C. Required Port Facilities and Equipment for Major Ports

(1) Required length and depth of berth

129. In order to handle increasing cargoes at major ports of Hanoi, Khuyen Luong, New North and New East, 1.5 km of berth (additional length: 0.8km) and 3.0 km of berth (additional length: 2.3km) will be required in 2010 and in 2020 respectively (see **Figure VI-6**).

130. Required water depth of berth is 2.5m below the 95% water level for vessels/barge trains deployed in the RRD by 2010 and 3.6m for Sea-cum-river vessels by 2020.

(2) Required handling equipment

131. For handling bulk cargoes, quayside mobile crane, grab bucket, shovel loader, bulldozer and dump truck will be used and for non-bulk cargoes, quayside mobile crane, forklift, truck and pallet will be needed. For handling containers, quayside mobile crane (heavy type), forklift (heavy type), tractor and trailer will be used.

(3) Required land space

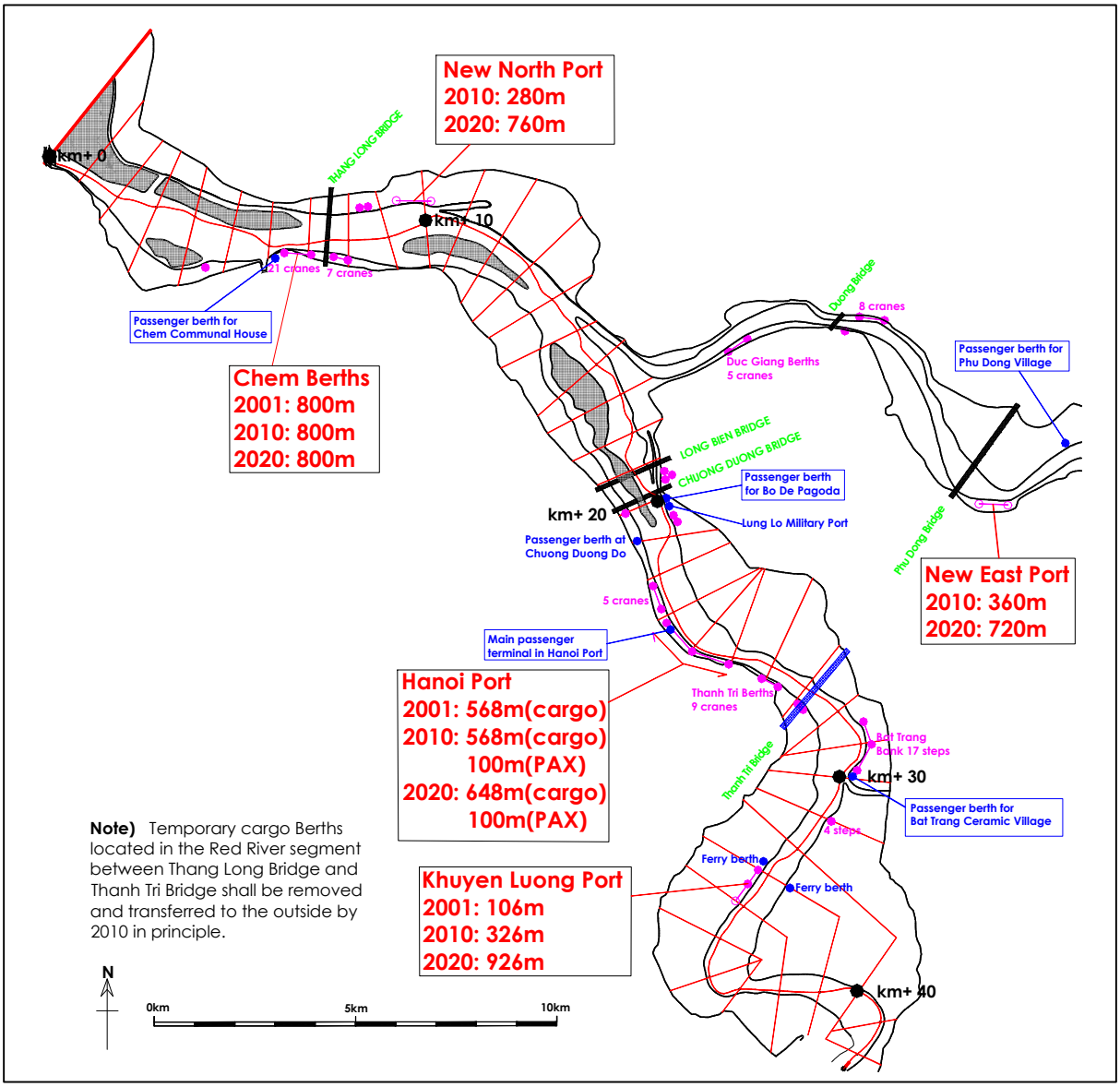
132. Space for storage yard (construction material and coal), warehouse, road, utility and reserve area is required. And in a port handling containers, ICD (inland container/clearance depot) consisting of CY (container yard), CFS (container freight station) and DC (distribution center) is also needed.

(4) Required number of access road lanes

133. Access roads between major ports and dyke road or Ring Road No.3 will have to be constructed. Two lanes will be required for all major ports.

(5) Required elevation of port facilities

134. Crown elevation of berths in major ports shall be set at a level slightly higher than Warning Water Level III (+11.5m at Hanoi Station). Ground elevation of roads, storage yards and warehouses shall be set at a level higher than that of berths in order to avoid traffic blockade and/or degradation of commodity value due to flooding.



Source) JICA Study Team

Figure VI-6 Location of Ports/Berths (2001, 2010, 2020)

D. Hanoi Port

135. Development direction of Hanoi Port is proposed as follows:

- Hanoi Port shall handle non-bulk and bulk cargoes as well as cargoes of SRV (2020), and serve mainly for Citadel districts. Bulk cargo, however, shall be decreased taking into account environmental preservation.
- Length of newly planned berths shall be 80m for cargo vessels (by 2020) and 100m for passenger boats (by 2010).
- Out-dated handling equipment shall be replaced.
- Road of low elevation shall be improved.

136. Master plan and short-term development plan of Hanoi Port are shown in **Table VI-2**, **Table VI-3**, **Figure VI-7** and **Figure VI-8**.

Table VI-2 Master Plan of Hanoi Port (2020)

Item	Description
Port Owner/Investor	MOT (small-scale investment: port operator)
Port Operator	Hanoi Port under NOWATRANCO
Facing IW Corridor	Corridor 1 (Quang Ninh - Hai Phong - Hanoi - Viet Tri) Corridor 4 (Sea - Hanoi)
Hinterland	Citadel districts
Design Capacity	1.2 million tons (Bulk: 0.3, Non-bulk: 0.5, SRV: 0.4)
Length of Waterfront	1.8km (Additional bank protection upstream of T4: 900m)
Berth Property	Existing: 568m for cargo (partial repair work is needed at berths No.4-6) Newly planned: 80m@-3.6m (+11.5m) for SRV 100m@-2.0m (+12.0m) for PAX
Land Area	Total: 7ha (Storage yard: 0.6ha, Warehouse: 1.6ha for port related use and 1.1ha for other use) (Newly planned warehouse: 1.4ha)
Handling Equipment	Quayside mobile crane: 9 units (8tons) Grab bucket: 2 units (3cu.m), Forklift: 23 units (3tons) Shovel loader: 1 unit (2cu.m), Bulldozer: 1 unit (5tons) Dump Truck: 3 units (10tons), Truck: 15 units (7tons) Pallet: 2,700 units (1.2mx1.8m)
Passenger Terminal	1 unit
Access Road	2 lanes to be linked to Dyke road (for Ring Road No.2) Planned: Elevation improvement to +12.0m (L=2.6km)

Table VI-3 Short-term Development Plan of Hanoi Port (2010)

Item	Description
Port Owner/Investor	MOT (small-scale investment: port operator)
Port Operator	Hanoi Port under NOWATRANCO
Facing IW Corridor	Corridor 1 (Quang Ninh - Hai Phong - Hanoi - Viet Tri) Corridor 4 (Sea - Hanoi)
Hinterland	Citadel districts
Design Capacity	0.8 million tons (Bulk: 0.6, Non-bulk: 0.2)
Length of Waterfront	1.8km (Additional bank protection upstream of T4: 900m)
Berth Property	Existing: 568m for cargo (partial repair work is needed at berths No.4-6) Newly planned: 100m@-2.0m (+12.0m) for PAX
Land Area	Total: 3ha (Storage yard: 1.1ha, Warehouse: 0.4ha for port related use and 0.9ha for other use)
Handling Equipment	Quayside mobile crane: 5 units (8tons) Grab bucket: 3 units (3cu.m), Forklift: 6 units (3tons) Shovel loader: 2 unit (2cu.m), Bulldozer: 1 unit (5tons) Dump Truck: 5 units (10tons), Truck: 4 units (7tons) Pallet: 700 units (1.2mx1.8m)
Passenger Terminal	1 unit
Access Road	2 lanes to be linked to Dyke road (for Ring Road No.2) Planned: Elevation improvement to +12.0m (L=2.6km)

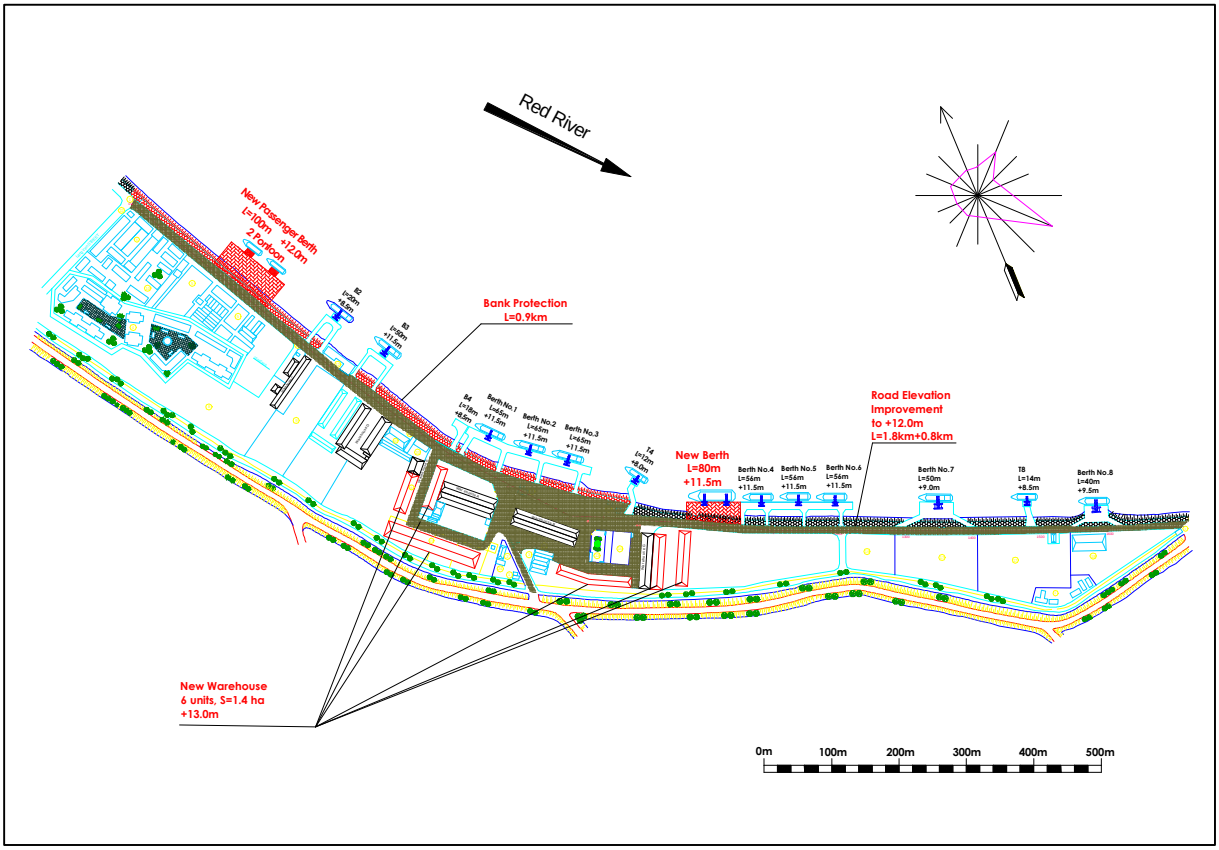


Figure VI-7 Master Plan of Hanoi Port (2020)

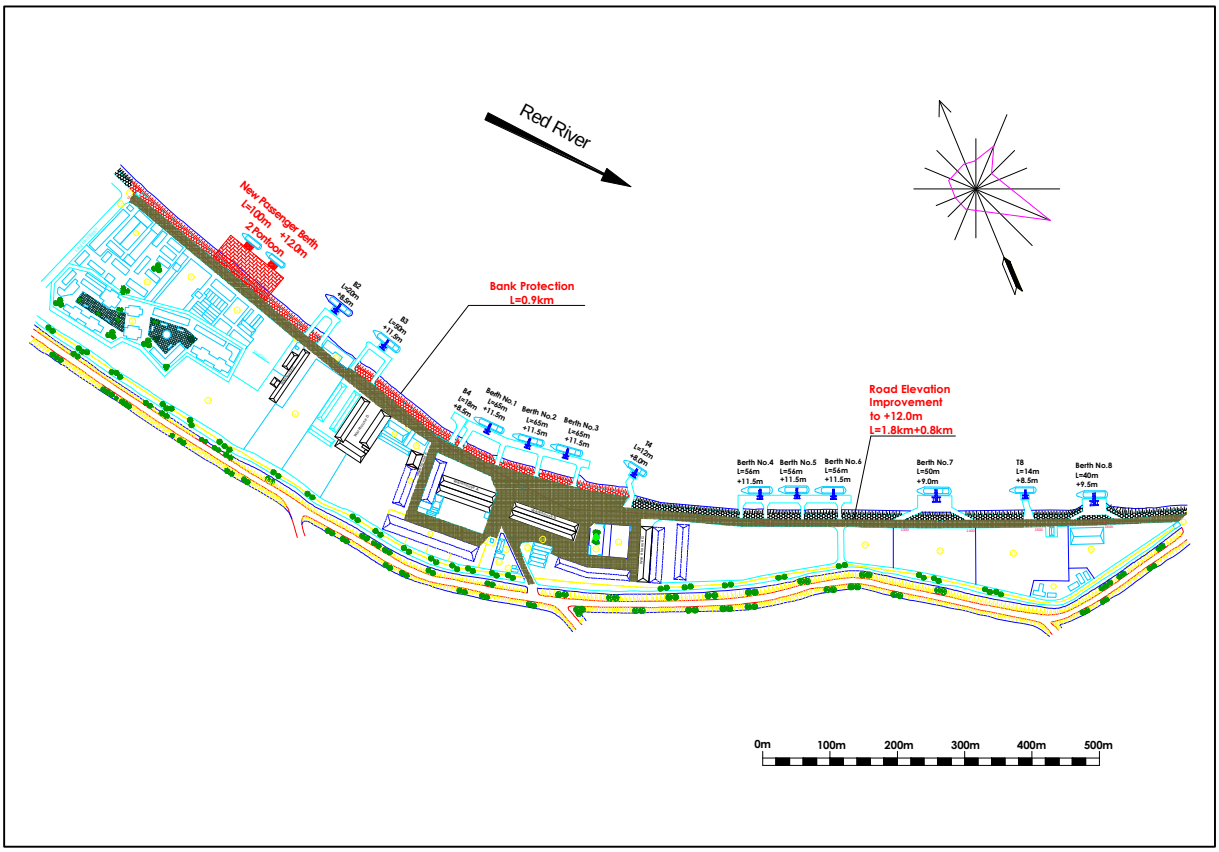


Figure VI-8 Short-term Development Plan of Hanoi Port (2010)