**Room 23-20240430 172458-Meeting Recording**

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I'm going to talk a little bit about what I'm going to talk about today, and then I'll talk a little bit about what I'm going to talk about today. Okay, let's begin. Welcome to this experiment for a structural engineering and design graduation project.

We are glad to have you here and hope you have a nice experience. Read the following instructions carefully. You will in a moment go through a design task.

It is important that you say aloud everything that you think or do. So in every step, explain what you do and why you do it. Try to keep speaking constantly, okay? Okay, the objective is stabilize the structural design with minimal structural elements or adjustments.

Say aloud everything you think and do. Okay, let's see what the structure looks like. Okay, so right now, I believe all the elements are just rods, and we want to stabilize the structure by adding or making minimal adjustments.

The structure consists of rods connected by hinges. Displacements are constrained at ground level. A rod is always connected to the structure with a hinged connection.

Makes sense? And a beam with a fixed connection. Yeah, please refer to the information sheet. Okay, I've read through it.

So let's start. So when looking at the structure, what I immediately notice is that there are no bracings in the structure. So let's see.

So let's have diagonal bracing, for example, in x direction, starting here, diagonally. Add rod diagonally, enter two opposite members to place a diagonal between. I want to place it here.

So let's say number 253 and 157, enter. Okay. So now we have a diagonal bracing.

And when looking at the stabilization methods that's on the sheet, this would be a stable means of designing. Okay. So what we do not want is bracings that go through the space.

So let's start by adding diagonal elements on the outsides of the structure. I believe if this is stable, then this part, the rods connected to the stable frame should also be stable, but I'm not sure. Let's try to place one anyway.

So now we have one here and here, and then we can add another between 158 and 258. We also have an option to replace rods with beams. I believe, yeah, so beams usually are members that can take bending moments, contrary to rods.

So looking at the structure, where would you have the highest bending moments? So probably the horizontal rods will have to take up some bending moments in the structure. So we could start replacing all the horizontal elements with beams. So let's start doing that.

216, 223, 232, 256, 259, 173, 171, 248. 160. Yes, 160.

Seems to be going good so far. 247. Is that not 247? It's a bit difficult to read.

Let's see. 154, 242, 154, 207. I'm assuming that these elements will have to carry a floor plate or something similar.

So these would need to be, will have to be subjected to a bending moment. So I will continue replacing all these with beam elements. 183, 173, 166, 157.

So these are all the beams, oh no, 233. And these on the top floor, 191, 142, 165, 164. It would be easier to submit multiple numbers at once, because right now it's kind of tedious to do it all manually.

183, 156, 156 again, 161. And two more, 156 and 142. So now all the horizontal elements are converted to beams.

But it's still not a stable structure, because a beam supported by only two rods is not a stable configuration. So let's try to introduce some braces in the top level of the structure. So let's say we want bracings in x direction between 163 and 159.

163, 159. And let's do it on the opposite side, 254, 158. 254, 158.

Oh, oops. It seems that it has created a very big diagonal. So let's delete it.

It is, what is it called? What is it called? 255? Invalid, okay. 235, 175. Yeah, I'm unable to read the number.

Unfortunately, it's a bit difficult. What other options are there? 155, 135? Okay, I will ask some help for this. Maybe in the meantime, I can continue placing the other diagonals in the structure.

So we still need some bracings in y direction. So let's place one between 156 and 170. And another between, what's it? 181 and 162.

So this top structure should now be stable. Let's look at the bottom structure. We're still missing diagonals on this side.

Let's place one between 145 and 188. Oh, Janneke. I don't know how to remove this one.

The numbers overlap with each other. I don't know. This input doesn't go away.

Yeah, I've tried a lot of combinations, but it's hard to read. Was it 171? No. 171? Yes, okay, thanks.

So I managed to remove the diagonal bracing. So let's replace it with another. So between 155 and 158.

So now the structure should be stable on the top. Let's introduce a bracing on this side. So 144 and 154.

I think if we put one bracing on this side, it should be enough. So we could maybe also remove two of these. So let's remove 234 and 275.

No, 232. Okay, now we still need a bracing on this side. So let's add one between 192 and 145.

And let's add another between 74 and 161. 174 and 161. Okay, I think I will now have a stable structure.

All the vertical elements are rods, which should be fine, as they only take the vertical forces introduced on the element. And I do not believe we have to take into account buckling. So, yeah.

Let me check the information sheet for assignment two, which says that structural elements are not allowed to span diagonally through the interior of a space, which is not the case. And an element should not span more than one bay. I'm not sure exactly what is meant by one bay.

But I believe it means crossing between different sections. Okay, I'm satisfied. Let's continue.

Yes. Oh, I just noticed I didn't press okay. Okay.

Okay. Okay. Oh.

Okay. Okay. Okay.

Okay. Okay. Okay.

Yeah. I'm sorry. I don't know.

I think in the end. Okay. Yeah.

Thank you.