



# Suspension bridge on floating foundations

When is the technology ready?

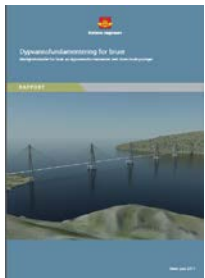
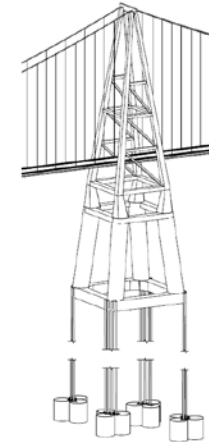
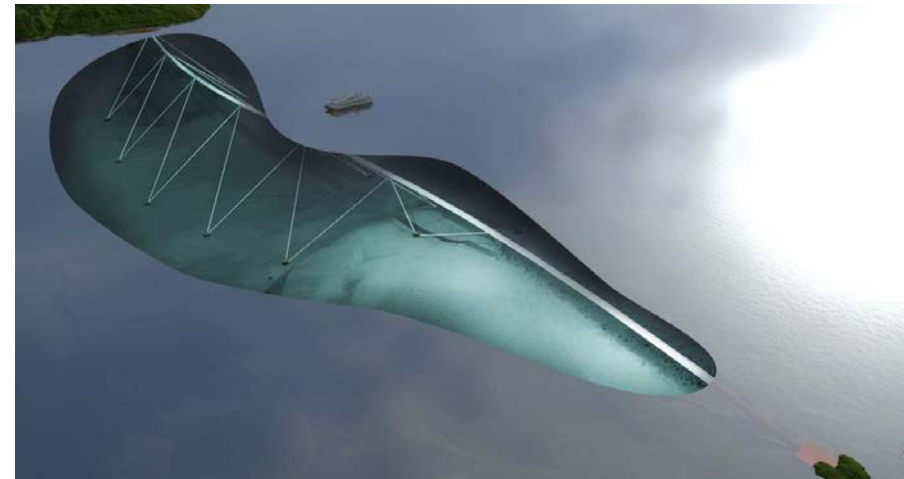


# Multispan suspension bridge on floating foundations

## Introduction

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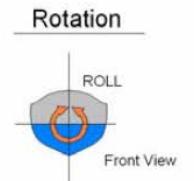
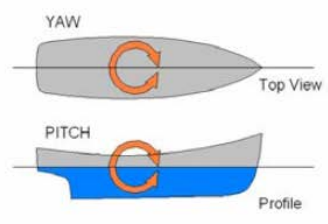
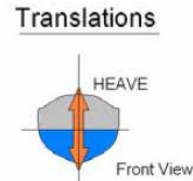
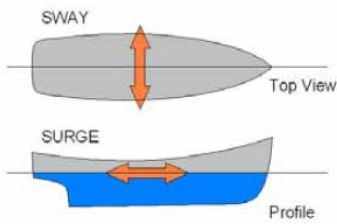
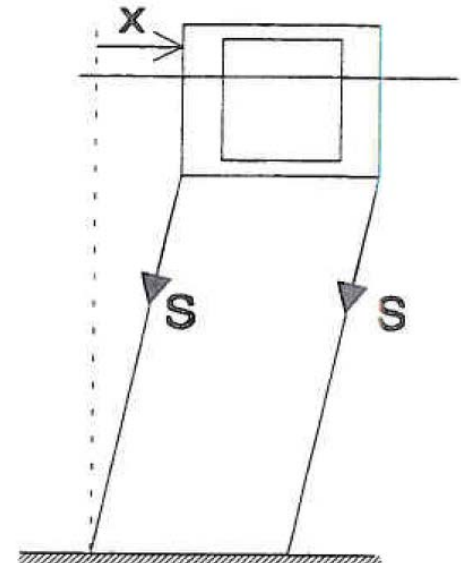
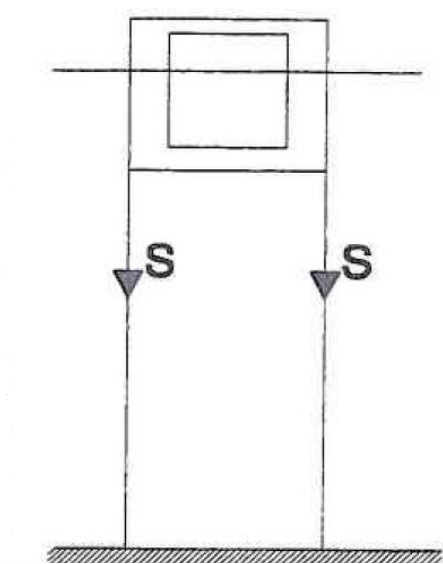
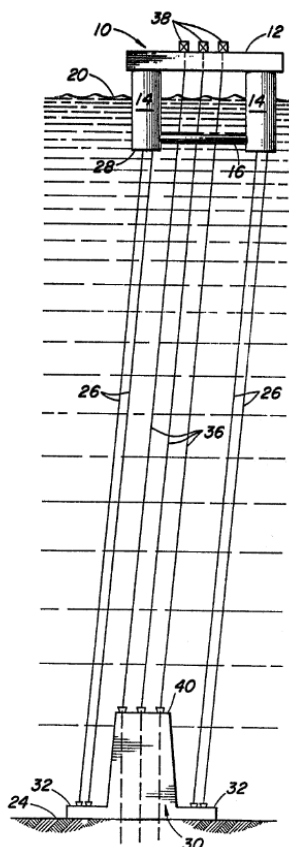
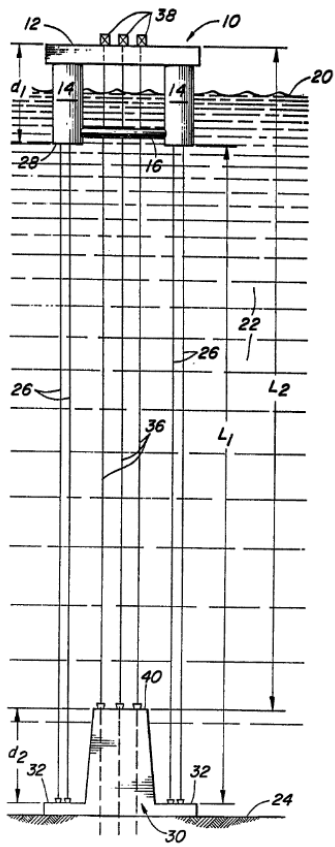
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# Multispan suspension bridge on floating foundations TLP characteristics

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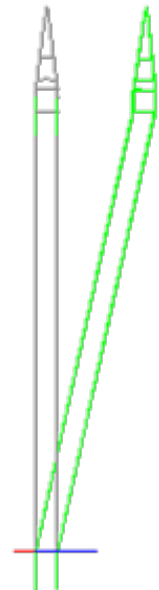
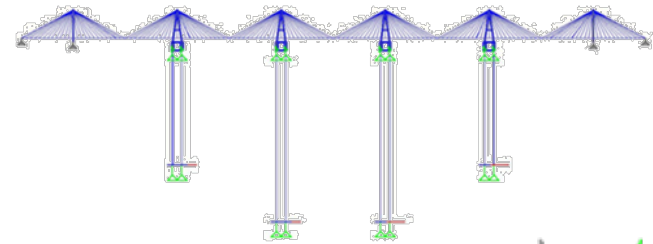
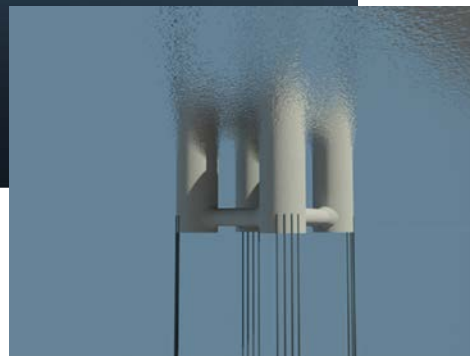




# Multispan suspension bridge on floating foundations Sognefjorden

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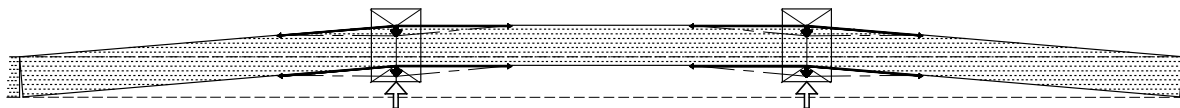
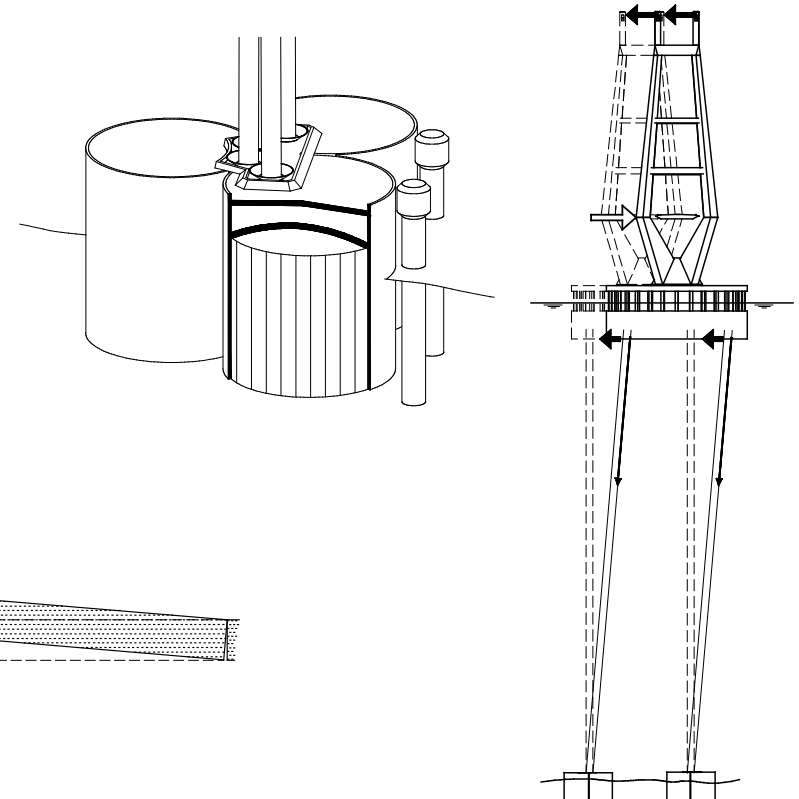


# Multispan suspension bridge on floating foundations

## Tension legged platform (TLP) foundations

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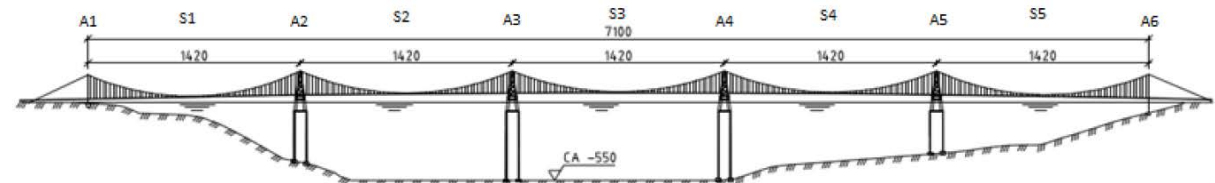




# Multispan suspension bridge on floating foundations Boknafjorden

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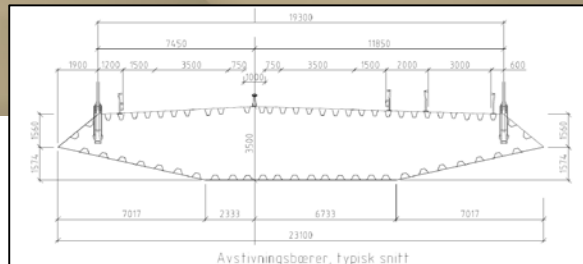
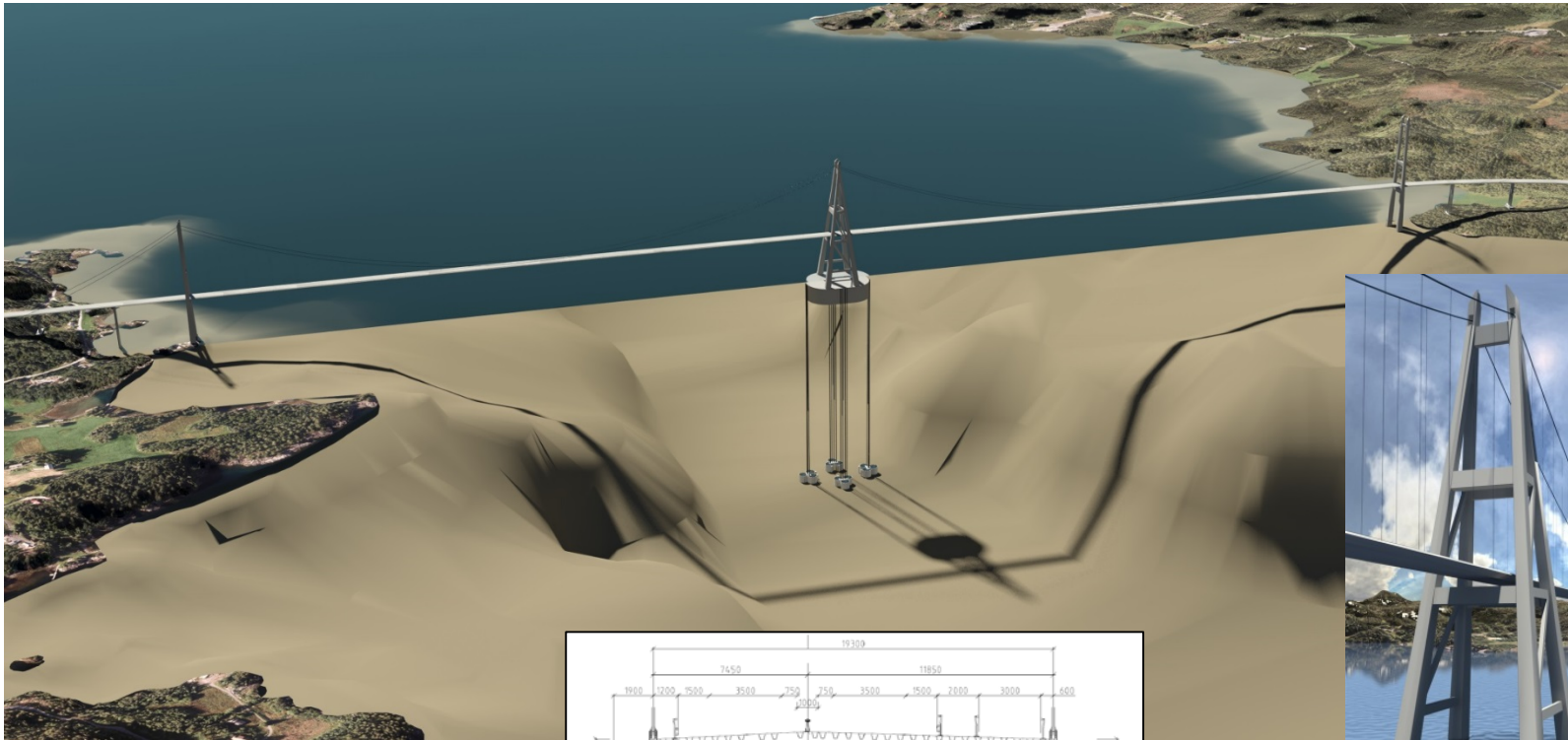




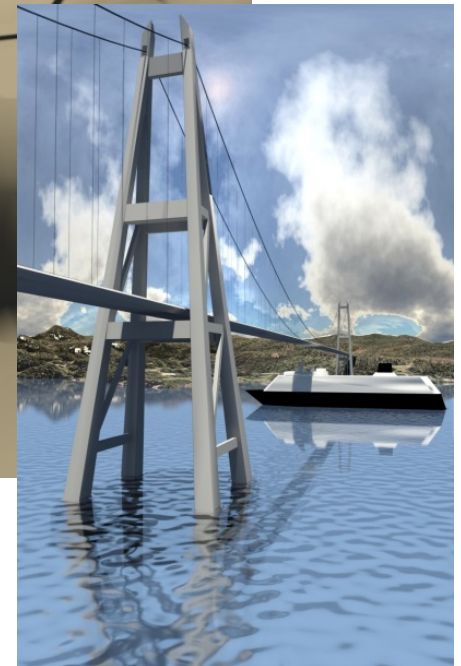
# Multispan suspension bridge on floating foundations Halsafjorden

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2 x 1200 m





**Statens vegvesen**  
Norwegian Public Roads  
Administration



# Multispan suspension bridge on floating foundations Bjørnafjorden

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**tda**



**Statens vegvesen**

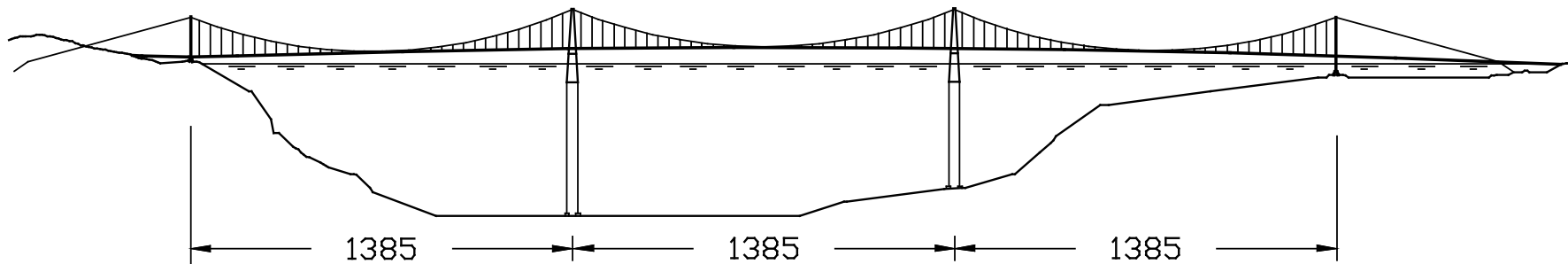


**PLAN**  
ARKITEKTER

 **Bentley**

 **AkerSolutions**<sup>TM</sup>

**Multiconsult**







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Norwegian Public Roads  
Administration



# Multispan suspension bridge on floating foundations Bjørnafjorden

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## Multispan suspension bridge on floating foundations

# Conceptual design

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### Objectives that apply to the process of designing the bridge:

- Lowering risk and increase the robustness to obtain a high degree of safety in all aspects
- Develop a solution which emphasis good architecture for the surroundings, for travelers and the road as an attraction.
- Lowering costs of construction, maintenance and operation
- Low impact on environment
- Low impact on marine traffic

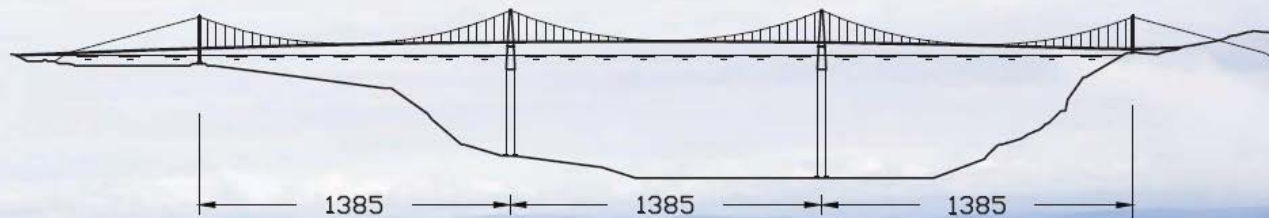
# Multispan suspension bridge on floating foundations

## Conceptual design

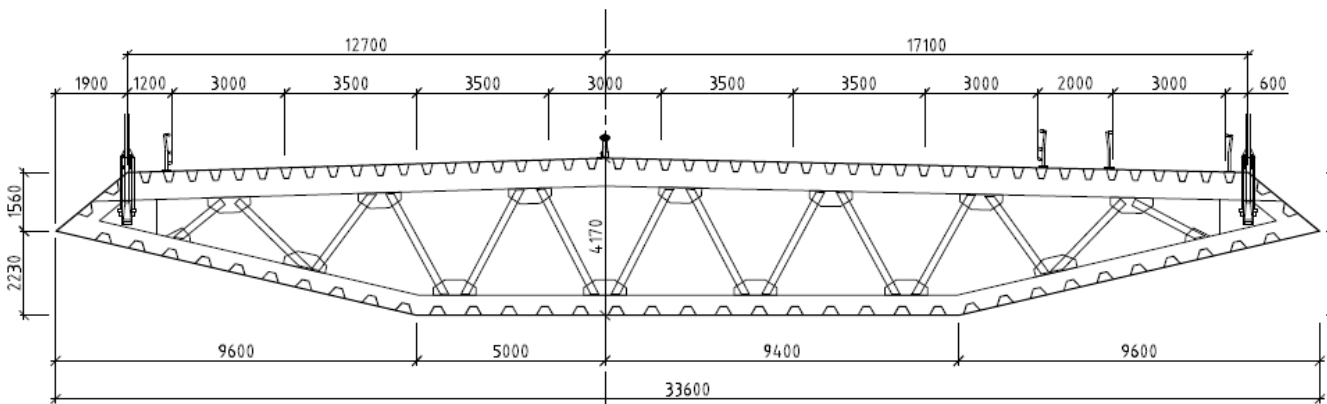
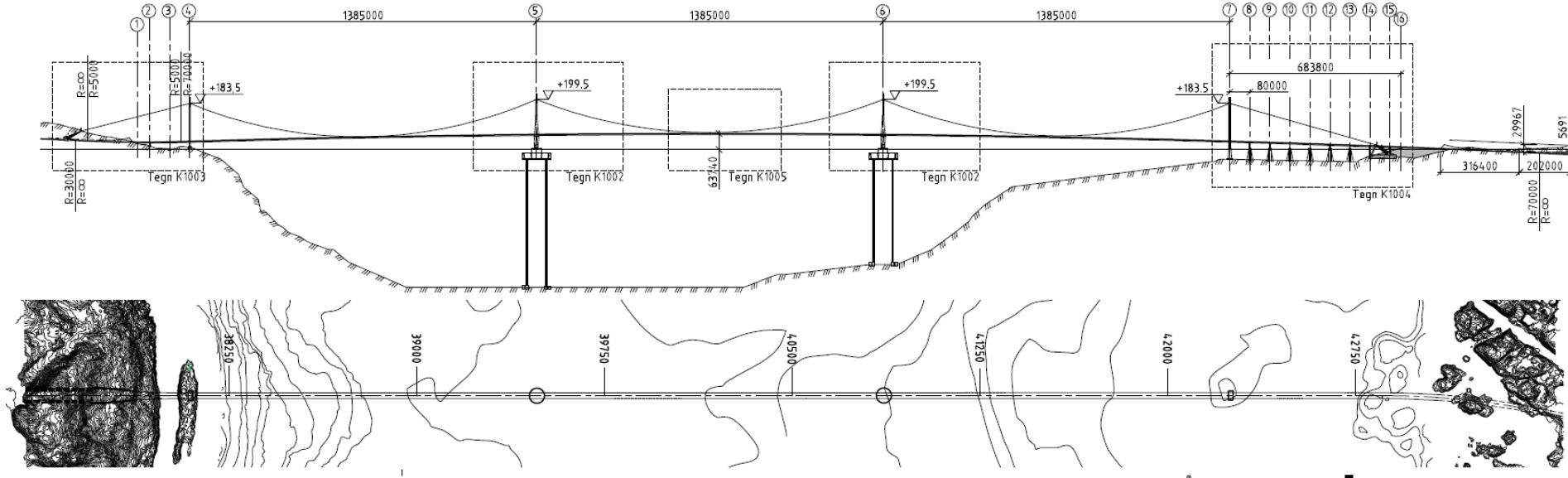
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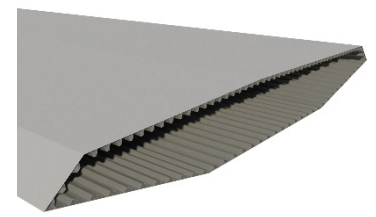
- 5 km wide
- Maximum depth of 550 m
- Two Land based concrete towers & two floaters (steel/concrete)
- Three main spans of 1 385 m



PROFIL NR.	38250				39000				39750				40500				41250				42000				42750																							
PROFIL H.	44,55	30,39	9,00	79,34	7,53	31,63	36,95		-249,11	40,94	-357,28	44,61	47,95	50,98	-549,11	53,68	56,07	58,13	59,87	61,28	62,38	63,16	63,61	63,74	63,55	63,04	62,21	61,06	59,58	57,79	55,67	53,23	50,47	47,38	43,98	40,25	36,21	31,84	27,15	22,13	16,80	11,14						
TERRENG H.																																																



Avstivningsbærer, typisk snitt  
1:100



Single aerodynamic steel box bridge girders. Two main cables with hanger-connection to the deck. Roadway with two lanes in each direction. In addition cycle and pedestrian lane.



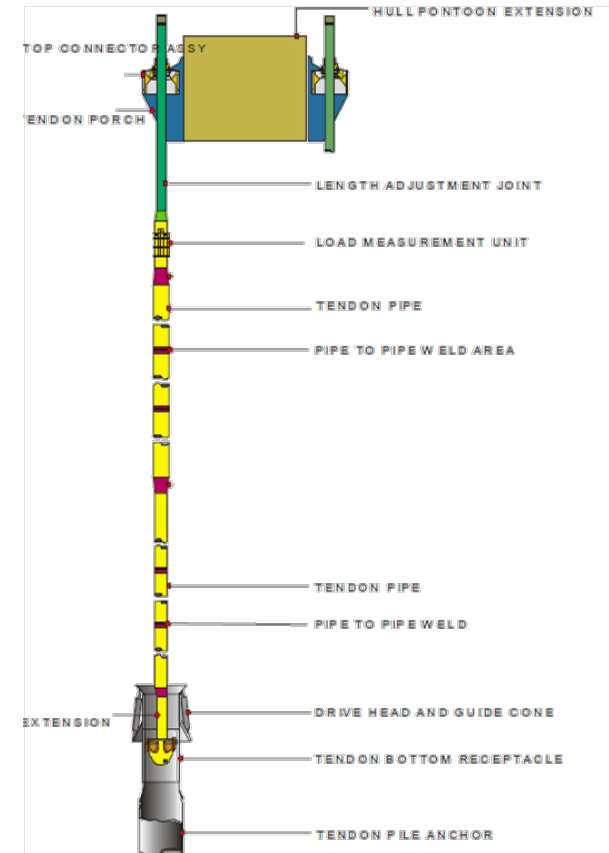
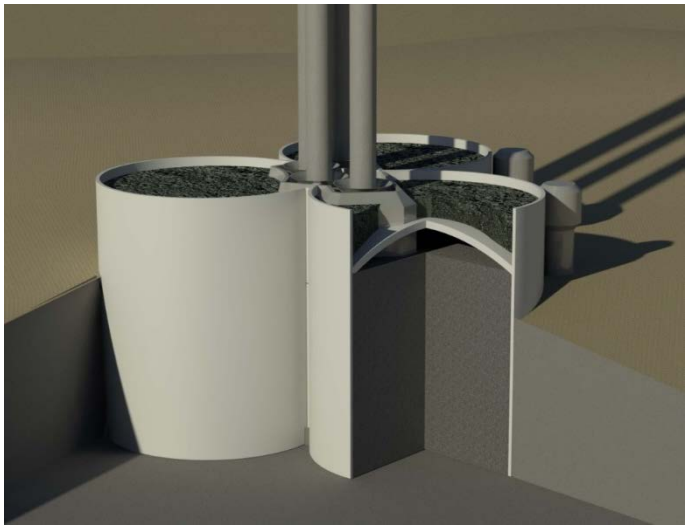
# Multispan suspension bridge on floating foundations

## Tendons

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Lower connector: Tendon pipe made of 1.118 mm \* 38 mm steel

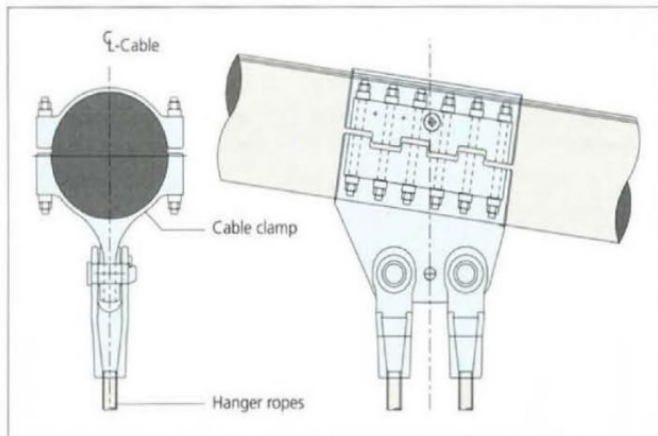


# Multispan suspension bridge on floating foundations

## Main cable and hangers

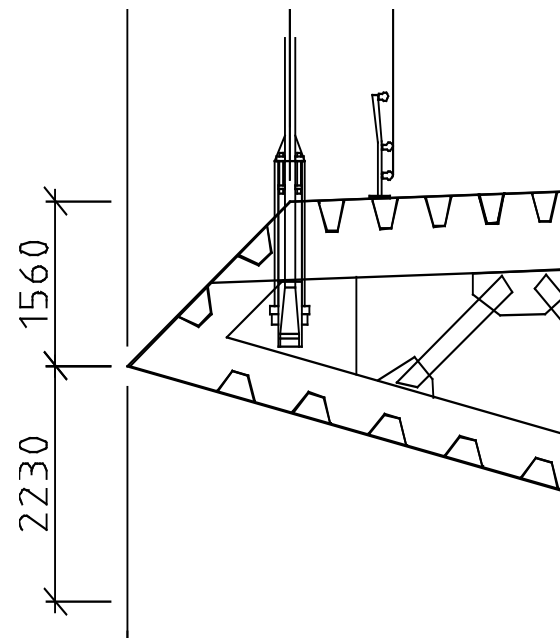
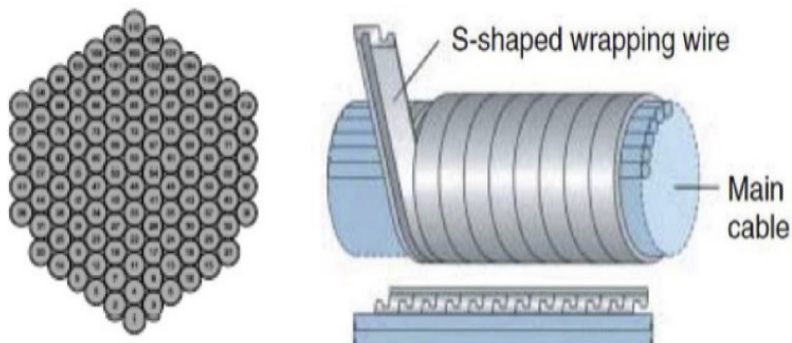
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Wires with a diameter of 5.96 mm assemble the strands. The main cable is assembled of 94 strands, each consisting of 127 wires

$$D = 0.725m$$



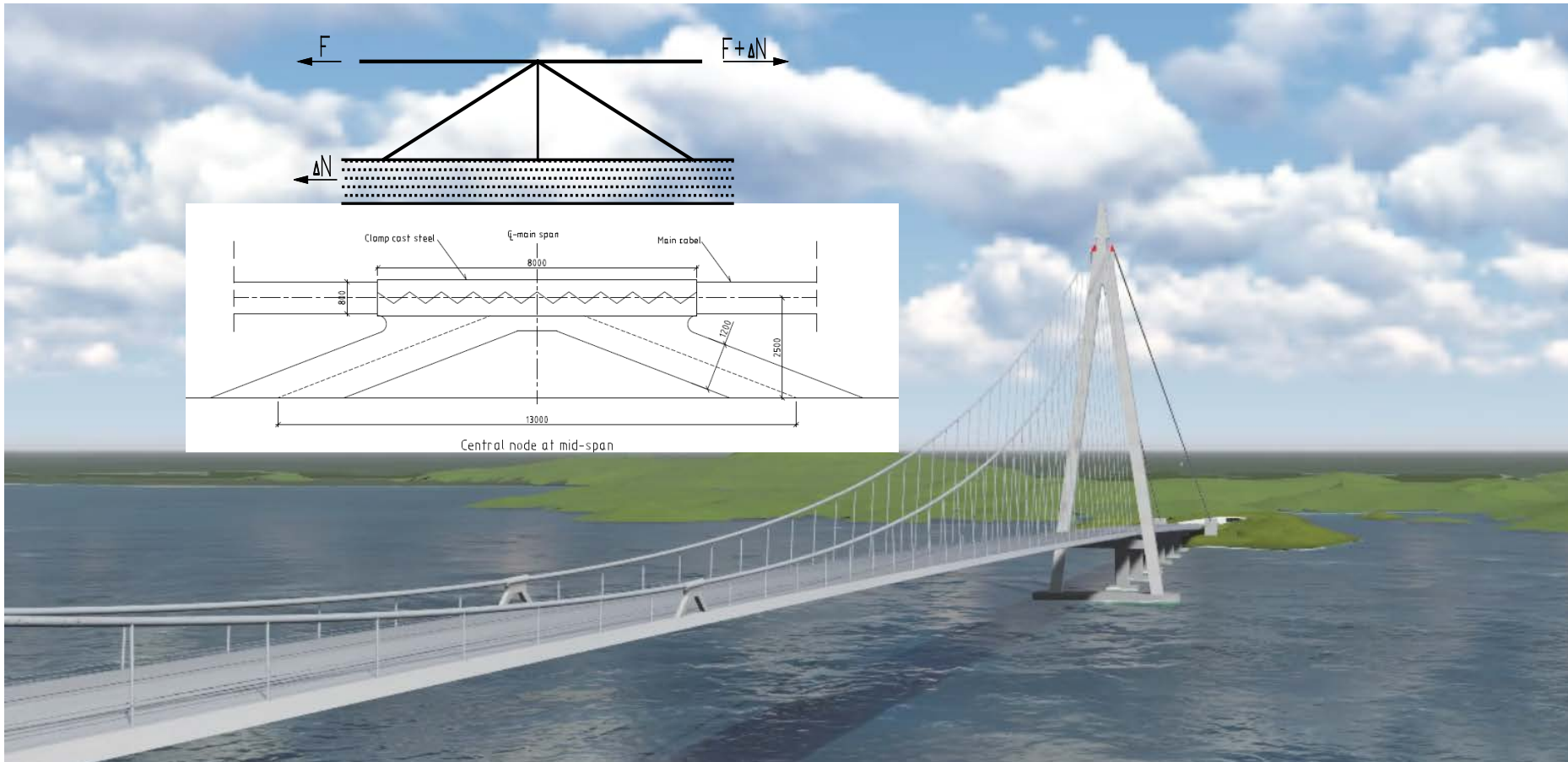
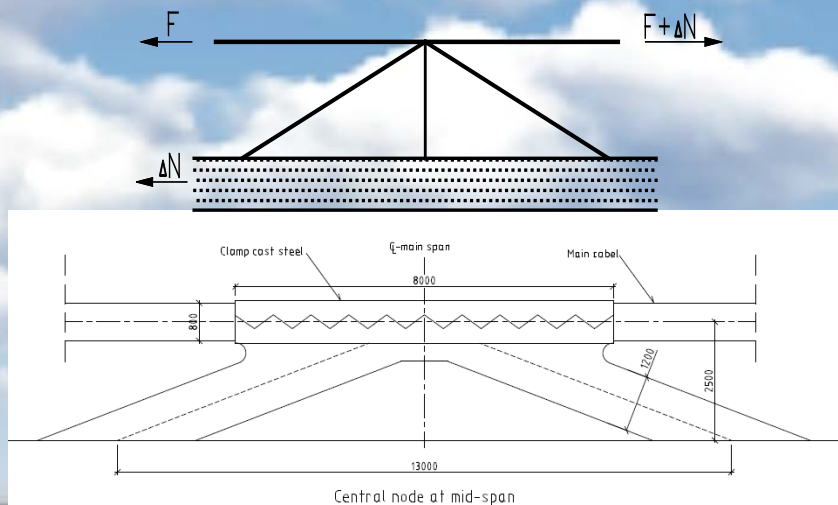


# Multispan suspension bridge on floating foundations

## Central node / cable locker

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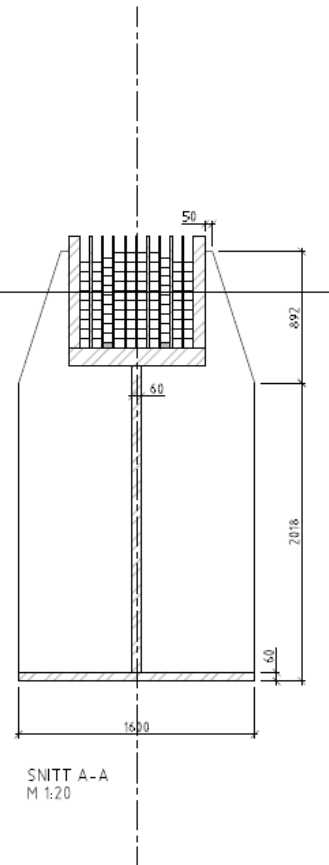
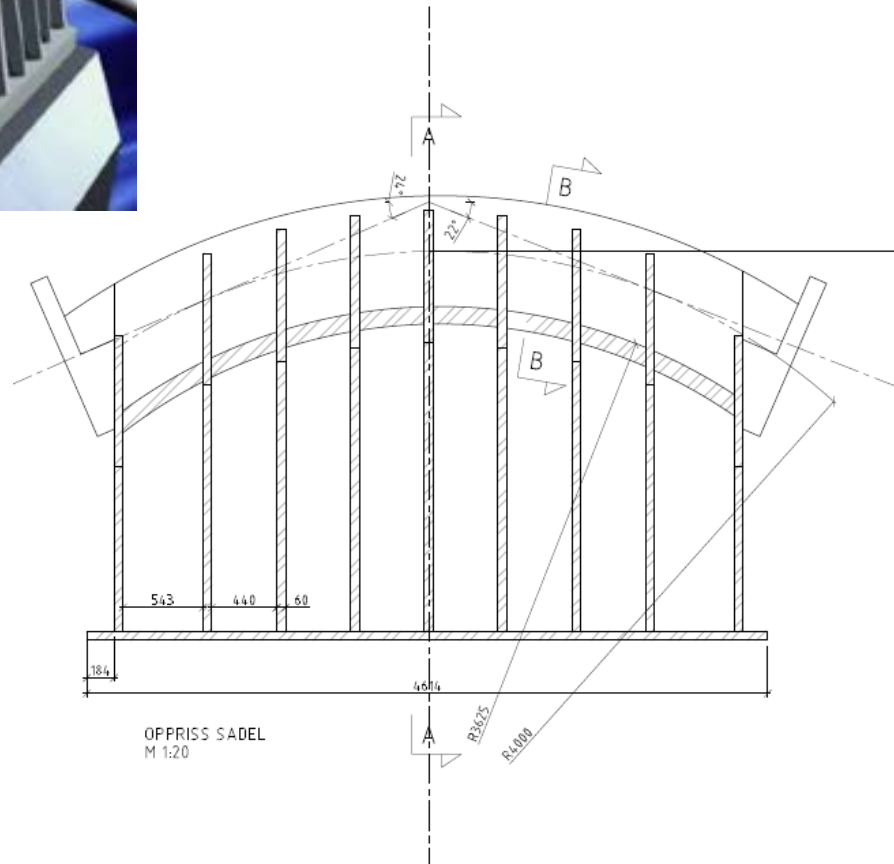


# Multispan suspension bridge on floating foundations

## Tower saddle

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4.62°

4.62°



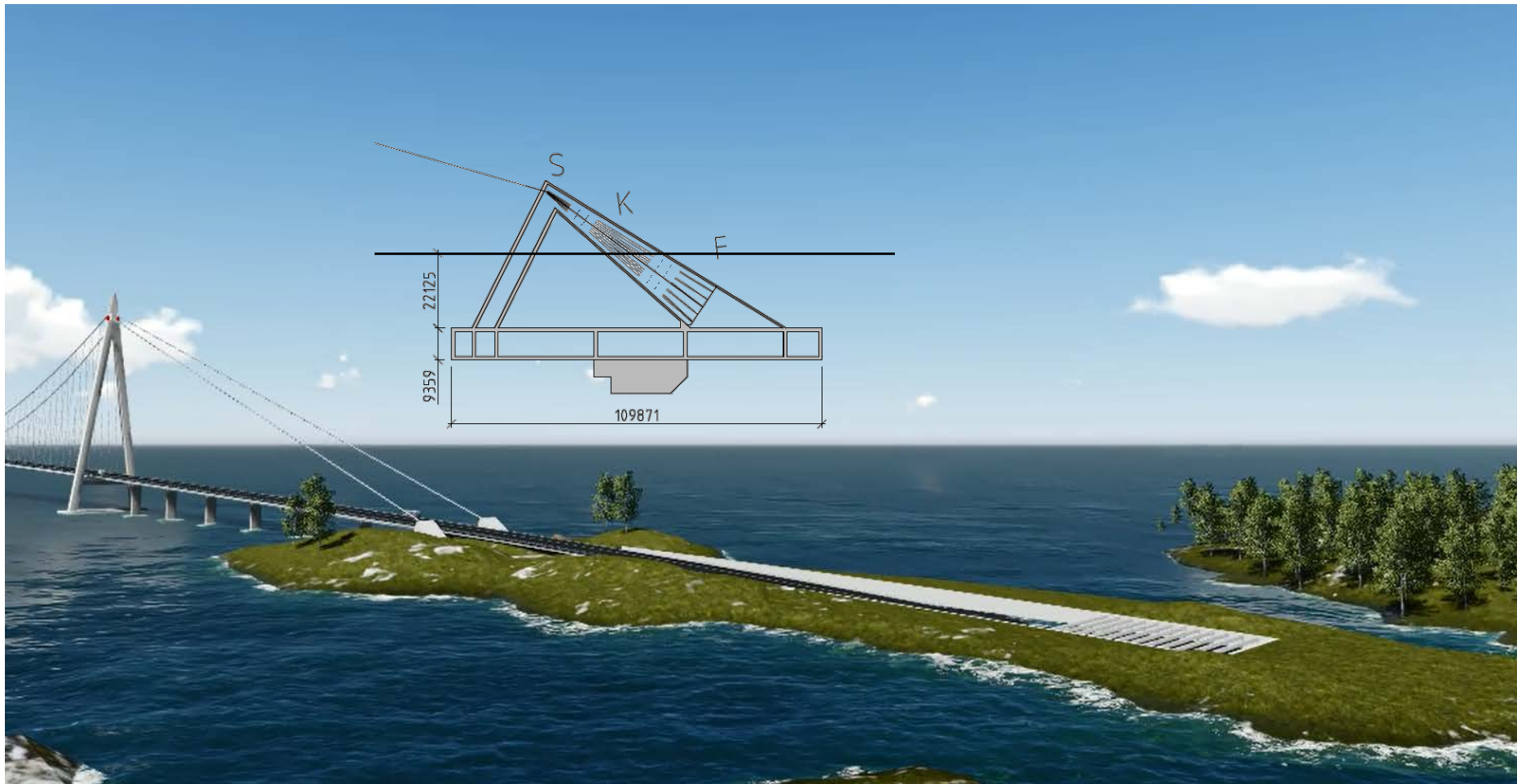


# Multispan suspension bridge on floating foundations

## Landing, north side

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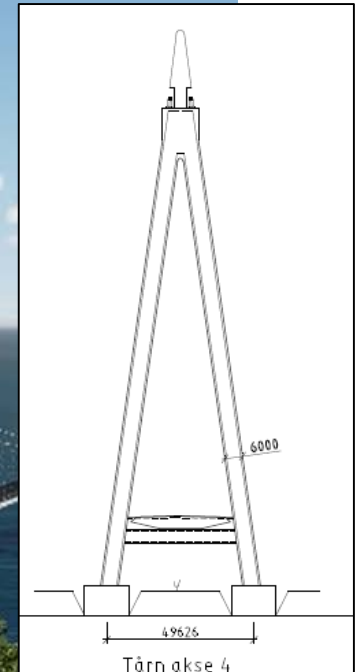
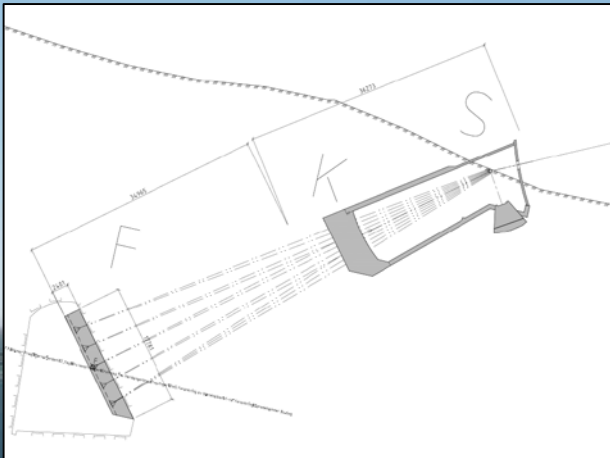
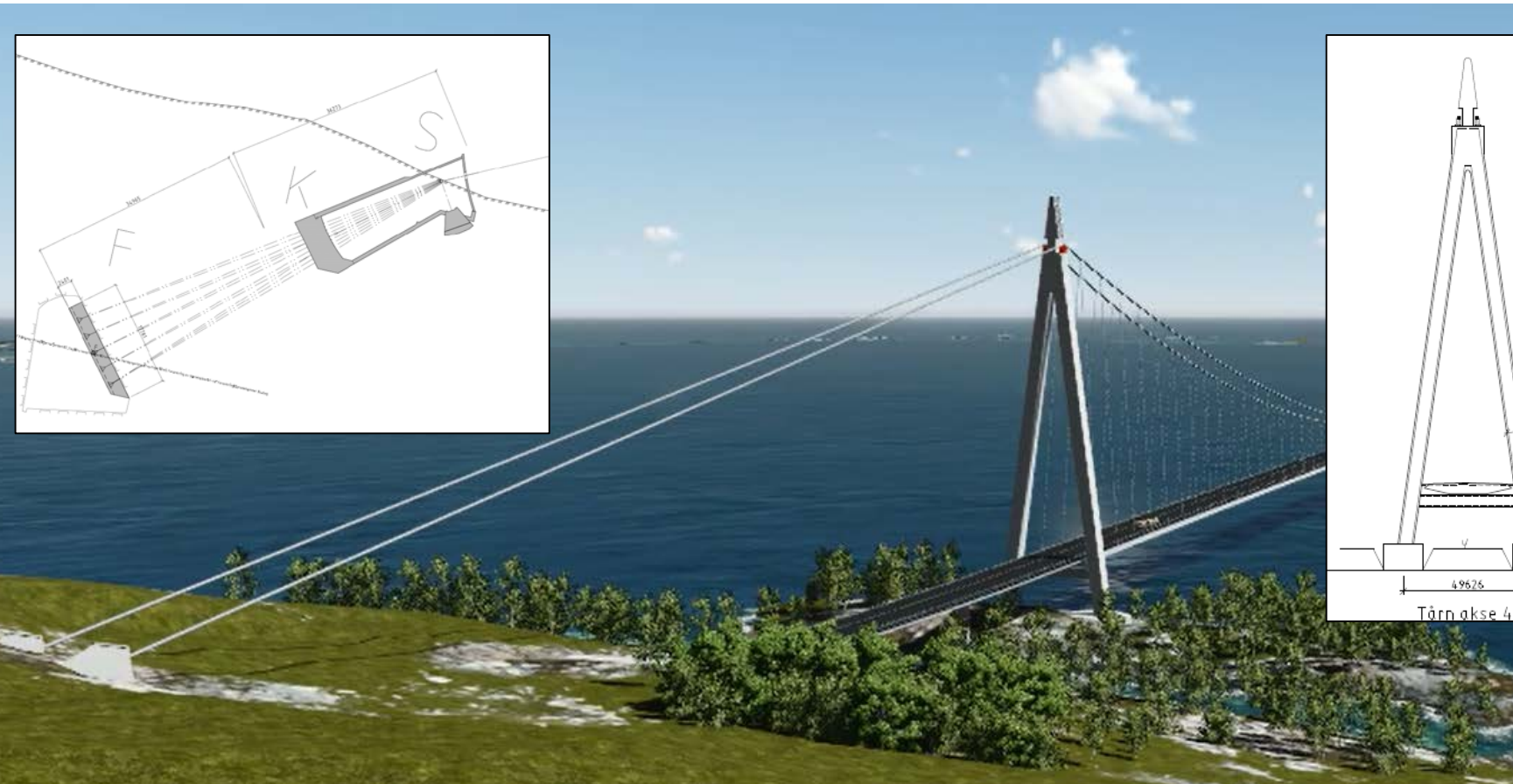




# Multispan suspension bridge on floating foundations Landing, south side

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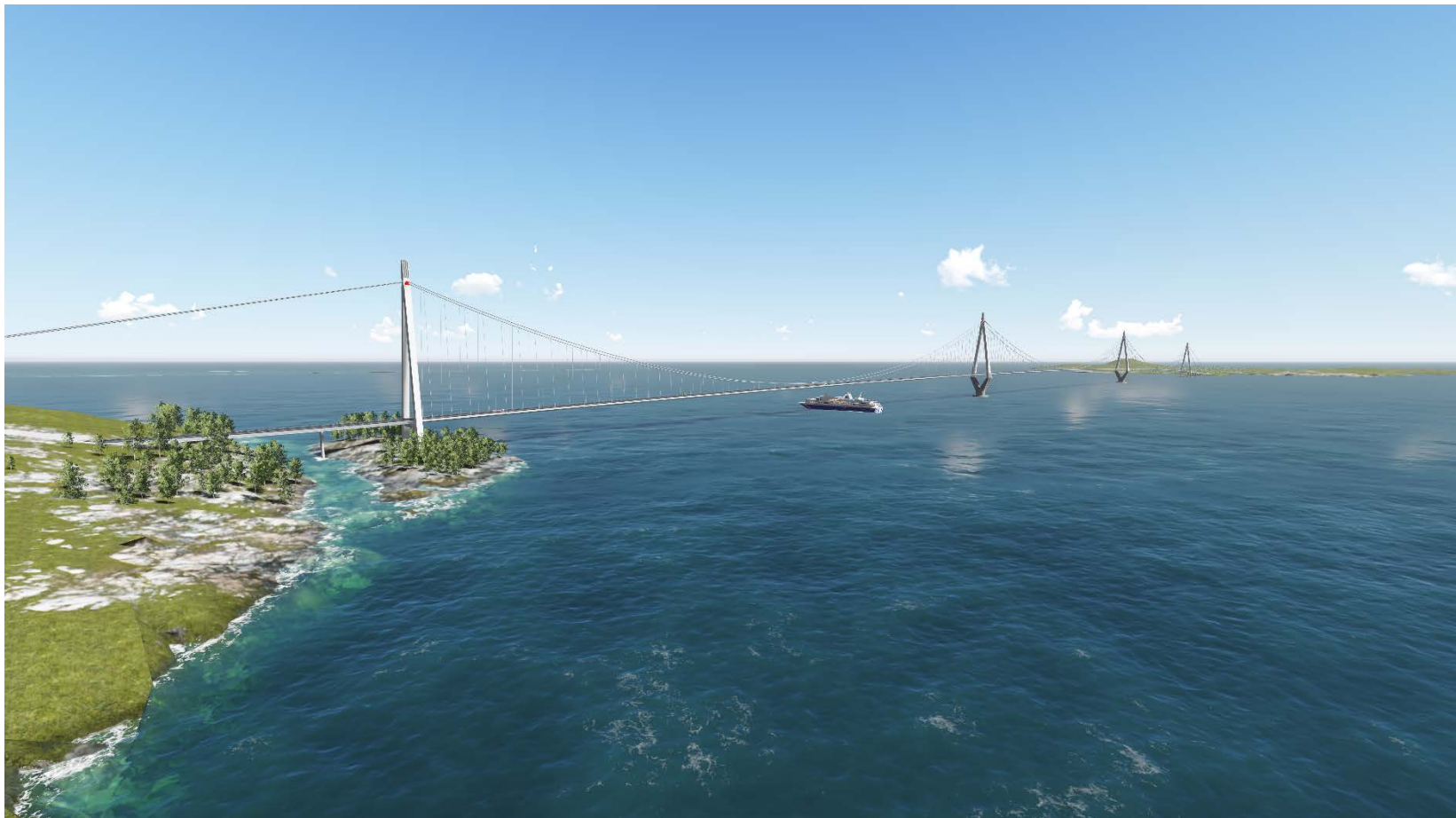


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# Multispan suspension bridge on floating foundations Complete bridge

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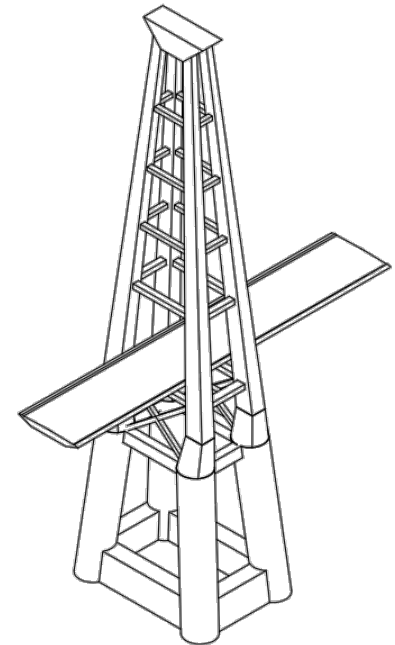
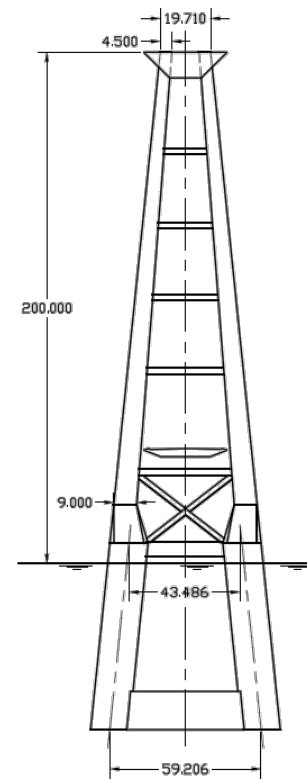
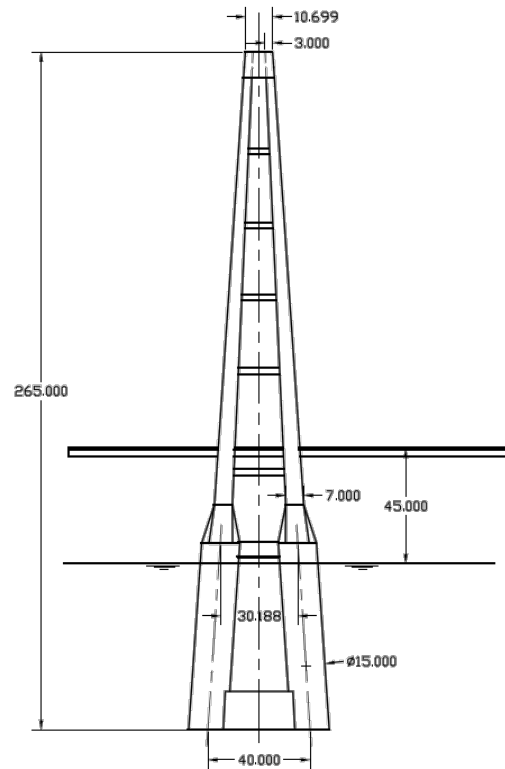
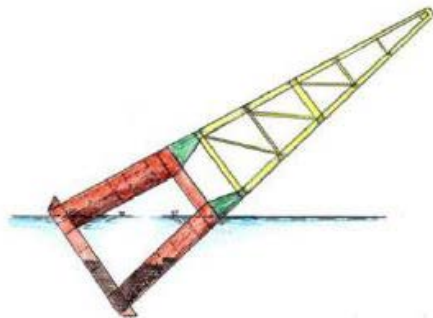
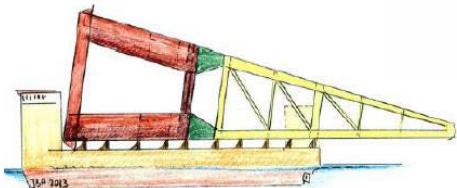


# Multispan suspension bridge on floating foundations

## Steel floater alternative

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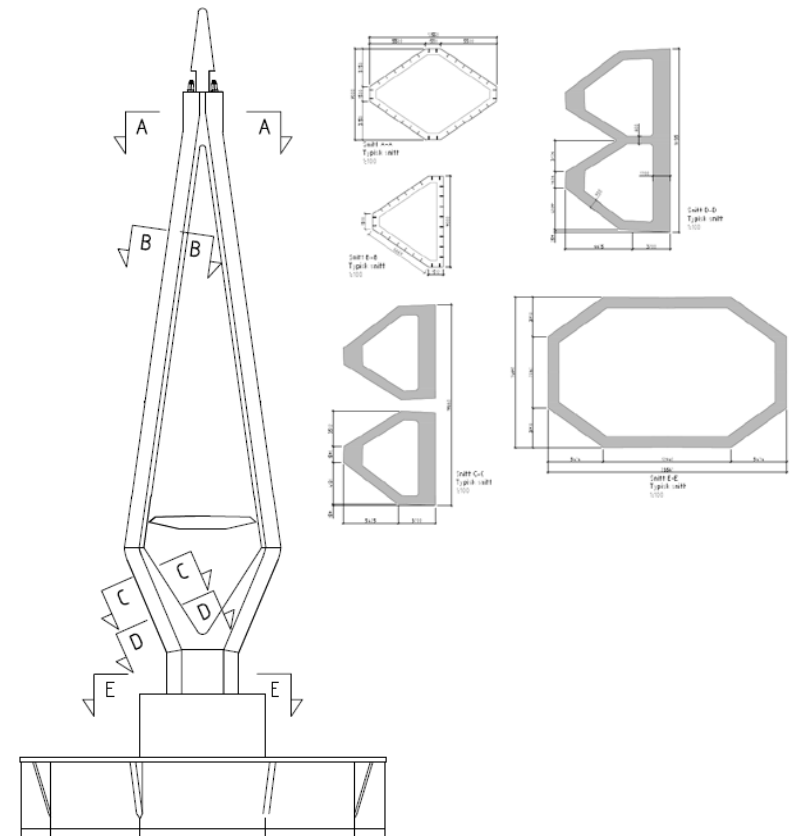
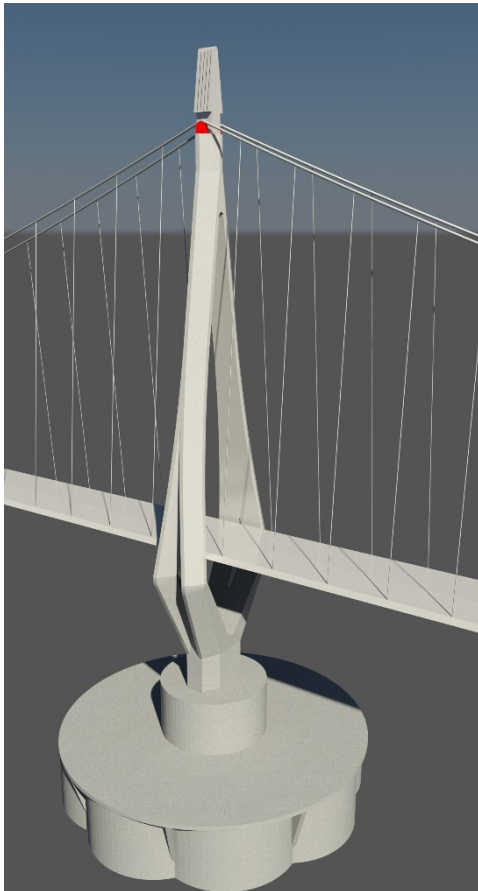




# Multispan suspension bridge on floating foundations Concrete floater alternative with steel tower

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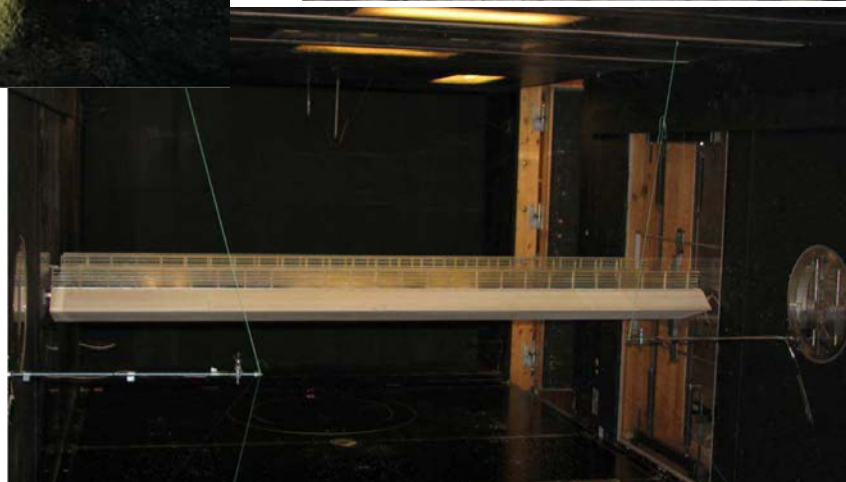
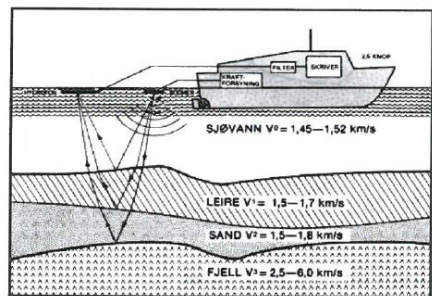
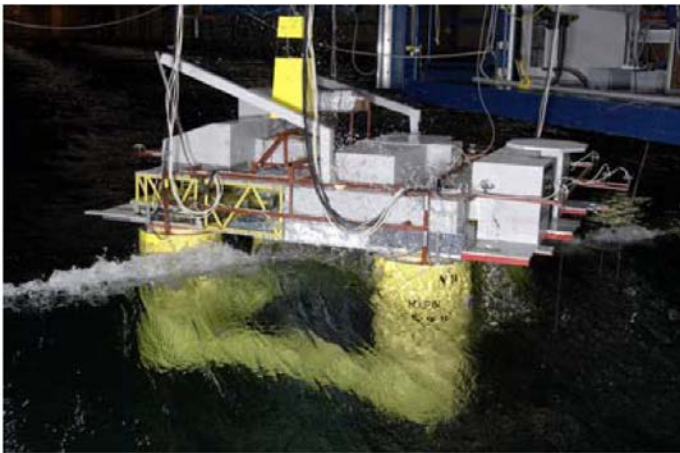


# Multispan suspension bridge on floating foundations

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## TLP-suspension bridges – when is the technology ready?



RECOMMENDED PRACTICE  
DNV-RP-A203

### Qualification of New Technology

DECEMBER 2012

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