

TERRAMARE'S MARINE WORKS IN FINLAND AND ABROAD

3 NOVEMBER 2020

COUNTRY	LOCATION	PROJECT	YEAR	CLIENT	SCOPE OF WORKS
Finland	Oulu	INSTALLATION OF OULU 12,5 M FAIRWAY NEW NAVIGATIONAL AIDS	2020	Finnish Traffic Infrastructure Agency	<p>Installation of 8 pcs of navigational seamarks in offshore conditions:</p> <ul style="list-style-type: none"> - Large diameter tubular steel pile driving (monopile foundations diameter 2.95...4.15 m). - Pre-treatment of moraine and breaking of boulders prior piling works by means of drilling and blasting. - Soil improvement works by means of dredging 16 183 m³, mass replacement 51 700 m³ and underwater deep compaction 3 800 m². - Sand and concrete fill of the monopiles. - Installation of the blasted rock scour protection. - Installation of the top parts and ice protection cones. - Distance to closest port 35 nm and water depth 19,3 m.
Finland	Helsinki	HERNESAARI LHC CURRENT PROTECTION RENOVATION	2020	Port of Helsinki	<p>The project included the renovation of the Hernesaari LHC cruise quay current protection.</p> <p>The quay wall was renovated by applying a drilled pile wall installed in front of the quay wall and an coping beam cast at the top. Drilling of tubular steel piles RD406x12.5, a total of 2,760 m.</p>
Finland	Helsinki	PRECONSTRUCTION WORKS OF KOIRASAARI AND STANSVIK	2020	City of Helsinki	<p>Preconstruction works of Koirasaari and Stansvik. The scope of work:</p> <ul style="list-style-type: none"> -dredging of contaminated sediments 4 700 m³ -dredging of clay and silt: 285 000 m³ (max. depth 24 m) -embankment and erosion protection construction from blasted rock 16 500 m³ -reclamation works (blasted rock fill), 800 000 m³ -deep compaction 52 000 m² -supply and installation of sand for leisure beach 75 000 m³

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Finland	Mussalo	MUSSALO HARBOUR, SECTION D, PHASE 1, SECTION 1 QUAY AND SECTION 2 DREDGING AND BREAKWATER	2019	Port of HaminaKotka	Expansion of the harbour by dredging and underwater drilling and blasting as well as construction of 620 metre lång breakwater. Construction of a 142 metre lång retaining quay wall. Dredging depth 17,5 m. Main quantities: Dredging of moraine 670,000 m3 Underwater drilling and blasting and dredging of the blasted rock: 250,000 m3 Concrete 8,000 m3 and reinforcement steel 1,337 ton for the retaining quay wall. Breakwater (length 620 m) was built from maximum depth of 18 m by dumping from barges and by using end-tipping method. Breakwater armor stone weight 5 ton / each.
Finland	Kalajoki	EXTENSION OF WEST QUAY AT PORT OF KALAJOKI	2019	Port of Kalajoki	The harbor extension scope included construction of a 142 m long new gravity quay wall and dredging of soil 73,000 m3 and drilling and blasting of rock 600 m3 for the new quay wall area and harbor extension Main quantities: - Dredging of soil 73 000 m3 - Drilling and blasting of rock 600 m3 - Dredging depth 9,5 m - Concrete structures 1 198m3 - Reinforcement steel 525 ton - Backfilling (blasted rock) 58 000 ton - Underwater concreting 398 m3
Finland	Helsinki	VUOSAARI ADR RAMP DEMOLITION	2019	Port of Helsinki Ltd	Demolition of a piled ramp, concrete 1,500 m3 + extraction of piles 48 pcs.
India	Mumbai	JAWAHARLAL NEHRU PORT, UNDERWATER DRILLING AND BLASTING IN THE ENTRANCE CHANNEL AND TURNING CIRCLE	2018	Joint venture Boskalis-Jan de Nul	Underwater drilling and blasting of rock in the entrance channel and the turning circle. Total 33 382 m2 / 33 162 m3 of blasted rock.

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Finland	Raahe	EXTENSION AND DEEPENING OF THE DEEP-WATER PORT OF RAAHE	2018	Port of Raahe	<p>Deepening and extension of harbour by backhoe dredging. Construction of a new 85 m long L-wall quay wall. Construction works included among others the quay wall element bed preparation works such as dredging of soils and underwater filling and levelling works.</p> <p>Construction works included also construction of a concrete RO-RO ramp, concrete coping beam, concrete erosion protection slab, quay accessories (bollards, fenders, etc.), backfilling works, rock revetment works and quay wall area structural layers and asphalt.</p> <p>Main quantities:</p> <ul style="list-style-type: none"> - Dredging of moraine 47 900 m3 - Concrete structures 1 438 m3 - Reinforcement steel 278 ton - Backfilling (blasted rock) 34 800 ton - Underwater concreting 610 m3
Latvia	Ventspils	EMERGENCY MAINTENANCE DREDGING WORKS OF SHIPPING CHANNEL OF VENTSPILS PORT 2016 – 2017 AND EXTENSION 2018-2019		Ventspils Freeport authority	<p>Emergency Maintenance Dredging Works of Shipping Channel of Ventspils Port.</p> <ul style="list-style-type: none"> - TSHD dredging 53 654 m3

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Finland	Helsinki	HERNESAARI CRUISE QUAY (LHD)	2018	Port of Helsinki Ltd	Construction of a new 313 m long quay wall for large cruise ships. Construction works included among others the quay wall element bed preparation works such as underwater drilling and blasting and dredging of rock, dredging of soils and underwater filling and levelling works. Construction works included also construction of a concrete coping beam, concrete erosion protection slab, quay specific accessories (bollards, fenders, etc.), backfilling works, structural layers and construction of a deadman anchored drilled pile wall (L=10 m) to connect the quay wall to existing quay wall structures. The scope included also the demolition works of the existing Ruumiskari quay wall, four separate main bollard foundations and construction of the municipality technique such as drainage. Main quantities:- Underwater drilling and blasting of rock 4 400 m ³ - Concrete counterfort elements (220 ton) 35 pcs- Concrete middle panel elements 34 pcs - Coping beam 313 m - Concrete structures 7 500 m ³ - Reinforcement steel 1 216 ton - Backfilling 140 000 m ³ - Underwater concreting 1 400 m ³
Finland	Pyhäjoki	HANHIKIVI 1, DREDGING OF APPROACH CHANNEL, CATCH BASIN AND RESERVE INTAKE CHANNEL	2018	Titan 2	Volumes according to contract: -Dredging of moraine 717 500 m ³ -Underwater drilling and blasting and dredging of rock 360 000 m ³ -Navigational aids supply and installation 15 pcs

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Finland	Naantali	NAANTALIN JETTY L26-L27 EXTENSION	2018	Port of Naantali	<p>Extension of existing L26-L27 jetty. The contract includes the modification part of the jetty, length 44 m and the new construction of extension part, length 50 m. The main scope and the quantities are:</p> <ul style="list-style-type: none"> - Demolition works of existing quay structures - Offshore tubular steel piling, D 813 x 16, 21 pcs / 798 m and D 1016 x 16, 18 pcs / 857 m. - Anchoring of piles, rock anchors type GEWI 75, 10 pcs / 576 m - Reinforced concrete deck structures, 1 300 m³. - Supply and installation of port specific fittings - Water and sewage pipe works
Finland	Hamina	HAMINA RIVER BOAT QUAY	2018	HaminaKotka Port Ltd	<p>Construction of a concrete deck jetty based on tubular steel piles including concrete ramps and a dolphin. Contract included also dredging of clay. Main quantities:</p> <ul style="list-style-type: none"> - Jetty and dolphin, main dimensions 13 m x 123 m - Concrete ramp, main dimensions 17 m x 63 m - Drilled tubular steel piles dia 406 mm, total 477 m - Drilled tubular steel piles dia 610 mm, total 1 135 m - Driven tubular steel piles dia 508 mm, total 603 m - Driven tubular steel piles dia 610mm, total 1 312 m - Rock anchors, type Gewi 75 plus, total 2 751 m - Reinforcement steel 375 ton - Concrete structures 3 128 m³ - Dredging of clay 46 350 m³
Finland	Loviisa	LOVIISA LIFTING DOCK	2018	Valkon Halli Oy	<p>Construction of a lifting dock based on tubular steel piles (dock capacity 670 tonnes). Main quantities:</p> <ul style="list-style-type: none"> - Marine tubular steel piling 711x12,5, 12 pcs and 610x12,5, 12 pcs - Onshore concrete piling b x h 300, 44 pcs - Construction of reinforced concrete beams, 253 m³

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Finland	Helsinki	HERNESAARI CRUISE QUAY PRE-CONSTRUCTION CONTRACT	2017	City of Helsinki	Dredging of contaminated sediments 29 400 m3 / 50 300 m2 Dredging of clay, silt and moraine 82 000 m3 Embankment construction / Rock fill 315 000 m3 Installation of submarine cables (electricity and fibre-optics) 5 km Installation of submarine seware and fresh water pipes 4,4 km
Finland	Uusi-kaupunki	HAMINA RENOVATION OF QUAY PK 3	2017	HaminaKotka Satama Oy	Widening and reinforcement of an existing quay wall based on tubular steel piles. - Drilled tubular steel piles D406x12,5, 98 st / 1669 m och D610x12,5, 50 st / 842 m - Driven tubular steel piles D610x12,5, 147 st / 2282 m - Gewi D 75 rock anchors 2628 m - Concrete constructions 4265 m3 - Reinforcement steel 564 ton - Demolition of existing concrete structures
Finland	Hamina	HEPOKARI HARBOUR, BERTH 4, NEW BOLLARD FOUNDATION	2017	Port of Uusikaupunki Ltd	Construction of a new bollard foundation based on tubulars steel piles. Piling 200 m och concrete structures 310 m3.
Sweden	Kapellskär	KAPELLSKÄR FERRY BERTH K4/K5 EROSION PROTECTION RENOVATION	2017	Port of Stockholm	Underwater hydro hammering and demolition of old concrete erosion protection slabs. Bottom levelling for new erosion protection. Fixing the front wall of the slab with concrete elements. Underwater reinforcement and concreting of a new 300 mm thick erosion protection slab, total 400 m2 / 637 m3.
Sweden	Nynäshamn	STOCKHOLM NORVIK PORT DREDGING CONTRACT	2017	Port of Stockholm	Capital dredging and drilling & blasting for a new port development for the Port of Stockholm. Dredging of soils 780 000 m3. Underwater drilling and blasting and dredging of rock 250 000 m3.

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Finland	Helsinki	KOIRASAARI FOUNDATIONS	2017	Keele Oy	The contract included the demolition of old concrete quay structure, 900 m ³ . Drilling of drilled piles , 24 pcs ,D610 mm, anchoring of inclined piles with GEWI rock anchors, 8 pcs. Suspended deck structures consists of 10 pcs of foundation precast beam elements and 39 pcs of precast core slabs. Cast-in-situ concrete structures, totally 550 m ³ . Construction of land abutments as well as dam-wall and 30 m long concrete tunnel structure including drilling and blasting.
Finland	Parainen/Na	LILLMÄLÖ AND PROSTVIK FERRY PORT MODIFICATION AND IMPROVEMENT PROJECT	2017	The Centre for Economic Development, Transport and the Environment (ELY Centre) Southwest Finland	The contract included the modification and improvement of two separate ferry berths located in remote locations at the islands of Turku archipelago. Dredging and drilling and blasting including reclamation of the material on shore; volume 2 610 m ³ , maximum dredging depth -5,5 m. Offshore pile drilling tubular steel piles Ø 406x12,5, total 26 pcs / 250 m. Rock anchors GEWI Ø63,5, 345 m. Reinforcement steel 115 ton. Concrete structures 1 050 m ³ . Underwater concrete erosion protection slab 168 m ³ . Prefabricated steel bridge.

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Sweden	Kapellskär	NEW 240-METRE QUAY WALL AND 245-METRE JETTY	2016	Kapellskärs Hamn AB	Design and build contract for new quay structures including: <ul style="list-style-type: none"> - Construction of a 245 m long and 20 m wide jetty including a dolphin, based on tubular steel piles partly driven and partly drilled in to the bedrock. - Construction of a 165 m long concrete self-retaining wall element quay on harbor area and a 75 meter m concrete self-retaining wall element quay on pilot port. - Installation of port-specific equipment and steel structures 160 ton.
Sweden	Husum	NEW 139-METRE LONG RETAINING QUAY WALL, VIKING HAMN PROJECT	2016	Metsä Board Sverige AB	Extension of the existing port by constructing a new quay wall utilizing counterfort elements, total length 139 m. Construction works included among others backfilling with rock, coping beam with equipment, fenders, approach lights, quay field structures and two light masts. <ul style="list-style-type: none"> - Dredging volume 40 000 m3, maximum dredging depth -26,5 m. - Rock fill under water 79 676 m3 and In dry 12 250 m3. - Deep compaction 3 564 drops. - Concrete counterfort elements 16 pcs, weight 200 ton/each. - Underwater concrete casting for gravity wall erosion protection 920 m2. - Concrete quay structures total 2 469 m3.
Finland	Tornio	RÖYTTÄ LNG-QUAY MODIFICATION WORK	2016	Manga LNG	Extension of the existing LNG quay (quay founded on tubular steel piles), dredging as well as installation of new quick release mooring hooks.
Finland	Tervola	LOUE-TERVOLA, THE KEMIJOKI RIVER CHANNEL IMPROVEMENT PROJECT,	2016	Kemijoki Oy	The dredging of the river Kemijoki at six separate sites on the river bed, a total of 190 000 m3. The dredged soil were removed for the protection of the river embankments along a distance of 10 kilometres. Additionally new spawning places installed for fish populations , approximately 2000 rtm3.
Finland	Helsinki	HELSINKI WESTERN HARBOUR TERMINAL PROJECT, LJT UPPER RAMP FOUNDATION PROJECT	2016	Port of Helsinki	Foundation structures for the upper ramp of the ferry berth containing piling works with the tubular steel piles D323 and D610 in diameters as well as building of collision protection.

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Finland	Äänekoski	METSÄ OY, BIOPRODUCT PLANT CHIMNEY, SLIPFORM CASTING,	2016	Metsä Fibre Oy	Construction of a massive foundation for a 120-metre high chimney, slipforming of chimney walls as well as installation of steel structures inside the chimney.
Norway	Hammerfest	INNSEGLING TILL POLARBASE	2015	Kystverket	Underwater drilling and blasting, dredging of blasted rock, total volume 132,000 m ³ . Dredging to the depth of 17,3 meters
Finland	Uusikaupunki	DEMOLITION AND MODIFICATION WORKS OF AN OLD TRAIN- FERRY BERTH AT THE PORT OF HEPOKARI	2015	Port of Uusikaupunki	The construction of two new dolphins and the demolition of the upper ramp and modifications of the lower ramp. Tubular steel piles D813x12,5 18 pcs / 450 m. Concrete structures 400 m ³ . Steel Structures 95 000 kg.
Sweden	Luleå	LULEÅ TEST DREDGING	2015	Swedish Maritime Administration	Test dredging for future Luleå ore port dredging project. Dredging of moraine for seven trial pits to depth of -16,75 m.
Sweden	Elleholm	ELLEHOLM, DREDGING AND QUAYWALL WITH TWO DOLPHINS	2015	Schweden Splitt AB	Dredging of harbour basin and fairway consisting silt and sand, 40,000 m ³ . Construction of a 15-meter jetty with two dolphins and complete quay equipment.
Sweden	Kapellskär	KAPELLSKÄR DREDGING	2014	Kapellskärs Hamn AB	Dredging of sand and moraine, 172,000 m ³ . Underwater drilling and blasting 55 000 m ³ . Construction of two breakwaters, length 60 m and 130 m, water depth -20 m. Construction of a retaining wall, length 50 m. Backfilling with blasted rock, 35 700 m ³ .
Sweden	Gävle	PORT EXTENSION AND UPGRADING NAVIGATION AIDS GÄVLE	2014	Sjöfartsverket	Dredging of contaminated soil, 800,000 m ² . Dredging of clay, sand and gravel approx. 2,5 mill. m ³ . Dredging of moraine approx. 1,1 mill. m ³ . Underwater drilling, blasting and dredging of blasted rock approx. 50,000 m ³ . Construction and planning of two new light houses and an erosion protection for the existing light house.
Sweden	Åhus	ÅHUS DREDGING	2014	Skanska Sweden AB	Maintenance dredging of fairway and harbour basin
Sweden	Tornio river, Haparanda	TORNIO RIVER ESTUARY DREDGING	2014	Torneå stad	Dredging of the fairway at the river estuary in order to improve flood protection. Total dredging volume, 266,000 m ³ .

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Denmark	Esbjerg	DREDGING IN ESBJERG HARBOUR	2014	Peter Madsen Rederi A/S	Dredging of foundation pits for offshore windmill transport to sea.
Finland	Loviisa	REPAIRING OF PITKÄLÄITURI	2013	Port of Loviisa	The scope included dredging of soils and dredging of contaminated sediments 4,000 m ³ .
Finland	Helsinki	WESTERN HARBOUR DREDGING CONTRACT 2013	2013	Port of Helsinki	Dredging of contaminated sediments and disposing them into onshore dumping basins for further treatment 42,000 m ² / 18,500m ³ .
Finland	Kotka	HIETANEN HARBOUR DREDGING	2012	Port of Hamina and Kotka	Dredging of contaminated sediments 37,000 m ³ by using environmental grab.
Finland	Raahе	FOUNDATION FOR A WIND POWER PLANT	2012	Evergreen Investment Oy	Construction of a foundation for a wind power plant including earth works.
Finland	Porvoo	EASTERN SHORE OF RIVER PORVOONJOKI	2012	City of Porvoo	Renovation of old shore wall, length 136 metres. Sheet piles, 260 tons, rock anchors 37 pcs, concrete structures 240 m ³ .
Sweden	Stenungsund	NEW JETTY PIER STENUNGSUND	2012	Petro Port AB	Construction of pier length 255 m. Marine piling of dia 610 mm tubular steel piles, total 99 pcs/ 3,500 m, concrete 4,200 m ³ and construction of tubular bridge length 310 m.
Sweden	Klintehamn	KLINTEHAMN	2012	Region Gotland	Dredging, drilling and blasting of Harbor basin, quantity 37 500 m ³ .
Finland	Kotka	MUSSALO CONVEYOR TUNNEL	2011	Fertilog Oy	Construction of a conveyor tunnel partly as an underwater work. Based on our own design. Sheetpile wall 65 tons, concrete structures 420 m ³ .
Finland	Turku	SAARONNIEMI QUAY	2011	City of Turku	Quay found on steel pipes with a concrete deck and wooden panelling.
Finland	Helsinki	RUUSUNIEMI BASIN AND QUAY WALL	2011	City of Helsinki (HKR)	Construction of a service quay wall and a port for leisure boats.
Finland	Helsinki	CAPITAL DREDGING FOR HARBOUR BASIN EXTENSION AND NEW ALIGNMENT FOR ENTRANCE CHANNEL, WESTERN HARBOUR	2011	Port of Helsinki	Dredging of contaminated sediments 280,460 m ² /136,781 m ³ using environmental grab. Dredged soil was used for land reclamation on the harbour area. Dredging of clay, 1,472,833 m ³ Dredging of moraine, 161,062 m ³ Underwater drilling and blasting, 203,385 m ³ Installation of submersible sewage pipe, 140 m

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Finland	Hamina	HAMINA BASIN DREDGING	2011	City of Hamina	Dredging of TBT contaminated sediments, 433,000 m ² . Dredging of clay, 457,000 m ³ . Dredging of moraine, 205,000 m ³ . Underwater drilling and blasting, 3,500 m ³ . Land reclamation 270,000 m ³
Finland	Naantali	NAANTALI QUAY	2011	City of Naantali	Construction of a quay founded on tubular steel piles. The quay construction is based on our own design. Steel piles 64 pcs, concrete structures 1,100 m ³ .
Sweden	Jokkmokk	LAKE TAP AKKATS, JOKKMOKK	2011	Vattenfall AB	Drilling and blasting and dredging of vertical water intake shaft to hydropower station. Water depth -10 m to -20 m. Blasted material to be dredged from -30 m. Size of the shaft 10 x 10 m.
Sweden	Göteborg	PORT OF GÖTEBORG	2011	Göteborgs Hamn	Underwater blasting 2,000 m ³ .
Sweden	Stenungsund	STENUNGSUND	2011	Petro Port AB	Dredging of the harbour basin quantity 100,000 m ³ .
Denmark	Gedser	GEDSER	2011	Scandlines AB	Dredging of the channel quantity 350,000 m ³ .
Sweden	Västervik	VÄSTERVIK	2011	Västervik kommun	Dredging, drilling and blasting of entrance channel and harbour, quantity 78,000 m ³ .
Finland	Rauma	RO-RO 7 DOLPHIN	2010	Port of Rauma	Construction of steel dolphin.
Finland	Pori	FOUNDATION FOR WIND POWER PLANT	2010	Technip Offshore Finland Oy	Dredging and filling works required for a steel caisson.
Finland	Sipoo	SIPOONRANTA	2010	Sipoonranta Oy	Construction of combi steel wall, length 220 m.
Finland	Oulu	NUOTTASAARI QUAY	2010	Port of Oulu	Renovation of the coping beam, partly executed as underwater work, 330 m. Erosion protection, 3,000 m ² , construction of pile supported slab, 1,800 m ² . Earth work and sewage work.
Finland	Savonlinna	DREDGING FOR HIGHWAY 14 SAVONLINNA	2010	Destia Oy	Dredging of contaminated sediments 20,000 m ³ by using environmental grab.
Finland	Hamina	HAMINA CHANNEL DREDGING	2010	Finnish Transport Agency	Dredging of channel, depth 12,0 m. Dredging of moraine, 676,000 m ³ . Underwater drilling and blasting, 202,000 m ³
Germany		NORD STREAM GERMAN LANDFALL	2010	Heinrich Hirdes GMBH	Dredging and backfilling of gas pipeline trench.
Denmark		KONTEC CABLE	2010	Peter Madsen Rederi A/S	Dredging trench app. 4,9 km depth to 12,0-18,0 m.

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France	Roscoff	ROSCOFF	2010	Westminster Dredging Company Ltd	Underwater blasting 3,500 m ³ .