BAKU INTERNATIONAL SEA PORT
BAKU, ÀZERBAIJAN

Renovation of the Ferry Terminal of Baku

Prequalification Documents
January 1998

VOL II, Description of Project

LIST OF CONTENTS

1. INTRODUCTION

Baku port is the only deep sea port of Azerbaijan and occupies together with Turkmenbashi port a key strategic position on the transport link across the Caspian Sea which constitutes an important section of the Traceca corridor linking Europe and the Caucasus region with the Central Asian countries.

Constructed in 1960, the ferry terminals in both Baku and Turkmenbashi, serving this sea link, today face various and serious problems that are of major constant to proper and smooth use of the terminals. If these problems are not addressed in a proper way in the near future , they may even constitute a threat to the continuation of the ferry service on the sea route linking the two ports.

The main issues of the present concern, when speaking of terminal infrastructure, are related to the following areas:

- poor state of repair of the terminal facilities
- inadequate terminal layout and insufficient facilities
- change of water level of the Caspian Sea

The objective of the present project is to address these problems by renovating the ferry terminal infrastructure at Baku port.

The project works are intended financed using the proceeds of a loan from the European Bank for Reconstruction and Development (EBRD).

Due to the present low level of traffic, the uncertainty in the momentum of the economic growth and traffic increase, the uncertainty in pace of changes in modal split, the present stop in water level increase, and the wish to maximise the financial feasibility it is proposed to implement the Terminal Development Plan in phases according to the pace of growth in terminal activities and possible reactivating of rise in Caspian Sea water level. The present project constitutes the 1st phase of the terminal development.

The information given hereafter is given in good faith but without any responsibility of the Employer. The Bidder shall satisfy himself regarding all conditions that may influence on his bid and no claims from the Contractor due to any error in the site information supplied by the Employer will be accepted.

Due to yet no final agreement on loan arrangements, the works described hereafter may still be subject to changes.

2. DESCRIPTION OF SITE

2.1 Location of Terminal

The sea port of Baku is the only major port in Azerbaijan located on the western shore of the Caspian Sea. Baku is the capital of Azerbaijan with approximately 2 million inhabitants. From Baku there is road and rail connection to Russia and Iran.

From the port of Baku, there is a ferry link to Turkmenbashi in Turkmenistan as well as some minor coaster routes to Russia, Kazakhstan and Iran. Through the Volga-Don system it is possible to reach the Black Sea. However, due to political reasons, it has in the past not been possible for Azerbaijan vessels to use this route.

Physically, the port of Baku is located on the southern side of the Apsheron peninsula, which provides natural protection against waves from northerly directions. The peninsula extends some 30 nautical miles to the east of Baku. The exact location is 40°22' North and 49°52' East. The location of the port can be seen from Dwg. B.01.00.

The ferry terminal is located close to the city centre, just east of the general cargo terminal. The sea entry to the port is through a 9 km long dredged channel.

2.2 Natural Conditions

2.2.1 Topography

The ferry terminal is located on reclaimed land with a surface level of -25.4 m near the ramps, and -25 m further back at the railway shunting yard.

A topographic survey has been carried out as part of the present project.

2.2.2 Bathymetry

In the port basin in front of the ferry terminal the water depth is between 6 (-33 BSL) and 9 (-36 BSL) meters. In the ferry terminal the water depth is between 8 and 9 metres. In 1972 a protecting stone layer was laid on the bottom of the ferry berth in order to protect against erosion from the use of the ferry propeller.

Bathymetric surveys are carried out every year and a dredger is available in the port of Baku.

2.2.3 Metereorogical Conditions

2.2.3.1 Temperature and Precipitations

The climate is characterized by a dry and hot summer, mild winter, short spring and sunny autumn. The annual average air temperature is +14.4°C. The absolute maximum temperature is 40°C in July, and the minimum is -13°C in January. The average number of frosty days is 8.

The annual precipitation is 204 mm. Snow can occur. The average relative humidity is 72%.

2.2.3.2 Wind

Wind roses are available, giving probability for wind direction and wind speed interval. The roses show that northerly winds are prevailing (40.5 %), followed by southerly winds (18.4 %). The maximum wind speed from the north is 40 m/s and from south it is 28 m/s.

Navigation in the port of Baku is suspended when wind speeds exceed 20 m/s. Wind roses are available.

2.2.3.3 Visibility

Fog can be observed mostly in February to April and basically in the morning hours. The average number of days with fog is nine. The duration of fog is approximately 12 hours.

2.2.4 Hydraulic Conditions

2.2.4.1 Waves

Wave statistics are available for the Bay of Baku. The bay is sheltered from north by the Apsheron peninsula, and the maximum observed wave height from southern directions is 1.5 metres. The wave statistics are available.

2.2.4.2 Currents

Currents are dependent on the wind activity. There are no permanent currents in the Bay of Baku. The average speed of currents caused by wind effects is 0.2-0.3 m/s.

2.2.4.3 Tide

Tides in the Caspian Sea are negligible.

2.2.4.4 Salinity

The average annual salinity in the Caspian Sea is 1.27 %. The maximum salinity is 1.45 % and the minimum is 1.11 %.

2.2.4.5 Ice

Sea ice can be considered as not appearing, as the average number of frosty days is 8.

2.2.5 Soil Conditions

A number of geological/geotechnical investigations have been carried out in the terminal area. Latest a minor investigation was carried out during the course of the design of the present project.

According to these specifications, the soil conditions in general can be described as:

~ 0-4 m	Fill of different origin
~ 4- 11 (level -35)	Sand with a varying organic content and occasionally interbedded layers of organic silt
From level -35 - 45	Stiff to hard silty clay

The old geological/geotechnical survey insufficiently characterise the foundation conditions for each building and structure. Therefor, a new survey covering each building and structure shall be carried out by the Contractor.

2.2.6 Seismic Conditions

Baku is situated in a seismically active area. According to the Soviet Standards, the seismic force in Baku is 9 (correspondingly to the Modified Mercalli Scale).

2.3 Navigational Aspects/Approach to Baku

2.3.1 General

A dredged channel of 6 to 7 metres water depth leads to the ferry terminal and the general cargo terminal. The maintained width of the channel is 100 m. The dredged channels are marked by 11 light buoys, that are located according to the IALA A System. The dredged channels start just to the west of the Bayuk-Zira Island and is about 9 km long.

Naval charts from 1980 are available for the approach to Port of Baku.

Pilotage service is available in Baku, but normally the captains of ferries choose to berth the vessel themselves. Maintenance of markings is carried out by the organization Caspmorput, which is a part of the Caspian Shipping Company.

2.3.2 Sedimentation and Dredging

According to information from Caspmorput, who in the past undertook all dredging work in the Caspian Sea, some siltation takes place in the approaches to Baku Port. According to the records it is estimated that a siltation in the order of 50,000 m^3/year is taking place in the port area. Due to continued rising of water level and lack of financing the deepening works have not been carried out since 1990.

2.4 Railway Facilities and Access

The railway terminal consists of a shunting yard, a group of parallel access tracks, and connecting tracks to the two ferry berths. The shunting yard is connected to the railway network at Baku station via a single track line. The physical layout is shown on the Terminal layout Dwgs. B.01.00 and B.01.03.

The shunting yard is used for:

Parking of wagons waiting for ferry transfer.
Sorting of wagons arriving in the terminal before the shunting to the ferry.
Inspection of wagons for defects.
Forming of wagons arriving with the ferry to trains going to Baku freight yard.

The shunting yard has 8 parallel tracks connected via a switch area to the connection line and to the access tracks. The length of the 8 tracks are between 323 and 456 m.

The access tracks to the ferry are used for parking of wagons waiting for shunting on board the ferry and for temporary parking of wagons from the ferry.

The access tracks are grouped with 4 tracks for each of the two ferry berths. Two of these four tracks are used for wagons to the ferry and the other two for wagons from the ferry. The length of the tracks varies between 233 and 300 m giving a capacity of 15 - 18 wagons corresponding to the capacity of 2 ferry tracks.

The operation of the railway terminal is managed from a signal box at the shunting yard and another signal box at the ferry connection tracks from where all signals and switches are controlled. All switches are electrically operated.

The tracks are equipped with the standard 65 kg/m and 50 kg/m (and some 43 kg/m previous USSR standard not produced any more) rails, generally mounted on wooden sleepers by rail spikes. The tracks are generally laid in stone ballast.

The tracks are in operational condition but show a lack of sufficient maintenance through several years.

2.5 Road Access

Only one access road lead to the ferry terminal. The road connects to the main road through Baku at the fly over bridge approximately 600 metres from the access ramps. The road is 6-10 metres wide. Within the last two years part of the pavement has been rehabilitated. On the part away from the terminal, the road is surrounded by warehouses and small workshops, that are in the way for the widening of the road.

2.6 Auxiliary Facilities and Utilities

2.6.1 Heating Supply, Heating and Ventilation

The main existing source of heat is a boiler house located at the ferry terminal. In the future layout this will be demolished and heating will be secured through installation of a heat exchanger connected to the main city boiler house (POK-2) located next to the fly over bridge.

On the territory of the ferry terminal distribution nets are in bad conditions.

In light of the above, it is decided to renovate the heat supply and the distribution nets to the Ferry Terminal.

2.6.2 Electrical Installations

The main source of electrical supply in the ferry terminal is a substation of 6/0.4 kV named No. 275(6). There are two transformers with a capacity of 630 kVA in the substation.

Both of the 630 kVA 6/0.4 kV transformers are in permanent operation. They use 40 % of the total power of the transformer in maximum regime.

The supply of terminal buildings/consumers is distributed through cable lines laid in a trench. The voltage of the lines for the consumers is 380/220 V and the frequency is 50 Hz.

Telephone communication internally within the divisions of the terminal as well as communication inside Azerbaijan is reported to be good.

2.6.3 Water Supply

Presently, the source of the water supply in the port of Baku is the city water pipelines. The main line to the Terminal is 150 mm made of steel and in good condition for future use.

2.6.4 Sewerage

Presently, there is a working sewer system on the territory of the ferry terminal. Sewage water is let by gravity via a pump station into the city sewer system at Transportnaya Street.

Drainage is presently also let to the sewerage system.

3. GENERAL DESCRIPTION

3.1 General

With reference to dwg. No. B. 01.03, the works and items subject of the present project are in brief the following:

- Terminal land works, comprising

  - demolition of water tanks
  - demolition of buildings and structural works
  - filling and levelling of land part of terminal area (4,000 m3)
  - execution of outside utilities networks for heating, power and water supply, sewerage, drainage, etc.
  - execution of internal roads and parking areas, including fencing and outdoor lighting
  - widening of the existing access road to Ferry Terminal (2,000 m2)

- Marine works, comprising

  - demolition of water pier
  - filling and levelling of reclaimed terminal area (170,000m3)
  - coastal protection/embankment works (~400 m)
  - partly demolition and reconstruction of one finger pier, central pier and lifting tower (6) foundation of one ferry berth
  - demolition and reconstruction of access bridge to central pier (80 m)
  - construction of a Ro-Ro ramp

- Ferry ramp works, comprising

  - dismantling of ferry ramp structures (3 link spans of 130 tons each) and lifting towers (6), including counterweights and machinery
  - cleaning, inspection and verification of dismantled structures and machinery
  - repair works on ramp structures with replacement of rails and deck and partly of structural parts due to deterioration
  - renewal of complete surface protection of all steel structures
  - disassembling and testing of ferry ramp structures and lifting towers, including new counterweights and machinery
  - new lifting tower building structures
  - new control system for operation of ramps, including electronic installations.

- Railway works, comprising

  - provision and installation of new P-65 rails on the ferry ramps (350 m)
  - widening of the two existing road/rail crossings at the access road and construction of new crossing at container road
  - execution of inspection walkway alongside rail yard track (900 m)

- Land building/structural works comprising

  - New Ticketing Building, including shed and heat exchange point (64 m2 + 270 m2)
  - New Border Control Building, including sheds (340 m2 + 2 × 400 m2)
  - New Public Service Building (124 m2)
  - New Passenger terminal building
  - New Electrical Workshop
  - New Passenger Bridge/Sky Walk between the Passenger Terminal and the central pier (75 + 100 m)

3.2 Terminal Land Area Arrangement

3.2.1 Layout, Arrangement

The chosen layout of the renovated terminal is shown on Dwg. no. B.01.03. According to this layout the terminal will comprise the following new/renovated areas:

- Arrival and Ticketing area
- Holding area for dangerous cargo
- Border control area (customs, police)
- Marshalling area
- Interface traffic area in front of ferry berths
- Vehicle disembarkation area
- Passenger reception and parking area

All these areas will be paved by asphalt on a gravel bed and supplied with drainage system and flood lighting. Traffic lanes will be separated by painted lines and low movable fences where found necessary. The customs area will be fenced off.

Access by road and rail will be through the existing infrastructure, but the widening of the access road is included in this project. To serve container traffic an internal road between the ferry terminal and the main port will be constructed.

The following new buildings/structures will be present on the terminal area:

- Vehicle Ticketing Building	(new)
- Border Control Building	(new)
- Public Service Building	(new)
- Passenger Pavilion	(new)
- Electrical Workshop	(new)
- Passenger Bridge/ Sky Walk	(new)
- Administration Building	(existing)
- Hotel	(existing)
- Restaurant	(existing)
- Public toilet	(existing)
- Railway Control Post	(existing)

The new buildings are further described in the following sections.

3.2.2 Demolition and Filling Works

To accommodate the layout of the renovated Terminal various existing building works and structures not fitting into the new layout shall be demolished and the demolished material shall be removed from the site.

The demolition works will have to be planned in accordance with the construction of the replacement building works and structures foreseen e. g. the substation.

Following the demolition works the level of the area shall partly be raised to levels as shown in dwgs (average approximately -23.5). Fill material for levelling may be taken either from quarry (28 km from Baku) or from the sea side.

3.2.3 Road and Parkings

All new traffic areas and roads are proposed to be constructed in the same way consisting of a three layer base (sand, gravel, crushed stone) on top of which a two layer asphalt wearing course is placed. Where new paved areas are constructed in connection with old ones (e. g. access road), a new asphalt wearing course shall be applied to the old road providing a uniform and levelled surface of the completed road.

Roads and parkings shall be provided with kerbstones, sidewalks, drainage and lighting. Further, traffic lane markings and road signs shall be provided.

Following the completion of pavement and earthworks the site shall be provided with plantation in the form of grass, bushes, trees and hedges.

3.2.4 Lighting, Power Supply and Electric Installations

Floodlighting masts, 18 m high each, with glow lamps in the floodlights, shall light the terminal area. Lighting of lanes, footpaths shall be arranged by fittings with ДРЛ type mercury vapour lamps, installed with a help of bracket on steel supports. Outside lighting and power supply net of the buildings and structures is executed from cable conduits 0.7 m under ground. Telephone and radio net is also made of cables.

3.2.5 Drainage, Water and Sewerage

There shall be a drainage system to drain rain waters from the terminal area. The system shall be provided with oil separator before the water is let through outlets into the sea.

On the terminal area, water supply pipelines shall be constructed to provide the buildings and the structures with drinking water. There is also a water pipeline, designed for provision with watering of plantation and washing of pavements. The designed water pipeline is to be connected to the existing water supply pipeline in the terminal.

The water supply pipelines shall be made from steel and they shall be laid at a depth of 1.0-1.2 m under ground.

The area will be provided with fire hydrants.

From the planned buildings the sewage flows to the sewage pump station through pipes made from asbestos-cement. From the pump station the sewage shall be pumped through a pressure steel pipeline to the city sewage line.

3.2.6 Heating Installations

The heat source is hot water, produced in the existing boiler house ĐIÊ-2, located behind the ferry terminal fence. The water shall be supplied to the designed heat distribution point, located in the ticketing building basement from where all buildings shall be connected for heating.

The pipelines shall be made from steel welded pipes and all pipes shall be heat insulated.

3.3 Marine Works

3.3.1 Layout, Arrangement

Drawing B.01.03 and B.02.01 are showing the layout of marine structures. Project components are summarised as follows:

. Land base for ferry ramps
. Access bridge
. Lifting towers (first row from land side)
. Lifting towers (second row from land side)
. Lifting towers (third row from land side) and stop fenders
. Lifting towers (third row from land side) and base of central pier
. Finger piers
. Central pier
. Head of central pier
. Coastal embankment/land reclamation
. Ro-Ro ramp

3.3.2 Land Base for Ferry Ramps

To serve future needs of ramp motion with water levels varying between level -25 m and level -30 m, the land base must be raised; but to reduce costs and taking into consideration the present water level it is decided to maintain existing ramp deck level at land base in the first phase. This entails rehabilitation of bearings and buffers. Minor concrete repair works shall also be executed.

3.3.3 Access Bridge

Existing substructure consist of reinforced concrete piles 350 x 350 mm in lengths of 12 - 14 m. Existing superstructure is a reinforced concrete slab, 6300 mm wide.

Existing access bridge shall be completely demolished.

A new steel access bridge shall be constructed. The bridge consists of 3 equal spans of 26 m U-shaped sections. Bridge supports are established as follows:

- Land base with steel sheet piles, concrete piles and a reinforced concrete superstructure
- 2 support reinforced concrete beams between bases of lifting towers
- Demolishing and concreting for a support in the rear side of pier base

Deck level varies from pier level in - 23.07 m to the existing level in -25.39 m. The result will be an inclination in the first span of about 0.082, which is considered acceptable.

Free height will be limited to 3.5 m by the existing control building on pier base exactly as it is limited today.

The passenger access bridge/sky walk is envisaged executed as a steel bridge at a higher level above access bridge using the same supports and with the same free spans. When crossing existing control building at the pier base it is planned to demolish parts of the top of this building to let the passenger bridge pass. For this purpose no installations should be placed in the mid section of existing control building.

3.3.4 Lifting Towers

A rectangular box (10.6 m x 5.6 m) of steel sheet piles forms the substructure in the first and second row. The concrete front towards ramp side is drawn back from steel pile front, and steel piles are cut at low level to allow ramp movements.

An irregular but almost rectangular box (14.5 m x 11.85 - 15.50 m) of steel sheet piles forms the substructure at the base of finger piers. At the same time the structure forms the first part of the finger pier.

An irregular box (15.4 m x 13.0 - 18.0 m) of steel sheet piles forms the substructure at the base of the central pier. At the same time the structure forms the first part of the central pier. Besides the building for the electrical system and control system is situated on the structure.

The inside of tower foundations are filled up with mass concrete, which is formed to create support for the steel structures, stop fenders, guiding fenders and pits for counterweights. The steel superstructures are towers for carrying the lifting mechanism and the counterweights.

To serve future needs of ramp motion with water levels varying between level -25 m and level - 30 m, lifting towers must be raised. Steel structures in existing towers shall be rehabilitated and reused. Tower foundations are raised by concreting.

Pits are designed to give the necessary space for motion of counterweights. The pits shall be rehabilitated and made watertight as follows:

- Existing counterweights are taken up
- Pits are pumped dry, cleaned and sandblasted
- A steel tank lining are installed to secure watertightness
- The volume between existing pit surface and lining are concreted
- Raising of substructures by concreting to level shown in table

New circular counterweights are constructed, eventually reusing some of the heavy steel from existing counterweights. Lay out design of counterweights include a well (manhole) for maintenance access to pits. Existing steel sheet piles are protected by sacrificial anodes.

3.3.5 Finger Piers

Existing substructure consist of reinforced concrete piles 350 x 350 mm with toe levels varying from - 15.0 to - 16.3 m. Existing superstructure is a reinforced concrete slab 6200 mm wide and about 28 m's in length. A front wall of pre-cast concrete units supports the guiding fenders. On top of the slab sand is filled in to top level of the pier. The finger pier is equipped with wooden guiding fenders supported by driven wooden piles. On the pier a lighting tower is placed.

Existing finger piers shall be totally demolished from pier end to base at lifting towers.

New shorter finger piers are established consisting of:

- Steel pipe piles foundation protected by sacrificial anodes
- A reinforced concrete superstructure anchored to existing tower support substructure
- Fenders

3.3.6 Central Pier

Existing substructure consist of reinforced concrete piles 400 x 400 mm with toe levels varying from - 16.5 to - 17.5 m. Existing superstructure is a reinforced concrete slab 12 m wide and 139.1 m's in length including pier head. A front wall of precast concrete units supports the guiding fenders. On top of the slab sand is filled in to top level of the pier. The pier is equipped with wooden guiding fenders supported by driven wooden piles. On the pier a lighting tower is placed close to the pier head.

3.3.7 Demolition

Existing structures to be demolished are:

- All existing fenders and pile supports for fenders
- Front walls of precast concrete units
- Pavement
- All structures above concrete slab

- Taking up scrap material, broken piles etc. from the bottom

Existing slab and concrete piles support shall be a part of the rehabilitated structure to serve as relieving platform.

3.3.8 New Structures

The new pier structure is carried out as follows:

- Driving of a new steel sheet pile wall. The wall must be slightly inclined to avoid interference with existing concrete piles.
- Mutual anchoring of the walls on both sides the pier by anchors in every double pile.
- Sand are filled in between the walls up to slab level. It might be necessary to make interim holes in the slab to completely fill up the volume below the slab.
- Concreting of bollards- and fender supports.
- Filling in sand on top of slab.
- Installing of water outlets, water pipes, cables etc.
- Pavement

3.3.9 Quay Equipment

Fenders are designed to cover all levels of fender list belting of the ships ranging from the highest ship deck level at water level - 25 m to lowest ship deck level at water level - 30 m. New fenders are the pivot type to avoid fender panels to tilt into ships hull. Fenders are constructed with a closed box design for the panel minimizing the exposed surface area to be protected from corrosion. Corrosion protection will be a combination of painted surface and sacrificial anodes. Steel panel facing is designed to be a 60 mm UHMWPE (ultrahigh molecular weight polyethylene) plate covering the total front from level -20.00 m to -27.00 m.

Pivot support is a driven steel pipe pile and top fastening and energy absorption is created by two rubber fender elements of types as "Trellex MV". Rubber fender elements can be installed in three different positions depending of actual water level.

Additional equipment to be installed are:

- Bollards per 30 m
- Sacrificial anodes on sheet piles
- Safety ladders
- Light
- Water supply
- Water outlets

3.3.10 Head of Central Pier, Dolphin

A rectangular box (7 x 12 m) of steel sheet piles filled with sand forms the existing substructure. A reinforced concrete quay wall is constructed on top of the sheet piles.

This existing pier head shall be totally demolished.
The new dolphin forming the pier head is positioned about 20 m far out than the original to create better berthing and mooring conditions for the ferries which are longer than existing pier.

A TT-shaped prestressed reinforced concrete beam makes the access to the dolphin.

The dolphin consists of:

- A circular substructure of driven straight-web steel sheet piles filled up by sand
- A reinforced concrete superstructure as a sand filled box
- Fender supports
- Bollards
- Fenders

3.3.11 Coastal Embankment/Land Reclamation

To create additional land areas for the renovated ferry terminal the sea area between the existing ferry terminal and the main pier of the port (area of water berth) shall be reclaimed to reach an upper surface level of approximately -23,70 m.

The works shall comprise

- Demolition of the water pier

- Removal of existing coastal protection and debris in the area

- Filling, levelling and compaction of fill

The horizontal dimension of the reclaimed area will be approx. 1,5 ha.

The reclamation shall be done using proper sand fill (possibly from sea), properly compacted to allow direct foundation of buildings works and roads.

The reclaimed area shall be protected from the sea side by a properly designed and constructed coastal protection. The crest level of the embankment shall be -23.00 in BSL and it shall be extended also to cover the existing embankment protecting the existing reclamation. The embankment shall be made from core of gravel with cover layers of armour stones.

3.3.12 Ro-Ro Ramps

A ro-ro ramp at the corner of berth No. 9 and the new reclaimed area shall be constructed. The ramp will be approx. 25 m wide with front edge in level -25 and an inclination of 1:10.

The ramp is constructed from a heavy slab of reinforced concrete supported by steel piles. The steel pipes shall be corrosion protected.

3.4 Ramp Structures

It is the objective of the project to reuse as much as possible of the original structure of the access ramps and the operating machinery, which for many years of service have proven records of reliable operation. Changes may be necessitated by deterioration, damages and accommodation to the future requirements for the operation of the terminals. Therefore the works start with the dismantling of the whole ramp structure incl. lifting tower for a detailed inspection on land, which may reveal weak points in the structures.

3.4.1 Elevating of Ferry Access Ramps

The existing ferry access ramps shall be relocated to adjust to the future water level variations.

The machinery shall be modified so as to allow for all three spans of the ramp to be positioned with a slope of maximum 4.6 % in upward as well as downward direction.

In the foreseeable future a maximum slope of 3.8% in both directions should be sufficient for the ferry terminal operation rendering a maximum allowable difference in ships position of 6.6 meters.

3.4.2 Structures of Ferry Access Ramps

The Wooden deck of the ramp spans shall be replaced with a deck of Ekki or Azobe timber.

The strength of the Azobe wood is such that the span between the supports of the timber may be maintained as it is on the existing structures, and yet the deck will be able to resist the design load from vehicles.

The steel structures of the ramp spans shall not be changed unless proven unable to resist the design loads agreed upon or unless they have been damaged or deteriorated. Decision shall be taken in agreement with Employer following the detailed inspection, testing and verification by the Contractor.

Since the rail switches on the seaward span of the ramps are not used (as the ferries have only two connecting rail tracks) the switches shall be omitted and only two straight tracks be provided. The existing rail, type P43, shall be replaced by rail type P65.

3.4.3 Machinery for the Ferry Access Ramps

3.4.3.1 Existing Machinery

In principle the existing machinery may be used with the following modifications:

- The lifting towers are raised to an elevation corresponding to the new elevation of the ferry ramps.

- The spindles and the counterweight wires for machinery in rows 1 and 2 are replaced with longer ones allowing for the increased slope of the spans.
- Wires for the lifting machinery and counterweights at row 3 are replaced with longer ones for the added travel length of the span.
- Counterweight mass shall be increased in accordance with the increased mass of the wooden decks.

Other modifications are not foreseen unless the towers or machinery are proven unable to resist the design loads as agreed upon or unless they have been damaged or deteriorated.

3.4.3.2 Alternative: Hydraulic Machinery

It is possible to remove the lifting towers at rows 1 and 2 and replace the towers with steel columns for suspension of oil hydraulic cylinders for operation of the ramp spans no. 1 and 2.

Using hydraulic cylinders for the operation will make the use of counterweights unnecessary, and the counterweight pits may be filled with concrete.

In order to carry the live load, the spans shall be equipped with hydraulically operated sliding bolts or similar locking devices.

The machinery at row 3, however, can not in a simple way be operated by hydraulic machinery as the counterweights are necessary to reduce the weight of the third span at the ferry support and as the stroke length of the cylinders would be too long.

3.4.4 Electrical Installations

3.4.4.1 General

The electrical installations on the ferry ramps and piers are of old construction and worn-out.

Generally, all the electrical installations (cable trays, cables, limit switches, motors, switch-boards, control boards, lighting fixtures, etc.) shall be changed. The following chapters describe in outline the work to be done in the different areas.

It shall be emphasised that during the whole construction period shall the contractor organise the electrical work in a way making it possible to operate the left ramp system when right ramp system is renovated and vice versa.

3.4.4.2 Power Supply to the Ramp System

For the time being, the whole ramp system is supplied from 3 (3x150 + 1x70) Cu cables. These cables shall be used in the future for supply of the new installations.

3.4.4.3 The Ramp Control Building

From this building the ferry ramps are controlled.

All the electrical installations in this building shall be changed. The contractor shall organise the work in the building in a way making it possible to operate one ramp side during the renovation.

After renovation, electrical heating in the managing centre shall be delivered and installed.

3.4.4.4 Lifting Tower Buildings

All the existing electrical installations in these 6 buildings shall be totally replaced. After the building and the machinery has been repaired and renovated, the new electrical equipment can be installed.

3.4.4.5 Outdoor Lighting Installation

The outdoor installations on the piers and the buildings shall be total new installations.

New masts (3 nos.) shall be furnished, each 21 m high.

3.4.5 Ramp Control System

The existing way to move the ramps with electrical motors, gears and counterweights shall be retained but the total electrical installations and materials (motors, limit switches, control boards, cables, breaks, etc.) shall be changed to new materials and new technology. Further, the motor control shall be changed from slip ring AC motors to frequency controlled AC motors.

The existing control system is based on relay systems. The new control system shall be based on a PLC system and relay system.

The control system shall not be based on a 2 wire loop system but hard wired from the lifting towers to the PLC placed in the main switchboard.

The emergency operation system (electrically) in each lifting tower shall be designed independently of the PLC system. These systems shall be hard wired and it shall be possible to run the systems locally with the PLC out of order, but in a safe way.

In each lifting tower and in each of the control panels emergency stop systems shall be installed.

3.5 Railway Works

No major railway works are to be carried out in the first phase of the project. Inside the railway yard itself, only a walkway alongside the inspection track shall be constructed. The inspection

walkway, 1.0 wide, shall be paved with asphalt as a footpath. Otherwise, only minor changes in connection with replacement of rails on ferry ramps and repair road shall be executed.

3.6 Building Works

3.6.1 Architectural Layout

Border control building is one-storey building which should be shared by the custom-house, water police and frontier-guards. The building dimensions are 12,4m x 27,4, the height is 3 m from the floor level up to the ceiling.

External doors are plastic aluminium. There are veneered wood doors in the office rooms.

The floor of the office rooms is parquet. The floor of toilets is covered with ceramic tiles. The floors in halls, corridors, rooms for customs examination are covered with marble plates.

The ceilings are suspended.

The walls in the office rooms are oil painted, walls of sanitary rooms are faced with tiles.

The facades are plastered with high-quality decorative plaster and painted.

The public service building is one-storey, with dimensions of 10x12.4 m and with a height of 3.0 m. The building is to be located at the marshalling area for vehicles. The structure is divided into two parts:

- kiosks, telephones, buffet
- toilets for men and ladies

The buffet floors are of marble, in the toilets they are made from ceramic tiles.

Walls in the buffet shall be painted with oil paint, in the toilets walls are to be covered with ceramic tiles.

The inside walls are wooden, covered with veneer.

Outside facades of the building are plastered with high-quality decorative plaster and painted.

Passenger Terminal/Pavilion is designed with a possibility to widen it in the second stage of construction. In this case the existing construction part is not to be demolished, but used completely.

The building is two-storey with dimensions of 12.4x26.10 m.

The height of the floors is accepted as 4.2 m (up to the bottom of the suspended ceiling- 3.3 m).

The passenger terminal shall be connected with a ferry through a passenger bridge.

Floors in the lobby, the arrival and the departure halls, the rooms of customs' and border policemen' examination are of marble, in the toilets they are covered with clay tiles.

Ceilings shall be suspended.

Outside windows and stained glass windows are individual, made of plastic and aluminium. In the service rooms they are wooden and veneered.

Walls of facades should be performed from light structures as they can be easily dismounted and mounted again after development has been implemented. Coming from this, it has been decided to use glass and suspended light cladding panels for the facades. From outside the panels will be plastered with a high-quality plaster and painted.

Ticketing terminal building is one-storey with rooms for work, rest, kitchen and toilet. The rooms have a height of 2.70 m.

Floors in the rooms and in the corridors are from parquet. In the toilets they are covered with clay tiles and with linoleum in the kitchen.

Ceilings are painted with water-emulsion paint.

Outside windows and doors are of PIMAPEN type, the inside doors are wooden and veneered.

Walls shall be painted with oil paint. In the toilets walls are to be covered with ceramic tiles.

Facades are plastered with high-quality decorative plaster and painted.

Electrical Workshop shall be used as a workshop for minor mechanical and electrical repair for the Ferry Terminal.

The dimensions are 11x6 m and the building is one-storey. The height is 3 m from floor to ceiling (inside height).

The walls are made of bricks with the thickness of 40cm. The walls are plastered and painted from inside. The overhead covers are pre-fabricated RC hollow panels, supported by the longitudinal walls. The roof water insulation is 3 layer fibreglass felt for heat insulation, blinding, etc.

External doors are plastic aluminium. There are veneered wood doors inside rooms.

The floor of the office rooms is parquet. The floors of workshop rooms are covered with concrete finishing.

The electrical workshop shall be equipped with power supply, water supply for hand wash and drain for hand wash. Ventilation is natural and heating is envisaged.

3.6.2 Structural Design

In general applies:

The walls are made of blocks with the thickness of 40 cm. The walls are plastered and painted from inside. The overhead covers are pre-fabricated RC hollow panels with the length of 5,86 m. supported by the longitudinal walls 1,2,3. The roof water insulation is 3 layer fibreglass felt for heat insulation, blinding, etc.

Foundation for PassangerTerminal/Pavilion is to be executed from pre-fabricated RC piles with a section of 30x30 cm and with length of 10 m. Column foundations, which have dimensions of 1.5x1.5 m, are connected by RC beams with a section of 40x50 (h) cm. A depth of laying is 1.2 m.
Direct foundation is utilised constructed as strip monolithic of RC on strip slabs for, Ticketing Terminal Building and Electrical Workshop. Moisture preventive actions are prescribed. The floors of the ducts are pre-fabricated RC plates.

The sheds covering the traffic lanes have dimensions 22.3x18 m, height 5.5 m.

Direct foundation with strip monolithic beams of RC on strip slabs.

The bearing steel columns are steel pipes.

The roof structure is a pre-fabricated steel structure, covered with galvanised steel plates.

3.6.3 Electric Installations

In general applies:

Lighting of the building consists of fluorescent lamps, built in the suspended ceiling.

Telephone and radio network and fire alarm system are installed in all rooms.

Fluorescent lamps, telephone and radio network is installed in the cabins in the sheds areas.

If installed, traffic lane barriers shall be electrically operated from cabins.

At the underside of the shed covers high durable fluorescent lighting fixtures are mounted.

The islands between the traffic lanes under sheds shall have identification lights to provide safe driving for vehicles.

3.6.4 Water and Sewerage

In general applies:

Water-supply network is made of galvanised steel pipes.

Sewage network is made of cast iron pipes.

Sewage network is placed under the floor in ducts. Pipe works above floors are visible.

3.6.5 Heating and Ventilation

In general applies:

There shall be a two pipe water heating system with lower separation. The pipelines shall be laid in the floor ducts canal.

Ventilation is mechanical. Air conditioning is installed. "ROOFTOP Heat pump" type conditioner is to be installed on the roof.

3.7 Passenger Bridges

3.7.1 Structural Design

The basic carrying structures are steel space frames and RC columns.

Roof of bridge is galvanised steel plates.

Floor of the bridge is steel plates covered with asphalt..

Direct foundations on in situ cast slabs is utilized.

Sides of the structure are made of steel nets with small mesh.

3.7.2 Lighting, Electric Installations

The lighting is carried out by lighting fittings with glow lamps, installed on the ceiling each 10 m along the whole passenger bridge.

4. DESIGN STANDARDS AND CODES OF PRACTICE

Constructed during the period of the former Soviet Union, the existing terminal infrastructure in Baku port have been designed and built according to Soviet standards and codes of practice.

After the break-up of the Soviet Union, the same norms and standards are still used. Despite their wide application these standards and codes are not readily available from ordinary sources in Azerbaijan and Turkmenistan but have to be procured through relevant design institutions and/or from Russia (Moscow). Also they are not available in English translation.

The designs/verifications shall be carried out applying what is considered the most appropriate under the present circumstances. This means that with the exception of the marine works, the designs of other works shall be carried out applying Soviet standards and codes of practice. The marine works may be designed according to relevant international norms, like Eurocodes, etc.

The above described principles have formed the basis for the elaboration of the contract drawings and specifications included in the tender documents. The verification of the project and the preparation of the execution project (calculations, drawings and specifications) which shall be done by the Contractor when he takes over the responsibility of the whole project, shall follow the same principles.

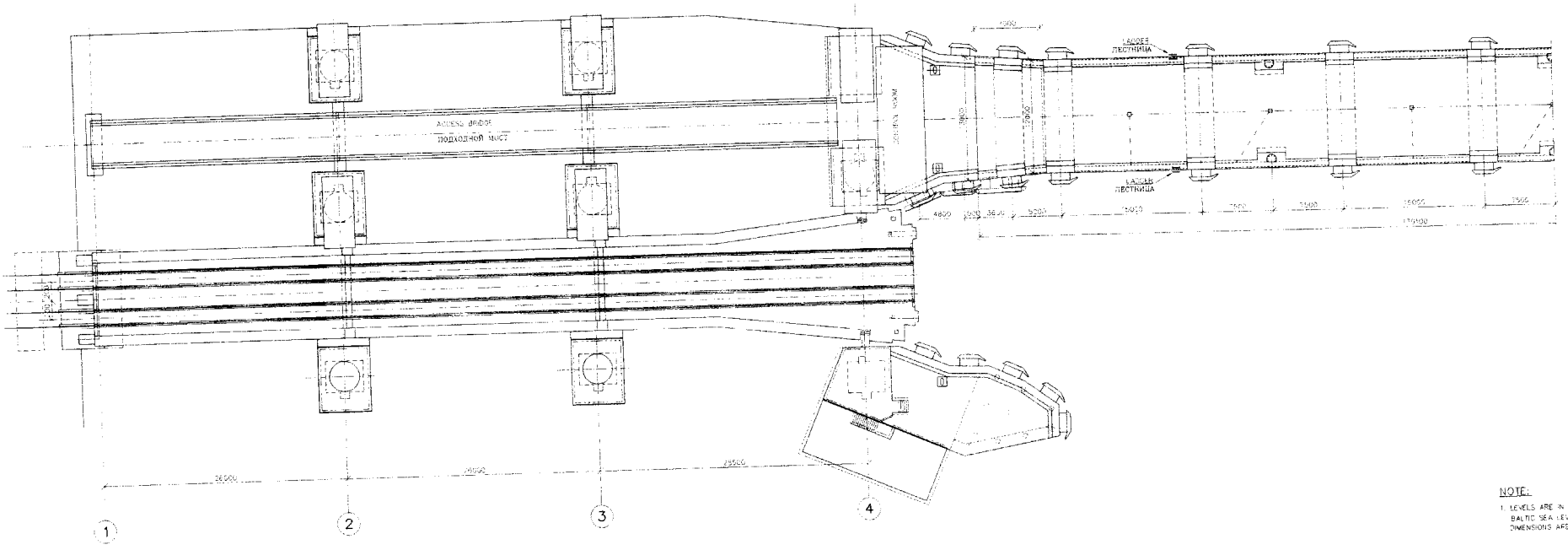
5. PLANNING OF WORKS

It is envisaged that the construction works shall be completed within 20 months from award of contract.

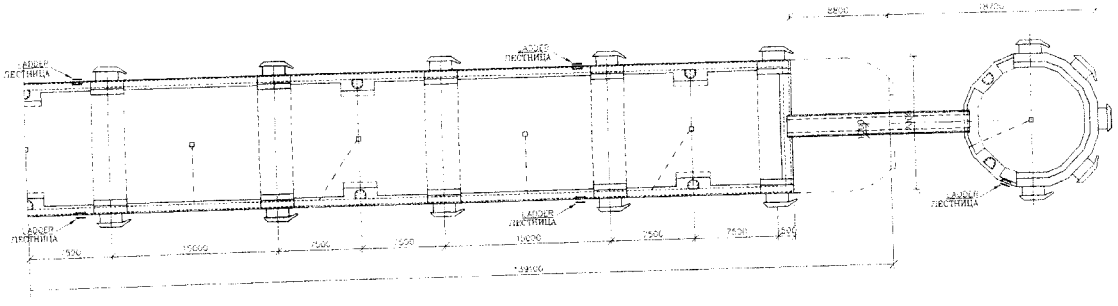
A schematic and general time schedule will be presented in the Tender Documents.

The detailed execution time schedule shall be prepared by the Contractor respecting the completion dates in indicated in the General Time Schedule and allow the identification of all major operations of significance for the execution of works under this contract (execution documents, ordering, provisioning, preparation, execution, testing, approbation, completion, etc.)

In the present project it is of particular importance that the planning takes into account that the ferry terminal shall be kept operational during the whole of the construction period. This shall be obtained by phasing the works, renovating only one berth and ramp at the time. The critical paths of this planning, assumed to be the finishing of substation works for works to be demolished and the completion of the renovation of the first ramp before the work on the second one can be started, shall be clearly indicated including reasonable margin of security. Also the road and rail traffic through the construction site and border control operations during the period of construction shall be planned in detail and necessary traffic regulation measures be taken by the Contractor before the different phases of the construction works can begin.



PLAN, 1:200
ПЛАН, 1:200



NOTE:

1. LEVELS ARE IN M. REF. SYSTEM -28.00 BALTIC SEA LEVEL (BSL)
   DIMENSIONS ARE IN MM

ПРИМЕЧАНИЯ

1. УРОВНИ В М ПРИВЕДЕННЫЕ К УРОВНЮ БАЛТИЙСКОГО МОРЯ
   РАЗМЕРЫ В ММ

REFERENCES:

DWG. B 02.22	LONGITUDINAL SECTION
DWG. B 02.23	GENERAL NOTE
DWG. B 02.24	PLAN AND SECTIONS
DWG. B 02.25	DETAILS A,B,S,D,E AND SECTIONS
DWG. B 02.26	DETAILS F,G,H AND SECTIONS
DWG. B 02.27	CRASH BARRIER
DWG. B 02.28	FOUNDATIONS

ССЫЛКИ

ПРОДОЛЬНЫЙ РАЗРЕЗ	
ОБЩИЕ ПРИМЕЧАНИЯ	
ПЛАН И СЕЧЕНИЯ	
УЗЛЫ A,B,S,D,E И РАЗРЕЗЫ	
УЗЛЫ F,G,H И РАЗРЕЗЫ	
БАРЬЕР БЕЗОПАСНОСТИ	
ФУНДАМЕНТЫ	

LEGEND:

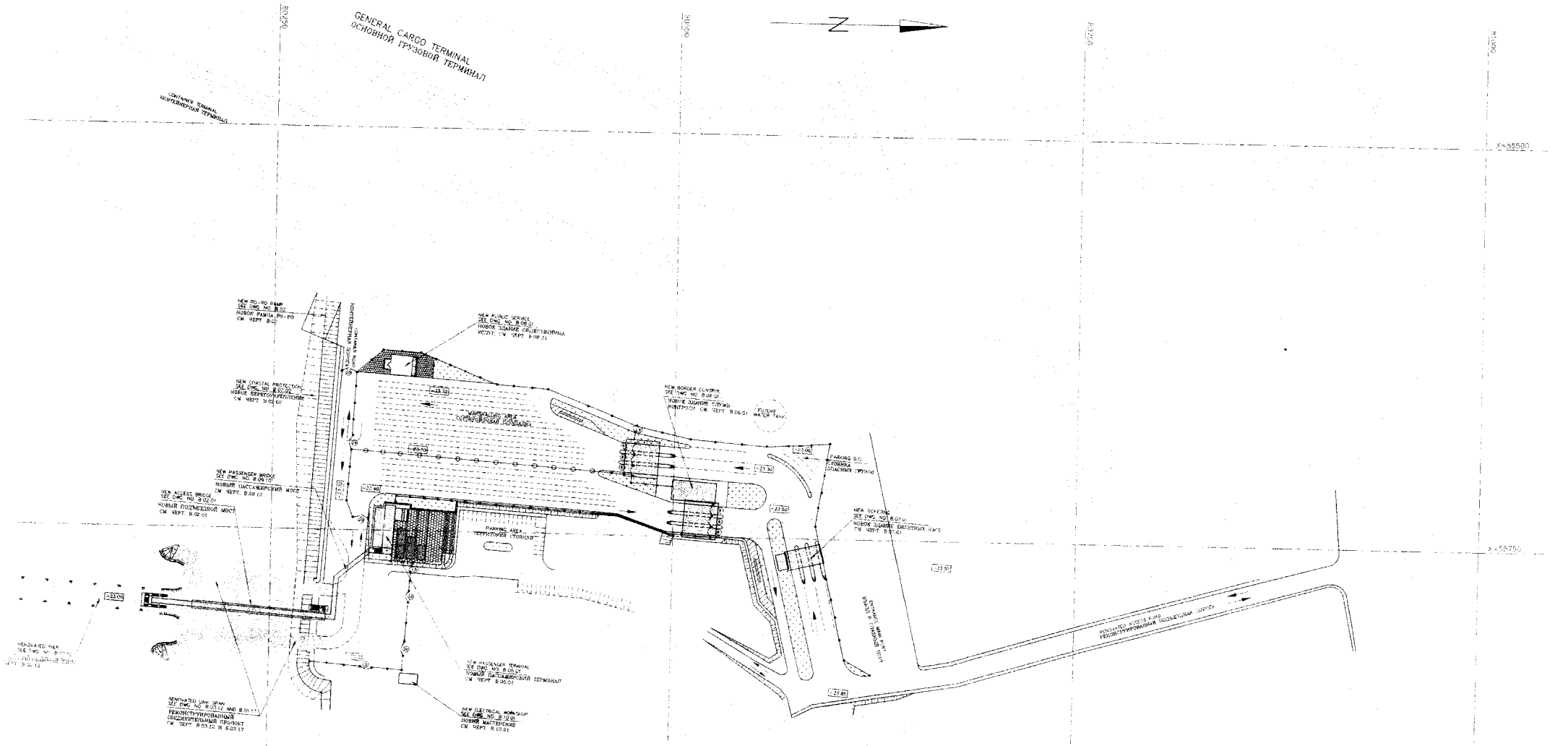
УСЛОВНЫЕ ОБОЗНАЧЕНИЯ

NEW CONCRETE	НОВЫЙ БЕТОН
EXISTING CONCRETE	СУЩЕСТВУЮЩИЙ БЕТОН
SAND FILLING	ЗАСЫПКА ПЕСКОМ
BUNDING	СТЯЖКА

RAMBØLL - Denmark
in association with:
Booz Allen & Hamilton - United Kingdom
Probel - Belgium

European Commission / Tacis
Port Network Plan and Improvement Programme
BAKU FERRY TERMINAL
MARINE WORKS
LAYOUT PLAN
МОРСКИЕ РАБОТЫ
ПЛАН УСТРОЙСТВА

B.0



HALF SCALE

NOTE:
- LEVELS ARE IN M. REF. SYSTEM : 28.00
- BALTIC SEA LEVEL (BSL)
- ROAD PAVEMENT PLAN AND FENCE SEE DWG NO. B.01.10

LEGEND:
- NEW /RENOVATED FACILITIES
- EXISTING FACILITIES
- WHARF FENCE, H= 2.9 M
- SEC. CHAIN, H= 2.0 M
- GATE
- -23.50 LEVEL OF PAVED AREA

ПРИМЕЧАНИЯ:
- УРОВНИ В М ПРИВЕДЕННЫЕ
- К УРОВНЮ БАЛТИЙСКОГО МОРЯ - 28.00 (УБМ)
- ПЛАН ДОРОГ /ОКРЫТИЯ И ОГРАДА СМ ЧЕРТ. B.01.10

УСЛОВНЫЕ ОБОЗНАЧЕНИЯ
- НОВЫЕ /РЕКОНСТРУИРОВАННЫЕ ЗДАНИЯ
- СУЩЕСТВУЮЩИЕ СООРУЖЕНИЯ
- СЕТЧАТОЕ ОГРАЖДЕНИЕ
- СТАРЫЙ ЦЕПЬ
- ВОРОТА
- УРОВЕНЬ ПОДНЯТОЙ ТЕРРИТОРИИ

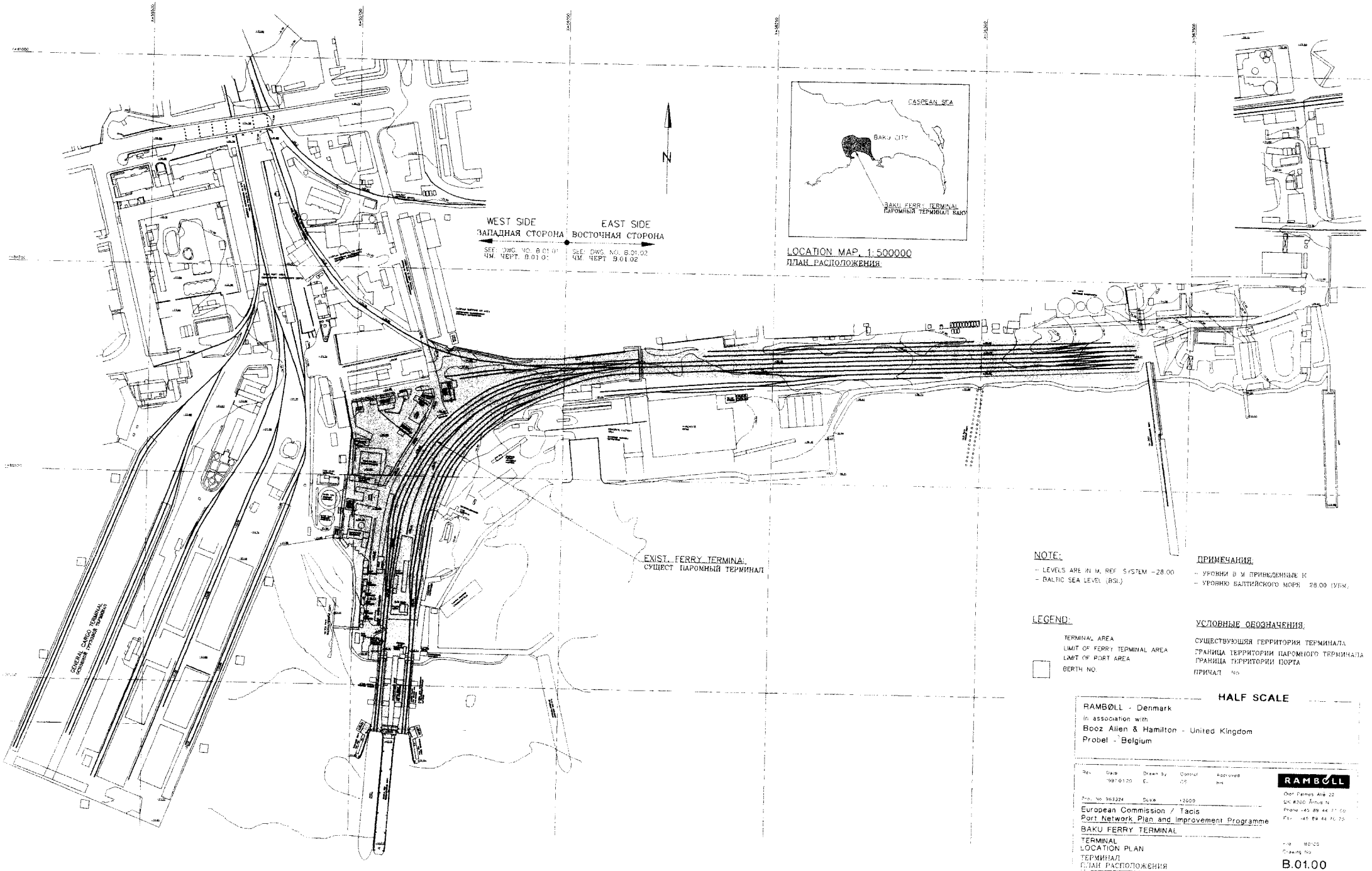
RAMBØLL - Denmark
in Association with
Booz Allen & Hamilton - United Kingdom
Probel - Belgium

Rev.	Date	Drawn by	Checked	Approved
	1997-09-01	PT	CG	GH

RAMBØLL

European Commission / Tacis
Port Network Plan and Improvement Programme
BAKU FERRY TERMINAL
NEW /RENOVATED FACILITIES
GENERAL PLAN WEST
НОВЫЕ /РЕКОНСТРУИРОВАННЫЕ СООРУЖЕНИЯ
ГЕНЕРАЛЬНЫЙ ПЛАН ЗАПАД

Scale 1:500 (A1)
Drawing No.
B.01.03



NOTE:

- LEVELS ARE IN M. REF. SYSTEM -28.00 - BALTIC SEA LEVEL (BSL)

ПРИМЕЧАНИЯ:

- УРОВНИ В М ПРИВЕДЕННЫЕ К - УРОВНЮ БАЛТИЙСКОГО МОРЯ -28.00 (УБМ).

LEGEND:

TERMINAL AREA
LIMIT OF FERRY TERMINAL AREA
LIMIT OF PORT AREA
BERTH NO.

УСЛОВНЫЕ ОБОЗНАЧЕНИЯ:

СУЩЕСТВУЮЩАЯ ТЕРРИТОРИЯ ТЕРМИНАЛА
ГРАНИЦА ТЕРРИТОРИИ ПАРОМНОГО ТЕРМИНАЛА
ГРАНИЦА ТЕРРИТОРИИ ПОРТА
ПРИЧАЛ No.

HALF SCALE

RAMBØLL - Denmark
in association with
Booz Allen & Hamilton - United Kingdom
Probel - Belgium

Rev.	Date	Drawn by	Control	Approved
	1997.01.20	EL	OS	HH

RAMBØLL
Ole Falmes Allé 22
DK-2000 Århus N
Phone +45 89 44 77 00
Fax +45 89 44 70 70

Proj. No. 961324 Scale 1:2000

European Commission / Tacis
Port Network Plan and Improvement Programme

BAKU FERRY TERMINAL

TERMINAL
LOCATION PLAN
ТЕРМИНАЛ
ПЛАН РАСПОЛОЖЕНИЯ

File 961325
Drawing No.
B.01.00

RAMBOLL Group
Gajibekov Str. 33/35, Apt. 93
AZ - 370010 Baku
Phone: +994-12-933114
Fax: +994-12-933114

Olof Palme Alle, 22
DK-8200 Arhus N
Phone: +45-89-447700
Fax: +45-89-447625