:01:08,580

just gonna use my smaller one to start

25

00:01:14,840 --> 00:01:11,119

off with anything needs it I'm gonna

26
00:01:17,960 --> 00:01:14,850
bring my a bigger one into play so let's

27
00:01:18,950 --> 00:01:17,970
give it a go before I show you that I'm

28
00:01:22,490 --> 00:01:18,960
gonna do a slightly different

29
00:01:24,920 --> 00:01:22,500
demonstration here I've got two columns

30
00:01:28,580 --> 00:01:24,930
and I've got two lengths of identical

31
00:01:31,069 --> 00:01:28,590
chain right here and another one here

32
00:01:35,539 --> 00:01:31,079
the difference between them is that this

33
00:01:37,460 --> 00:01:35,549
length of chain this has been welded so

34
00:01:40,160 --> 00:01:37,470
it's stiff and this is just a regular

35
00:01:42,140 --> 00:01:40,170
piece of chain so why don't they do

36
00:01:44,420 --> 00:01:42,150
first is take the stiff piece of chain

37
00:01:47,660 --> 00:01:44,430
which would be the floor truss or a

38
00:01:50,960 --> 00:01:47,670

regular floor beam and attach it to

39

00:01:54,800 --> 00:01:50,970

these two columns and you'll see it does

40

00:01:57,770 --> 00:01:54,810

a nice job of acting like a floor I can

41

00:02:01,969 --> 00:01:57,780

even put on some load on it I've learned

42

00:02:04,520 --> 00:02:01,979

walking around any X just fine but say

43

00:02:05,590 --> 00:02:04,530

this walk there's more trust this beam

44

00:02:07,120 --> 00:02:05,600

or whatever

45

00:02:09,699 --> 00:02:07,130

to lose its structural integrity and

46

00:02:13,059 --> 00:02:09,709

start to Sag that's gonna be represented

47

00:02:14,559 --> 00:02:13,069

by this of course is a very extreme

48

00:02:16,390 --> 00:02:14,569

example it's lost all of its integrity

49

00:02:17,949 --> 00:02:16,400

he demonstrates the principle of what

50

00:02:19,750 --> 00:02:17,959

happens when something is sagging and

51
00:02:21,790 --> 00:02:19,760
it's attached to something that was

52
00:02:23,229 --> 00:02:21,800
previously stiff now one thing to know

53
00:02:25,750 --> 00:02:23,239
to say this is the core of the building

54
00:02:28,780 --> 00:02:25,760
goes to the outside any exterior loads

55
00:02:31,030 --> 00:02:28,790
actually get transmitted through the

56
00:02:33,250 --> 00:02:31,040
floor because it's depth so this will

57
00:02:35,080 --> 00:02:33,260
resist being pushed in from the side so

58
00:02:38,309 --> 00:02:35,090
any generation of this column will be

59
00:02:41,229 --> 00:02:38,319
resisted by the floors as well as laws

60
00:02:45,520 --> 00:02:41,239
holding up what underneath them so let

61
00:02:51,270 --> 00:02:45,530
me take this this floor off and replace

62
00:02:54,130 --> 00:02:51,280
it with a failed four and move them out

63
00:02:57,699 --> 00:02:54,140

so they're straight and straight away

64

00:03:00,699 --> 00:02:57,709

you can see that it does it just pulling

65

00:03:03,009 --> 00:03:00,709

in that it's not stable at all if I pull

66

00:03:04,930 --> 00:03:03,019

it so it's perfectly straight straight

67

00:03:08,050 --> 00:03:04,940

away as soon as it starts to sag a

68

00:03:11,289 --> 00:03:08,060

little bit it's calling in the reason of

69

00:03:13,030 --> 00:03:11,299

course is that when you have something

70

00:03:16,180 --> 00:03:13,040

suspended between two points you have

71

00:03:17,680 --> 00:03:16,190

this catenary action which means it's

72

00:03:19,509 --> 00:03:17,690

very very difficult when when it's

73

00:03:26,039 --> 00:03:19,519

straight pretty much all of the force is

74

00:03:32,289 --> 00:03:26,049

going this way if member is not stiff so

75

00:04:03,560 --> 00:03:32,299

this is what happens this law is just

76

00:04:03,570 --> 00:05:27,399

[Music]

77

00:05:35,860 --> 00:05:32,209

so there you go the bar failed in the