

### **3 DESCRIPTION OF THE PROPOSED RECONFIGURATION**

#### **3.1 CONSTRUCTION PHASE**

1. This section of the ES describes the form of the proposed Felixstowe South Reconfiguration and the rationale behind it. It goes on to describe the manner in which the works would be carried out and then the main features of the development in its operational phase.

##### **3.1.1 Details of the works**

1. The reclamation and landward reconfiguration works would comprise the following:

- Landside demolition;
- Marine demolition;
- Dredging and reclamation;
- Site establishment;
- Divert outfalls;
- Quay wall piling;
- Quay wall capping beam;
- Rear crane beam;
- Paving and miscellaneous;
- Buildings; and,
- Site demobilisation.

2. The overall duration of the construction phase is expected to be 41 months (approximately 3.5 years), with Phase 1 (a and b inclusive) and Phase 2 each having a predicted duration of 18 months. For the purposes of this assessment, Phase 1 has generally been assumed to coincide with 2004 and Phase 2 2005.

##### **3.1.2 Demolition**

1. Demolition would involve the removal of existing buildings and structures as shown on Figure 1.3.1. The four existing quayside cranes (not shown on Figure 1.3.1) would also be removed.

2. A recent survey of the existing port buildings has identified the presence of asbestos-containing materials that will require specific consideration during the demolition programme. An overview of the legislative requirements and the risks associated with asbestos is provided in Part II of Appendix 5, along with a description of the measures to be taken to limit the risks.

### 3.1.3 Capital dredging

#### *Description of proposed dredge areas*

1. Figure 1.3.2 shows the area that would require capital dredging to create a berthing pocket and to deepen and widen the approach channel. In order to create a berthing pocket for vessels it would be necessary to dredge an area of seabed to a depth of -16m CD adjacent to the proposed quay face. The berthing pocket would be 55m in width (see Figure 1.3.2). The northern 700m (approximately) of the proposed quay would be adjacent to a section of the approach channel that is currently dredged to -14.5m CD and, therefore, no capital dredging is proposed in this area in addition to that required for the berthing pocket (see Figure 1.3.2). However, the remaining length of the proposed quay to the south is adjacent to a section of channel that is dredged to -12.0m CD and deepening of this section to -14.5m CD would be required (Figure 1.3.2). The total area of dredging required to create the berthing pocket and the immediate approaches to the berth would be approximately 15ha.

2. In addition to the above, there would be a requirement for capital dredging to the west of the existing approach channel at a depth of -14.5mCD in order to allow sufficient turning space for vessels (Figure 1.3.2) the area of seabed to be dredged in this location would be approximately 25ha. The overall area to be dredged, therefore, would be 40ha (15ha for the berths and immediate approaches and 25ha for the widening of the approach channel).

#### *Origin and description of dredged arisings*

3. Figure 1.3.2 divides the proposed dredge zone into 4 areas. The bulk of the material would be dredged from Area A on the western side of the existing channel. The maximum depth of dredging in this area would be 9.5m below existing bed level and the volume of dredged material would be in the order of 2.53Mm<sup>3</sup>. The majority of this material would be geological stiff clay, fine sand and pieces of rock; there is some post-glacial sand and gravel along the northern edge of this area.

4. Area B on Figure 1.3.2 includes dredging of the approach to the proposed quay and the southern end of the berth pocket. Dredging of between 2.5m and 12m below existing bed level would be required in this area and the total volume of material would be 640,000m<sup>3</sup>. This material would comprise geological stiff clay with a small percentage of rock and gravel and the southern end.

5. Area C would be deepened by between 2m and 6m below existing bed level and dredging of this area would give rise to approximately 170,000m<sup>3</sup> of (mainly) post-glacial sands and gravels.

6. Between 1m and 3m of mud, stiff clay and gravel would be dredged from Area D (i.e. within the footprint of the proposed reclamation, landward of the proposed berthing line). Approximately 520,000m<sup>3</sup> of material would be derived from this area.

7. The proposed dredging depths and volume and type of material expected to arise from the dredging of the different areas are summarised in Table 3.1.1.

**Table 3.1.1 Summary of the proposed dredge depth below existing bed level, approximate volume of material arising and nature of dredged material from different areas**

Area (refer to Figure 1.3.2)	Proposed dredge depth (below existing bed level) (m)	Approximate volume of material arising (m <sup>3</sup> )	Stiff clay	Rock	Gravel	Sand	Mud
A	9.5	2,530,000	✓	✓	-	✓	-
B	2.5 to 12	640,000	✓	✓	✓	-	✓
C	2 and 6	170,000	✓	-	✓	✓	✓
D	1 and 3	520,000	✓	-	✓	-	✓
<b>TOTAL</b>		<b>3,860,000</b>					

Source of data: ground investigation completed in October 2003

### 3.1.4 Reclamation and phasing

1. The footprint of the proposed reclamation required to construct the new quay below the level of mean high water springs (MHWS) would be approximately 28.4ha, including the existing Dock Basin. Given that the scheme involves reconfiguration of an existing quay face, the majority of the footprint of the reclamation (approximately 94%) would be within the subtidal area. There would be the loss of approximately 1.7ha of intertidal area above CD according to Admiralty Charts (comprising an area around the oil jetty to the north of the proposed development and an area of shingle foreshore to the south). Dredging would also be required within the footprint of the proposed reclamation to remove soft material prior to construction.

2. The reclamation would be undertaken using suitable material that would be derived from dredging the approach channel. However, it is envisaged that approximately 2.1Mm<sup>3</sup> of additional material would need to be imported from a licensed offshore source.

3. The terminal would be constructed in two phases, as shown on Figure 1.1.2 and summarised in Table 3.1.2, with Phase 1 consisting of two parts (Phase 1a and 1b). Phase 1a would provide 410m of quay wall immediately followed by Phase 1b which would provide a further 350m of quay wall. In total, Phase 1 would provide two deep-sea berths. When completed, the existing services using the Landguard Terminal would be transferred to the completed Phase 1, thereby allowing the construction of Phase 2 to commence. When completed, Phase 2 would provide a further 590m of quay wall and, in total, the new terminal would offer 4 deep-sea berths.

**Table 3.1.2 Length of quay construction during Phases 1a, 1b and 2 of the proposed development**

Development phase	Length of quay construction (m)	Area of reclamation (ha)
1a	410	18.4
1b	350	
2	590	10.0
<b>TOTAL</b>	<b>1350</b>	<b>28.4</b>

### 3.1.5 Disposal of dredged material and beneficial use

1. Of the approximate 2.53Mm<sup>3</sup> of material that is expected to arise from the widening of the channel to the west (Area A), it is proposed that the majority would be disposed of at the Inner Gabbard (East). This material would comprise (approximately) 110,000m<sup>3</sup> of boulders and broken rock (in association with stiff clay), and 1,660,000m<sup>3</sup> of stiff clay. The balance of material (760,000m<sup>3</sup> of fluvioglacial marine sand and gravels) would be used for reclamation purposes.

2. The material dredged from within the footprint of the reclamation (Area D) would include some mud (approximately 50,000m<sup>3</sup>). It is proposed that this material would be mechanically disaggregated and dispersed at the existing Inner Gabbard dispersive disposal site. This approach was considered to be acceptable by DEFRA and adopted for the Trinity III Terminal (Phase 2) Extension. The remaining 470,000m<sup>3</sup> dredged from this area would comprise a mixture of clay and gravel and it is proposed that this material would be disposed of at the Inner Gabbard (East).

3. The dredging of the berthing pocket would give rise to approximately 720,000m<sup>3</sup> of stiff clay, sand, gravel and rock and 90,000m<sup>3</sup> of mud. It is proposed that the stiff clay would be disposed of at the Inner Gabbard (East) and mud would be disposed of at the Inner Gabbard dispersive disposal site.

4. Table 3.1.3 summarises the proposed disposal options for the dredged material.

**Table 3.1.3 Summary of the disposal options for material arising from the dredging of the berths and approaches to the proposed development**

Disposal solution	Total volume of material (m <sup>3</sup> )
Use within reclamation	760,000
Inner Gabbard (existing)	140,000
Inner Gabbard (East) (proposed)	2,960,000
<b>TOTAL</b>	<b>3,860,000</b>

5. Beneficial use options for the dredged arisings have been considered and it is proposed that clay would be placed along the Shotley foreshore to improve the standard of coast protection. In addition, 760,000m<sup>3</sup> of sands and gravels would be used in the reclamation. Other than these uses, however, the nature of the residual material, being a complex mixture of rock, stiff clay and geological sand (that cannot be separated), is considered to be generally unsuitable for other beneficial uses. The only real purpose suited to material of this nature would be its use for the creation of an offshore marine habitat. Such a habitat would develop at the Inner Gabbard (East) disposal ground following the deposit of materials at the site.

### 3.1.6 Site establishment

1. The new quay wall would be formed using a combination of steel tubes and steel sheet piling (combi wall) which would be constructed at the same time as the demolition and reclamation works. The reclaimed area would be levelled using mechanical plant

and the area surcharged with sands and gravels. Wick drains would be installed to drain the site and these, in conjunction with the surcharging loads, would consolidate the reclaimed material.

2. Once the area had been sufficiently consolidated, a foundation of Cement Bound Material (CBM) would be laid and approximately 60 hectares of concrete block paving would be laid for the stacking areas and roadways.

3. The quay wall would be installed extending in a straight line between the existing oil jetty to the west, for some 1350m to a point 100m west of Landguard Fort, returning to the existing Landguard container terminal (see Figure 1.1.2). The quay wall would be constructed with a combination of steel tubes and sheet piling, with a concrete capping

4. Bollards, rubbing strips and fender panels would be attached. The level of the quay would be the same as the existing Landguard Terminal (i.e. +4.32m ODN).

### **3.1.7 Outfall relocation**

1. The existing DSM Bakery Ingredients outfall that discharges near the seabed from the end of the oil jetty would be relocated to discharge at a point off the new quay wall. In addition, the existing Anglian Water Services outfall would be extended to the face of the new quay wall. It is proposed that both of these outfalls would be relocated to a point on or adjacent to the new quay wall which is closest to their current location.

2. Other pipework located in the jetty would be removed.

### **3.1.8 Buildings and terminal based works**

1. Significant new structures comprise a 6 lane in-gate of approximately 10.65m in height and a workshop of approximately 16.2m in height. The workshop would be constructed on the site of the existing Rank Hovis Mill, which is 19.3m high. Other structures would include an electrical substation of approximately 3m in height and a number of gantries to provide power and enable access for inspection to refrigerated containers within the container yard; these gantries would be approximately 6.2m in height. All of these structures would be developed so that the completion coincides with the completion of the new quay. Many of the existing structures would be used such as the office/administration building (Wickenden House), the amenity facilities and the in/out-gate which, in Phase 2, would become an out-gate. Existing buildings at Landguard Terminal and elsewhere in the port would be used to service the facility including existing small workshops, inspection facilities and offices for staff.

2. Power supply to the sites substations would be via an underground route. It is proposed that two new 11kv feeder cables are installed underground between the existing primary supply at Fagbury Road substation and new incoming switchgear to be established within existing substation No. 2 located next to the Port fire station. The route of the new incoming supply would be within the Port Estate.

3. HPUK would purchase 13 Ship to Shore Gantry Cranes (SSGCs). These would be 80m high in their operational ('boom down') position (113m high in their not in use 'boom up' position) and finished in blue, the Port's corporate colour. This equipment would serve 4 berths. In addition, 50 RTG cranes capable of lifting one container over 5

stacked containers would serve the proposed development. These cranes would be 21m high and would generally be finished in blue. These SSGCs and RTGs would be provided in sufficient number to match the quay and yard capacity of 1.96m TEUs per annum, when fully developed.

4. The NNRT (see Section 3.1.9) would be initially served by 3 rail mounted gantry cranes (RMGs), increasing to 6 in later years (i.e. from 2014); these cranes would be approximately 25m in height.

5. The operational area works comprise the construction of a container handling and stacking facility, based on a RTG operation with HGV parking etc., and would link to the existing rail facilities. Perimeter fencing 2.4m high would be erected around the site.

6. A port control tower of 18.3m in height would be erected at the junction of the new quay wall and the existing quay wall. Office accommodation and an operations centre would be associated with this structure.

7. The construction of the works would include the short-term presence of construction plant on land and on the water, temporary access roads across the site and safety lighting.

### 3.1.9 New North Rail Terminal

1. The NNRT would be constructed on already reclaimed land at the Trinity Terminal at the northern end of the Port of Felixstowe. The new terminal would consist of 8 operational tracks of 700m in length, up to 6 RMG cranes and would include container stacking areas. Tracks would link the rail terminal into the existing branch line owned and operated by HPUK connecting to Network Rail's routes throughout the UK.

2. The site of the NNRT is currently land in the latter stages of reclamation, with an established 9m high perimeter bund (5m above quayside level) to the east and north of the site. The area comprises graded fill material overfilled to achieve required settlement which is currently being re-graded. Consent has been obtained for the Trinity III Terminal (Phase 2) Extension and construction of this extension is underway; this provides a backdrop and partial screen to the NNRT.

### 3.1.10 Relocation of viewing area

1. As part of the proposals, the existing viewing area - located at the seaward end of the existing Landguard Terminal and leased to, and managed by Suffolk Coastal District Council - would be relocated onto the southern end of the proposed reclamation area. As a consequence of this, it would be necessary to alter the existing access route to the area.

2. It is likely that works to the viewing area and the surrounding area of the Landguard Peninsula would comprise the following:

- Realignment of the fence line between the new terminal and View Point Road;
- Relocation of the public viewing area to accommodate 80 vehicles;
- New public seating areas;

- New public walkway;
- Public information boards;
- Incorporation of a bus turning circle;
- Upgrading of the existing access road (View Point Road) to adoptable standard (see Section 3.1.11);
- Visitor management within the SSSI area;
- Potentially some bunding and landscaping works in the area of the fence realignment; and,
- Associated site works including lighting and fencing.

### **3.1.11 Works to View Point Road**

1. Works are proposed to View Point Road in order to bring the road up to the standard of adopted highway (see Figures 3.1.2 to 3.1.5). In summary, the following works would be undertaken:

- The width of the road would be not less than 5.5m; where the existing road exceeds this width, the existing width would be maintained. In order to achieve this, some widening of the road would be required in localised areas as indicated on Figures 3.1.2 to 3.1.5. In some areas, the removal of the existing footway (see below) would provide the space for this widening;
- A 33m forward visibility is required along the whole length of the road;
- The footway on the eastern side of View Point Road would be retained to serve the HM Customs and Excise (HMCE) as far as chainage 235 (see Figures 3.1.2 to 3.1.5). At this point, the existing footway is to be broken out and a new 1.5m footway is to be constructed on the western side of the road as far as the HMCE access (see Figures 3.1.2 to 3.1.5);
- The carriageway would be bounded by flush kerbs and surface water would run off onto the surrounding soft verges and soakaway;
- Vegetation is to be removed from areas around junctions; a 70m x 4.5m visibility splay is required at the junction of View Point Road with Langer Road and a 70m x 2m visibility splay at the access point to HMCE (see Figures 3.1.2 to 3.1.5); and
- Speed cushions may be required at 80m intervals due to the long, straight nature of the road.

2. No additional street lighting would be required to View Point Road. The road construction would primarily be an overlay of the existing road.

Fig 3.1.2 (A3 back to back with 3.1.3)

### 3.1.3

Fig 3.1.4 (A3 back to back with 3.1.5)

### 3.1.5

### 3.1.12 The passenger foot ferry

1. Currently a passenger foot ferry operates between the settlements of Harwich, Shotley and Felixstowe. The service is privately operated, limited and irregular. Various stakeholders including the local Councils and The Haven Gateway Partnership are involved with initiatives for the improvement and upgrading of the service. An application has been made by others to the East of England Development Agency (EEDA) for funding in order to undertake feasibility studies. In response to the potential of a future passenger foot ferry service, HPUK has undertaken to engineer the end of the viewing area car park so that a suitable landing platform could be incorporated.

## 3.2 OPERATIONAL PHASE

1. For the purpose of this ES, it has been assumed Phase 1 of the port development is would be fully operational by the beginning of 2006 and Phase 2 by mid 2007.

### 3.2.1 Overview of container handling

1. Import containers are discharged or offloaded from the ships using the SSGCs. Twenty foot long containers can be lifted two at a time using special spreaders on the SSGC, although 40 foot long containers can only be lifted individually. The containers are then lowered onto an Internal Movement Vehicle (IMV), which takes them to a designated stacking location within the yard where the RTG lifts the containers, one at a time into the stacks. Subsequently hauliers will enter the Port at the Security Gate and are advised of the container's yard location. The haulier collects the container from the stack, with transfer again being made by an RTG. For the export of containers, the process works in reverse. The volume of containers due for transshipment will be 20% to 30% of the total number handled at the terminal. These containers will not exit the Port by rail or road. Some transshipment containers will be discharged from the ship and moved to a stack ready for loading onto the appropriate outbound vessel, whilst others will be transferred directly from inward ship to outward ship.

2. A ship may be worked by several SSGCs simultaneously. Approximately 1.5 RTGs and 5 IMVs will serve each SSGC. Each piece of equipment is manned by trained operators to sufficient levels to ensure that the ships work continuously, i.e. the gangs do not stop work for meal breaks although the individuals do. For example there are 3 SSGC drivers per 2 SSGCs (1.5 drivers per SSGC), 4 RTG drivers per 3 RTGs (1.33 drivers per RTG) and 1 IMV driver per IMV although with 5 IMVs per SSGC and anticipating 4 IMVs operating at any moment.

3. Containers vary in length (20ft, 40ft and 45ft). Two x 20ft containers can be 'twin picked' by the SSGCs. Trailer trains will also be used, as required, with specially designed IMVs having the capability of pulling 5 trailers simultaneously.

4. Hauliers arriving at the terminal will access and egress the Port through the terminal in-gate/out-gate, which will be manned 24 hours a day. There will be haulier traffic on and off the Port during the night but most hauliers will arrive during the day, with peak traffic flow occurring during the afternoon. There will be a haulier waiting area at the rear of the stacking area with facilities for lorry drivers, such as a canteen and washrooms.

5. There would be a new workshop facility, RTG parking bays and maintenance pads for plant. Use would be made of existing staff facilities such as rest-rooms, First Aid posts, canteens, offices and staff parking etc., at the rear of the container stacking areas; these are existing buildings and facilities.

### 3.2.2 Rail

2. The handling capacity of the two existing rail terminals at the Port of Felixstowe is estimated to be 550,000 TEUs annually. In 2002, the Port handled 380,000 TEUs through the rail facilities, equating to approximately 70% utilisation of the rail capacity. Given anticipated growth in total port volumes this can be expected to increase to 95% of capacity by 2007.

2. At such high levels of utilisation, performance can deteriorate. It will, therefore, become necessary to increase capacity; hence the proposed NNRT which would have a handling capacity of 616,000 TEUs per annum. It is proposed that this new terminal would become operational in 2008.

3. The NNRT would initially be serviced by 3 RMGs and, from 2014, 6 RMGs.

### 3.2.3 Lighting

1. The operational lighting for the proposed development comprises the installation of two new rows of (nominally) 31.5m high lighting masts, set back from the quayside by some 210m to minimise light spill on the estuary and over-lighting the quayside. The operational areas immediately adjacent to the quaysides would not be equipped with fixed working lighting. The handling cranes (gantry cranes) carry their own working lighting providing lighting to the ship's working area and the quayside during the movement of containers. In summary, the lighting for the operational phase would comprise the following:

- Mast lighting for the container storage area (31.5m high);
- Lighting for car and lorry park areas (between 6 and 8m high); and,
- Quayside gantry crane lighting fixed (42.5m high) with safety lighting on the end of the crane booms extending up to 113m high.

2. Lighting standards at all UK docks are regulated by the Docks Regulations 1988, which provide minimum lux lighting levels for working areas. The lighting for FSR has been designed to minimise light glare by, for example, ensuring that the main beam angle (tilt angle) of all lights directed towards any potential observer is kept to a maximum of 6 degrees (see Section 16). For the purposes of comparison, the majority of existing lighting at the Port of Felixstowe has an aiming angle of 70 degrees which results in glare substantially more pronounced than that predicted for the Felixstowe South Reconfiguration.

3. The lighting at the NNRT would be of a similar specification as described for the main container stacking area described above. Lighting masts at the NNRT would be 31.5m in height and lighting for the adjoining container stacking area would comprise mast lighting of approximately 30m in height. The RMGs would be equipped with their

own lights for localised illumination. All lighting would be in accordance with the Docks Regulations 1988 which specify minimum lighting levels for operational areas.

### 3.2.4 Fencing

1. Security fencing aligns the current port boundary and this would remain. A portion of realigned fencing is proposed to the southern boundary of the port terminal

### 3.2.5 Direct employment

1. The development would initially generate a further 89 direct jobs at the Port of Felixstowe. As the throughput and activity develops over the years, then further direct jobs would be created. Table 3.2.1 shows the growth in total direct employment as a result of the proposed scheme and Table 3.2.2 shows a breakdown of employment by type of job based on the working agreements at the Port of Felixstowe which establish the equipment manning levels for the equipment at the Port.

### 3.2.6 Maintenance dredging

1. The existing maintenance dredging regime would be unchanged as a result of the proposed development because there is not predicted to be an increase in siltation of the berths and approaches to the Port of Felixstowe (see Section 5.8). Therefore, there would be no increased maintenance dredging requirement.

**Table 3.2.1 Total existing direct jobs at the Landguard Terminal and total direct jobs generated by the proposed scheme during the operational phase (2007 to 2016)**

Year	Total jobs
Existing Landguard Terminal	202
2007	291
2008	387
2009	631
2010	715
2011	735
2012	795
2013	795
2014	819
2015-2021	823

**Table 3.2.2 Total direct jobs by type generated by the proposed scheme in 2007 and 2015**

<b>Job</b>	<b>2003</b>	<b>2015+</b>
Quayside Gantry Crane Drivers	20	60
RTG Crane Drivers	35	296
Berth Operators	51	200
IMV Drivers	53	164
Forklift Drivers	8	24
Other	35	29
<b>TOTAL</b>	<b>202</b>	<b>823</b>