

Deepening of the Vuosaari approach channel and harbour, construction plan

Presentation for contractors/Vuosaari Harbour
Antti Saarikoski – Matti Karttunen /Meritaito Ltd
11.12.2019

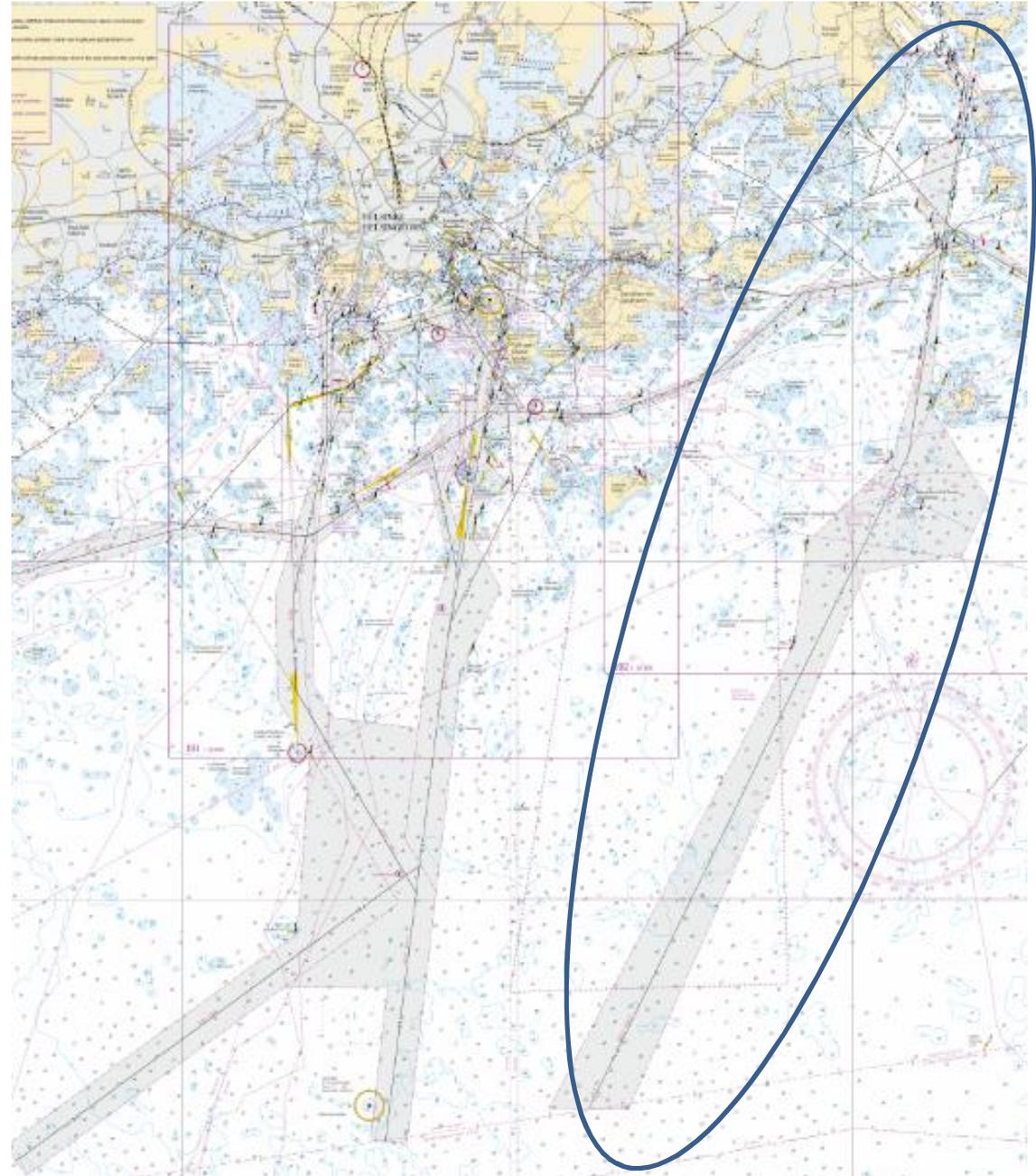


Vuosaari harbour

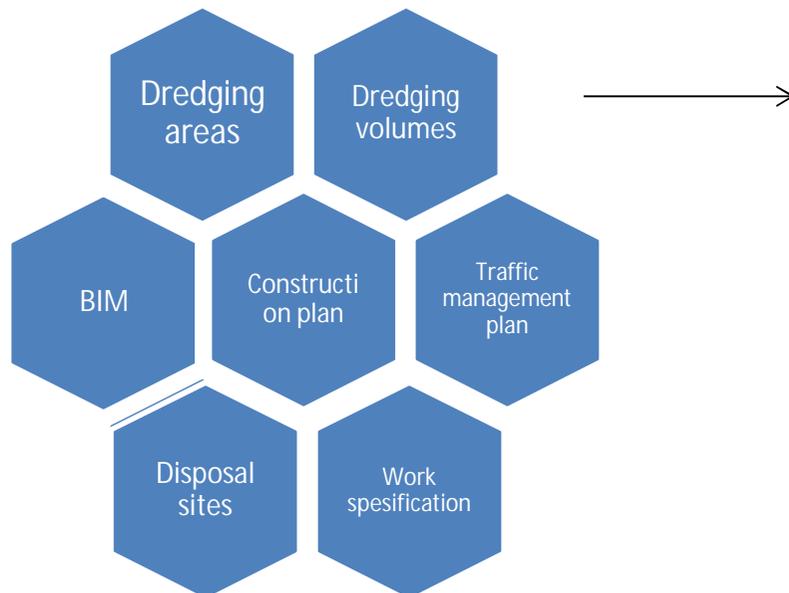
Harbour and approach channel was constructed 2003-2008 to the depth of 11 m (sweeping depth of 13 m – 12,5 m the deeper basins)

Vuosaari approach channel

- Length approx 32 km
- In this construction plan the approach channel and the 11 m harbour basins are deepened to the depth of 13 m (the sweeping depth 15,3 m → 14,8 m → 14,1 m)



Construction plan

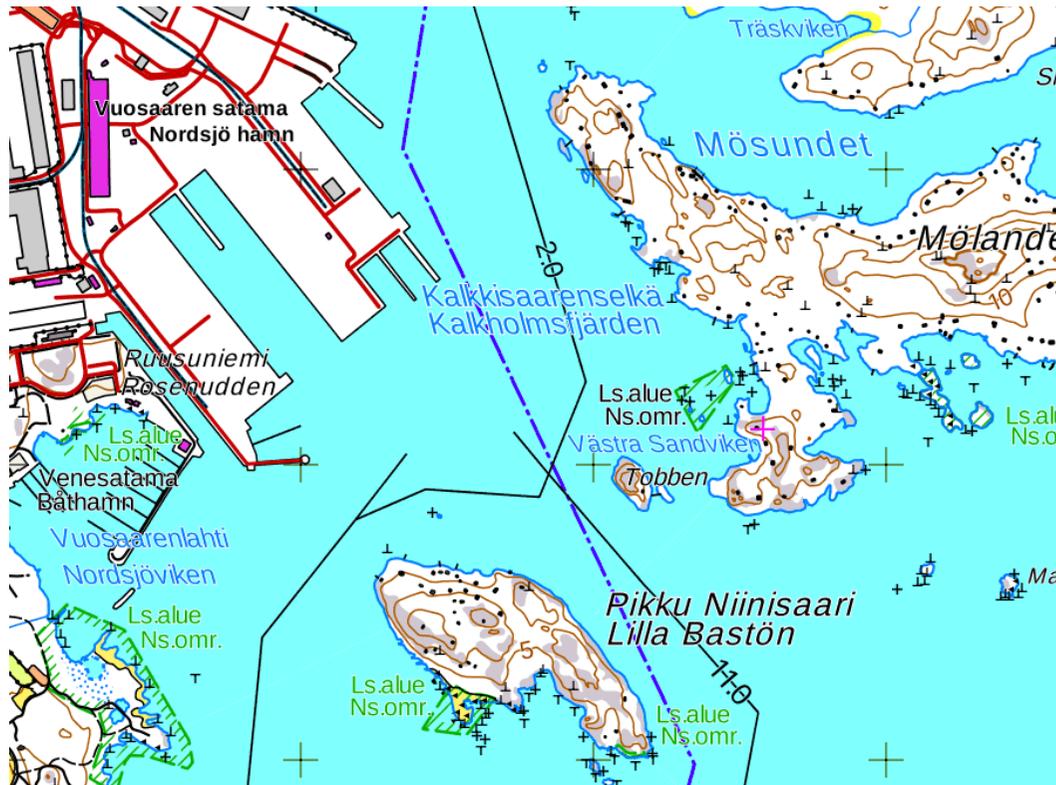


The plan is based on following data:

- The data from the original construction of the channel and harbour (2003-2008)
- The ground investigations (2014-2015)
 - Percussion drilling with rods
 - Swedish weight sounding test
 - Cone penetration test (in harbour)
 - Disturbed samples
- MBES (2019)
- Bar sweeping (2015)

Some notes for the work

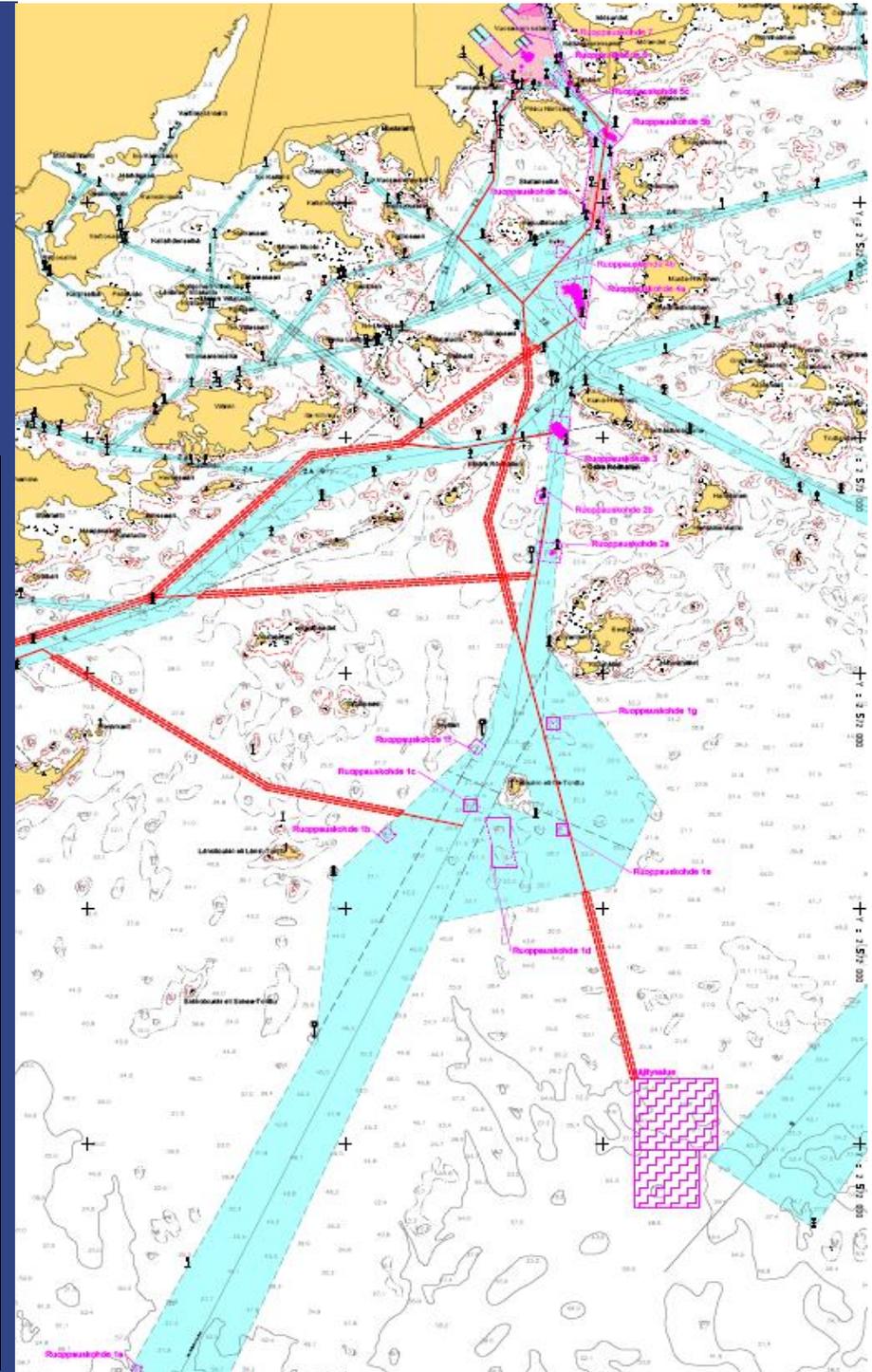
- Timetable for works between 2020-2021, limitations on sites RK5a and part of RK7
- Work is mainly dredging and blasting
- There are no contaminated sediments or UXO found
- The harbour traffic is dense and will not be stopped during the work
- There are summer cottages in the islands near the channel and the harbour (less than 200m away from the dredging sites)



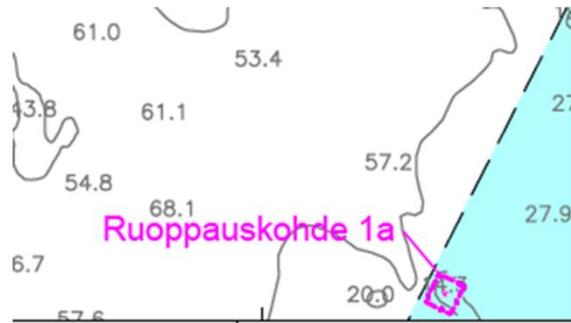
Dredging sites

7 dredging sites (RK1-RK7) with smaller subareas

Site	Soil (theoretical)		Bedrock (theoretical)	
	m ³	m ²	m ³	m ²
RK1a	0	0	147	443
RK1b	0	0	23	261
RK1c	5	63	0	0
RK1d	1495	4319	0	0
RK1e	0	0	0	354
RK1f	114	698	0	0
RK1g	6	152	0	152
RK2a	3761	8603	1466	3094
RK2b	10353	7471	9026	3822
RK3	11987	24256	52364	41536
RK4a	45852	57847	104898	76983
RK4b	119	354	47	142
RK5a	272559	223939	1845	2161
RK5b	14263	25191	21985	18905
RK5c	149	1141	0	0
RK6	273652	403181	20404	23699
RK7	307380	197795	0	0
Total	941 695	955 011	212 058	171 109



Dredging sites



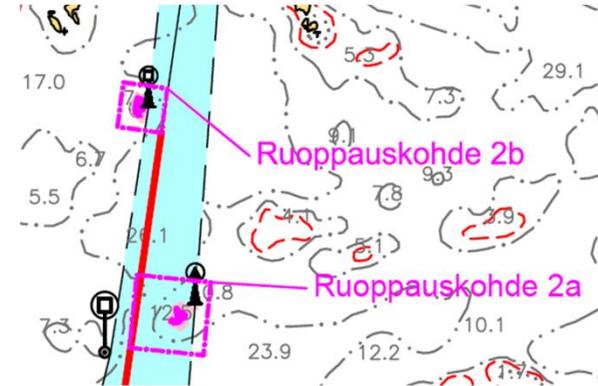
RK1a

- - RK1a located on Navys restricted area
- Bedrock, sand, gravel, till
- Might have some boulders



RK1b-RK1g

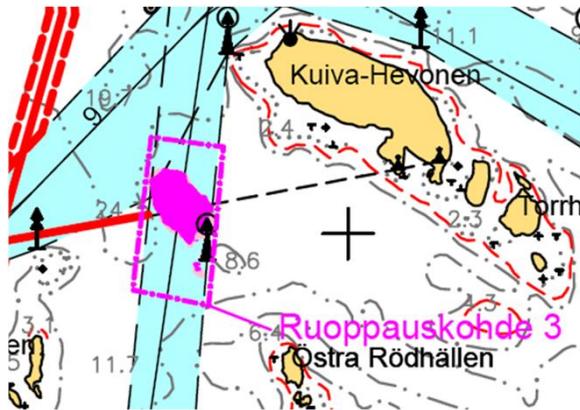
- Bedrock, sand, gravel, till
- Might have some boulders



RK2a-Rk2b

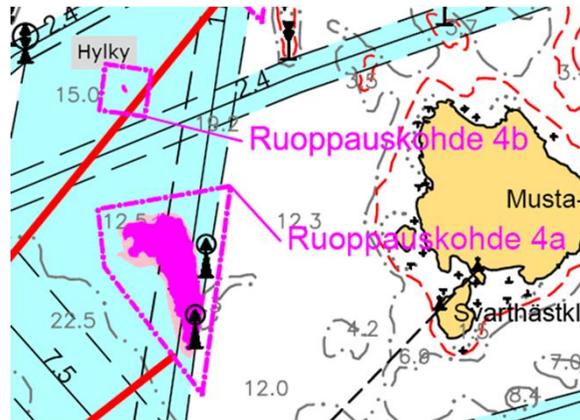
- Previously blasted stone, bedrock, gravel, till
- Might have some boulders

Dredging sites



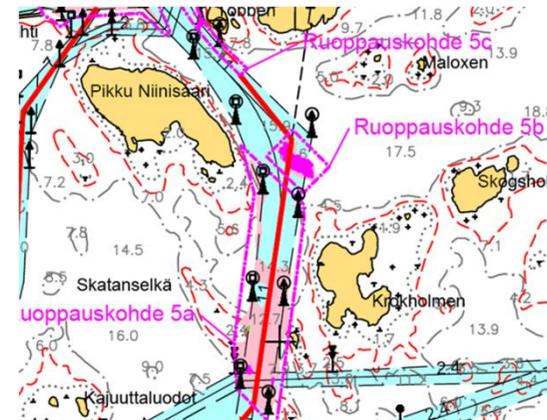
RK3

- Previously blasted stone, bedrock, gravel, sand, till
- Might have some boulders



RK4a-RK4b

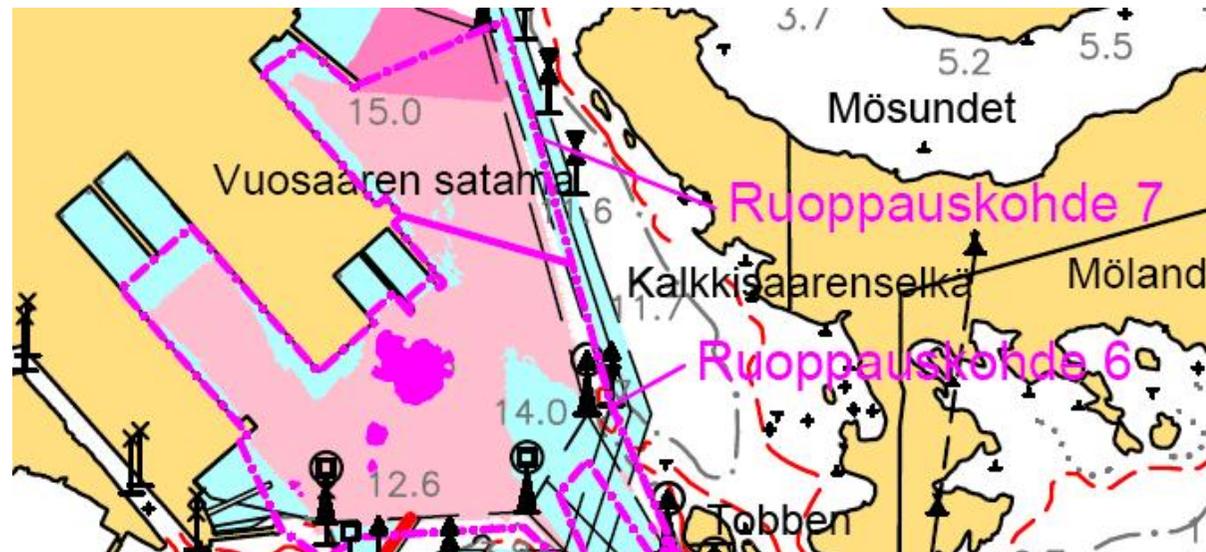
- Previously blasted stone, bedrock, gravel, sand, till, clay, silt
- Might have some boulders
- A wreck located near the site RK4b



RK5a-Rk5c

- Previously blasted stone, bedrock, gravel, sand, till, clay, silt
- Might have some boulders
- A cable through site RK5c
- Dredging is forbidden (RK5a) between 15.4.- 31.7. due to water permit -limitations

Dredging sites

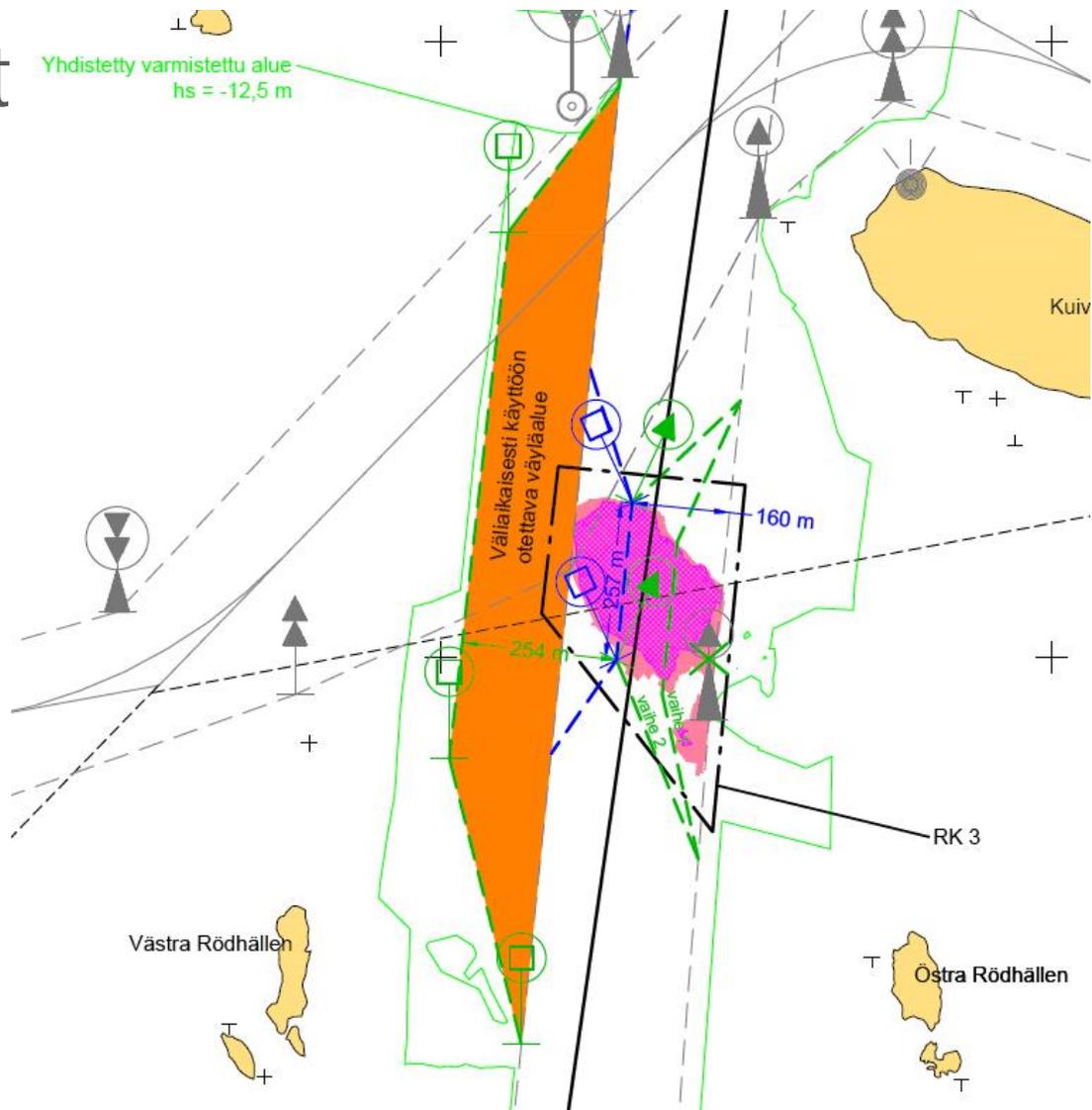


RK6-RK7 Harbour sites

- Previously blasted stone, bedrock, gravel, sand, till, clay, silt
- Might have some boulders
- Dredging is forbidden in part of RK7 between 15.4.- 31.7. due to water permit - limitations
- A lot of constructions that have to be noted when planning the blasting (amount of explosives etc.) like quay-walls, piers and a tunnel for condensing water (diameter 6 m, needs also silt curtain installation).
- There is debris of the previously demolished ramp in the corner of the quays A and D

Traffic management

- A preliminary traffic management plan is part of the construction plan
- The contractor will do the final plans for marking the sites according to the principles given in the preliminary plan
- In the approach channel there must always be at least 100 m wide free fairway for the passing vessels (100 m in good weather, 120 m in bad weather)
- The hardest sites are RK5 and harbour (RK6-RK7)
- In the harbour area there will be situations where dredgers, barges, tugs need to be moved away to give room for the vessels to turn etc.
- Establishing and maintaining good and clear communication procedures is essential



Disposal areas

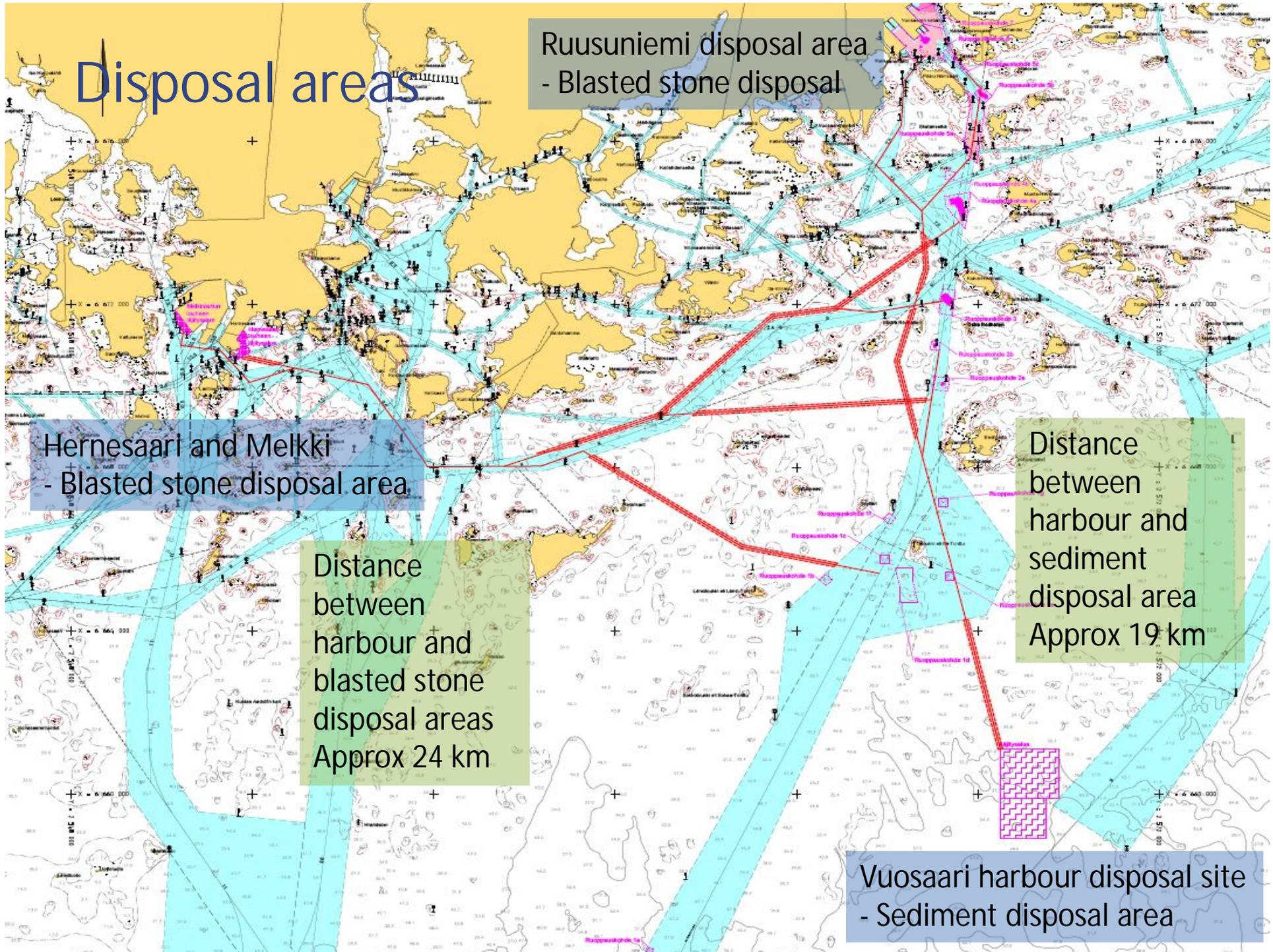
Ruusuniemi disposal area
- Blasted stone disposal

Hernesaari and Melkki
- Blasted stone disposal area

Distance between
harbour and
blasted stone
disposal areas
Approx 24 km

Distance
between
harbour and
sediment
disposal area
Approx 19 km

Vuosaari harbour disposal site
- Sediment disposal area



Main challenges of the dredging work (planners view)

- Dredging and blasting volumes are quite large → fleet
- Previously blasted dredging sites → bedrock is not solid and there is previously blasted stone on the bottom
- Heavy traffic on approach channel and in harbour → traffic management during work
- Disposal areas are remote → fleet
- Sediment disposal areas location on open sea → weather conditions



Thank you for your
attention! Any
questions?

