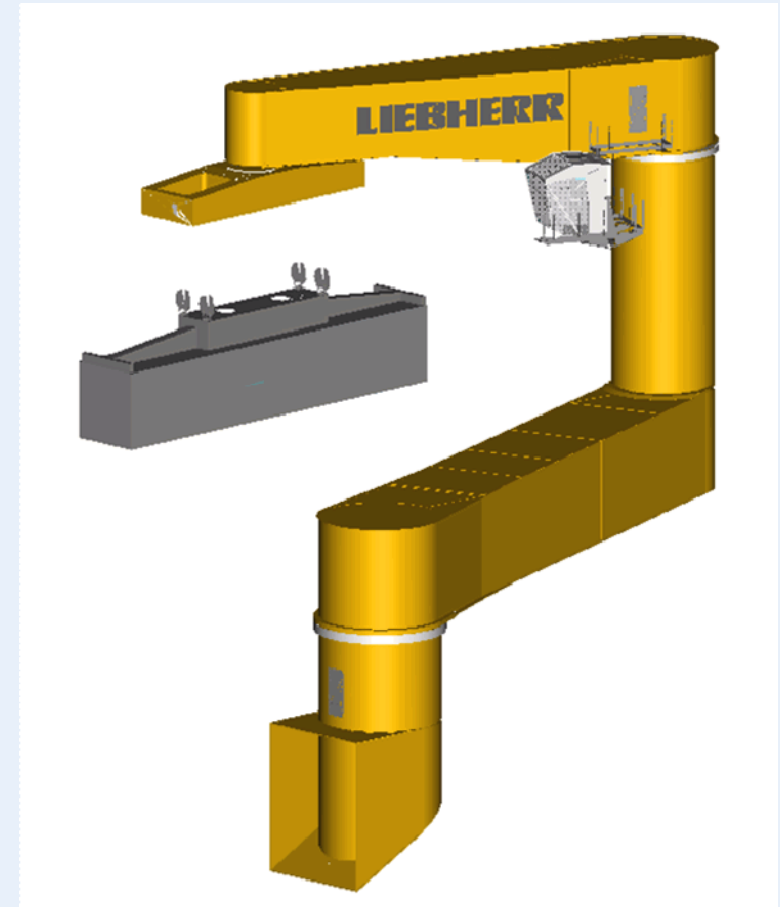


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MPC

The Double Girder Crane for efficient Container Handling

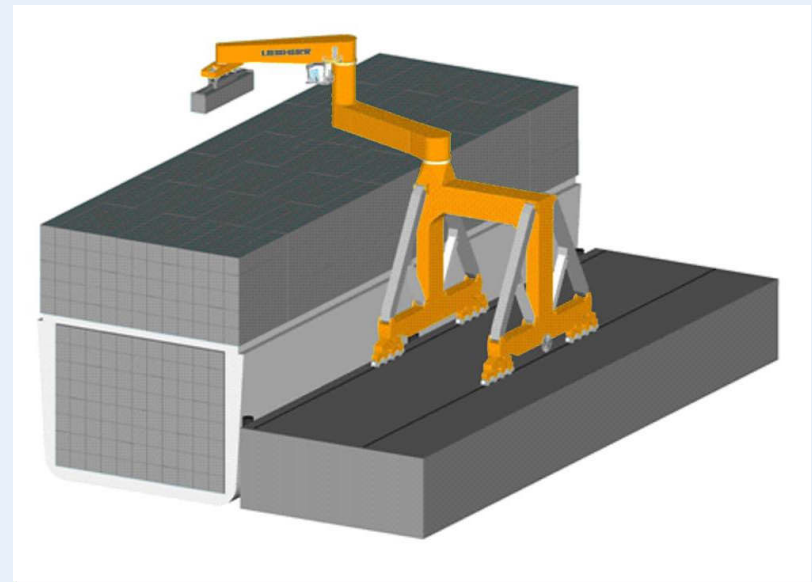
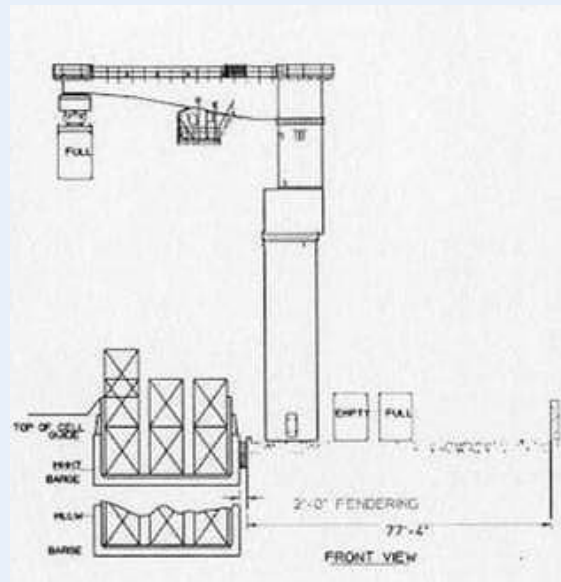


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Liebherr Port Equipment: MPC combined with

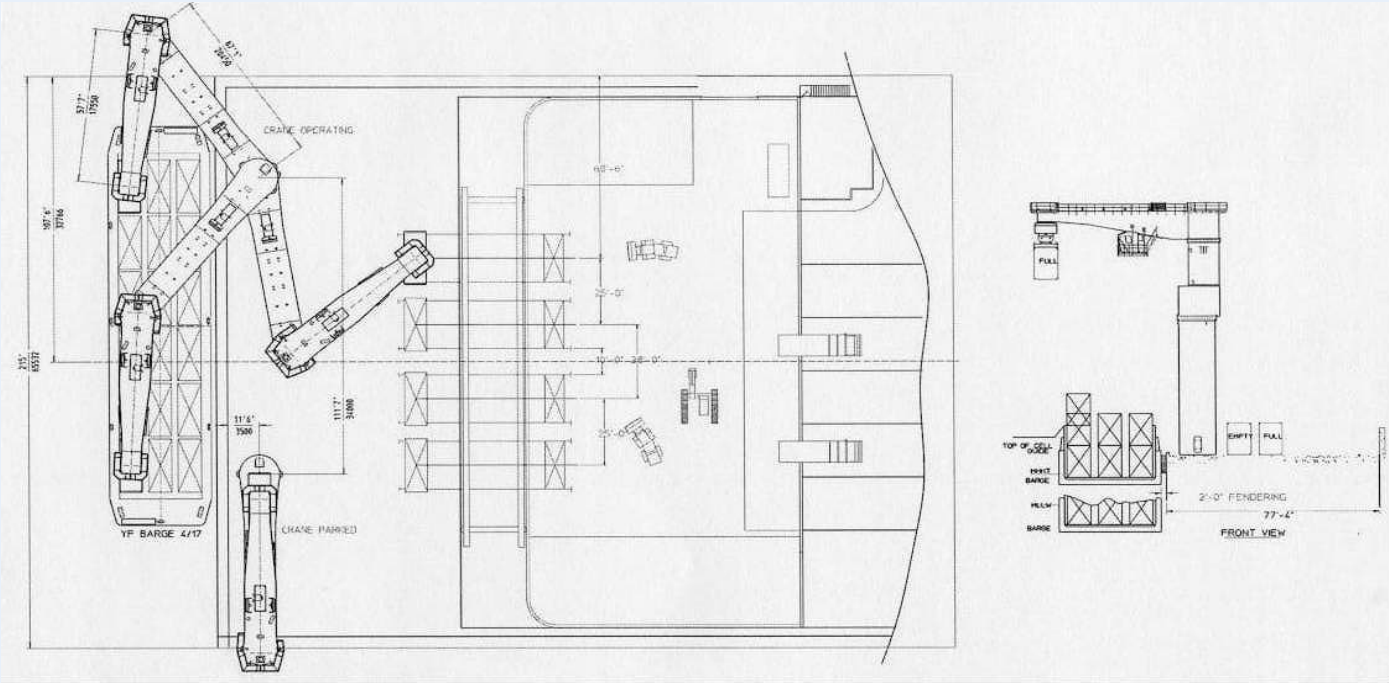
- FCC (fixed on a pedestal adapter) or
- TCC (travelling on gantry)



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MPC on fixed Installation

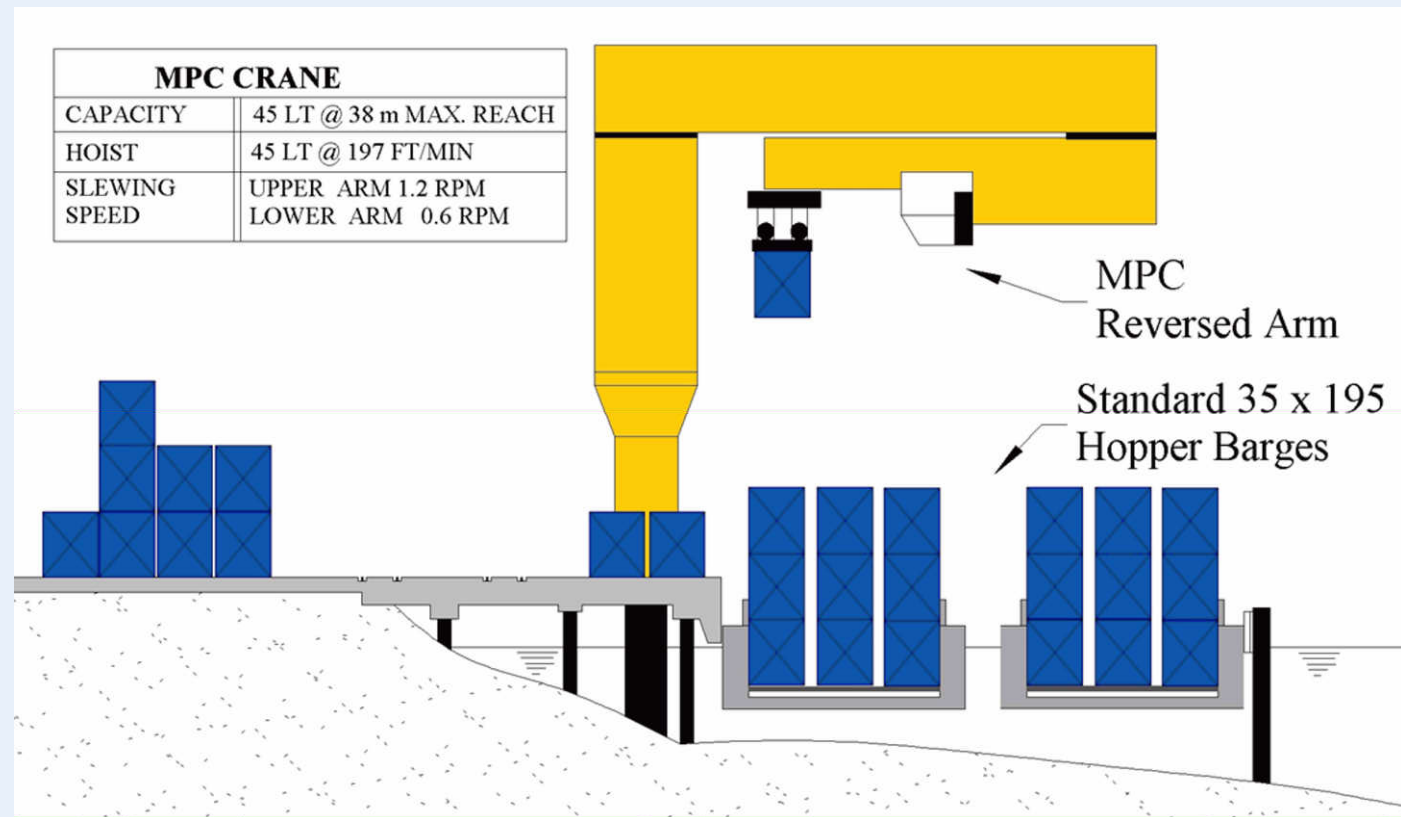


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MPC on Fixed Installation

The Double Girder Crane for fast container handling from barges.

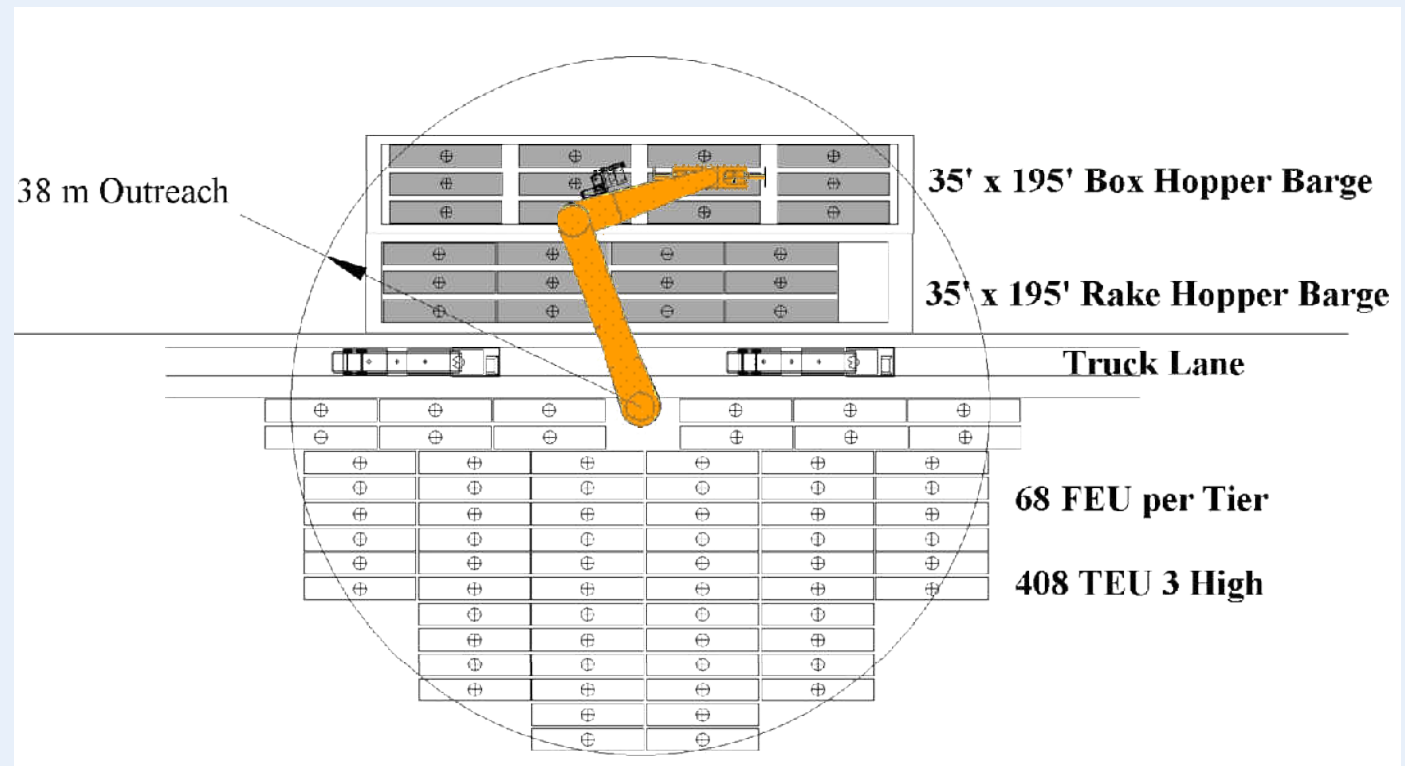


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MPC on fixed Installation:

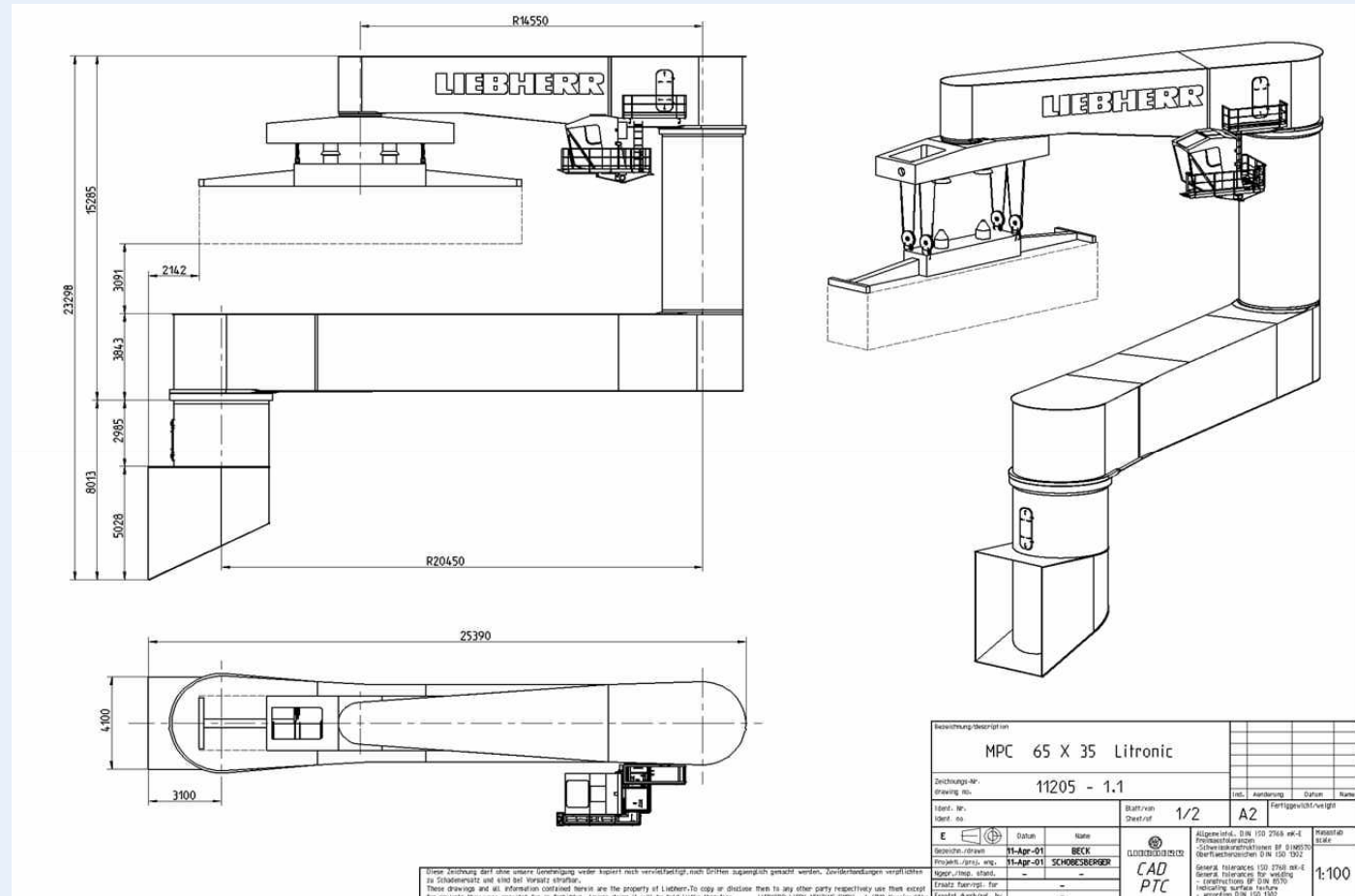
For Inland COB Facilities.



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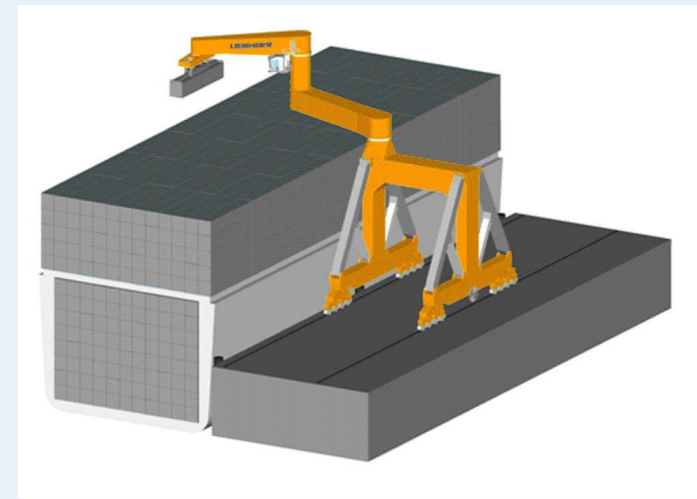
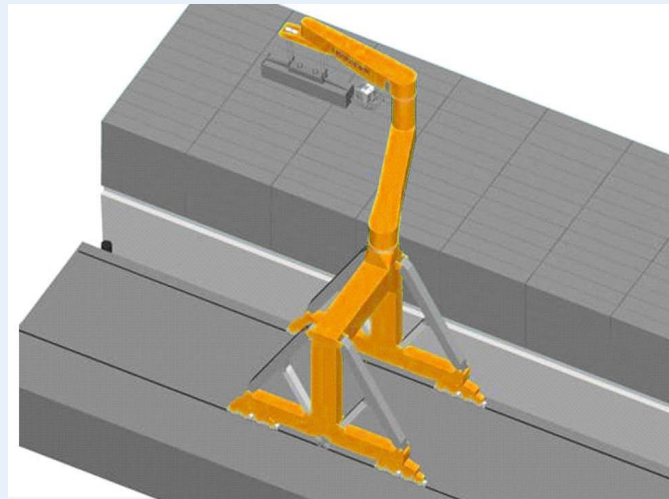
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MPC double girder crane on travelling gantry for loading and unloading of Panamax vessels (13 container rows) – min. rail span 20 m

Capacity 45t at 38 m



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Comparison MPC versus conventional Gantry Crane

1. Maintenance and Wear & Tear costs:

due to the simplicity of the MPC the following parts are not needed to be maintained:

- no rails on gantry

- no wheels on the trolley

- no travel gear for the trolley

- no cable trolley on the gantry for the trolley movement

- no sheaves and wires for trolley travelling

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All the above components are substituted by slew bearings and slewing gears which are very robust and simple in design by requiring a minimum of maintenance (built in automatic greasing system)

All major components of the MPC crane are inside the crane and therefore well protected against the environmental influences;

The simple box construction of the MPC allows easy paint repair;

The MPC type crane is equipped with a modem which checks remote system and finds faults without the presence of a service engineer;

The MPC crane has a LITRONIC control system including detailed fault finding indications;

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2. Spare Parts costs:

With the use of an electro-hydraulic system the MPC crane will have significantly reduced spare parts costs; e.g. a hydraulic motor will be at least two times cheaper than an electric one

Thyristor or frequency control systems are generally sophisticated and expensive parts and have to be maintained or repaired by specialists

Due to the aforementioned points of reduced maintenance work the costs for parts and labour will be also reduced

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3. Crane Operation

With the MPC crane a flexible operation is possible, i.e. free positioning of containers on the pier and on the vessels; with the gantry crane only a specific container line (bay) can be handled unless the crane driver moves the whole gantry onto another container bay which is quite time consuming

The MPC crane is equipped with a semi automatic control system; i.e. the crane driver only needs to pre-select the start end ending point and the crane then automatically performs the positioning of the spreader only hoisting and lowering has to be done manually

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During a storm the MPC type crane can easily and very fast be parked using a hydraulically operated parking bolt and can in this condition withstand wind speeds of up to 65 m/sec

The active anti collision (ACC) system built in the MPC crane can be programmed for fixed obstacles (e.g. houses, walls, the other crane, etc. and the crane will move automatically around them;

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4. Safety:

The LITRONIC semi-automatic crane control allows simple and non-tiring crane operation; this will reduce operating errors and therefore increases safety

The MPC crane is equipped with a active anti collision (AAC) system which is fully tested and approved by a certifying authority; the ACC is fully redundant and will not just stop the crane in case of a possible collision but will automatically direct the crane in a safe area; in case of any failure of this system the crane operation will be stopped immediately

The MPC crane has an internal and such a safe access

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5. Costs:

MPC compared to conventional Gantry Crane has 30 % to 50 % lower investment costs!!

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	Slewing				Duration s		Simultaneous Movements
	Start	End	Start	End			
Closing Spreader	-	3,0			3,0		
Hoisting acc.	3,0	6,0			3,0	26 m	
Hoisting full Container	6,0	29,0			23,0	60 m/min	
Hoisting dec.	29,0	32,0			3,0		
Slewing acc.			17,0	22,0	5,0	120 °	15
Slewing			22,0	37,0	15,0	1 rpm	
Slewing dec.			37,0	42,0	5,0		
Lowering acc.	34,0	37,0			3,0	15 m	8
Lowering full container	37,0	49,0			12,0	60 m/min	
Lowering dec.	49,0	52,0			3,0		
Positioning of full Container	52,0	60,0			8,0		
Opening Spreader	60,0	63,0			3,0		
Hoisting acc.	63,0	66,0			3,0	15 m	
Hoisting without Container	66,0	73,0			7,0	90 m/min	
Hoisting dec.	73,0	76,0			3,0		
Slewing acc.			61,0	66,0	5,0	120 °	15
Slewing			66,0	81,0	15,0	1 rpm	
Slewing dec.			81,0	86,0	5,0		
Lowering acc.	73,0	76,0			3,0	26 m	13
Lowering without container	76,0	90,3			14,3	90 m/min	
Lowering dec.	90,3	93,3			3,0		
Positioning to full Container	93,3	101,3			8,0		
Number of full Containers					35,5 per hour		
Cycle time					101,3 s		

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Technical Parameter

Capacity:	in container operation	45,0 metric tonnes SWL (also higher capacity available)
Outreach:		38,0 m
Arm length:	main rotating arm spreader rotating arm	20,45 m 17,55 m
Max. hoisting height		34 m
Weight of crane (excl. spreader)		approx. 210 t
Weight of pedestal adaptor	height 3,0 m	approx. 20 t
Ambient temperature		-10 deg. to +45 deg. C
Max. dynamic overturning moment		approx. 58000 kNm
Max. dynamic vertical load		approx. -2700 kN

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Operating Speeds

Hoisting / Lowering

- 100 percent infinitely variable speed control from zero to maximum speed Electronic
- controlled acceleration and deceleration (adjustable), in order to avoid shocks to load and crane and to enable smoother speed control
- automatic power output regulator

0 - 90 m/min with empty spreader
0 - 60 m/min with 45 t SWL (40' container)

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LIEBHERR MPC

Slewing

- 100 percent infinitely variable speed control from zero to maximum speed Electronic
- Controlled acceleration and deceleration (adjustable), in order to avoid shocks to load and crane and to enable smoother speed control

slewing speed:

main arm: 0,5 rpm
container arm: 1,0 rpm

Main and spreader arm slewing range:

360 deg. continuous

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Drive System

Drive system	electro-hydraulic
Prime mover:	
- nominal output	4 electric squirrel cage motors 2 x 230 kW, S1 2 x 95 kW, S1
- class of protection	IP 54/55
- class of insulation	F
- starting	star delta
- make	ABB or equal
Main power supply	440 V, 60 Hz, 3 ph.
Aux. power supply	220 V, 60 Hz, 3 ph.
Power transmission	via slipring collectors

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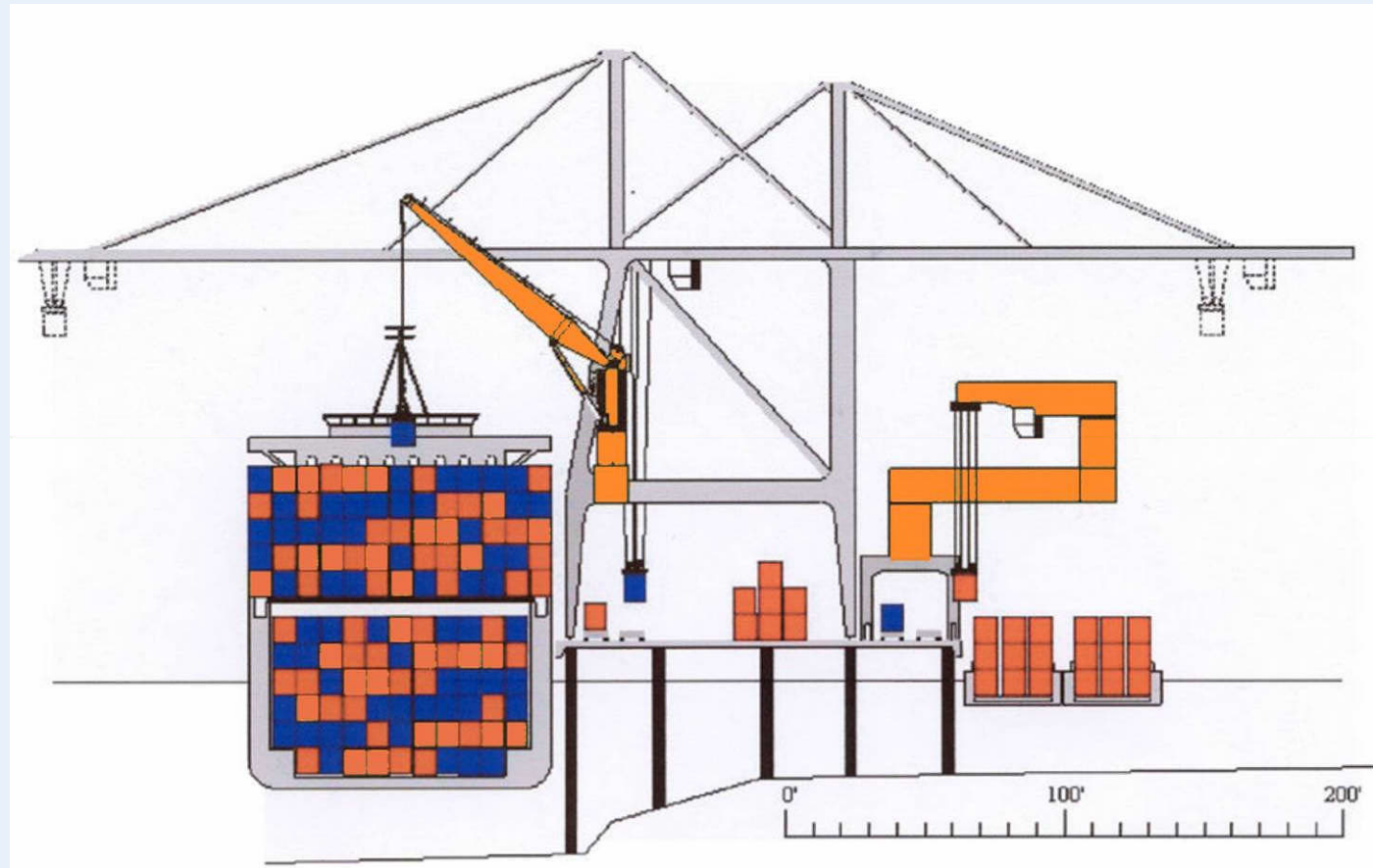
Seapoint Millenium 2000 Port USA



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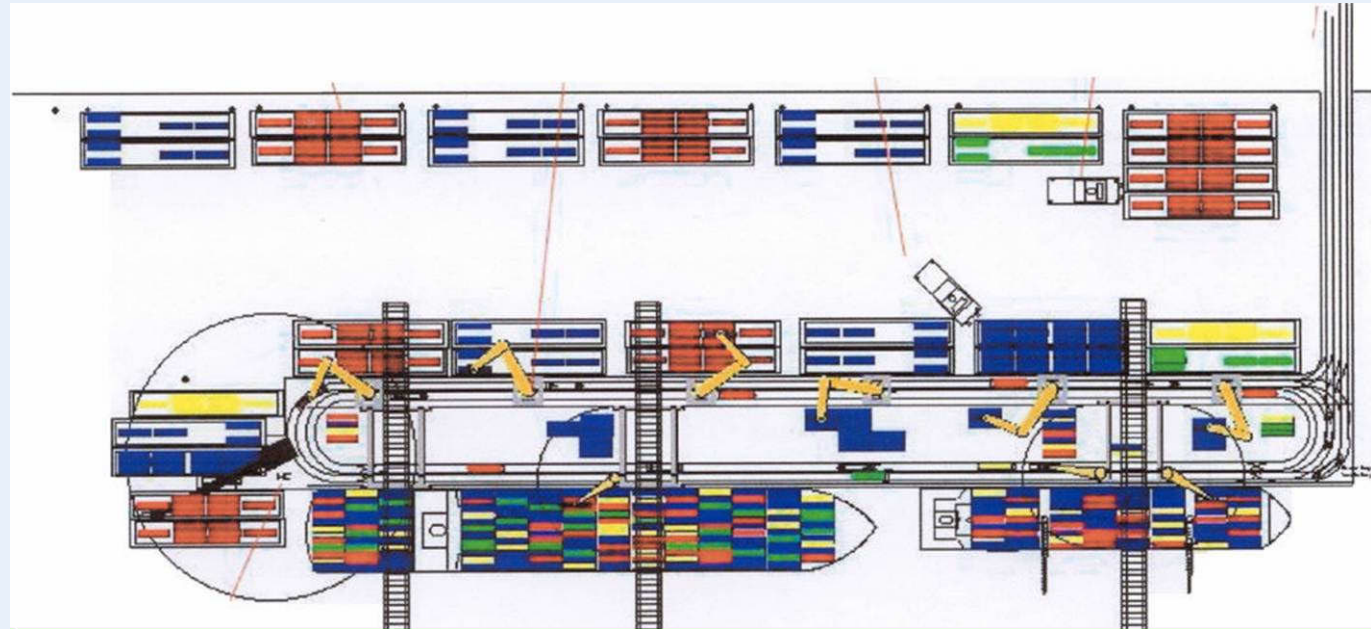
Seapoint Millenium 2000 Port USA



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Reference Letter:

Seapoint Project Millenium Port

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September 2, 2003

To Whom It May Concern

Dear Sir or Madam:

Today I learned from Thomas Nesler that you are considering several devices including a Liebherr MPC crane for a barge loading operation. From the brief description Thomas gave me it appears to me that your barge operation is similar to Sea Point's in many respects. I can tell you that we have considered many devices for our container on barge operation including small gantries, bridge cranes and jib cranes. To date, none of these devices compare to the robust construction, simplicity and speed of the MPC cranes. In our search we have worked with many different equipment vendors. None of them can match Liebherr's product diversity and engineering capacity. Liebherr has provided solutions for Sea Point.

Please accept my unqualified and enthusiastic recommendation for Liebherr, their products and most importantly the depth and quality of Liebherr's people.

Sincerely,

Bob Amoss

· World Trade Center · 2 Canal Street, Suite 2344 · New Orleans, LA 70130
· Tel.: (504) 523 0019 · Fax: (504) 523 0950
· E mail: rsamoss@portsolutions.net · Web: <http://www.portsolutions.net>

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High Speed with Litronic CAN BUS Control

Electro-Hydraulic Driven

Cranes for Marine Application

Load Cycles 30-35/h

The right crane for low budgets compared to conventional gantry container cranes

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