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The Construction of JadeWeserPort A Deepwater Container Terminal in Wilhelmshaven

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1. A Terminal for Next Generation Container Ships

The JadeWeserPort deepwater container terminal is to be constructed on the west bank of the Inner Jade – part of the Jade estuary of the North Sea – approx. 9 km northeast of centre of Wilhelmshaven. Its location east of Voslapper Groden, between the "Niedersachsenbrücke" (coal terminal) in the South and the WRG Pier facility to the North will make it an integral part of the port facilities of Wilhelmshaven. The average distance to the WRG Pier and jetties to the North is around 2,200 m.

The ideal location of the port was confirmed by nautical simulations. With a short approach channel of a length of 23 nm, the next generation of super-large vessels of well above 8,000 TEU with dimensions of up to 430 m in length, 58 m width and drafts of up to 16.5 m will be able to call at the port with a tide-independent access. A planned quay length of 1,725 m guarantees that 4 large container vessels together with feeder ships will be simultaneously served by way of 16 container bridges. The project timing is considered critical: international trade is growing rapidly and container traffic is booming. Experts agree that this growth rate will persist for many years ahead.

After completion, JadeWeserPort will be the most easterly deepwater port of the European North Range between Le Havre and Hamburg. Its annual turnover is predicted to be approximately 2.7 million TEU. It is anticipated that around 60 per cent of the overseas container turnover via the Wilhelmshaven main hub will comprise sea transit shipments within European distribution traffic to Scandinavian, EU Baltic state and Russian seaports. JadeWeserPort will be an essential key component of the trans-European "Motorways of the Seas".

The terminal area of 120 ha is complemented by another 170 ha for logistics and port-oriented services, with a freight village also in the planning. Both, road and rail networks will offer a high capacity access; for road traffic, the German A29 motorway ends at the port gates. The overall investment volume amounts to Euro 950 million. The EUROGATE group as port operator will invest Euro 350 million into the port superstructure.

Fig. 1: Aerial view with the proposed new port area

2. Current Planning Status

The realisation of the JadeWeserPort project has involved planning approval procedures in accordance with the German Waterway Act (WaStrG) and the German Mining Act (BBergG). Final approval was granted in accordance with the German Mining Act in September 2006 with immediate execution granted, effective November 2007. The plan approval order in accordance with the German Waterway Act was pronounced with immediate execution rights in March 2007. Six objections against this planning approval order were submitted to the Higher Administrative Court in Lüneburg. Two of these were expedited appeals to suspend the immediate execution of the plan approval order. Both of these claims were dismissed in March 2008.

The JadeWeserPort construction project as applied for in accordance with the German Waterway Act includes the following measures:

- Creation of a new terminal area:
  - land reclamation with embankments
  - construct quay, return and embankment walls
- Quayside transport connection
  - realign the Jade channel
  - construct terminal access channels
  - relocation of a leading light
- Landside transport connection
  - construct road access
  - construct rail access
- securing the “Niedersachsenbrücke”

Tenders for the construction works for the terminal land areas including the quay and embankment walls were invited according to a European pre-qualification procedure in early January 2006.

Bids received from approved bidding consortia were opened on 4 May 2006. The five approved consortia submitted not only their principle proposals but offered also 400 specific proposals.

3. Construction of new Terminal Area

The central component of the proposed project is the establishment of a new port area extending into the Jade. The required land area of 360 ha for the port overall is subdivided into the following sections designed for various utilization, as shown in Fig. 2:

- Terminal area with quay,
- Hafengroden (logistics zone),
- Traffic areas for road and rail,
- River embankments.

4. Terminal Area and Quay

The terminal area will have a quay length of 1,725 m and an overall width of 650 m. These dimensions represent the surface area required to accommodate the predicted container volumes with consideration of expected changes in ship size and capacity.

The fundamental quay design is to be safe at high water with a ground level of 7.50 m above mean sea level. With the harbour seabed specified at – 20.10 m below mean sea level,

Fig. 2: Layout plan with subdivisions

the quay covers a height difference between harbour seabed and surface of at least 27.60 m. Adding on a safety margin for excavation tolerance and possible erosion of 3 m determines the maximum pile length for the proposed combined sheet pile walls to be around 43 m. The quay walls will ultimately be of a height almost without parallel in the world. The new port area including embankments is to be constructed by sand fill creating an overall surface area of approx. 360 ha. The landfill will require approx. 43 million m^3 of sand.

Required sand quantities will be obtained from dredging works connected with the new fairway and access areas including moorings, as well as from 2 sand extractions pits located north and south of the future port area. Excavation will extend down to 35 m below mean sea level. The approval for sand removal (general operating plan) from the two sand pits was granted consequent to the planning approval procedures in accordance with the German Mining Act (BBergG).

The approx. 170 ha area located to the west of the terminal area, known as Hafengroden will be used for port-related industries and services. The area will be enclosed to the north, east and south by traffic areas. To the west the terminal area is bordered by the new Voslapper sea dyke.

The embankments planned around the new land areas will offer protection against wave action and erosion, also during the landfill phase. The extension of these dykes will involve laying between 500,000 to 600,000 tonnes of water building blocks – representing an extreme challenge to both engineering and logistics. Last but not least, the embankments also provide protection against high water levels and flooding for the terminal and the logistics areas. To the east the port is bordered by the quay structure. Preparatory calculations, taking storm water levels and tidal actions into account, have confirmed that a quay height of + 7.50 m above sea level is adequate to provide the necessary high water protection.

The northern embankment is approx. 1,950 m long; the heavy bank protection of the seaside slope will be compliant with standard dyke construction rules and regulations. A height of + 8.50 m above sea level is planned here to cope with North Sea waves.

The "Niedersachsenbrücke" will be integrated in the approx. 1,100 m long southern embankment. The lower slope directly south of the "Niedersachsenbrücke" (access road) will have a concrete cover. The upper slopes will be covered in their lower sections with Lauenburg clay topped with bran. The surface height here is specified at + 7.50 m above sea level reflecting its protected location behind the JadeWeserPort.

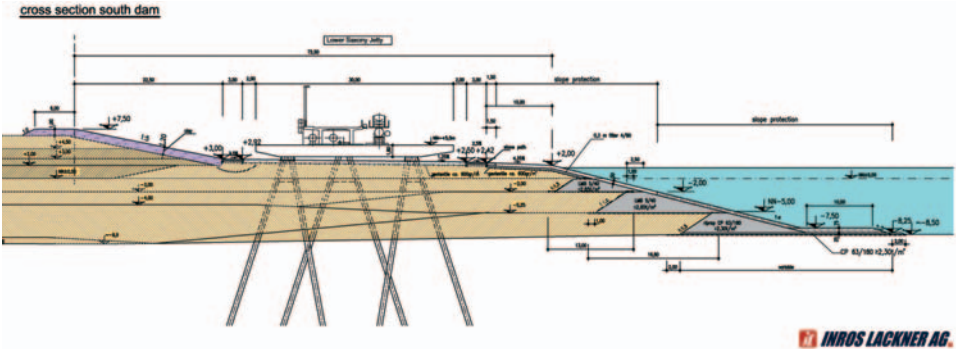

Fig. 3: Cross-section of the southern dam

5. Quayside Transport Connection

The Jade estuary is a federal waterway. The fairway width is 300 m. The Jade range is suitable for ships with drafts of up to 16.5 m irrespective of the stage of tide. Ships with drafts of between 16.5 m and 20.0 m may use the Jade approach under suitable tidal conditions.

One aspect of the project is the relocation of the Jade channel up to the new quay. This is necessary for nautical and hydrographical reasons between km 7 and km 15.

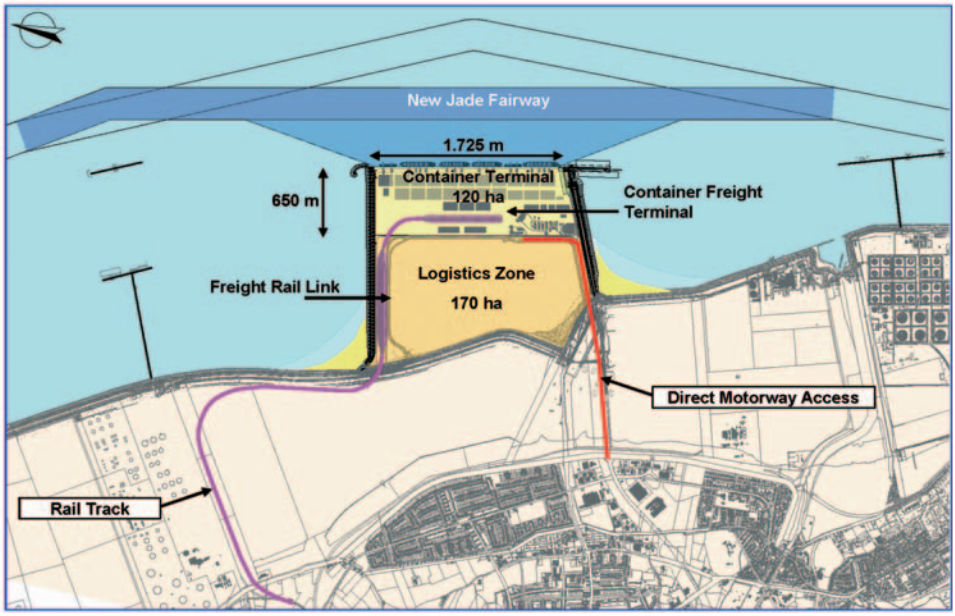

Fig. 4: The port and its modified access channel

6. Landside Transport Connection

6.1 Road Traffic

JadeWeserPort will be linked to Germany's arterial road network via the Lower Saxony embankment and a direct extension of the German motorway A29. The main arterial route for traffic to and from the port is the A29, ensuring that the city of Wilhelmshaven will not be impacted by additional road traffic.

In 2000 the traffic volume map issued by the Lower Saxony state office for road works and transport with respect to the A29 motorway indicates a capacity usage of around 43 % in the vicinity of the Wilhelmshaven intersection. Some 25,500 cars were counted there on a daily basis. The road cross-section has an existing capacity of 60–65,000 cars per day without risk of traffic jam. Port road traffic will then split at the Ostkreuz Oldenburg intersection between the A29 towards the southwest and the A28 towards the northeast, the capacity utilisation is currently approx. 61 %.

In order to optimise the road connections of the Hafengroden area and the container terminal itself, the Oldenburg branch of the Lower Saxony state office for road works and transport, is planning to extend the A29 motorway by approx. 1.8 kilometres and add two additional lanes. The motorway will then expire, approx. 1,200 m from the terminal gates, in a roundabout providing direct access to JadeWeserPort. These building measures are all scheduled for completion prior the commissioning of JadeWeserPort.

Consequent to the completion of the Wesertunnel south of Bremerhaven in January 2004, the B437 federal road took on a new role as link road between the A29 and A27 motorways. This connection is a high capacity alternative west-east connection to the A1. Due to a road traffic survey undertaken during 2000, an average daily traffic load of approx. 6700 cars per day was indicated. The degree of efficiency of the B437 is currently at approx. 34 %.

The completion of the A31 motorway in December 2004 provided an additional and noticeable improvement to road connections in the region, in particular with North Rhine-Westphalia. The A31 is reached from JadeWeserPort via the A29 and A28, such the port has an excellent high capacity road link to the Ruhr area of Germany and the Benelux countries, which is independent of the A1 motorway.

The current federal and country road network in northwest Lower Saxony has sufficient capacity to safely and adequately take up the anticipated traffic generated by JadeWeserPort. The overall road access of JadeWeserPort will be further optimised in 2008 by the completion of the stretch between the A28 motorway and the A1 in the area of the Delmenhorster intersection.

Another major transportation project in northwest Germany is the planning and construction of the A22 coastal motorway. Being part of Germany's federal road plan 2003, it is a priority project. Initial investigations have indicated that the construction of the A22 would divert approx. 16,000 trucks from the A1. When the A22 project comes to fruition, it will create a new east-west connection in the northwest, independent of the A1 motorway. It would reduce the distance from JadeWeserPort to the Ruhrgebiet/Benelux areas. Similarly the distances between the south-west and the area of greater Hamburg, Schleswig-Holstein, Denmark, Sweden and Norway would be shortened as well. The eastern regions of the Netherlands would have quicker access to the JadeWeserPort than they have to Rotterdam.

In October 2007, the governmental substitution Lüneburg commenced with a corresponding regional planning procedure. The schedule for the project until road opening is as follows:

October 2007–August 2008	Area planning procedure and alignment determination
September 2008–October 2010	Drafting of technical proposals
November 2010–October 2013	Planning approval procedure
Followed by	Commencement of construction
From 2017	Available for use

6.2 Railway traffic

JadeWeserPort rail connections can be divided into four sections:

1. JadeWeserPort trackages:
   - 4 km access line between DB track section 1552 – north industry branch – and the new Voslapper sea dyke

- Marshalling yard, consisting of up to 16 tracks
- bimodal traffic handling installation (suprastructure)[1]

2. DB track section 1552 – northern industry branch
3. DB track section 1540 – between Sande and Esens
4. DB track section 1522 – between Wilhelmshaven and Oldenburg

The JadeWeserPort sidings will connect to the single-track non-electrified northern industry branch line via an approx. 4 km long line. This approximate 10 kilometre long track section will be for goods traffic only, and will be upgraded by Deutsche Bahn until the start of the port commissioning, to create a high capacity rail link for the JadeWeserPort.

The development concept includes upgrading the industry track using modern control, safety and signal technologies. The ultimate capacity would be for 100 railway slots per day (24 hour period) while current usage comprises a mere eight slots on average per day for trains to the Wilhelmshaven oil refinery. The industry track will ultimately be connected via a branch line to the Sande–Esens line. This line section terminates at Sande station where it connects to Deutsche Bahn track section 1522 (Wilhelmshaven–Oldenburg). The Wilhelmshaven–Oldenburg line is a for the most part two-track non-electrified main line. This track section is used to provide regional public transport at an hourly frequency between Wilhelmshaven and Oldenburg as well as local goods traffic. During a 20-hour day, this line currently handles approx. 43 passengers and an average of 8 goods trains per day.

The track sections between Varel, Jaderberg, Hahn and Rastede also include two single-track sections of seven and five kilometres in length, respectively. The upgrading to a full two-track status – for which approvals already exist – and the electrification of this main line are also a new project classified as high priority in the German transport plan 2003. Deutsche Bahn (German Rail) has agreed to complete the engineering work necessary for twin tracks and electrification in a timely fashion prior to the start of operations at JadeWeserPort.

Trains coming from JadeWeserPort are redirected at the Oldenburg junction, travelling on to either Bremen, Lehr/Rheine or the Osnabrück/Ruhr area.

7. Execution of construction works

The actual construction work on the terminal will commence immediately after the higher administrative court in Lüneburg has ruled on the expedited appeals.

The order to build the terminal area and construct the quays (construction phase 1) was granted to a consortium under the management of the Bunte Group, based in Papenburg in Emsland, on 26 September 2007.

Final plans prior to construction are currently being concluded. Works on creating port transport infrastructure connections will start shortly.

The actual construction work for phase 1 is presently scheduled to start in mid 2008. The first areas of the terminal will be ready for hand-over to EUROGATE, the terminal operator, after an approx 18 month construction period such that it can commence with the installation of all necessary suprastructure, such as land surfacing, container bridges, a gatehouse, workshop area and cargo handling equipment for road and rail transports. Container operations are scheduled to commence in 2011 on the southern quay section, planned for completion by that time.

[1] Plans are based on a combined traffic transhipment facility comprising six parallel tracks of suitable length