.CONTENT

1. GENERAL, TECHNICAL INFORMATION, CONDITIONS, NORMS AND REGULATIONS

1.1. General

Document content refers to:

Grab unloader (overhanging crane), type with a grabber - hereinafter: crane.

A used crane is intended for unloading bulk cargo from ships at the bulk cargo terminal in the Port of Koper. Cargo from ships is unloaded with grabs into a hopper which is component part of the crane. The cargo is deposited from the hopper through a vibration feeder a divided onto one of the existing parallel converyor belt conveyers.

Scope of the supply:

A used crane 32 t x 35/18 m, supplied and installed, with everything necessary to immediately connect onto the existing technologically completed unit of the bulk cargo terminal in the Port of Koper and to connect to the central control system for bulk cargo terminal in the Port of Koper.

The crane must allow inserting wheel loader with an attached loading bucket (CAT 950H, Komatsu WA380-6, Volvo 120L) and the telescopic forklift DIECI Pegasus 45/19, held by four chains onto the grab through the hopper in the ship's hole.

The crane must be manufactured as a crane with a towing, main and auxiliary trolley.

The crane must be manufactured to be suitable for harbour transhipment operating conditions in terms of its heavy constructions.

1.2. Transhipment capacity

The crane must be manufactured for the following transhipment capacity:

material: coal, carrying weight 0.8 t/m3

maximum ship size: 150.000 DWT

- theoretical average effect: 1,100 t/h in 8 hours

- theoretical maximum effect: 1,300 t/h in 1 hour

1.2.1. 'Theoretical average effect'

The theoretical average effect is the quantity that is transhipped per hour, taking into account the carrying cargo weight (coal = 0.8 t/m3) and geometrical relationship between the unloader and the ship being unloaded without interruptions with trained crane operators, at full working speed and acceleration, to the effect that all unloading capacities are utilised at medium water condition.

The grab, filled with a nominal load, moves between a particular point in the middle of the ship, over the surface level of the cargo of a half-emptied ship and to the unloading point above the hopper (= 1 m height above the top edge of the hopper).

1.2.2. 'Theoretical maximum effect'

The theoretical maximum effect is a short-term achievable unloading quantity that is similar to point 1.2.1. but at maximum possible water condition, the rate of filling the grab = 1 or in special conditions more than 1 so that the grab moves between the unloader most favourable point, at the highest possible cargo surface level of a full ship, and the unloading point.

1.3. Transhipment material

Coal

carrying weight	0.8 t/m3
granulation	up to 50 mm
special properties	breaking into clod

Iron ore

carrying weight	up to 2.5 t/m3
granulation	up to 250 mm

The main cargo is coal, Fe ore and palettes, hot briquetted iron (HBI)

1.4. Ship size

Ship size to be unloaded:	up to 150,000 DWT

1.4.1. Testing procedure

a. all movements are tested with a nominal load

b. all movements are tested with a 10 % overload

c. the crane is loaded at a stand-still with a 25 % overload

d. testing of effects in accordance with 1.4.1.1 to 1.4.1.3 with coal carrying weight 0.8 t/m3

1.4.1.1. One-hour test

Maximum effect at least 1,200 t/h in favourable unloading conditions (see point 1.2.2.)

1.4.1.2. Eight-hour test

In this period, the average achieved effect must be 1,000 t/h. The terminal must ensure the testing is without interruptions. Each interruption is deducted. For this purpose, it must have at least 3 ship's holes, medium water level, each ship's holes must be fully loaded, have a trained crane operators, good weather conditions (see point 1.2.1.).

1.4.1.3. Three-day test (72 hours)

This shows the functional capacity of the equipment during continuous operation. The terminal must ensure the testing is without interruptions.

The effect is the average sustainable effect, lower appropriately to the conditions. Testing the effect is made with the belt conveyer weigher.

1.4.1.4. Control noise measurements at points a-d

The supplier takes measurements of the noise level during testing to show the crane does not exceed legally prescribed noise levels during its operation.

2. TECHNICAL DESCRIPTION OF THE SCOPE OF SUPPLY AND SERVICE

2.1. Crane composition

The supply is for 1 piece - a used crane 32 t x 35/18 m

Aside from the mechanical equipment, the steel structure, electrical connections and controls, the crane is composed of many primary sub-systems, namely:

- crane boom movement
- trolley driving
- hoisting and lowering a grab
- closing and opening a grab
- cab driving
- gantry driving

Aside from these primary drives, the system also has:

- power cable drum
- anchor, clog
- platform movement
- hopper hatch elevation
- vibrating feeder
- straightening trolley ropes
- water pipe drum
- showering of hopper and chute

2.1.1. Technical description of individual mechanic construction of parts

a. steel structure

Main steel structure of the crane must be manufactured from RST 37.2 or ST 52-3 according to DIN 17100 or other suitable Yugoslavian standards.

It is constructed from a hoisting boom on the seaward side and the connecting main girder, a tow beam with a hoisting boom, two portal frames, bottom horizontal connections, diagonal connections, main balancing mechanisms, middle balancing mechanisms, running wheels balancing mechanisms, a hopper, a device for equipment from the hopper, two trolley frames.

Drive of the towing winch, the hoisting and closing winch, the trolley driving winch are mounted on own girder frames.

The main girders and the hoisting boom are made as double box girder. The hoisting boom allows for movement through 4 slide bearings. The trolley rails are mounted on an elastic foundation with a steel insert.

The top belt of the main girder is constructed as a safety fence across the whole length. Access is possible by a personal elevator and emergency ladder. The personal elevator is mounted on one of the pillars on the landward side.

Direct access to the operator's cab is possible through a passable platform.

A ladder to access the auxiliary tower is on the second girder.

A service elevator can be lowered to the ground of individual part of the towing mechanisms, the hoisting grab mechanism, as well as the driving trolley mechanism.

The operator cab for the towing mechanism is mounted on the middle portal connection on the seaward side.

The crane has bumpers on four corners.

b. trolley frames

The trolley frames are manufactured from welded steel sheet and made from a driving mechanism frame with roller girders for treadmill wheel bearings and a console for redirecting of ropes (with rope protection).

c. operator's cab

The operator's cab is made as air-conditioned self-propelled gondola with perfect visibility. All functions of the unloader are operated from the cab, excluding the hoisting mechanisms that can be operated from a separate control cabin. The driving crane mechanisms is operated from here.

d. gantry driving mechanism

The crane drives on treadmill wheels from steel casting which has roller bearings and a wheel wrath. The treadmill wheels are placed in the balancer with the aid of a beam. Driving wheels are driven by a reducer.

e. protection against windstorm

Track-claws are on each portal side and on the landward anchoring side as a protection against windstorms.

Track-claws have string operation and are hydraulically opened. In case of power supply failure, the claws compress automatically.

The anchoring is hydraulic.

f. trolley driving mechanism

The trolley driving mechanism is part of the rope towing system. The trolley winch mechanism, mounted above the hoisting mechanism has the following arrangement:

A one directional electric motor, an elastic clutch with a brake pad, a flat brake on spring pressure and hydraulically operated, a reducer, a movable drum clutch, a rope drum with slotted grooves for rolling and unrolling 4 ropes (2x2) and a drum standing bearing.

2 pieces for the left side and 2 pieces for the right side of a running wire rope which runs through starter pulleys on the roller bearings, mounted at the end of the girder towards the main and auxiliary trolley.

Two ropes are connected through a levelling handle on the main trolley. On the auxiliary trolley, they run through re-directing starter pulleys towards the powered power winch.

Main trolley

The frame from welded profile steel with 4 pieces of treadmill wheels on roller bearings and 4 pieces of starter pulleys for holding and closing ropes; reels for closing ropes are made as calliper reels.

The main trolley and the auxiliary trolley have guiding starter pulleys. Starter pulleys are welded and mounted with roller bearings.

Auxiliary trolley

The frame is from welded profile steel with 4 pieces of treadmill wheels on roller bearings. 2 pieces for redirectional starter pulleys for trolley towing ropes, 1 piece starter pulley for closing and holding ropes, 1 piece starter pulley for compensation rope.

Compensation rope

Only one rope leads from the auxiliary trolley to the main trolley, it is redirected through the starter pulley and leads to the compensation spring shock absorber on the portal on the seaward side of the pillar. It serves for keeping the rope system strained.

The winch for tensioning ropes consists of:

A reducer which was a built-in electro engine and non-slotted drum that is placed on both sides.

The drum is of heavy structure and is mounted with a mechanical block during normal operation.

Main technical information:

Diameter of the drive drum:	1400 mm
Diameter of starter pulley:	1600 mm
Diameter of ropes:	44 mm

g. grab hoisting mechanism

The grab hoisting mechanism is made from double winch mechanism without connections. Each drive unit has a one directional engine that is connected through an elastic clutch and brake with a multilevel front reducer. A flat brake is used for hydraulic braking. Driven end of the gear unit has a moving drum clutch and is connected with a rope drum, mounted on the sheet metal housing. The drum has slotted grooves.

The opposite side of the rope drum is placed in a bronze standing bearing with the assistance of a welded axle. Limit switches are installed on the same side. To replace ropes, drums can be routed independently of each other.

Both closing and bearing ropes lead from these drums down across onto the rope through the re-directional starter pulley towards the auxiliary trolley and from there through the main trolley up to the grab.

Main technical information

Diameter of drum:	1120 mm
Diameter of rope:	36 mm
Diameter of starter pulley:	1250 mm

h. boom hoisting mechanism

The hoisting mechanism drive is driven by an electrical motor with sliding rings and an upgraded brake on a turbulent current that is connected through an elastic clutch with a brake pad with a multi-level reducer. The brake pad operates with an electric hydraulic spring loaded brake plate.

The reducer drive beam is driven by a starter pulley through a movable drum clutch. The second end of the drum is placed in a standing position. The drum is made from a welded steel structure with slotted grooves.

On one of the standing bearings, the drive limit switch is mounted. Safety brakes, made as flat brakes, operate for each rope drum and are controlled by a centrifugal switch. This allows to ensure the boom is held if one of reducer fails.

Two ropes run from the drum through a redirectional starter pulley until the handling with the boom starter pulley. The remaining rope ends are strained by a balancing crossbar.

The handle is held by two movable tension pole. The middle bolt and swiveling points at the ends are equipped with sliding bearings not requiring maintenance. The connection onto the tension beam is made through bolt connection on the portal tower and on the handle.

The lifted handle is held by the hydraulically operated catching hooks on the tower. The hoisting procedure is completely automated while the switch for hoisting is turned on.

i. hopper and collection from hopper

The hopper size must be for 4 full grabs (80 m^3 = 80 t coal). When the maximum filling is reached, the function ‘open grab’ is enabled and the crane operator receives an optical signal. This prevents overloading of the hopper.

The hopper is equipped with a side panels such as anti-dust dispersion protection.

The walls of the hopper are covered with a quality manganese steel of 14 mm in thickness. The angle of the walls is at least 65°. The hopper is equipped with a hopper grate (350 mm x 350 mm). The front side of the hopper is equipped with a movable horizontally mounted flap as protection against falling material. The flap movement is electronically by using the trolley winch.

The removal from the hopper is done through a vibrating feeder and a dividing line. The flow of material is regulated by with a continuous frequency converter. Regulating the vibrating feeder (from/to) is possible from the operator’s cab.

The height level of material can be adjusted by a hydraulically operated latch. The hydraulic aggregate is equipped with a reservoir which allows for closing the latch for 200 mm in case of a power cut or an emergency. This way, overfilling of belt conveyer is prevented during operations.

From the vibrating feeder, the material enters the divider. With the help of a hydraulic latch in the drawer, the material is optionally added to one or the other belt conveyor. The divider under the vibration feeder is on the side of the belt conveyor, which has the centre line at a distance of 4,3 m from the rail on the seaward side, covered with rubber vulcanized ceramic linings, on the side of the conveyor belt, which has the centre line at a distance of 6,6 m from the rail on the sea side by stainless steel sheet.

Within the dosing range, the divider/conveyor belt is lifted and guided over hanging rollers.

j. personal elevator

The elevator is situated on one pillar on the landward side. The personal elevator is for three people.

Technical information:

- Load capacity 240 kg
- Driving speed 30 m/min
- Stations 3 (ground, operator's cab, machinery room)

The elevator is operators from the cab. It can be called from any station. In case of emergency, it has an acoustic signal (horn).

k. auxiliary elevator

This elevator is installed in the machinery room. It is made from flange mounted winch with manual operation and accompanying supporting structure. It must allow for hoisting/lowering of the heaviest element (component) in the machinery room.

I. lubrication

All drive components of crane are made for submerged oil lubrication. Bearings of the gantry driving mechanisms are lubricated with a grease through the central electrical lubrication device. The standing drum bearings in the machinery room are lubricated the same.

All other lubrication points must be lubricated manually with grease dispensers where all other points next to it are centralised. All lubrication points for manual lubrication must be safely accessible.

m. safety devices

The crane must have all prescribed safety devices and labelling boards according to valid European and Slovenian laws.

All passable parts of the crane are mounted with prescribed fences and protected with leg protections.

When the crane is not operational, the treadmill trolley must be positioned between the two portals.

The boom hoisting mechanism is turned on only when the trolley and the operator's cab are between the two portals.

The hoisting mechanism is secured against the breakage of the gear unit with hydraulic safety brakes on each drum.

2.1.2. Anti-dust system

In order to prevent dust dispersion in the hopper during dosing of cargo and on chute locations, the crane is equipped with an anti-dust system.

To limit dust dispersion while emptying a grab in a hopper, there is:

- wind protection wall on the hopper side edges;
- water nozzle (the nozzle is mounted on the wind protection wall and on the hopper, on the vibration feeder and on chute locations above belt conveyors) creating water fog.

When a grab approaches the hopper water showers turn on. They are turned on also for the time when grab drives towards the ship's hole. The duration of showering can be adjusted through the crane controls.

The main components of of anti-dust dispersion device are:

- Pipe installations for all component elements with required valves and connection to the water supply network on the coast (technological partially salt water is used!) through a rolling pipe drum which rolls and unrolls the pipe according to the crane's driving direction. The connection to the technological water is onto a kinete on the seaward side of the operational coast.
- High-pressure pump for creating water fog with all necessary fittings, filtration of technological water, electrical equipment and connection to the crane control.
- Water nozzle on the hopper and chute locations with all accompanying high-pressure fittings.

2.2. Grabs

The crane uses only scissors grabs.

2.3. Anti-corrosion protection

Parts to be supplied must have anti-corrosion protection during the warranty period of at least 8 years.

The steel structure parts - the complete steel structure is given anti corrosion protection according to DIN 55928, part 4, level of removing rust Sa 2.5.

Mechanical equipment.

Mechanical equipment, such as the beam and other parts are coated with protective coating.

Serial parts such as bearings, motors, reducers, etc. are coated with a coating based on anti-corrosive varnishes with corresponding to coatings that are usual in serial production.

Stairways, platforms and girders are hot zinc plated.

2.4. Electrical equipment

2.4.1. High-voltage device

The device is made from 1 drum for medium voltage cable for spiral winding with an idle motor, including a re-directional funnel for two-way disposal of a 320 m long cable, a limit switches, a power consumer and heater in an idle position and a power consumer for communication via optical fibres in the power supply cable itself.

1 medium voltage power cable of 320m in length, for 20 kV with 12 optical fibres, including end caps and couplings.

High-voltage device remains permanently turned on during normal circumstances.

2.4.2. Low-voltage device

The switchboard in the electrical room consists of:

A low-voltage switchgear, an auxiliary drive control, a control and regulation of the main drives. Constructed in closed switchboard cabinets (IP20) with closing doors, made in welded construction and light profiles.

The low voltage device has all the necessary switching, protective and protection elements, as well as control and rectifier units, cabinet heating, sockets, cabinet lighting and, if necessary, a fan with filter. Switching cabinets are fully wired and tested.

The dimensioning of all fuses, switches and lines is carried out with the appropriate rated current of the motors, taking into account the specified duration when switched on and the ambient temperature.

All control leads are made of PVC insulation, with a minimum cross-section of 1.5 mm2, placed in plastic ducts and connected to serial buckles with a 10% reserve. The power connections for the main drives are constructed separately, with wire leads and tubes on wires. Cables are connected from below, with strained load directly on the protection.

Buckles, wires on both sides, equipment and cabinets are marked with plates.

There must be 10 % reserve for subsequent additions.

The device protective system:

Individuals are protected by zeroing or with a protective conductor system so that all devices are connected to multi-pole cables that include an insulated protective conductor. All protective conductors are connected to the protective conductor in the feed box.

Each drive must be suitably protected (thermal, current, voltage).

Power supply in emergency:

In the event of power failure, a socket 3 x 400V, 50Hz for heating, lighting, auxiliary lift and 230V sockets are installed on the foot of the crane.

2.4.3. Drives

2.4.3.1. Hoisting and closing mechanism

2 piece one directional parallel winding engine, compensated insulation class F, with heating in an idle position, a resistance sensor for warning and shut-off, a ventilator, a filter and a filter protection.

- Rated power 450 kW
- Operating method S5 - 80% ED
- Rated speed 1200 min-1
- Torque transfer relationship max/min 1.8
- Implemented form B3
- Protection IP23

2 piece tachodynam and centrifugal mounted switch

2 piece electrohydraulic brake cam

2 piece limit switch on a reducer on an auxiliary current

2 piece pulse for mounting onto a reducer

Driving without beneficial weight from weaker field to 120 % of the rated speed. To limit the highest and the lowest position of the hoisting mechanism, limit switch is mounted on the reducer. The limit switch runs through the hoisting mechanism and controls the closing mechanism via an electrical differential. Pre-switch off is fixed for hoisting and set according to the ship's depth by the operator.

Two further contact contacts of this gearbox limit switch are for the final emergency switch off. Closing mechanism has its own reducer limit switch for the final emergency switch off. The emergency switch-off operates directly on the low-voltage power switch.

2.4.3.2. Trolley driving mechanism

1 piece of one directional parallel winding engine, compensated, insulation class F.

1 piece of mounted tachodynam

1 piece of hydraulic brake cam

1 piece impulse

The engine with heating in an idle position, a resistance sensor for warning and shut-off

- Rated power 250 kW
- Operating method S5 - 60% ED
- Rated speed 1200min-1-1
- Torque transfer relationship max/min 2
- Protection IP23
- Implemented form B3

2 manual limit switches as an emergency stop switch. The final operation switch-off is operated through the reducer limit switch on the drum drive. A situation when the trolley is before or after the point of pivot handles is registered. This criteria is needed for lowering the hoisting mechanism handle. The levellers for final switch-off are driven by hoists; the bridge only has sensors and manual switches.

2.4.3.3. Gantry driving mechanism

A frequency converter (8 - 50 Hz), with support current regulation, 14 engines with short-circuit rotors, each of 14kW, S3 - 40% ED, 1470 min-1, V1, IP54, with a built-in flat brake, resistance sensors and heating in an idle position. While the mechanism is operating, gantry driving has 2 interval sirens and 4 flashing lights for approach. Separate additional operation with 10 % of maximum speed is possible through the local control point on the foot of the portal.

2.4.3.4. Hoisting mechanism

1 piece engine with sliding rings with a mounted torque curve and controls of rotor resistors

1 piece mounted tachodynam

1 piece centrifugal switch on the drum bearing

1 piece electrical hydraulic brake cam

1 piece reducer limit switch

2 piece safety hydraulically operated brake plate on the drum

2 piece hydraulic-hydraulic cam for the catching hooks drive with a limit switch for an automatic hoisting/lowering of the catching hooks. The limit switch for different protection of temperature resistance warning sensor and shut-off, heating in an idle position.

- Insulation class: F
- Rated power 110 kW
- Operating method S1 - 10% ED
- Rated speed: 1000 min-1
- Type of construction: B3
- Protection IP54

2.4.4. Crane control

Control is manual by using an expert switches in the operator's cab which is passably mounted on the main girder to allow for unobstructed view of the ship's hole.

The control can be manual, semi-automatic or automatic.

Semi-automatic means that the operator drives the manual grab only through the ship's hole.

When the grab lifts from the ship, it is programmed to drive until the hopper, emptied, and driven back through the ship's hole where it is again taken over by the operator by the expert switch.

A semi-automatic and automatic operating system operates according to input parameters in the control panel by the operator. Working movements of the crane can be freely and frequently repeated until there are changes to external conditions which require re-optimisation of input parameters.

Freely programmable control for connecting all control functions, to report obstacles, protection of overloading the mechanism, opening of a grab, driving the trolley, gantry driving, boom hoisting mechanism, safety technical connections are connected to the PLC and shown on the operator's panel in the operator's cab and in the electrical room.

The complete control leads are placed in cabinets in plastic channels and are connected onto a batten with serial buckles.

2.4.4.1 Devices in the operator's cab

- An ergonomic seat for the crane operator, revolving + - 45 °, with boomrests and adjustable backrest.
- An operator panel for showing and changing all crane parameters.
- A monitor for showing live pictures from cameras mounted on the lower portal beam
- Operating the hoisting rods and grab closing, the trolley driving and the portal driving
- warning and showing the hopper overload
- lights 230 V, sockets
- an external warning device with a noise warning
- a portable hand held flashlight with charger
- sensor for emergency shut-off
- various sensors, switches and signal lights
- speaking device - UHF radiation station programmed according to the terminal frequency
- air conditioning device for heating and cooling
- windscreen wipers with a washing device
- a fire extinguisher
- a device for showing wind speed, weight load on ropes and the flow of material on the transporter belt onto which the crane moves a cargo
- an auto-radio with speakers
- an electrical cab heater
- panels for glass surfaces (sun glare)
- heat and sound insulation
- 2 piece reflectors on the cab passage pointed towards the ship's hole
- A cab's floor under the seat is made from processed glass.

2.4.4.2 Control cab mechanism for hoisting the boom

The operator's cab with a control panel for standing control with for manual control mechanism devices for boom hoisting and the mechanism for gantry driving as well as a boom hoisting position display.

- Heating device
- Ventilator

2.4.4.3 Operating mechanism methods for hoisting and closing

- **Normal**
  Normal machinery operation. Trolley driving operates with full speed across the boom and back to the end of the hopper. Hoisting/lowering operates until the top set height (at least around 3 m) at a full speed. Closing and opening of the grab operates at full speed.

- **Special**
  Special machinery operation. Trolley driving operates at low speed across the boom and back (almost back to the bumpers) Hoisting/lowering operates until the top set height (at least around 3 m) at a low speed. Closing and opening of the grab operates at a low speed.

  This method of operation is intended for parking a grab onto a position above the road.

- **Settings**
  Setting the machinery operation. Trolley driving operates at low speed across the boom and back (almost back to the bumpers) Hoisting/lowering operates until the top set height (at least around 3 m) at a low speed. Closing and opening of the grab operates at a low speed without restrictions; grab closed or opened.

  This method of operation is intended for setting the grab position as open or closed.

- **Hook**
  Hook machinery operation. Trolley driving operates at low speed across the boom and back (almost back to the bumpers) Hoisting/lowering operates until the top set height (at least around 3 m) at a low speed. Closing and opening of the grab is switched off. This method of operation is intended for hoisting the load without operating closingropes.

2.4.4.4 Boom hoisting mechanism

Turning on the mechanism for the hoisting boom is from the cab for operating the mechanism or by locally turning it on in the machinery room - crane mechanism.

After turning on the boom release, the brake disk opens first and allows for operating the boom movement. The boom slowly starts hoisting until the final top position. The hook which is released during the opening of the boom is lifted once the boom is in its top position. The hook is lifted until the boom is completely released. The boom is slowly released from the top position, then it moves fast and just before the lower position its movement is slow again until is in its final bottom position.

After turning on the boom lift, the brake disk opens first and allows for operating the boom movement. The boom slowly starts hoisting, then it moves fast and just before the position its movement is slow again until it is in its final top position. The hook which is lifted while the boom is hoisting releases once the boom reaches its top position. The boom then releases for a few seconds until steel ropes are released and the boom catches by the hook.

The position of suitable limit switches is shown on the control panel.

The function ‘one-before last top position, ‘one-before last bottom position’ are reached by using a limit switch with a reducer.

Boom limit switch performs the position ‘final position above’ and ‘emergency switch-off below’.

When hoisting the boom, the resting reflectors turn off and the warning light for the overflows turn on. The trolley driving is blocked at the same time.

2.4.5 Auxiliary devices

2.4.5.1 Mechanism for driving operator's cab

2 short-circuit motors with a movable rotor brake of 0.8 kW, a starting resistor which is bridged after turned on

6 manual limit switches for restricting driving paths

1 manual limit switch for protecting the manually switched on windstorm brake

1 manual limit switch on passage doors to access the cab in its parking position. The function of a switch is to provide the condition for driving the cab from the parking position when the doors on the platform are physically closed (preventing the fall of the controller into depth).

The device for towing the cab is for 42 m rail track with cable trolleys.

The cabinet with buckles and treadmill rails.

2.4.5.2 Hopper

2.4.5.3 Personal elevator

2.4.5.4 Auxiliary elevator

2.4.5.5 Trolley for hoisting and lowering the hopper platform

2.4.5.6 Rail claws

2 hydraulic rail claws with a hydraulic pump, each with 2 limit switches for a final position. Rail claws are hydraulically automatically opened when the main switch is switched on (low voltage power switch, switch-on in the operator's cab) and closed when the power is turned off or there is a power out.

2.4.5.7 Local operating position

Various local operating positions, IP65 for manual control of individual drives.

2.4.5.8 Protection against overload

The crane must be equipped with a protection against overload in accordance with valid European and Slovenian laws.

When protection is operational, the grab can be only released and opened. There is a visual and acoustic signal in the operator's cab.

2.4.5.9. Speaker devices

The crane has a build in UHF radio station in the operator's cab, programmed for frequency used at the bulk terminal in the Port of Koper.

2.4.5.10. Device for preventing collusion

The device for preventing collusion between the crane and other cranes or obstacles on the crane rails.

2.4.5.11. Lubrication device

2.4.5.12. Ventilators with filters

2.4.5.13. Windstorm brake

2 pieces with a hydraulic operation, a protection via the limit switch located on both sides of the rail on the landward side, compatible with existing anchor points on the operative quay.

2.4.5.14 Lighting, sockets and emergency switch off

The lighting, sockets and emergency switch-off must be made in accordance with the European and Slovenian laws and regulations.

Reflectors for lighting ships, hoppers and the surrounding area of the crane. The lighting on passable crane areas, safety lighting, etc.

2.4.6. Fire protection

Portable fire extinguishers for both cabins (operators cab and cabin for boom hoisting), machinery room, E-room. Routes in the event of a fire are marked with plates. The operator's cab must have an emergency exit on the boom of the crane from any position on the cabin on the boom.

2.4.7. Placement for operation

- Prior testing of all the crane's functions are made by the supplier.
- The final installation for operation on the operative quay of the bulk cargo terminal in the Port of Koper, including all testing and obtaining the operating permit by the authorised State authority in Slovenia.
- Training of operators and maintenance staff during the final installation for operation and the acceptance by the buyer.

3. DOCUMENTATION IN CASE OF OREDER

The documentation is given in 4 identical copies and in 1 digital copy on an USB key, in Slovenian and English.

When the procurement is awarded, the seller shall deliver to the Contracting Authority the following documentation:

3.1. For the machinery equipment

- transparent drawings of the whole crane, the main cornerstones, auxiliary cornerstones as well as plans consumable parts.
- factory acceptance records
- factory statements under DIN 50049-2.2 of girder structure parts
- operating and maintenance instructions in Slovenian
- catalogue of spare parts
- static calculation

3.2. For electrical equipment

- documentation for obtaining operating permit
- datasheets
- list with instructions
- connecting plan for buckles
- cable plan
- disposition plans for cabinets
- list of devices
- operating and maintenance instructions in Slovenian

Corrected documentation with changes made during installation for operation; to be delivered in 2 months after installation for operation.

4. EXCLUSIONS FROM THE SCOPE OF SUPPLY AND SERVICE

The crane must be functional when installed onto the location. All costs are on the seller.