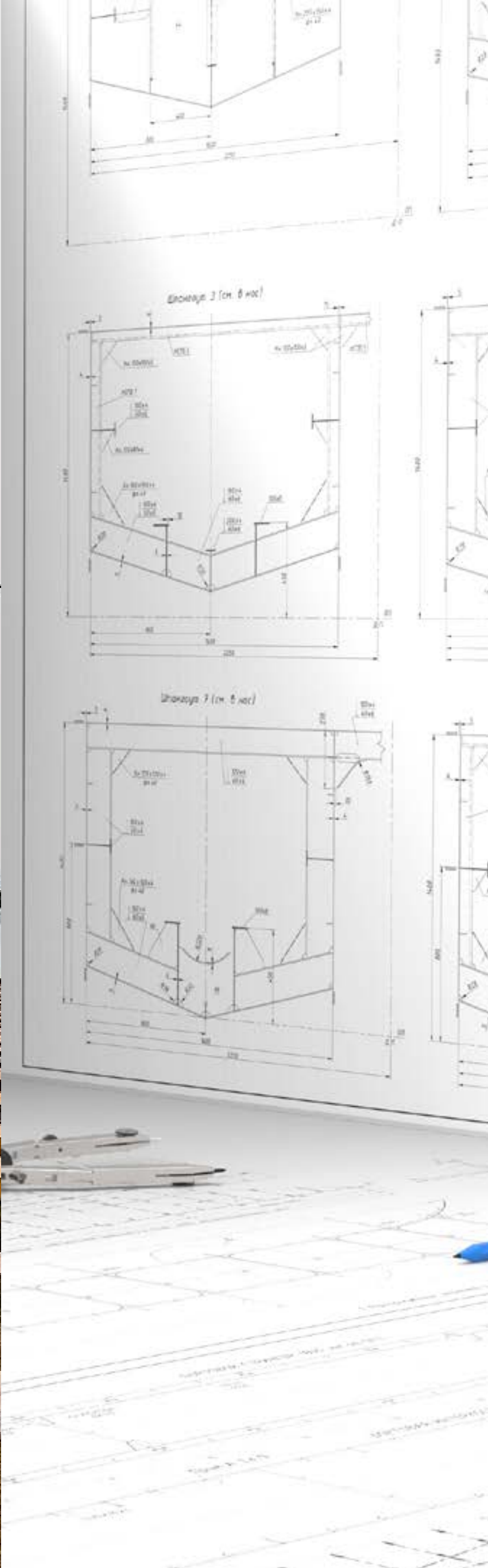
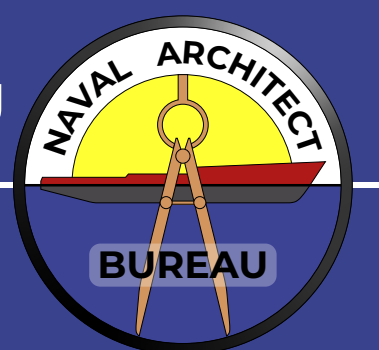


PROJECTS PORTFOLIO



NAVAL ARCHITECT BUREAU

- Ship design
- Vessels modernization and reclassification projects
- Developing of operational documentation
- Evaluation of ships technical condition
- Reverse engineering



STERN-LIFTER

Vessel type: floating dock

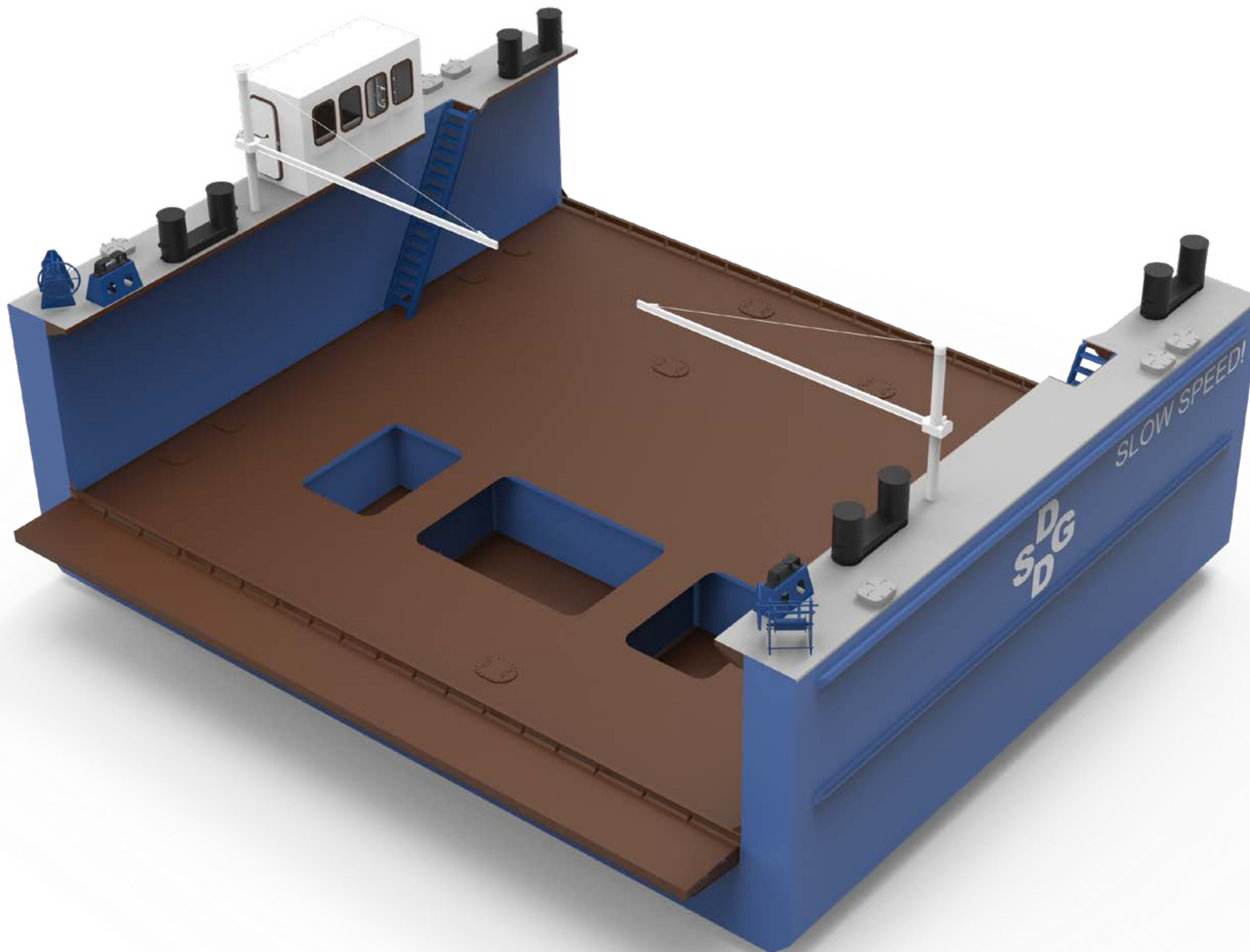
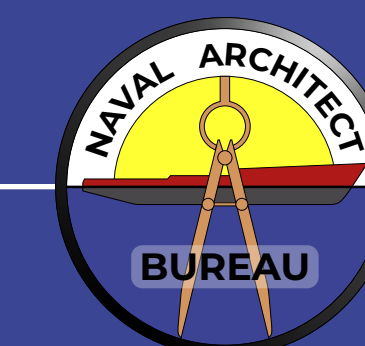
Purpose: lifting of bow and fore part of barges and vessels for repair propulsion, bow-thruster or for hull repair of the extremities

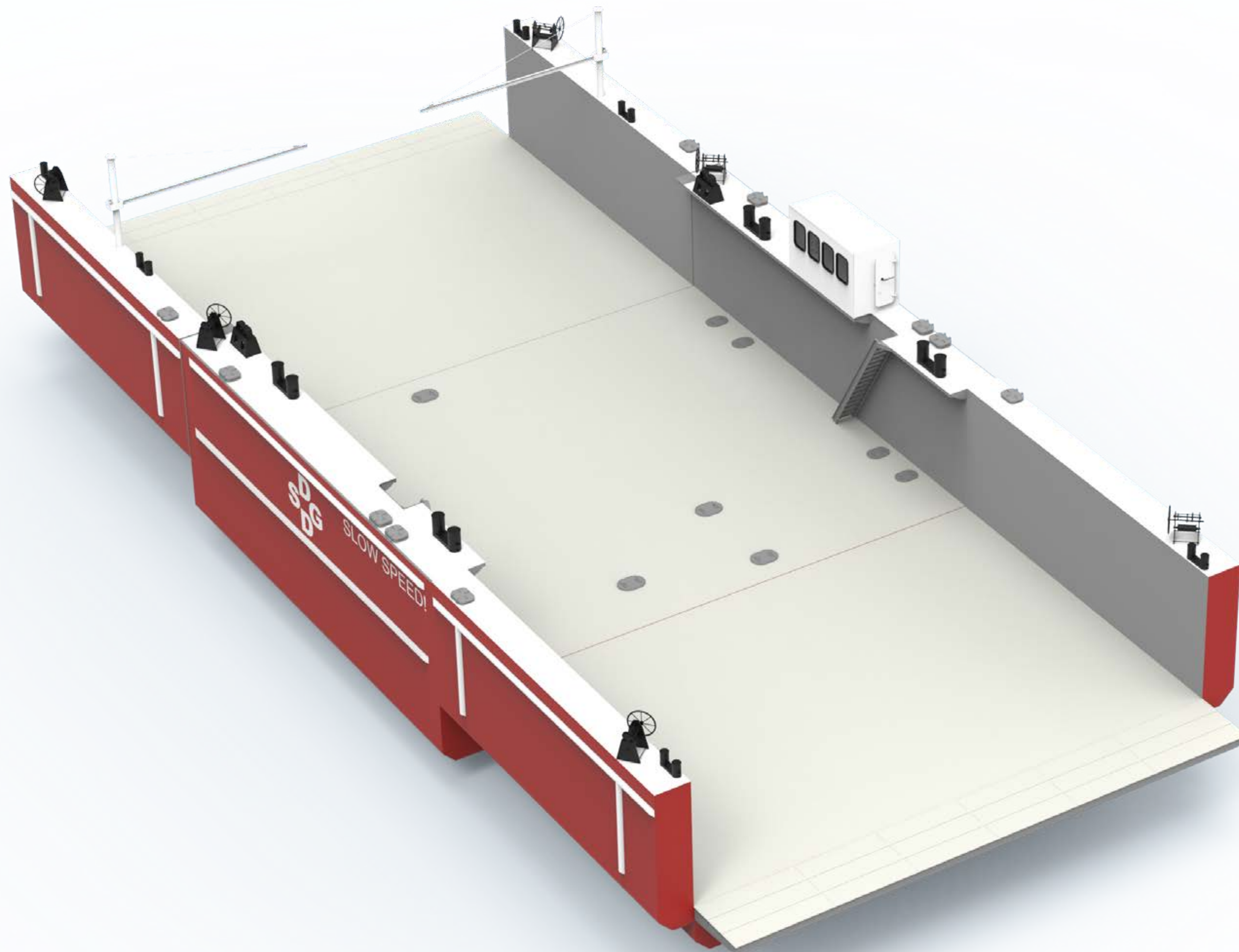
LLC «NAB» supplied:

- Basic design under BV classification
- Detailed design of hull construction and systems
- Technical support while building on the shipyard

TECHNICAL PARTICULARS

Length overall	16.50 m
Length	15.00 m
Breadth o.a.	19.00 m
Breadth	18.75 m
Pontoon deck breadth	16.60 m
Wing deck depth	6.20 m
Pontoon deck depth	2.15 m
Lifting capacity	350 t
Framing space	500 mm
Ballast pumps	2x200 m ³ /h





FLOATING DOCK

Vessel type: floating dock

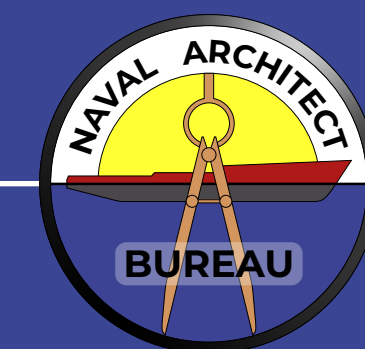
Purpose: docking vessels for inspection and shiprepair, lifting of bow and fore part of barges and vessels for repair propulsion, bow-thruster or for hull repair of the extremities

LLC «NAB» supplied:

- Basic design under BV classification
- Detailed design of hull construction, systems, and section connections
- Technical support while building on the shipyard

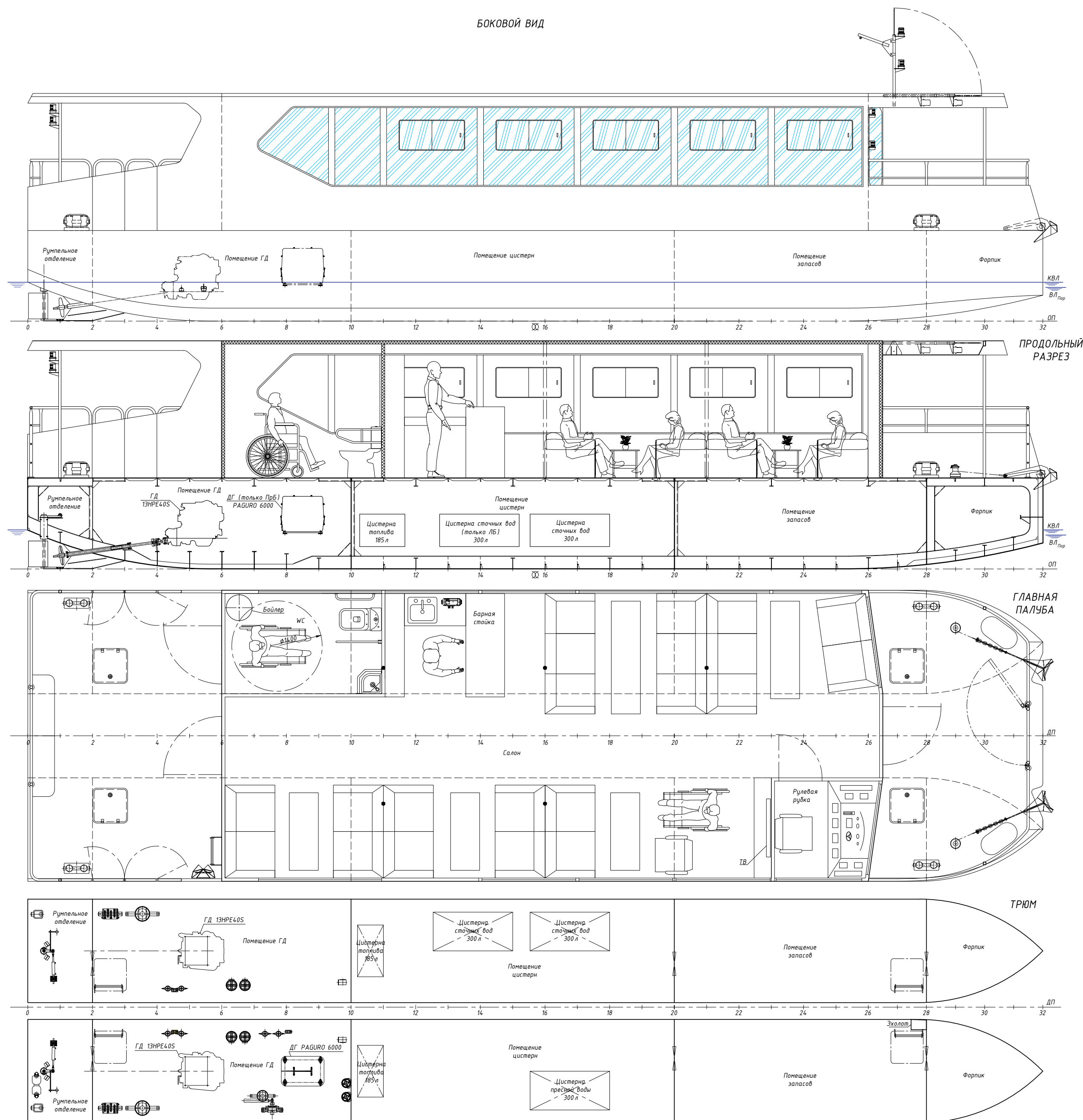
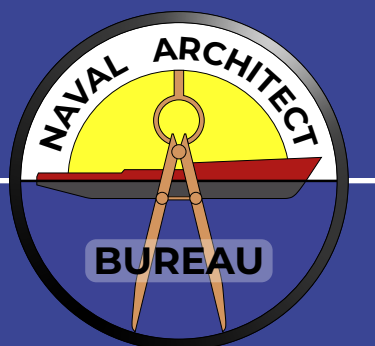
TECHNICAL PARTICULARS

Length overall	41.40 m
Length	38.90 m
Breadth o.a.	19.00 m
Breadth	18.75 m
Pontoon deck breadth	16.60 m
Wing deck depth	6.20 m
Pontoon deck depth	2.15 m
Lifting capacity	500 t
Framing space	500 mm
Ballast pumps	2x200 m ³ /h



- Class project under Shipping Register of Ukraine
- Detailed design of hull construction, mechanical and electrical parts, operational documentation
- Technical support while building on the shipyard

Length o.a.	15.7 m
Breadth	4.5 m
Depth	1.4 m
Draught	0.6 m
Displacement	22.0 t
Main engines	2x40 h.p.
Maximum speed	15 km/h
Crew number	2 per.
Passenger capacity	25 per.
Class notation	B 3 (zone 3)



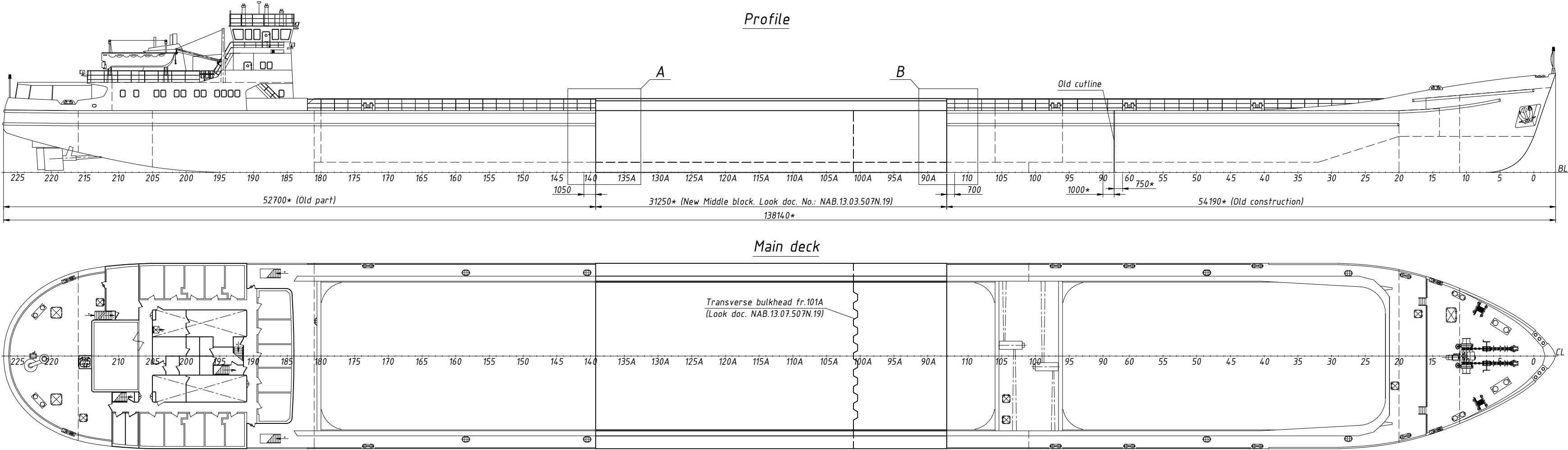


VESSEL LENGTHENING

Vessel type: steel, two-deck, double-screw general cargo ship, with double bottom, double sides, with forecastle, with engine room, and deckhouse at the stern part, with 4 cargo holds (before lengthening - two holds and one deck vessel)

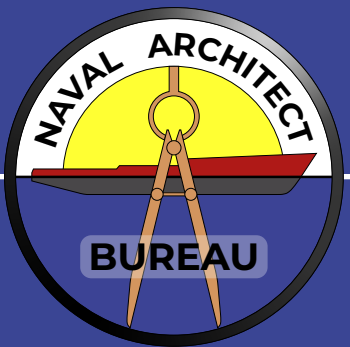
Purpose: carrying of general and bulk cargoes in holds and containers

- LLC «NAB» supplied:
- Fully detailed lengthening project under PHRS
 - Detailed design of new hull constructions
 - Technical support while lengthening on the shipyard



TECHNICAL PARTICULARS

	BEFORE	AFTER
Length o.a.	107.1 m	138.2 m
Breadth	16.5 m	16.5 m
Depth	5.5 m	5.5 m
Draught	3.49 m	3.71 m
Deadweight	3550 t	5332 t
Displacement	5050 t	7353 t
Main engines	2x662 kW	2x662 kW
Class notation	Ice 1 R2-RSN	Ice 1 R2-RSN(4.5)





SHORTENING & CHANGING TYPE

Before modernization

Dry cargo vessel

After modernization

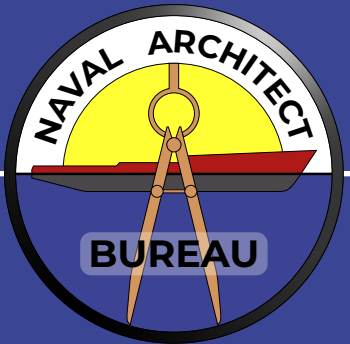
River pusher (also supplier) able to push 12 barges with total loading capacity 19 000 t on European waterways

LLC «NAB» supplied:

- Fully detailed project under Bureau Veritas
- Detailed design of new hull constructions, systems and operational documentation
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

	BEFORE	AFTER
Length o.a.	90.02 m	42.00 m
Breadth	10.96 m	10.96 m
Depth	3.2 m	3.2 m
Draught	2.5 m	1.8/2.6 m
Cargo capacity	1600 t	- / 313 t
Displacement	2300 t	620.3/936.6 t
Main engines	2x746 kW	2x746 kW
Pushed caravan loading capacity	19000 t	19000 t
Navigation area	Zone 2	Zone 2



RECLASSIFICATION

Before modernization

Non-self-propelled barge section, with double bottom and sides, designed for inland navigation

After modernization

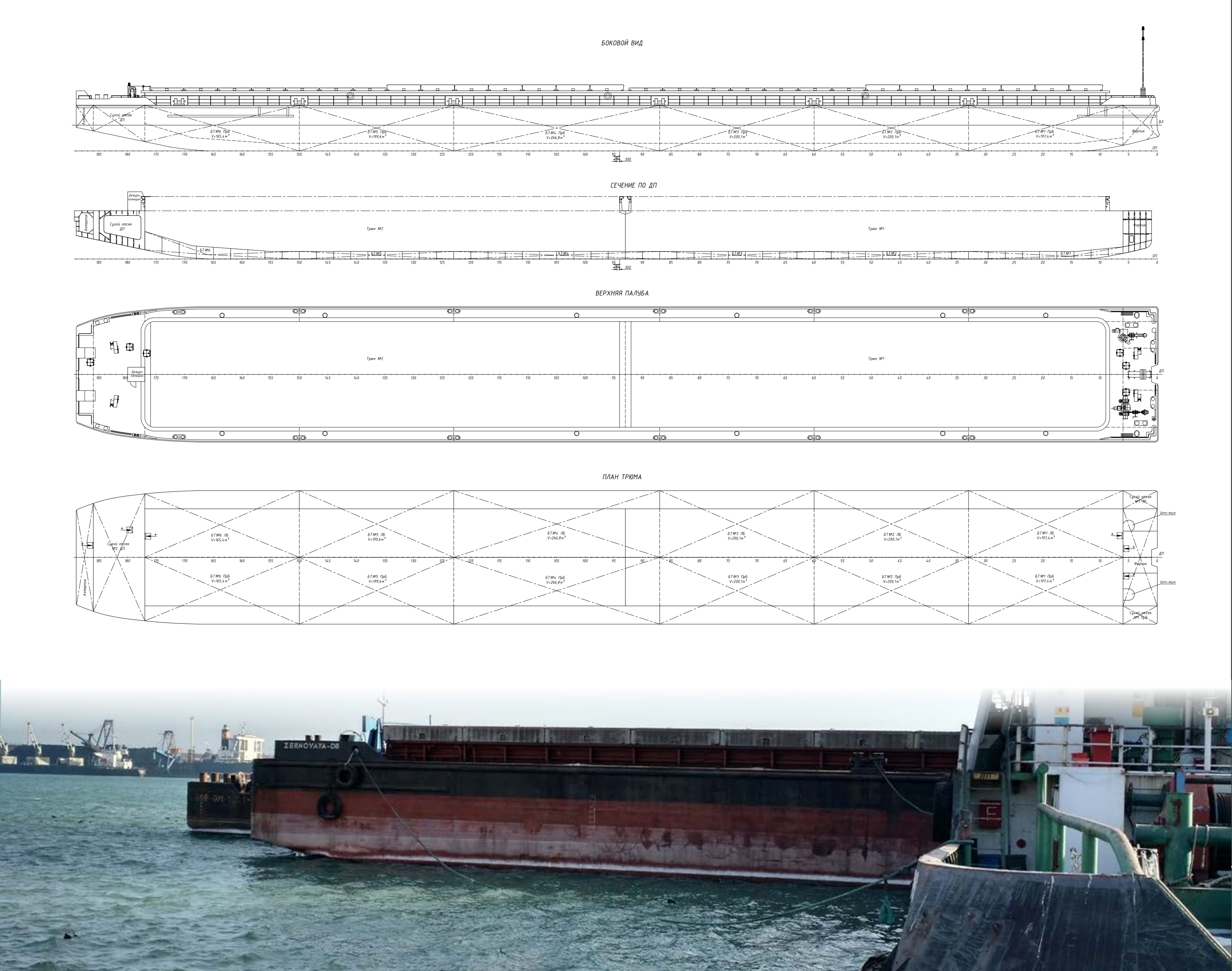
Non-self-propelled barge section, with double bottom and sides, reinforced for sea coastal operations

LLC «NAB» supplied:

- Fully detailed project under Shipping Regiter of Ukraine
- Detailed design of new hull constructions
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

	BEFORE	AFTER
Length o.a.	114.45 m	114.45 m
Breadth	14.00 m	14.00 m
Depth	4.80 m	4.80 m
Draught	3.50 m	2.70 m
Cargo capacity	4332 t	3214 t
Displacement	5205 t	3936 t
Crew	without	without
Class notation	+ O 2.0	KM + R3
Navigation area	Inland	Sea and coastal





DESIGN OF PARTIAL DOCKING

Numerous projects involving various cases of partial lifting operations in floating docks and stern-lifters have been undertaken. These partial liftings are infrequent and come with inherent risks, challenging us to expand our expertise in handling such non-ordinary scenarios.

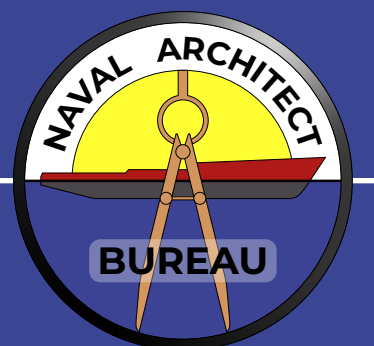
During lifting operations, there is a potential risk of the vessel cracking or sliding out of the dock area. The primary objective is to accurately calculate all design loads and assess the strength and stability of the dock-vessel system, as well as each component individually.

LLC «NAB» supplied:

- Marine engineering of non-ordinary cases
- Stability calculations
- Hull strength calculations
- Fastening means

TECHNICAL PARTICULARS

Floating dock length	38.90 m
Max length of lifted vessel	135.00 m
Stern-lifter length	15.00 m
Max length of lifted vessel	76.50 m



WHEELHOUSE MODERNIZATION

Before modernization

Wheelhouse type: fixed height wheelhouse

After modernization

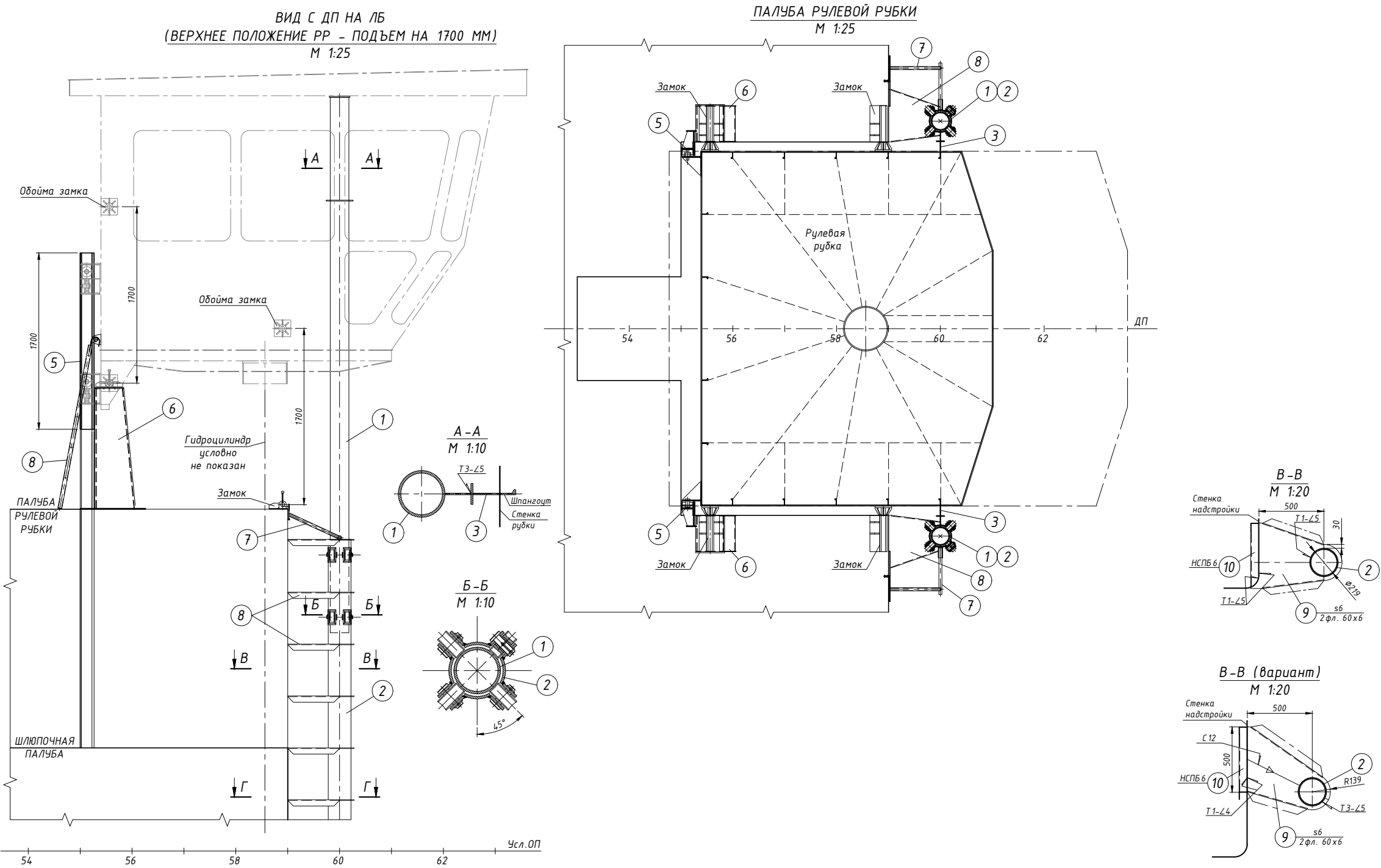
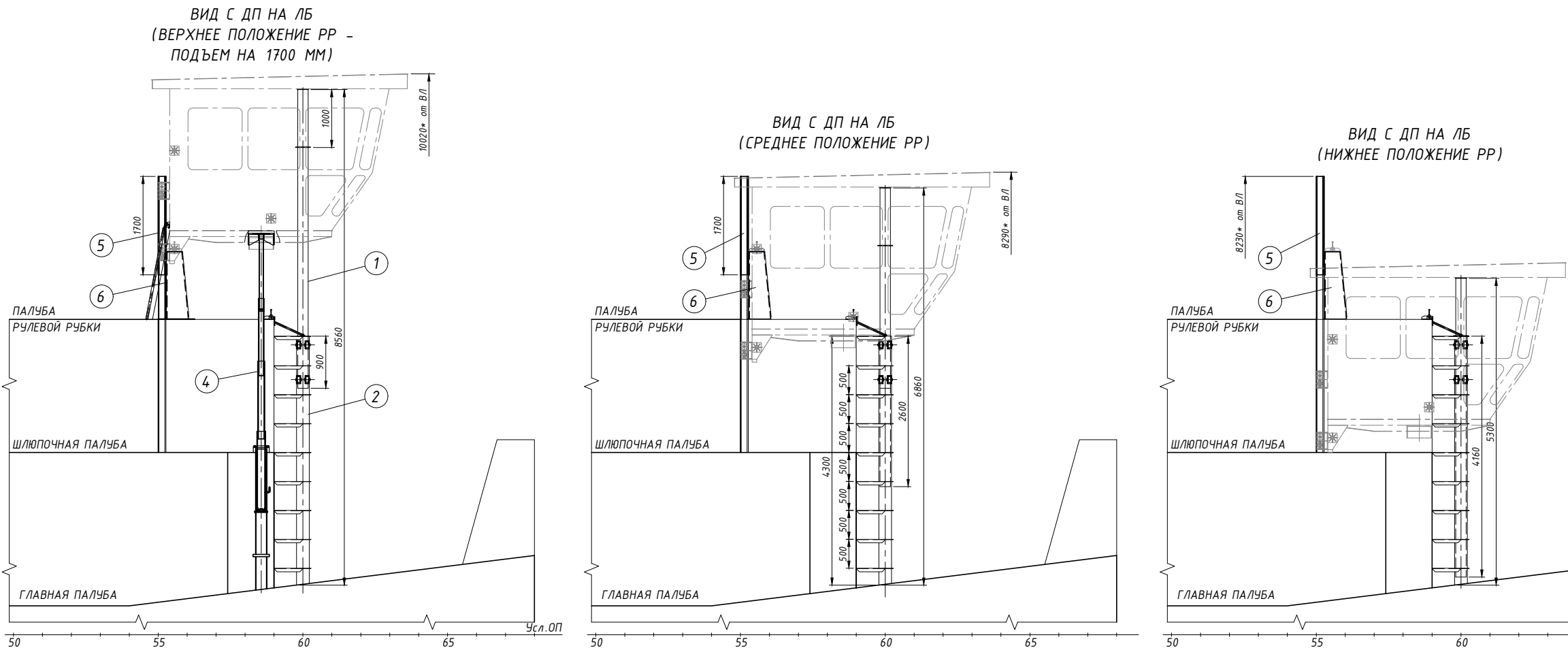
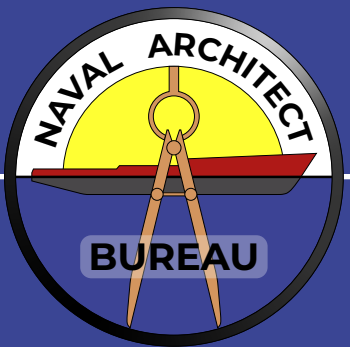
Wheelhouse type: adjustable height hydraulic system wheelhouse

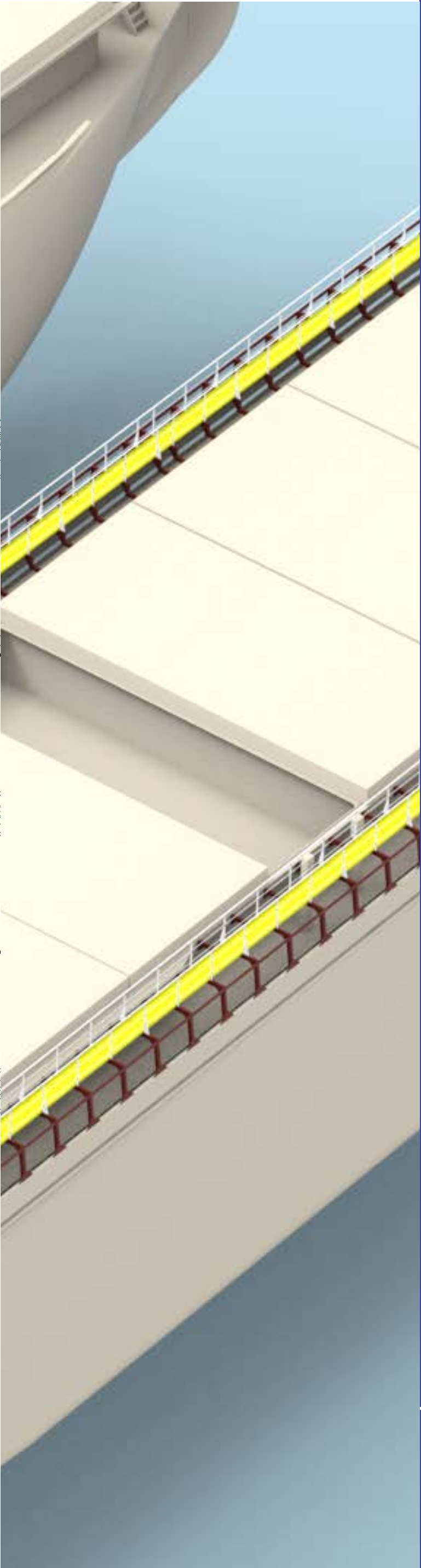
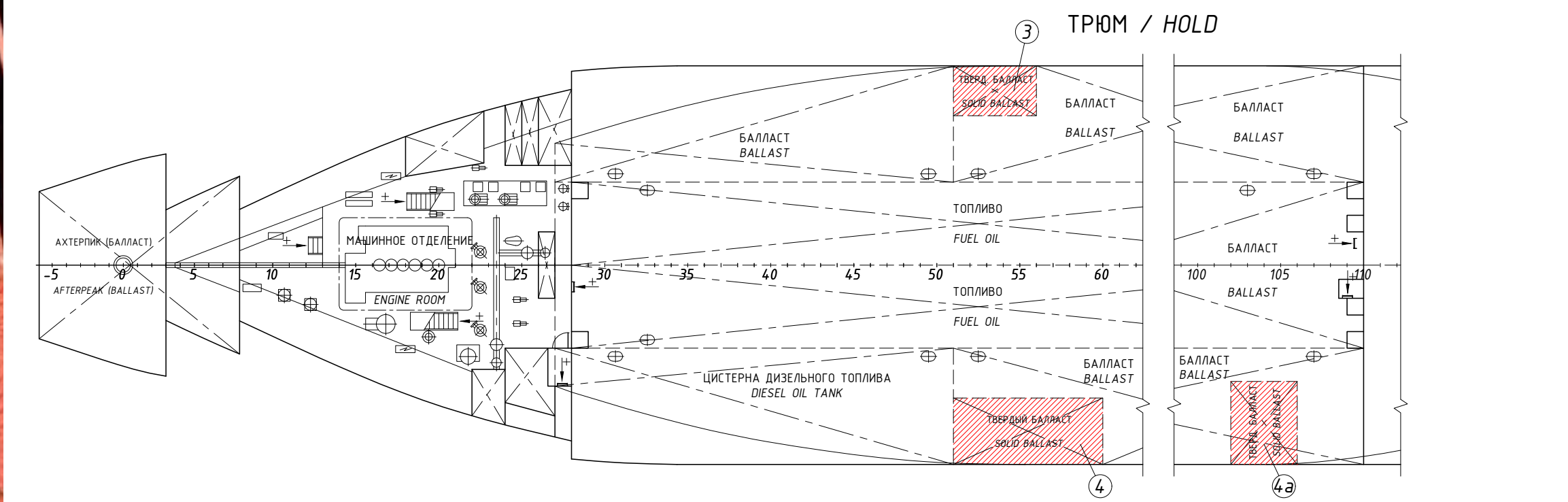
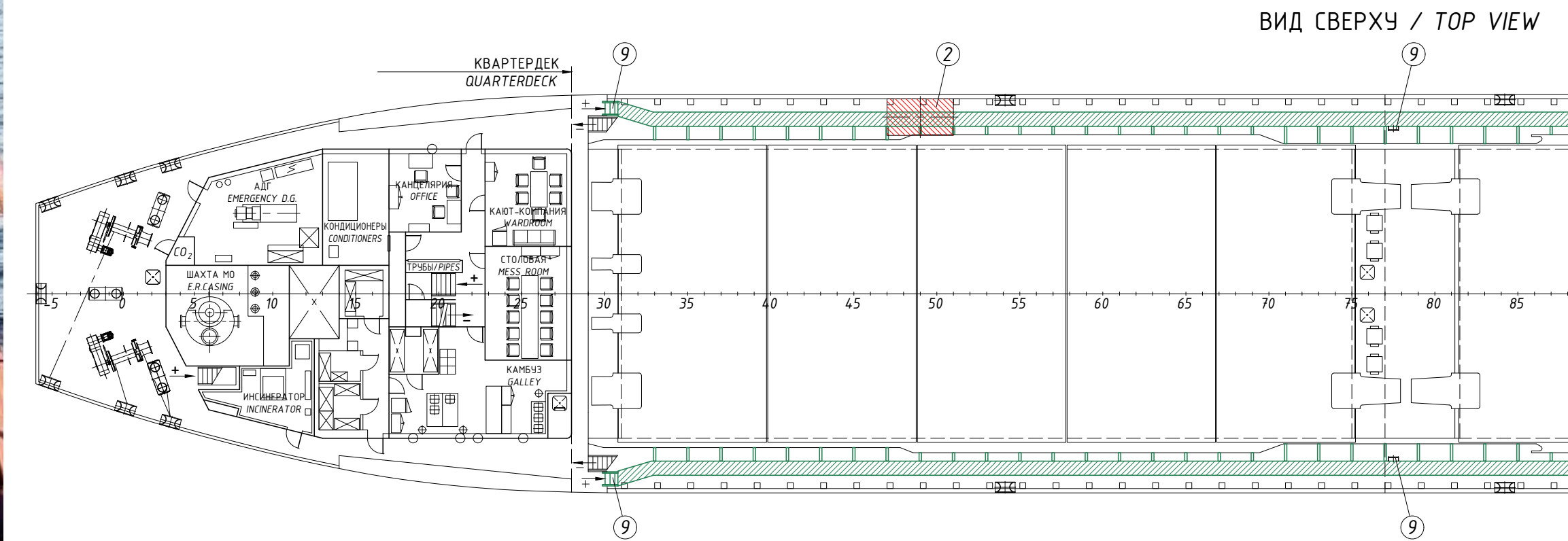
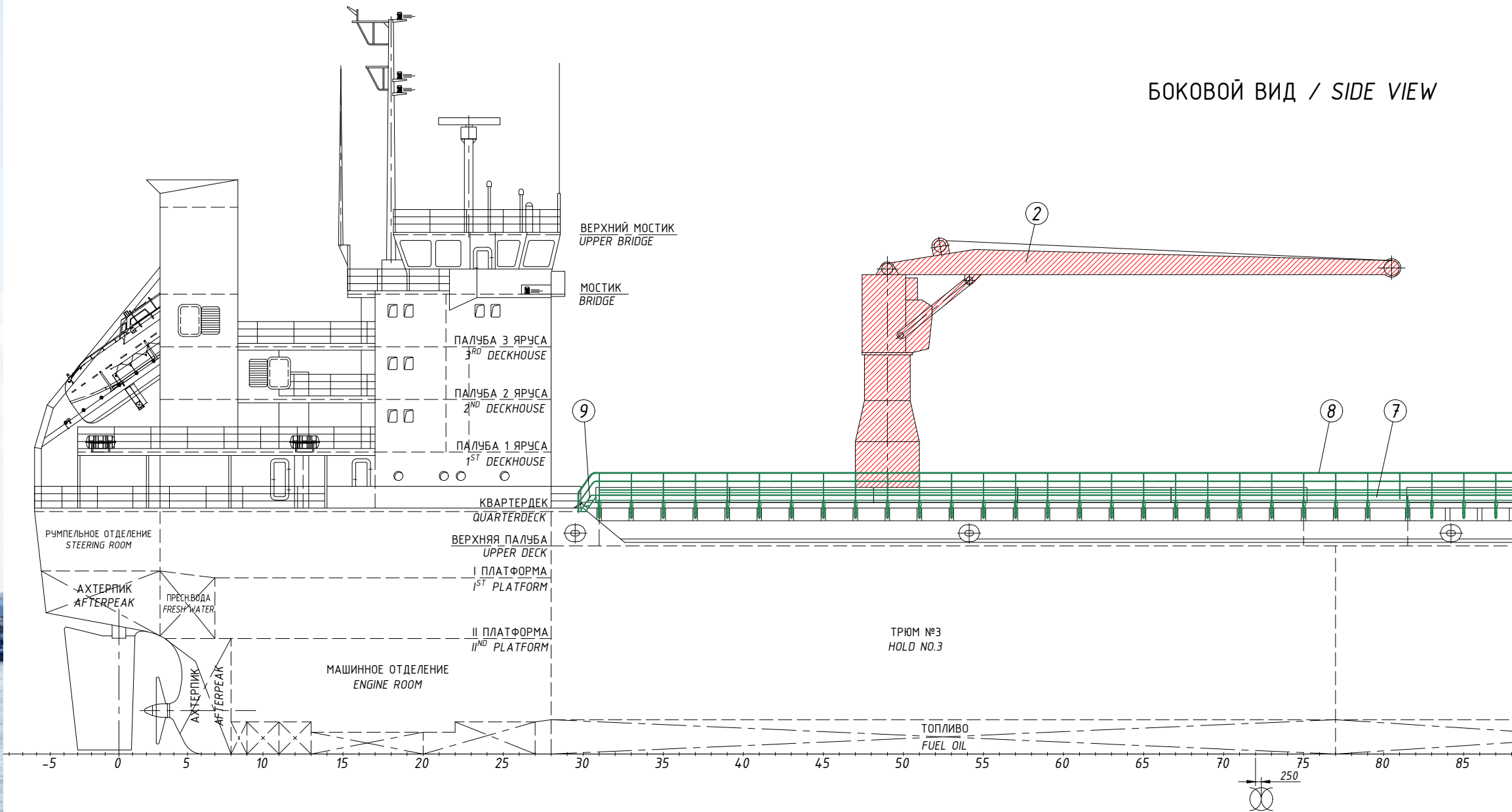
LLC «NAB» supplied:

- Fully detailed project under Shipping Register of Ukraine supervision
- Detailed design of new constructions and hydraulic system
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

Length o.a.	34.52 m
Breadth	11.00 m
Depth	2.80 m
Draught	2.02 m
Displacement	508.10 t
Main engines	2x883 kW
Maximum speed	10.8 kn.
Number of crew	6 per.
Class notation	Ice1 R3-IN





CARGO CAPACITY INCREASING

Vessel type: dry cargo vessel, single-crew, with three holds with central cargo hatches, minimum freeboard, with aft deckhouse and engine room, with forecastle and quaterdeck, with transom stern and bulbous bow

Purpose: carriage of general cargoes, long-sized and heavy-weight, grain and solid bulk cargoes

Cargo capacity was increased by the following measures:

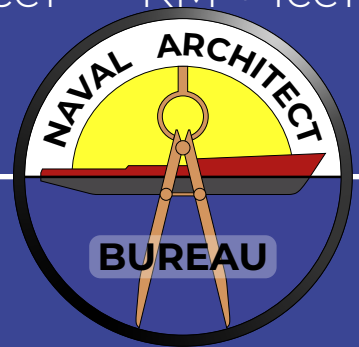
- Dismantling of side cargo cranes and solid ballast
- New freeboard calculation
- Installation of new coaming bridge
- Hatch covers strengthening

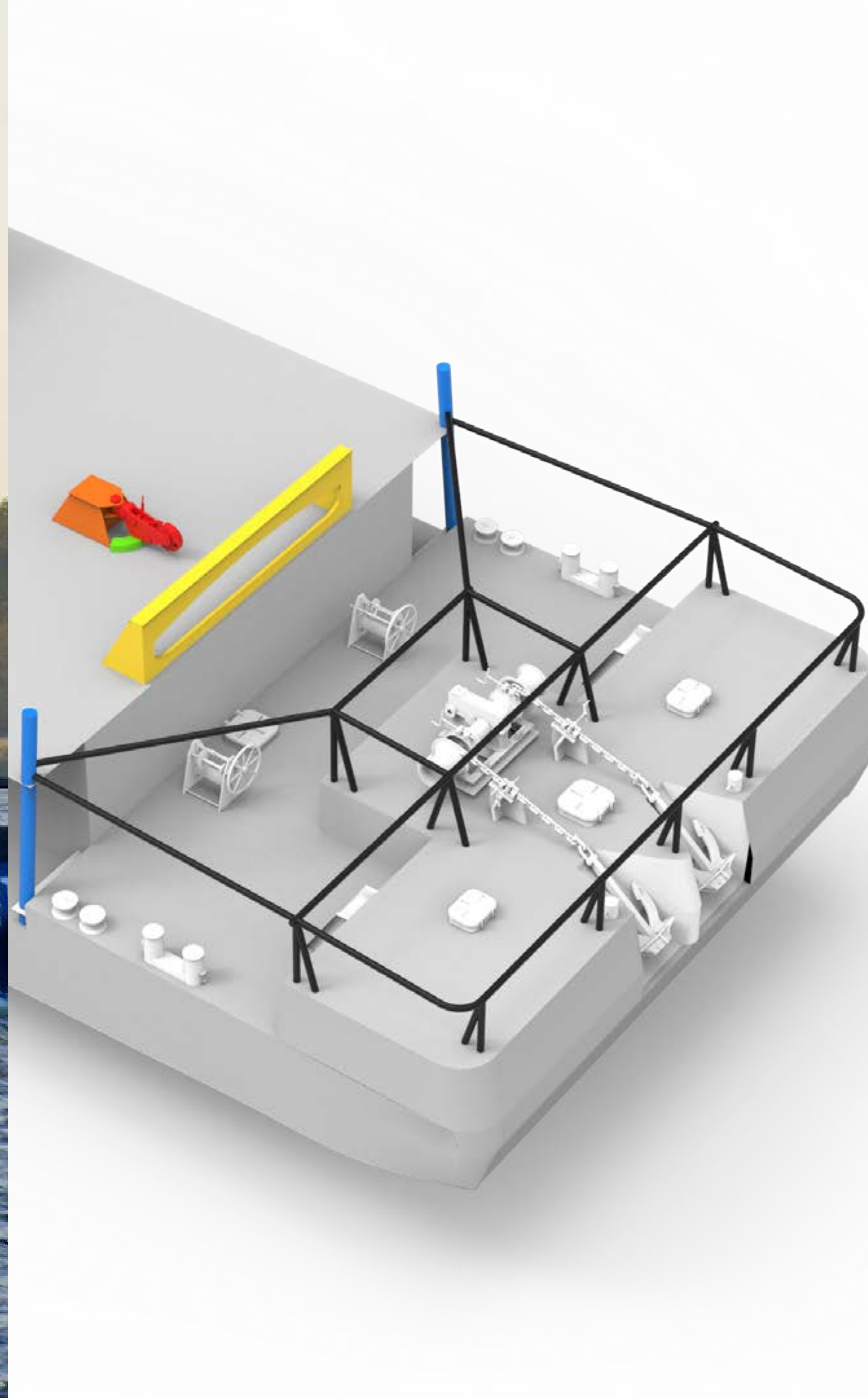
LLC «NAB» supplied:

- Fully detailed project under Shipping Register of Ukraine supervision
- Detailed design of new hull constructions
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

	BEFORE	AFTER
Length o.a.	106.6 m	106.6 m
Breadth	16.80 m	16.80 m
Depth	9.10 m	9.10 m
Draught	7.06 m	7.517 m
Displacement	9334 t	10022 t
Deadweight	6917 t	7735 t
Main engines	2400 kW	2400 kW
Class notation	KM + Ice1	KM + Ice1





TOWING GEAR INSTALLATION

Before modernization
Only pushing operations

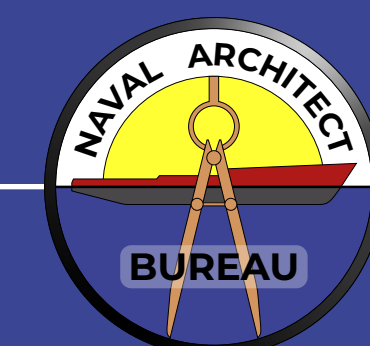
After modernization
Pushing and towing operations

LLC «NAB» supplied:

- Fully detailed project under Shipping Register of Ukraine supervision
- Detailed engineering of new constructions and hull strengthening for towing gear
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

Length o.a.	34.52 m
Breadth	11.00 m
Depth	2.80 m
Draught	2.02 m
Displacement	508.10 t
Main engines	2x883 kW
Maximum speed	10.8 kn.
Crew number	6 per.
Towing force	150 kN
Class notation	Ice1 R3-IN



PUSHING BOX INSTALLATION

Before modernization

Pushing operations are impossible or forbidden

After modernization

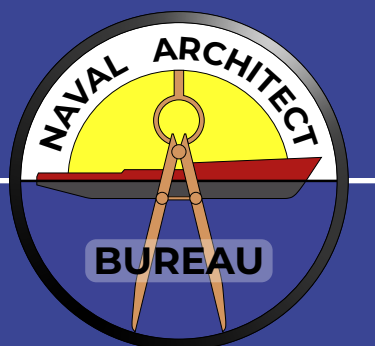
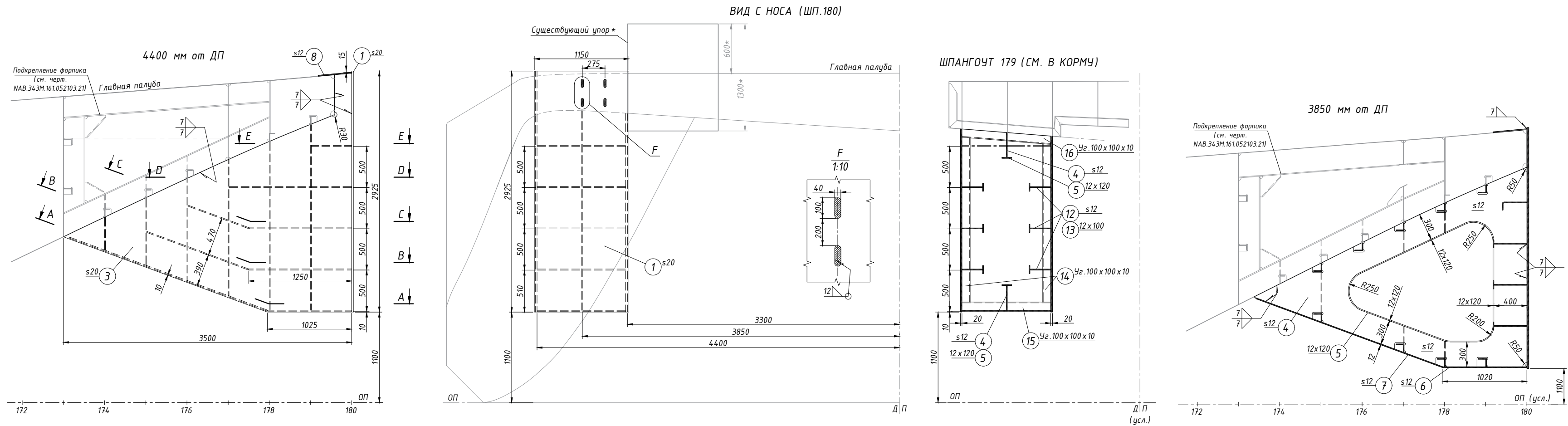
Pushing operations are possible and allowed

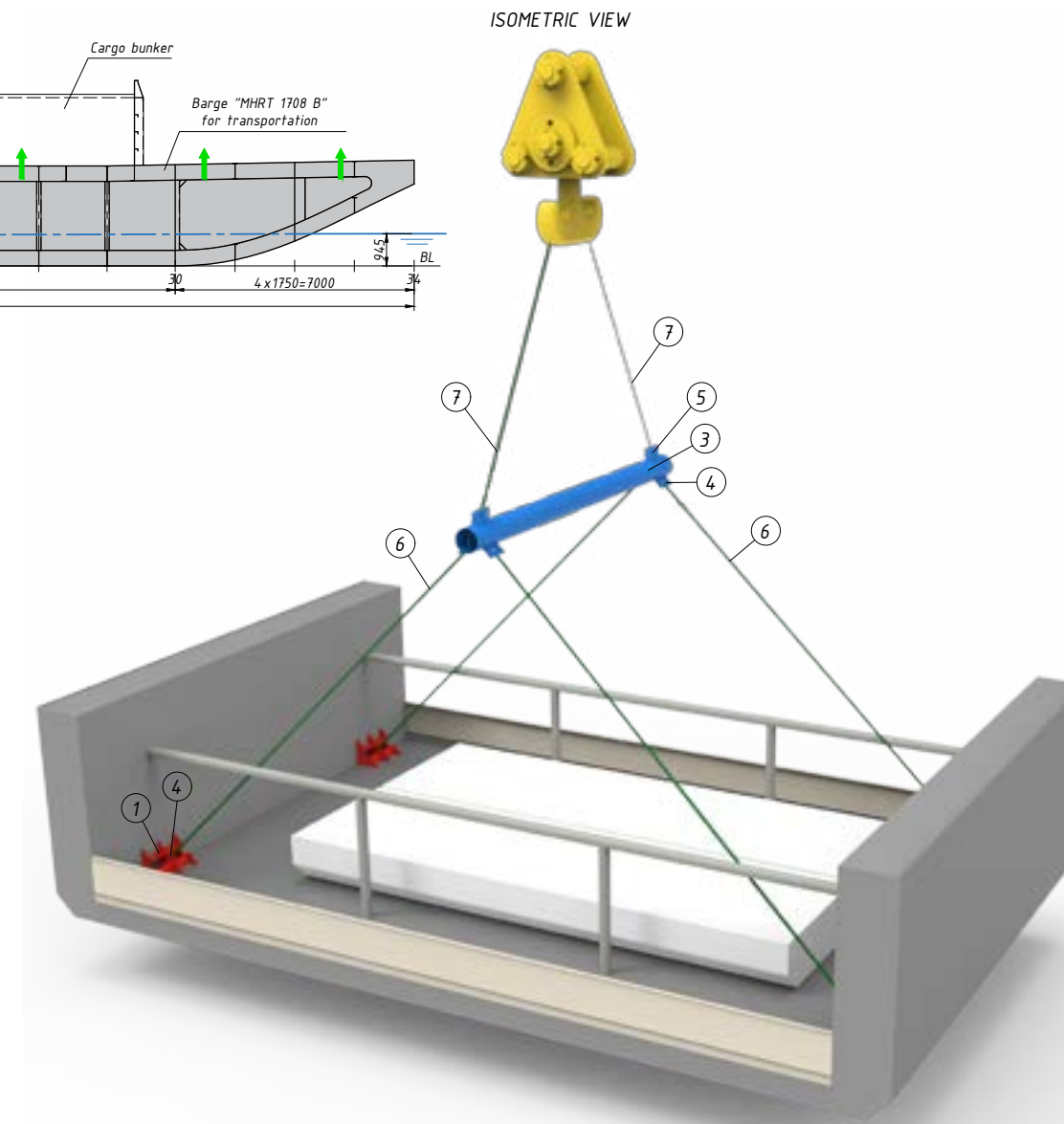
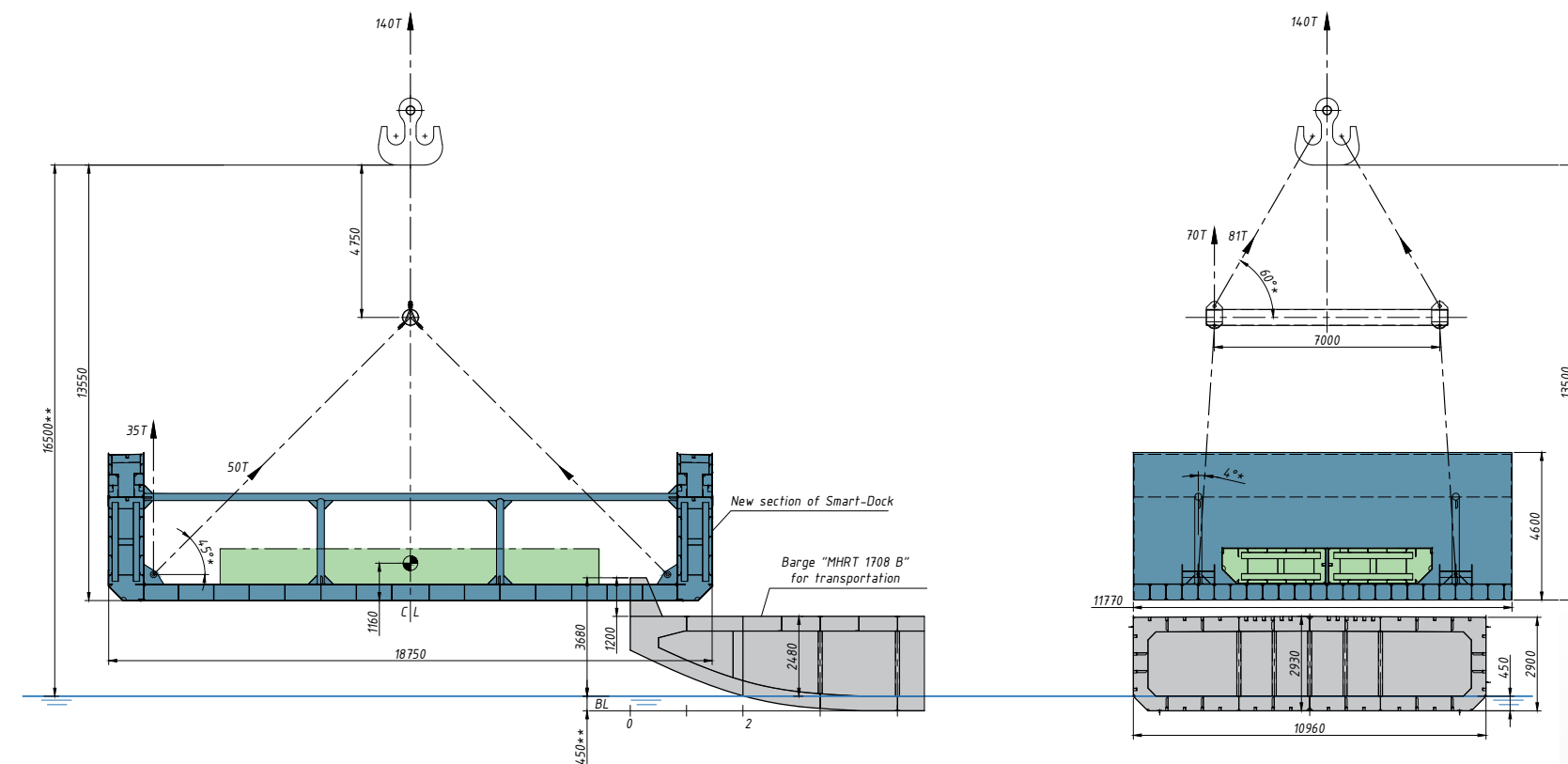
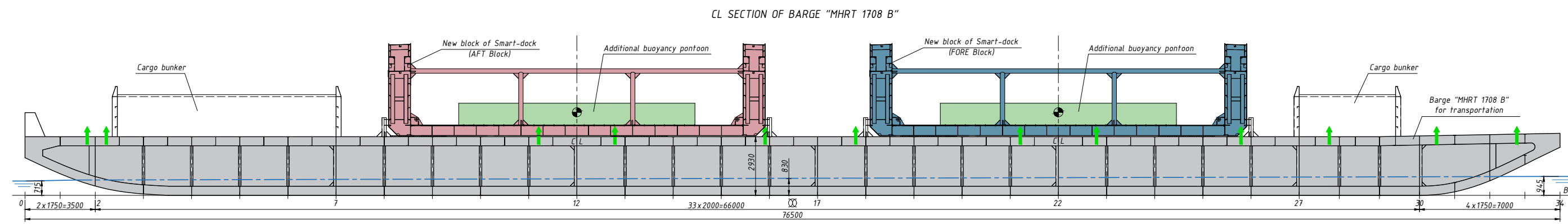
LLC «NAB» supplied:

- Fore part modernization projects
- Pushing boxes design
- Fore shape analysis
- Fully-detailed drawings for manufacturing
- Technical support while modernization on the shipyard

TECHNICAL PARTICULARS

Length o.a.	42.00 m
Breadth	10.96 m
Depth	3.20 m
Draught	2.60 m
Displacement	420 t
Main engines	2x746 kW
Pushed caravan loading capacity	19 000 t
Navigation area	Zone 2





HEAVY CARGO TRANSPORTATION

LLC «NAB» supplied:

- Transportation project under Bureau Veritas supervision
- Conveyance project to the place of assembly
- Engineering supervision during all transportation process
- Fastening means, calculations and manufacture drawings

New parts of floating dock were successfully carried on the barge deck



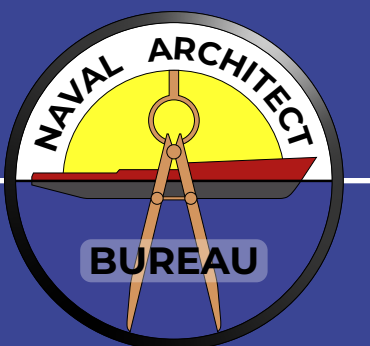
TECHNICAL PARTICULARS

Barge:

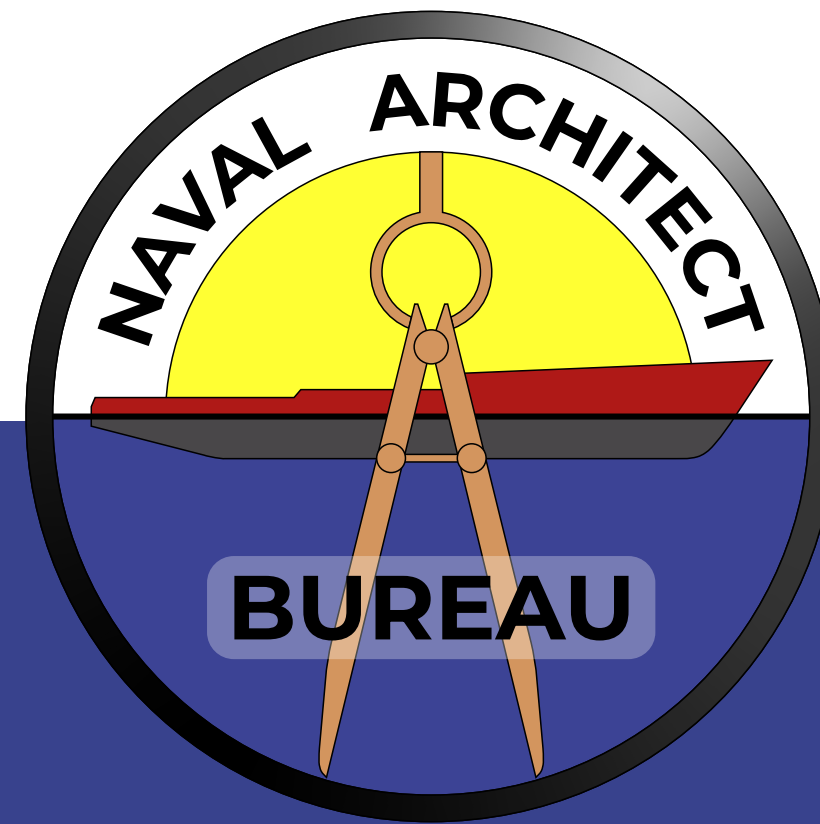
Length o.a.	76.50 m
Breadth	10.96 m
Cargo capacity	1600 t

Carrying block:

Length	11.75 m
Breadth	18.75 m
Height	4.61
Weight	140 t



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