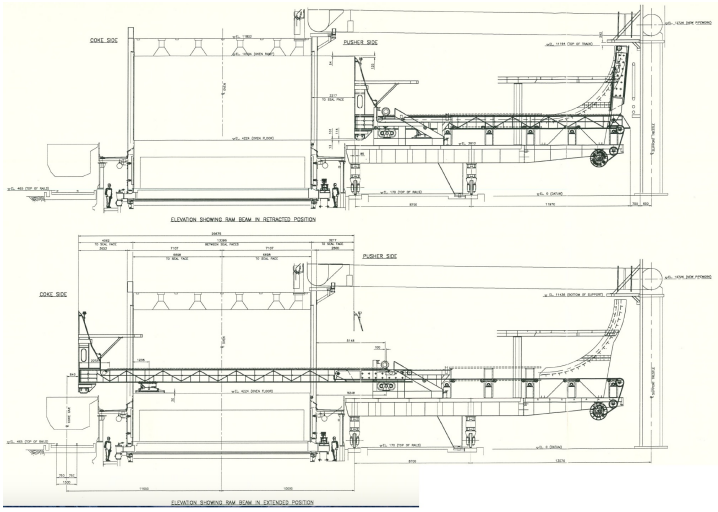
Kocks Goliath Crane



Listing ID - 1473

Description **Crane**

Product type Heavy Equipment

Usage Varied

The following unloading equipment comprises one bridge type ship unloader working with a self propelled grab trolley with grab slewing device.

The unloader will be able to charge the unloaded material onto the pier-conveyor. The unloader will be electrically driven on a rail system. The maximum wheel load will not exceed 627.85kN, spaced 1100/1650 mm during operating conditions

Handled Material
Material / Bulk Density
Iron Ore Pellets: 1.9 – 2.2 t/m3
Coal: 0.8 – 0.9 t/m3
Coal Coke: 0.5 – 0.65 t/m3
I.O. Additives: 2.0 – 2.6 t/m3

Ships to be unloaded
Following data are showing the different sea-going ships which the unloader will be able to serve

Ship Type (dwt) 72,000
Length: 245m
Width: 32.2m
Depth: 19.6m
Max Draft: 14.0m
Max Draft (lightered)
Draft Unloaded: 4.6m
Holds Nos.: 7
Length: 19m
Width: 15.5m

Ship Type (dwt) 130,000
Length: 280m
Width: 42m
Depth:22.2m
Max Draft:17.2m
Max Draft (lightered): 12.5m
Draft Unloaded: 5m
Holds Nos.: 9
Length: 14.4m
Width: 17.6m

Ship Type (dwt) 115,000
Length: 270m
Width: 43m
Depth: 20.2m
Max Draft:14.5m
Max Draft (lightered): 12.5m
Draft Unloaded: 4.6m
Holds Nos.: 8
Length: 20m
Width: 21m

Local Situation
The shipunloader will be installed at the bulk terminal of Lucchini Steel at Piombino Italy

Levels and Tides
Essential data for the unloaders outlay and the evaluation of its unloading capacity are the levels of pier and conveyors as well as the water level and its variations. All levels are measured against a calculative zero.

Mean Water Level: +0.00m
Railhead Level: +4.81m
Conveyor Level: +6.00m

Climatic Data
According to the situation of the pier the unloader has to work all over the year in a wet atmosphere together with a certain portion of salt to be considered due to the near of the ocean

The prevailing wind direction is assumed to be mainly in direction parallel to the crane rails.

The unloader is prepared for operating during wind velocities up to 20m/s. Max Wind Speed for Crane travelling to locking point up to 27 m/s. The max wind speed for the design of the rail clamps will be 35.8m/s. Maximum design wind is 42 m/s

All equipment of the unloader will be able to withstand temperatures in between -5 degree Celsius and 40 degrees Celsius as well as relative humidity up to 100%

Layout and Dimensioning
Taking into consideration all the above given data the shipunloader is designed for the calculative free digging capacity 1,800 t/h according to the following prescriptions:

Specific Gravity: (see cycle diagram)
Grabbing Point: at mean water level and centerline of ship
Discharge Point: One meter above hopper on its centerline
Ship Type: 72,000 DWT
Berthing Side: Sea side
Ship's Draught: Half Filled at mean water level

Base for Design and Calculation (Krane and Hebezeuge)

For the steel structure
FEM 1.001, 1987, group U9-Q4 = A8 considering chapter 2.1.4
FEM "Guidelines for the Choice of Steel Qualities", edition of October 1974
DAST-Guideline 012: Buckling Resistance Analyses for Plates
An unobjectionable runway in accordance with the FEM code "Tolerances of Cranes and Runways" is prerequisite. Intolerable deviations will originate special actions

For the mechanical equipment (excluding wire ropes)
FEM 1.001, 1987 and the most up-to-date knowledge the field of mechanical engineering

Classification
Hoisting Gear: T9 – L4 = M8
Closing Gear: T9 – L4 = M8
Trolley Travel Gear: T9 – L4 = M8
Boom Hoist Gear: T4 – L3 = M5
Crane Travel Gear: T8 – L3 = M8
Conveyor: T8 – L3 = M8

For Ropes
Safety factor against minimum breaking load will be at least

- 4.5 for boom hoisting
- 7 for grab operations

For accidental prevention
The applicable local regulations

Technical Design Data of Structural and Mechanical Equipment
Unloading Capacity
Lifting Capacity on the ropes: 45t

Maximum Capacity (Cream Digging or Peak Digging): 2,000 t/h
Rated Capacity (Free Digging): 1,800 t/h
Practical Average Capacity: 1,200 t/h

For reference weight of bulk material as per specification
Iron Ore Pellets: 2.05 t/m3
Coal: 0.85 t/m3

Dimensions
Gauge (distance between rail centres): 18.5m
Length over buffers: 30m
Max outreach from Waterside rail: 34m
Max outreach from landside rail: -2.0m
Lifting Height above rail: 21m
Lifting Height below rail: 19m
Total Lifting Range max: 40m
Total Practival Runway: approx. 350m

Wire Ropes
Grab operating rope diameter: 38mm
Boom Hoist Diameter: 38mm

Rails, Wheels, Corner Loads:
Rail Waterside: A 100
Rail Landside: A 100
Headwidth of Rail: 100 mm
Wheels (double flanged) waterside: 2x 10
Wheels (double flanged) landside: 2x6
Wheel Diameter: 900mm
Drives 2x 5 at waterside on 2x5 wheels
Drives 2x 3 at landside on 2x3 wheels

Max Corner Loads
In operation with wind 21.9m/s on broadside, boom down grab max outreach
On landside: approx. 242t
On Waterside: approx. 414t

Rail Brakes
Automatic Rail Brakes (push down type)
Holding Force Waterside approx.: 4 pcs, 130 kN each
Holding Force Landside approx.: 2 pcs, 130 kN each

Receiving Hopper
Extract Conveyor: apron feeder
Variable output: 300 to 2500 t/h
Hopper opening level above top of rail approx.: 12m
Struck Hopper Volume approx.: 110 m3
Hopper Opening approx.: 9x9m
Limited Hopper Contents approx. 180t
Environmental Protection

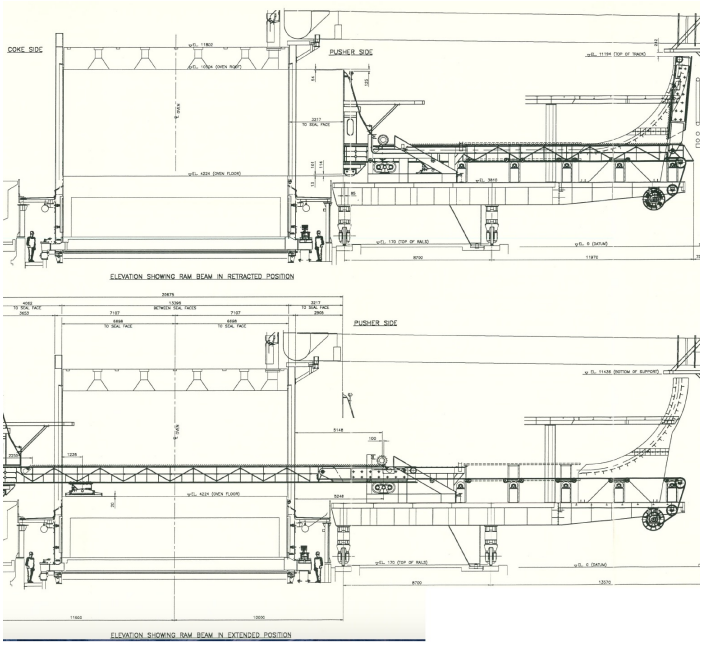
Max Noise emission in 100m distance approx. 75 dB(A)

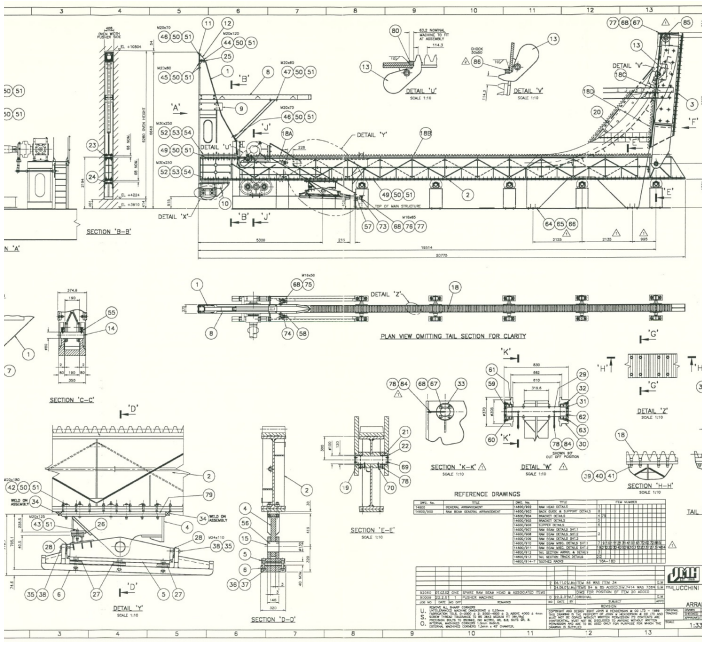
Operating Speeds
Lifting / Lowering: 120 / 150 m/min
Closing / Opening: 100 / 150 m/min
Trolley Travelling: 180 m/min
Crane Travelling: 25 m/min
Boom Hoisting / Lowering (in approx.):7 min each direction
Cab Travelling: 20 m/min
Grab Slewing (90 degrees): 20 sec

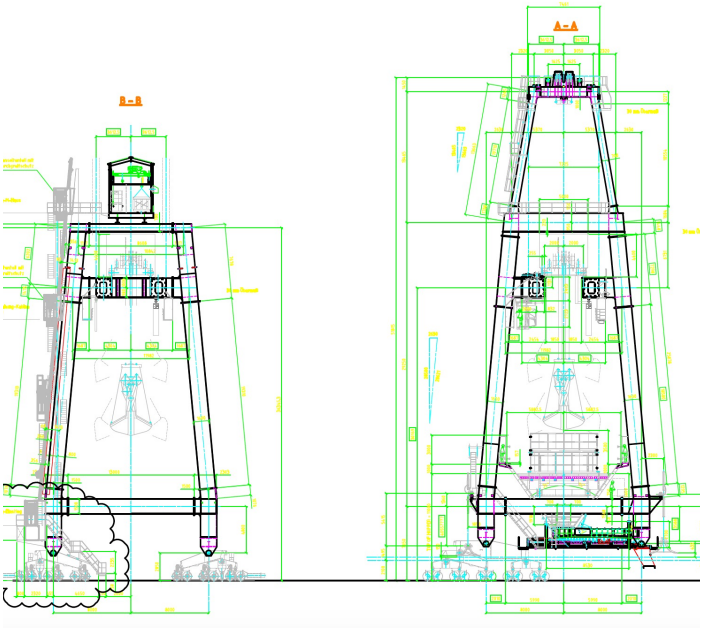
Accelerations
Hoisting / Lowering Full Grab approx.: 2.5 s
Closing approx.: 2.1 s
Hoisting / Lowering empty grab approx.: 3.2 s
Opening approx.: 3.2 s
Trolley Travelling approx.: 6.0 s
Gantry Travel Against 50% OWL approx.: 3.0 s
Gantry Travel against 100% OWL: approx. 4.2 s

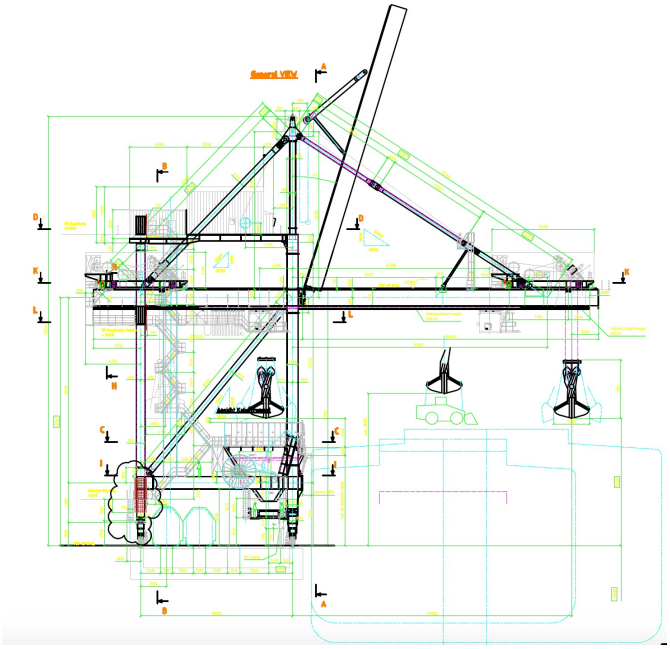
Total Weight
Ship unloader including counter weight and grab, excluding loads approx.. 1040t

Remark
All technical design data not to be directly derived from the physical properties of the pier will be subject to final design
The supplier will optimize the speeds and dimensions of the unloader with respect their partition in the whole crane's function and in determining the unloading capacity.
The same idea is followed in designing all components and the pertaining handling equipment
This allowance is based upon the understanding that the contracted free digging capacity itself will be guaranteed.

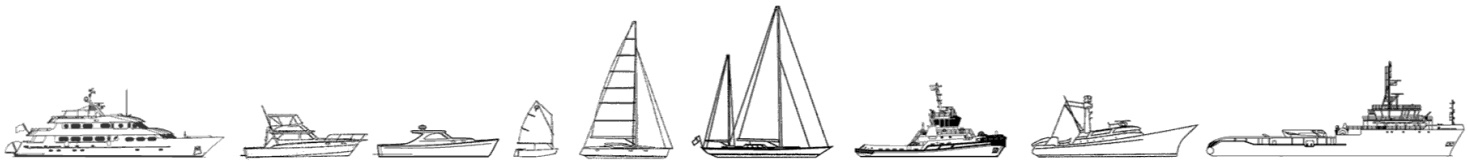








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