The growth of container traffic at Tanjung Priok port in the last 10 years (1999-2009) average is at 5 percent. On the other side, operation of Tanjung Priok port today is the biggest port of Indonesia that may accept and service ship class with 6,000 TEU’s (Twenty-foot Equivalent Unit) capacities. Meanwhile, another big port in the world is accept and service ship class with 15,000 TEU’s – 18,000 TEU’s capacities. Based on the condition, PT Pengembang Pelabuhan Indonesia as subsidiary of PT Pelabuhan Indonesia II (IPC) develop port planning and development of New Priok Terminal Project.

Tanjung Priok Port is one of twelve port under management PT Pelabuhan Indonesia II (IPC). At the North Jakarta Region, Tanjung Priok port act as sea gate of Jakarta metropolitan city. Tanjung Priok Port is the biggest contributor and become the backbone of IPC in the port service area.

Until today, operation of Tanjung Priok port is the biggest port of Indonesia that may accept and service ship class with 6,000 TEU’s (Twenty-foot Equivalent Unit) capacities. Other Indonesian port, the average acceptance and service is ship class with 1,700 TEU’s capacities (1970 generation). Meanwhile, another big port in the world is accept and service ship class with 15,000 TEU’s – 18,000 TEU’s capacities.

With the current condition, big ship class cannot enter and service by port of Indonesia. Big ship class with big capacities should transit at port of foreign country such as; Singapore, Malaysia etc, doing transshipment process to deliver the Indonesian cargo. At the transshipment process, big ships should unloading the cargo and load into small ships to deliver Indonesian cargo, it is cause double handling and increase the total logistic cost.

At the other side, the growth average of container traffic at Tanjung Priok port in the last 10 years (1999-2009) is 5 percent. On 2008, the handling from general cargo change to container system”, as Mr. Dani’s said.

Innovation of packing technology from general cargo change to container, as explained by Mr. Dani also increase the capacity of Tanjung Priok Container Terminal from 4.5 million TEU’s to 7.5 million TEU’s up to 8 million TEU’s. “with the increase of capacity to 7.5 million TEU’s, and based on the actual condition utilization area already at 6.2 million TEU’s, that mean almost reach the maximum limit, because port facility development need long time from design until construction. Ideally base on practice if area utilization reach 60 – 70 percent the next development should be executed.”

Because of the traffic growth at Tanjung Priok is very high and the utilization of existing area already 6.2 million TEU’s from 7.5 million TEU’s. “Congestion risk rise up should be minimize, congestion is ship cannot enter and service by terminal operator because the terminal already at full capacity. Meanwhile, opera-
Regarding with the New Priok port development, the initial process start by PT Pelabuhan Indonesia II at June 2010. PT Pelabuhan Indonesia II currently known as IPC as new brand image, propose the Kalibaru terminal or New Priok port development concept to the Government of Indonesia. Next step is development of The Tanjung Priok Port Master Plan, the Environmental Impact Assessment (EIA/Amdal) etc. On April 2012, the President of Indonesia issue presidential decree, then on August 2012 MoT issue concession agreement and environmental impact assessment issued on December 2012 by MoE. The New Priok port development start effective on January 2013, but the ceremonial ground breaking commence on 22 March 2013 by the president of Indonesia Mr. Susilo Bambang Yudhoyono.

As President Director of PT Pelabuhan Indonesia II, Mr. RJ. Lino rally up all effort to realize the New Priok port development. All support comes from the government of Indonesia, community, port business association, share the same vision make the project comes true. Ide-ally, in the big scale project such as development of Kalibaru container terminal is need 10 to 15 years period for design development until construction. Meanwhile, for the New Priok port design develop in 2 years and now construction phase already started. “Good communication, leadership and sharing same vision all come to one conclusion and make it happen. This point also informed to all investor and partner by interna-tional network and add more attractive point for international partner to come and involve in Indonesia investment” as state by Mr. Dani.

**Construction Phase**

For information, the existing area of Tanjung Priok port at 120 years ago is ± 635 Ha. Effective use for stacking yard and operational area at 250 Ha. Meanwhile, construction phase of Kalibaru terminal development already started. Kalibaru terminal design consist of 7 Container Terminal and 2 Liquid Produk Terminal, (oil, fuel, chemical etc) with 392 Ha area.

Kalibaru terminal development divide into 2 construction phase. First phase with 212 Ha area, consist of 3 container terminal and 2 liquid product terminal already started, the capacity of container terminal is 1,5 million TEU’s and 5 million Cbm/year per liquid product terminal. Kalibaru terminal development phase 1 will increase the capacity of Tanjung Priok at 4,5 million TEU’s/year for container traffic and 10 million Cbm/year for liquid product terminal.

If the second phase of Kalibaru terminal development, when CT4, CT5, CT6, and CT7 come in place with 2 million TEU’s capacities each terminal, that will add 8 million TEU’s, it is mean Kalibaru terminal development will give 12,5 million TEU’s additional capacities of Tanjung Priok. The additional capacities is expected will accommodate the container traffic growth in 15 – 20 years, based on assumption 5 -10 percent per year.

In the first phase of Kalibaru terminal development, as Mr. Dani said. The first step is build the 48 Ha area of CT1 with deck on pile construction system. This system chosen because existing location of Tanjung Priok port is the outfall of three Jakarta river.

It is caused high contami-nation risk at Tanjung Priok port. With deck on pile system application, it
is expected the seawater at Tanjung Priok will circulate and clean.

Other reason is the traffic growth of Tanjung Priok increase significantly, PT PPI as port developer company should build the Kalibaru terminal as soon as possible. “If all Kalibaru terminal development phase 1 use reclamation system, it is need long time for consolidation, settlement period of reclamation area. Based on that PPI and IPC agree with deck on pile construction system and applied for The Kalibaru terminal development” as Mr. Dani explain.

Different at the other terminals, CT2, CT3, PT1 and PT2 will build on top of reclamation area. Reclamation material will come from 25 million cubic meters dredging material of berthing pool, turning basin, and access channel, plus 10 million cubic meters sand material for leveling purpose. The berthing pool, turning basin, and access channel will dredge until -16 m. The depth of existing port is variable at -14 meters. In the new terminal, water depth design until – 20 meters. In the initial phase, all area will dredge to – 16 m, it is mean big ship with 10,000 TEU’s – 12,000 TEU’s capacity will accept and service by the new terminal.

In the Kalibaru terminal development phase 1, a half of CT1 construction area will finish at the end of 2014, overall CT1 area will complete on June 2015. The other terminals (CT2, CT3, PT1 and PT2) expect to be complete in 2017 – 2018, because of reclamation process (reclamation material, pre-loading, settlement etc). Otherwise, reclamation area already started with breakwater construction as initial work.

Design of Kalibaru terminal development come from LAPI ITB as direct appointed design consultant. Timing and short work period is the background of the appointment. Royal Haskoning appointed as supervision consultant by international tender. PT Pembangunan Perumahan (PTPP) act as main contractor by open tender.

“The first phase of Kalibaru terminal development will need IDR 25 trillions of investment. 13 – 15 trillion for infrastructures and 10 – 12 trillion for upperstructures” as Mr. Dani explain.

Construction Process

Due with construction process, Ir. Pande Ketut Gede Karmawan as General Manager of PT Pembangunan Perumahan explained that the Kalibaru terminal development bidding process by PT Pengembang Pelabuhan Indonesia. Start the bidding process in May 2012 and the bidding document in July 2012. After evaluation and selection, PTPP awarded as the preferred bidder and main contractor. Based on contract, project value is IDR 9,017 trillion (tax include) and construction started in September 2012, multi-year contract status, unit
yard use concrete spun pile with 800 mm diameter, 10,214 in total with average length 29 m. 450 m of CT1 plan to complete in December 2014. Total 850 m of CT1 will complete in June 2015.

In order to accelerate the construction progress of CT1, PTPP mobilize 7 units tower crane, stand over specialize dedicated rail, it is give flexibility movement to the tower crane. Tower crane choose because of radius and service area, with 8 tons lifting capacity and 30 m radius of service. Other are 20 unit mobile crane with 25 – 150 ton per unit for precast fabrication and service works.

Previously, the installation of precast beam need precast concrete headstock change to temporary steel clamp. The clamp function as temporary supporting for the beam during pile cap in situ concrete pouring. When the concrete age reach the optimum strength, the clamp will dismantle and remove to another pile for next precast beam installation process and in situ pile cap concrete pouring.

Access road build as connector from CT1 to the main land, the access road with 500 m length, build from 917 units 500 mm diameter of concrete spun pile. Same method of construction as CT1 used at the access road. Concrete spun pile as foundation and precast concrete beam with half slab precast concrete and combine with concrete cast in situ.

Same as CT1 structures and the access road, there is also concrete structure at Jetty 1B. The jetty 1B designed with same size of ship service, 220,000 DWT. With – 20 m depth of berthing pool and dimension of the jetty is 50.0 m x 1,658.4 m. Concrete spun pile combination between 716 units of 800 mm diameter and 2,736 units of 1,000 mm diameter with pre boring.

**Breakwater**

Breakwaters structures is the outer side protection for port and reclamation area. At the New Priok Port project used the breakwaters structures of “rubble mound” type. The breakwaters consist of rock bund and A-Jack concrete armor at the outer side, usually used in open area. This method minimize the wave effect in the construction and the core layer of breakwater should protect by armor layer as soon as possible.

In the breakwater construction, bamboo material used in the initial phase, bamboo cluster pile into seabed. 7 bamboo with 8 meters length roped as one cluster. 1 meter pile range between one clusters to another. Bamboo cluster pile into seabed use barge and crane help. Then 7 layer of bamboo roped into bamboo matras formation. Only bamboo with 8 – 10 cm diameter in the bottom and another end 5 -7 cm diameter. Cover with geotextile then sinking with rock as counter ballast. Rock material used in breakwater construction is 50 – 75 kg for core layer, 40 % abrasion, specific gravity at 2.4 with slope 1 : 1.5.

Not only bamboo, the breakwaters construction at New Priok Port project need the rock quantity more than 2 million cubic meters. For the breakwaters construction, PT PP as project contractor should mobilize many heavy equipment and labor to produce the rock material from rock quarry at Bojonegara, Banten. Big barge used by sea transportation to carry away the rock material from rock quarry to project with range around 80 nautical miles. The rock material classification by 50 -75 kg for core layer and 400 kg for cover layer and A Jack concrete as armor layer.

At the moment of interview and project visit, the breakwater construction of New Priok Port progress up to C and A section north side breakwaters of Container Yard 1B. All core layer of the A section breakwaters already over the sea water level along 3,500 meters. Cur-
and armor layer of A-Jack. At the east side of Container Yard 1B, already start the B section of breakwater along 850 meters. After the cover layer installation complete the construction continued with A-Jack armor layer installation.

“In the fabrication process, transportation and installation, consider the weight of A-Jack, relocation of A-Jack use hook and sling modification due with practical basis of A-Jack relocation. The method is use crane body movement (rotation) not the boom movement, this method will create equal range in the movement. First sling to lift up the A-Jack and the hook, second sling will unhook and loose the first sling and the hook from A-Jack.” As explained by Pande.

**Dredging and reclamation**

Dredging and reclamation at New Priok development PTPP should mobilize special equipment. PTPP as main contractor ask Van Oord the biggest international dredging company from Netherlands, which is specialize and competent in dredging and reclamation work.

Commencement of dredging work in order to realize the depth design, which is – 20 meters for berthing pool of Jetty 1A, -20 meters at berthing pool of Jetty 1B, -16 meters at turning basin and access channel. Dredging work at Jetty 1A use 1 unit grab Dredger 25 cubic meter. Dredging work at Jetty 1B use 2 units grab dredger 25 cubic meter and dredging work at turning basin and access channel use 1 unit Trailing Suction Hopper Dredger (TSHD) and 1 unit Cutter Suction Dredger (CSD). “Total dredging volume is 25,180,595 cubic meter, become the biggest dredging work in Indonesia” as explained by Mr. Wira – Project Manager of PT PP.

In the dredging process, TSHD will sail with 1 – 3 knot of speed, depend on condition of the dredging area, activity of the sailing area and the parameter of dredging material. With productivity at 350,000 cubic meter per week, TSHD comply with the dredging work and big dredging volume. In this project, TSHD use at dredging work of turning basin and access channel to realize depth design – 20 meters.

Otherwise, PTPP also mobilize dredging equipment with small capacities that is grab dredger. The grab dredger is dredging equipment with clam shell capacity 25 cubic meter, clam shell will deploy to the sea bottom, then material lift and placed at split barge. In this project the grab dredger use at the dredging area of Jetty 1A and 1B to realize depth design – 20 meters, until today the accumulation of dredging volume is 9 million cubic meters.

Reclamation area will utilize as container yard in the future. In this project reclamation area divide into 2 area. Container yard 1B and Disposal Area A and B. Reclamation area...
Beside shipwreck finding another obstruction is the existing structure of sheet pile breakwater. Breakwater structure consist of 2 layer steel sheet pile with depth 31 m in the turning basin area of New Priok port. Commencement of sheet pile extraction in June – July 2014 has executed.

Based on daily report, 112 unit sheet pile or equal with 46 meter length of breakwater already done. For the sheet pile extraction PTPP mobilize crane barge with 150 ton capacities equipped with vibration hammer / extractor 80 ton capacities.

In the near future, based on contract of the Kalibaru terminal development have three milestone target, which is the 450 meters CT1 in the end of December 2014, the 850 meters CT1 in the end of June 2015 and completion of CT2 and CT3 in the end of 2016.

Besides, project challenges is the international quality of work with the existence of supervision consultant and the project management at international level. One of the option is to realize the common goal, commitment of the New Priok Development team and stakeholder to the quality value and standard, and continues improvement with the opportunities in order to gain better output for all stakeholder.

In the peak session under PTPP management, the New Priok Project there is more than 2,000 man power consist of labor, supervisor, engineer and project management staff. After the peak session man power reduce to 1,000 man power. For project coordination purpose we held weekly coordination meeting with all stakeholder, and daily coordination meeting at project site, as Mr. Wira said when close the interview session.