Steensby Inlet Marine Structures

Freight Dock – Design Criteria

Mary River Project

21-Nov-2011	E	Approved for Use-FEL3 Report	V. Lake	R. MacCrimmon	S. Perry	
09-Nov-2011	D	Approved for Use-Environmental Permit	K. Skebo	R. MacCrimmon	J. Casson	
22-Sept-2011	C	Client / Internal Review	K. Skebo	R. MacCrimmon	J. Casson	
07-Sept-2011	B	Client / Internal Review	K. Skebo	R. MacCrimmon	J. Casson	
05-Aug-2011	A	Internal Review	K. Skebo	R. MacCrimmon	J. Casson	
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**APPROVED BY**
			HATCH			**CLIENT**

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1. Introduction

Baffinland Iron Mines (BIM) plans to ship up to 18 million tonnes of iron ore per year from a new port at Steensby Inlet, Baffin island, Canada. The shipping operation will be year round, using ice breaking ore carriers.

The new port will require a freight dock to support construction and operations over a period of approximately 25 years.

The function of the facility will be to:

- Unload construction materials and equipment during the last three years of the construction of the Mary River Project
- Unload materials and goods for the operations of 25 year life of the Mary River Project
- Unload fuel during the last three years of the construction and the operations of the 25 year plus life of the Mary River Project
- Provide temporary staging for the unloading of materials and goods and for the back haul of empty containers etc.
- Supply the tugs and ice breakers with fuel and goods

On July 27th BIM advised the proposed freight dock location remains in the Baseline (AMEC / Sandwell) Location at N 7 798 800 : E 595 500 – See Figure 1-1.

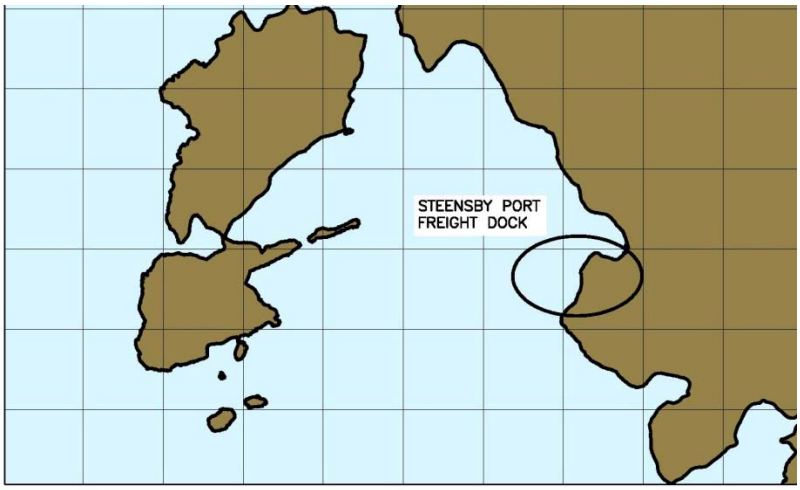

Figure 1-1: Baseline Dock Site Location

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2. Project Objectives

The key objectives for this project are:

- Provide a new freight dock for use by the ice breaking vessels through the winter months
- Provide a freight dock that can service multi-purpose vessels and fuel tankers during the open water season
- Provide designs that are appropriate for challenging Arctic conditions.

At the end of the project life all components of the freight dock except for rock fill must be removable.

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3. Freight Dock Layout

In accordance with decisions from trade off studies, the following parameters have been set:

3.1 Dock Length

The dock face is approximately 100 m and the overall dock length is approximately 120 m. This allows for a ship of up to 200 m long to dock at the facility.

3.2 Dock Width / Storage

Sized adequately to allow for removal of goods and to stage the vessels cargo. Both incoming and back hauling of empty containers.

3.3 Dock Elevation

Pending further study of effects of waves and ice, the surface of the dock will be at Elevation 7.0 m CD (+4.06 Geodetic).

3.4 Water Depth

The minimum water depth is set at 13 m Chart Datum. This allows for a ship with 11.5 m of draft to dock at low tide while keeping a minimum gap under the ship keel.

3.5 Deck Surface

The deck surface will be a concrete deck for a distance of 30 metres behind the wharf face.

The deck surface behind the 30 metre concrete pad will be graded gravels.

3.6 Cranes

The dock will be serviced by track mounted and rubber tired mobile cranes as required.

3.7 Ro-Ro

The ro-ro capabilities will be by properly ballasted barge moored against the dock face.

No facilities for ro-ro ships will be installed.

3.8 Ship Services and Access

- An access road will provide access to the storage area and dock.
- Potable water to tugs will be supplied by mobile tankers.
- Sewage from tugs will be removed by tankers.
- Fire protection lines will not be supplied.
- There will be fuel lines both for supply of the project and refuelling of the tugs.

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- There will be one logistic service buildings on the dock.
- Access to ships will be via ship's ladders. There will be no specific provision in the design of the dock.
- Safety ladders will be provided on the dock face in accordance with Canadian regulations and industry practice.

3.9 Spill Protection

No specific measures for spill protection into the water during loading operations will be provided in the design. See other documentation for spill protection measures.

3.10 Power / Lighting

Lighting will be provided on the dock and in the storage area by means of fixed lighting poles.

Power to be provided by local genset to logistic buildings and lighting (by others).

Power at dock face for outlets / welding or refrigeration stations (to be determined, by others).

Navigational light to be placed on the corner of dock.

3.11 Provision for Expansion

No provision will be made for future expansion.

3.12 Provision for Removal

Design and construction methods must account for removable of all components except rock fill at the completion of the Mary River mining project.

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4. Design Proposal

4.1 Dock Structure

In accordance with the trade-off study recommendation, the proposed structure for the freight dock will be a rock filled circular sheet pile cell structure.

4.2 Berthing

In Canada there is no legislated Standard for design of docking facilities. Current practice is reflected in publications such as "Port Designers Handbook", 2003, by C. Thoresen, and literature by reputable fender manufacturers. In the absence of other information, these references will form the basis of the recommendations contained herein.

Docking of the ice management vessels will be under their own power.

Multi-purpose vessels ships will dock under their own power if properly equipped with twin screw drives and bow thrusters.

Pending further study, it is recommended that docking velocity be assumed to be 0.15 m/s.

A fendering system for protection of the dock and ships' hulls will be provided. The safety factor for abnormal impact will be of 1.5.

Fenders will be installed on the dock face at an appropriate height and spacing. Considerations will include the range of ships and risk of damage due to ice.

4.3 Mooring

The reference for mooring arrangement and devices will be as for docking.

Seventy tonne stationary bollards will be located at each end of the dock and between as required, for spring lines.

Bow and stern lines will be tied to gravity bollards set back on the embankment. The arrangement is unconventional and the Captain of each vessel shall make their own determination of what wind conditions to pull off the dock.

4.4 Drainage

Drainage for the 30 metres wide concrete slab will be collected to central catch basins and passed through an water / oil separator prior to discharged to the ocean (to be confirmed, see cost estimates by others for drains and treatment).

4.5 Sound Control

Refer to Environmental Impact Study (EIS).

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4.6 Marine Siltation Control

Adequate measures for construction of all components of the freight dock construction will be taken to minimize turbidity effects such as the use of a siltation curtain placed from surface to harbour bottom.

4.7 Attenuation of Marine Noise / Vibration

For mitigation measures refer to the EIS report. Measures in consideration include an air curtain / bubble system to reduce the effects of sheet pile installation.

4.8 Permanent Ice Reducing Bubble System

A permanent bubble system to extend the summer operation time at the dock face will be investigated (to be confirmed).

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5. Design Criteria

This section includes criteria to be followed for the design and construction of the freight dock.

5.1 Codes and Standards

Codes and standards will include:

- National Building Code of Canada 2005 (NBCC)
- CAN / CSA-S6-06: Canadian Highway Bridge Design Code (S6)
- CSA A23.3-04: Design of Concrete Structures (A23.3)
- CSA S-16-1: Design of Steel Structures (S16)
- The Canadian Geotechnical Manual
- U.S. Army Corps of Engineers, Design of Sheet Pile Cellular Structures Cofferdams and Retaining Structures
- Piling Handbook, Arcelor Mittal
- Canada Labour Code, Maritime Occupational Health and Safety Regulations.

Note: Design and construction of docks is not explicitly covered by any Canadian Standard. The proposed dock structural arrangement is more like a bridge than a building. The designers must use judgment and follow accepted practice for similar structures. Therefore the Codes and Standards listed above will be referenced only as deemed appropriate by the designers. Reference will be made to current publications such as “Port Designer’s Handbook” previously referenced, and “Port Engineering”, 2004, by G. P. Tsinker.

The return period for earthquakes in the NBCC has been changed from 1 in 500 years in former editions to 1 in 2,500 years. Associated design parameters that are necessary for design of wharves have not been adjusted accordingly, therefore CAN/CSA-S6 will be used which provides values for the 1 in 500 year seismic event, commonly used for design of these structures throughout North America.

5.2 Datum

Canadian Geodetic Datum (CGD) 0.0 has been calculated to be 2.94 m above Chart Datum (CD) 0.0.

5.3 Units

The SI (metric) system will be used.

5.4 Climatic Data

Taken from Aker Kvaerner DFS Appendix A, unless noted otherwise.

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5.4.1 Temperature

- Minimum temperature: -50 ºC
- Maximum temperature: +21 ºC

5.4.2 Rainfall

- Maximum (1 in 10 years) 15 minutes rainfall: 4 mm
- Maximum (1 in 30 years) 24 hours rainfall: 45 mm
- Total annual precipitation: 251 mm

5.4.3 Snow

- Ss: 1.7 kPa
- Sr: 0.2 kPa

5.4.4 Harbour Ice

- Thickness (level ice): 2 m

5.4.5 Ice Accretion

Taken from CAN/CSA S6:

- 12 mm

5.4.6 Wind

Hourly wind pressure:

- 1/10 probability of exceeding in a year: undefined
- 1/50 probability of exceeding in a year: 0.66 kPa

5.4.7 Earthquake

Taken from CAN/CSA S6:

- Peak Ground Acceleration, 500 years return period: 0.08
- V: 0.10
- Za: 2
- Zv: 2

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5.4.8 Water Characteristics, Steensby Inlet

- Water: saline
- Tides: yes, semi-diurnal
- Higher High Water Large Tide: elevation +4.8 m CD
- High Tide Level: elevation +4.3 m CD
- Mean Sea Level: +2.26 m CD
- Low Tide Level: elevation. +0.2 m CD (estimated)
- Lower Low Water Large Tide: elevation +0.0 m CD
- Current: predominantly tidal, see separate report H337697-3100-12-124-0002
- Waves: see separate report H337697-3100-12-124-0003

5.5 Geotechnical

5.5.1 Site Conditions

Geotechnical conditions as of the time of issue of this report are contained in Thurber Reports:

- Mary River Project, Steensby Inlet and Milne Inlet Port Offshore Geotechnical Investigation Summary of Results , File 19-1605-126, November 9, 2011;
- Mary River Project, Initial Geotechnical Recommendations Offshore Structures at Port Steensby, File 19-1605-126, November 11, 2011.

5.5.2 Slope Protection Criteria

Refer to H337697-3100-12-124-0007.

5.6 Design Ships

The design ships considered as a base for the design of the dock are generic vessels with characteristics as follows in Table 5-1:

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Table 5-1: Design Ship Characteristics

Name	Multi – Purpose General Cargo	Tanker	Barge	Ice Breaker
Length overall (m)	150 – 200	180	200	66
Beam (m)	26.4	27.4	25	18
Deadweight tons (DWT)	15,000 - 30,000	37,500	10,000	1,000
Draft (m)	11.2	11.2	4 -8	6.5
Displacement Tons	35,000	42,000	N/A	7,000
Estimated Cargo	10,000 - 24,000	30,000	10,000	-

5.7 Design Loads

5.7.1 Dead Loads

- Reinforced concrete density: 24 kN/m^3
- Steel density: 77 kN/m^3

5.7.2 Operating Loads

On the dock:

- 200 t capacity rubber tired mobile crane, unfactored outrigger load: 1,200 kN (to be confirmed).
- Unfactored surcharge: 100 kPa.
- Reach Stacker Loads - Front Axle – two tires: 50 tonnes (to be confirmed).
- Refer to Appendix A for "Equipment Unloaded at Steensby Freight Dock".

5.7.3 Stockpile Loads

See unfactored surcharge loads in Section 5.7.2.

5.7.4 Crane Load

See Section 5.7.2.

5.7.5 Berthing Forces

- Displacement: 45,000 tonnes
- Docking speed for ship approaching at five degrees: 0.15 m/s
- Kinetic energy to be absorbed by dock and fenders: Refer to H337697-3100-12-124-0006.

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5.7.6 Mooring Forces

- Forces on dock: 30 kN/m perpendicular to the dock and 20 kN/m parallel to the dock
- Tying forces: 70 tonnes per bollard

5.7.7 Ice Loads

Refer to H337697-3100-12-124-0004.

5.8 Load Combinations

Table 5-2: Load Combinations, Allowable Stresses and Load Factors for Wharves Limit States Design

Combination	1	2	3	4	5	6	7	8	9
D*	1.2	1.2	0.9	1.2	0.9	1.25	1.4	1.2	**1.2**
L_c + I or L_u	1.6**	1.6		1.0		0.5***		1.0	
B	****	****	****	****	****	****	****	****	****
B_e	1.6								
C		1.6	1.6	1.3					
E	1.2	1.2	1.2	1.2	1.25	1.25	1.2	1.2	
Eq					1.0	1.0			
W			1.6	1.4					
Ws			1.6						
R + S + T									**1.3**
Ice								**1.3**	

Load Symbols

D = dead load
L_c = concentrated live load
B = buoyancy load
C = current and wave load on structure
E = earth pressure load
W = wind load on structure
R = creep / rib shortening
T = temperature Load
L_u = uniformly distributed live load
I = impact factor (for L_c only)
B_e = berthing load
C_s = current load on ship
EQ = earthquake load
W_s = wind load on ship
S = shrinkage
Ice = ice pressure

Notes:

* 0.9 for minimum axial load and maximum bending

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** 1.3 for outrigger maximum loads; 1.4 container storage

*** on storage only; other live loads excluded (to follow)

**** buoyancy effects accounted for in submerged weight of structures

Table 5-3: Load Combinations, Allowable Stresses and Load Factors for Wharves Allowable Stress, Serviceability and Geotechnical Design

Combination	1	2	3	4	5	6	7	8	9
D*	1.0	1.0	0.9	1.0	0.9	1.0	1.0	1.0	1.0
L_c + I or L_u	1.0**	1.0		1.0		0.5***		1.0	
B	****	****	****	****	****	****	****	****	****
B_e	1.0								
C		1.0	1.0	1.0					
E	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Eq					0.7	0.7			
W			1.0	1.0					
Ws			1.0						
R + S + T									1.0
Ice								1.0	

Load Symbols

D = dead load
L_c = concentrated live load
B = buoyancy load
C = current and wave load on structure
E = earth pressure load
W = wind load on structure
R = creep / rib shortening
T = temperature load
L_u = uniformly distributed live load
I = impact factor (for L_c only)
B_e = berthing load
C_s = current load on ship
EQ = earthquake load
W_s = wind load on ship
S = shrinkage
Ice = ice pressure

Notes:

* 0.9 for minimum axial load and maximum bending

** 1.0 for outrigger maximum loads; 1.0 container storage

*** on storage only; other live loads excluded (subject to further study)

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**** buoyancy effects accounted for in submerged weight of structures

5.9 Life Expectancy

All components of the dock extension will be designed for a life expectancy of 25 years.

5.10 Erosion / Scour Protection

Ships equipped with powerful engines and bow thrusters can cause severe erosion, characteristics can be found in Table 5-4.

As part of the design, mitigating measures such as mattress protection or assumed loss of support to the caissons will be required.

Table 5-4: Scour Protection Vessel Criteria

Name	Multi – Purpose General Cargo	Ice Breaker
Number of propellers	1	2 azipods
Number of rudders	1	0
Power	23,000 kW	2 x 8 MW
Propeller diameter (mm)	6750	5000
Assumed elevation of propeller shaft above keel (m)	4	3
Type Propeller	free or non-ducted	free or non-ducted

5.11 Steel Corrosion

- The water is sea water;
- Minimum thickness of sheet pile steel will be 12.7 mm;
- Reinforcing steel will be protected by proper cover for marine environment and good construction practice;
- Loss of metal to corrosion is estimated at 0.1 mm per year.

5.12 Concrete Deterioration

Likely causes of damage and deterioration of concrete in the marine environment are:

- Poor quality concrete;
- Improper placing procedures;
- Inadequate cover to reinforcing steel;
- Inadequate surface drainage.

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Measures will be incorporated into the construction documents to address these issues.

In accordance with the recommendations of A23.1-09, Clause 4.1.1.5, Sea Water Conditions, concrete will be classified C-1, minimum strength 35 MPa within 28 days in accordance with Table 2.

Reinforcing steel cover will be in accordance with A23.1; except as follows:

- 100 mm minimum cover on sea face;
- 75 mm minimum cover for other exposed surfaces.

5.13 Technical Specifications

Refer to H337697-3250-12-123-0001 for Freight Dock Technical Specifications.

5.14 Construction Procedures

To be considered as it affects the design:

- Site preparation: blasting / excavation along shore line;
- Dredging: dredging of unsuitable material and disposal on land or by sidecasting;
- Pile installation: vibration / Pile driving and effects of marine life;
- Schedule: summer open water construction period mid July to mid October.

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Appendix A:
Equipment Unloaded at Steensby Freight Dock

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Table A-1: Largest Piece of Equipment Being Unloaded at the Steensby Freight Dock

Equipment Description	Number	Dimensions (m)			Weight				Comments
PM503	of Units	L	W	H	(kg)	2014	2015	2016	
Material Handling Equipment									
Reclaimer Undercarriage, complete with bogies wheels and equalizers	2	30	16	9	522,000	X			See Figure 2, Figure 3
Stacker cwt boom section	3	30	14	7	280,000		X		See Figure 5
Reclaimer boom with mechanicals	2	60	6.4	3.8	180,000		X		See Figure 5
Stacker Boom with mechanicals	5	50	6.4	3.2	140,000		X		See Figure 5
Stacker Tripper Car gallery c/w mechanicals	4	60	3.5	2.3	120,000		X		See Figure 5
Bucket Wheel Complete	2	11.5	11.5	11.5	85,000		X		See Figure 4
Mine Auxilary Equipment									
4400 HP Locomotive	-	22.3	3.1	4.7	188,420		X	X	-
Construction Equipment									
777 Rock/Haul Truck	-	10.53	5.22	5.2	163,293	X			See Figure 7, Figure 8, Figure 9
DEMAG 450t crane	-	8	2.99	3	120,000	X			See Figure 10

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As shown in Figure A-1, there are many components to the Bucket Wheel Reclaimer. The main components include: Bucket Wheel, Superstructure (undercarriage), Counterweight and Conveyor boom. These components are shown below in images and drawings.

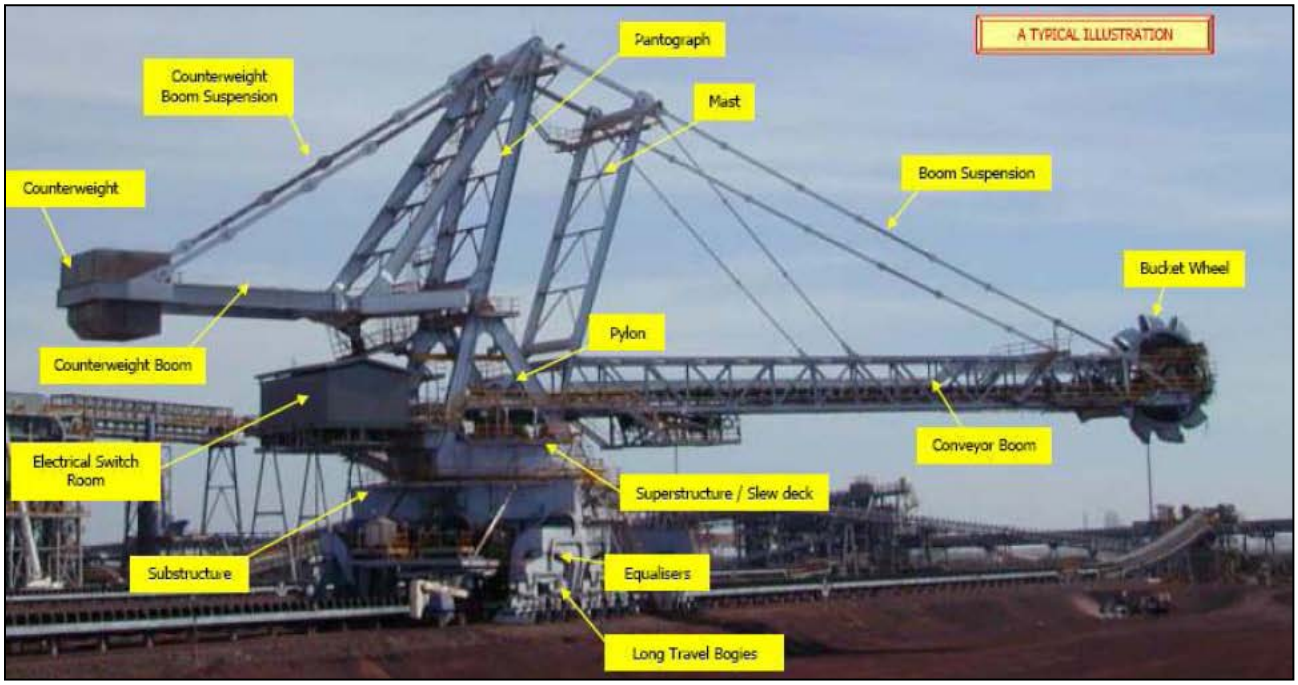

Figure A-1: Bucket Wheel Reclaimer

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The undercarriage for the Bucket Wheel Reclaimer is shown in Figure A-2 with the bogies, wheels and equalizers attached. Figure A-3 shows the bogie assembly.

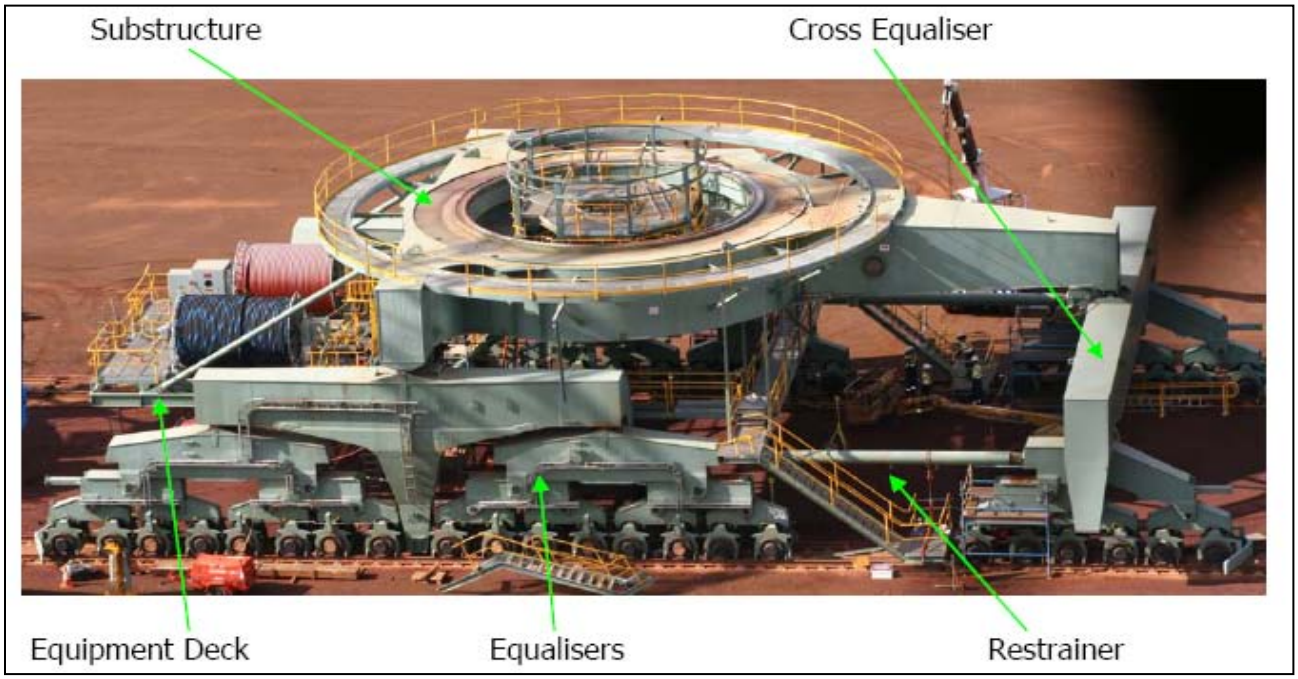

Figure A-2: Bucket Wheel Reclaimer Undercarriage with Bogies, Wheels and Equalizers

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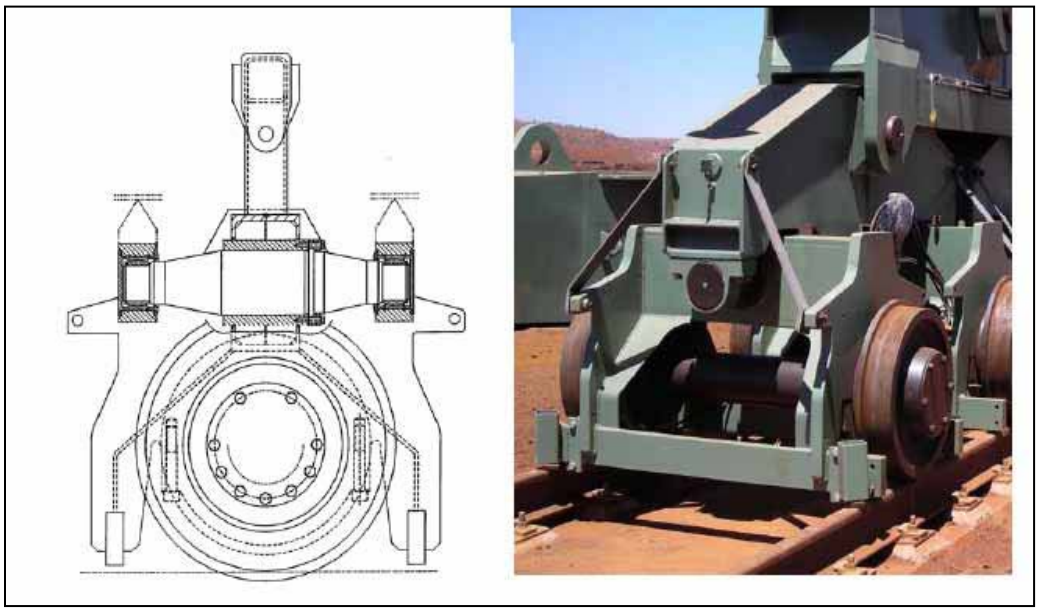

Figure A-3: Bogie Assembly

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As shown in Figure A-4, is the Bucket Wheel Assembly which is one of the main components on the Bucket Wheel Reclaimer.

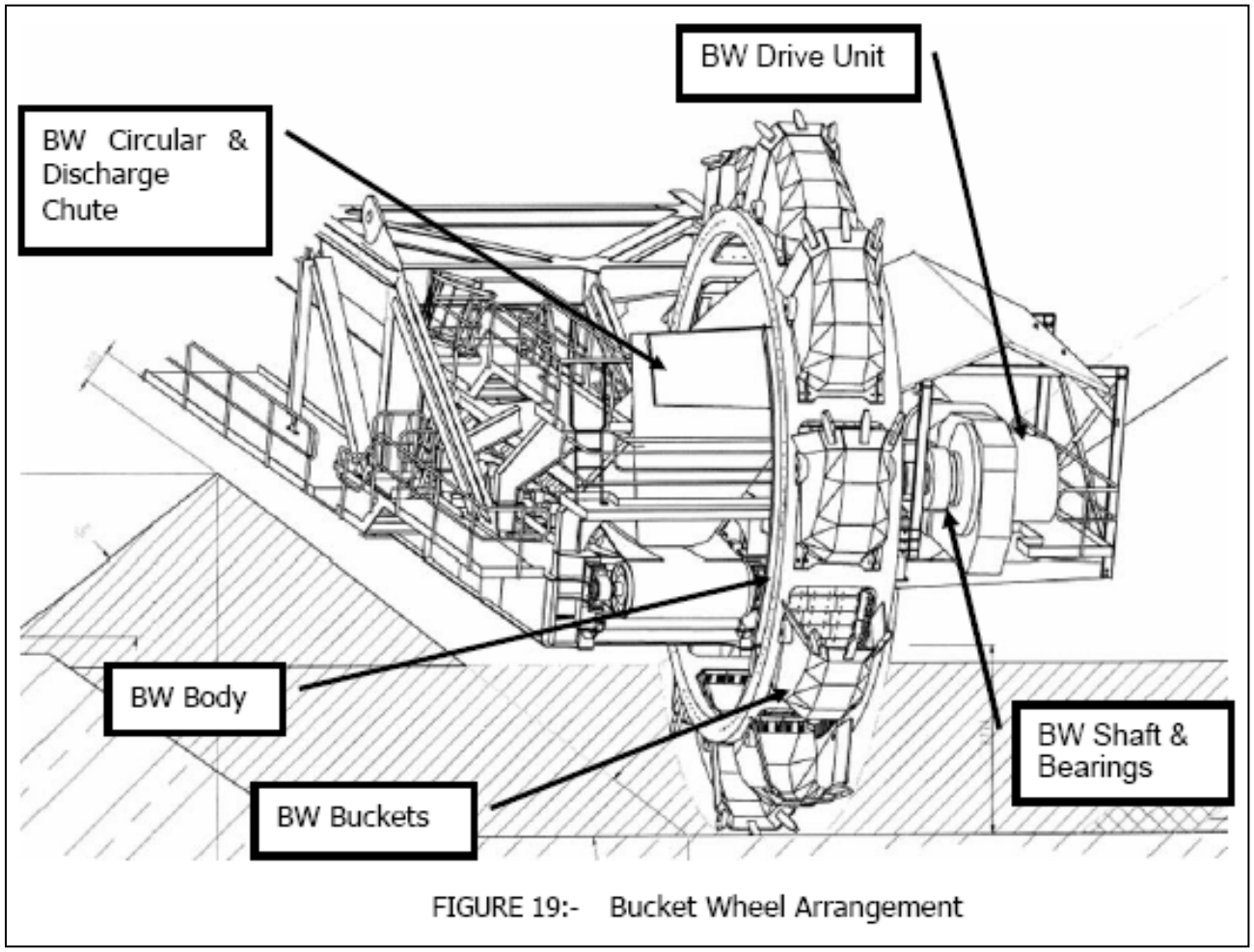

Figure A-4: Bucket Wheel Assembly

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All of the components mentioned in Table A-1, are shown below in Figure A-5.

Figure A-5 includes which corresponds with Table A-1:

1. Bogie
2. Counterweight Boom
3. Bucket Wheel with Boom
4. Bucket Wheel without Boom
5. Trailer and Tripper Car
6. Bucket Wheel

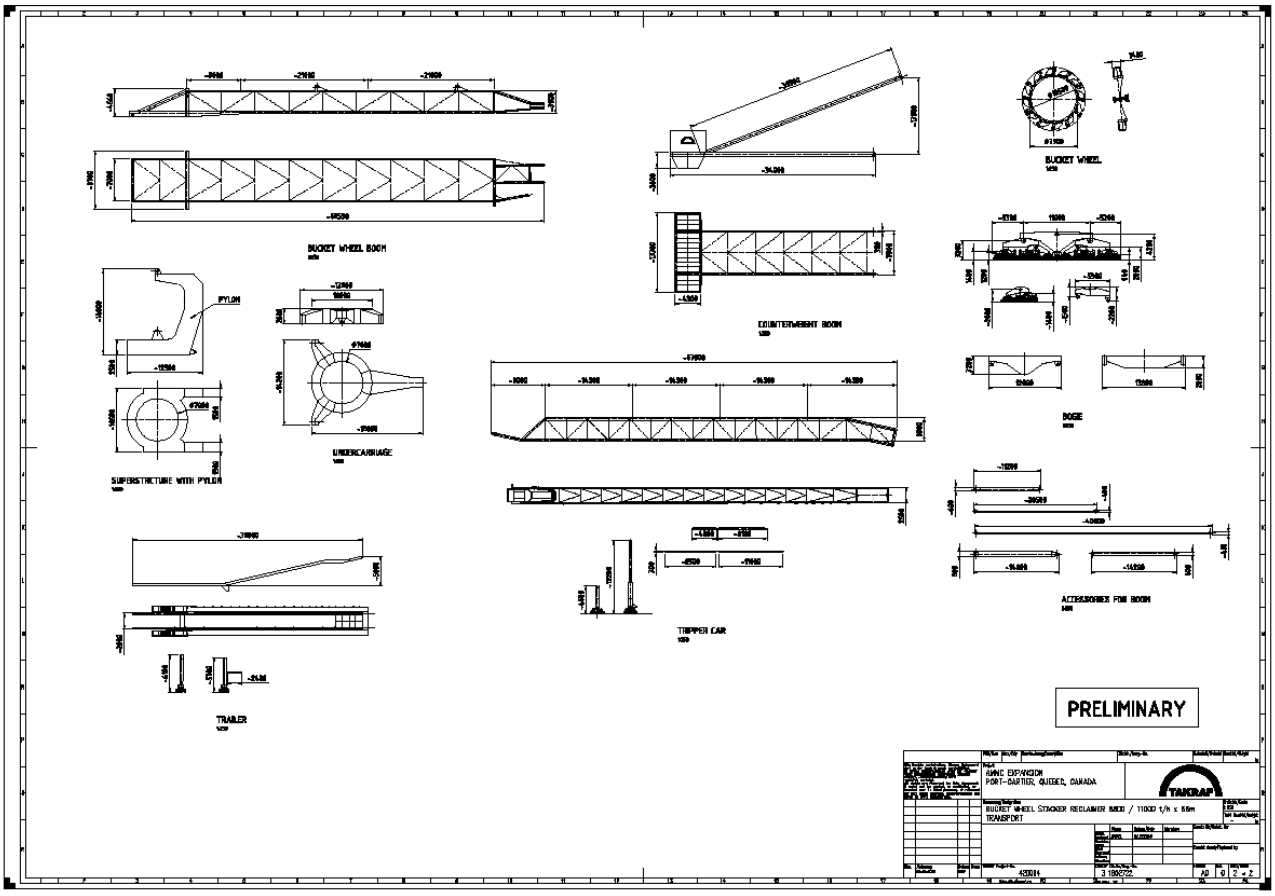

Figure A-5: Bucket Wheel Stacker Reclaimer 8800 / 11000 t/h x 66 m Transport, Page 2

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In Figure A-6, are the components that are mentioned in Figure A-5 and complied together to form the Bucket Wheel Reclaimer, also shown in Figure A-1.

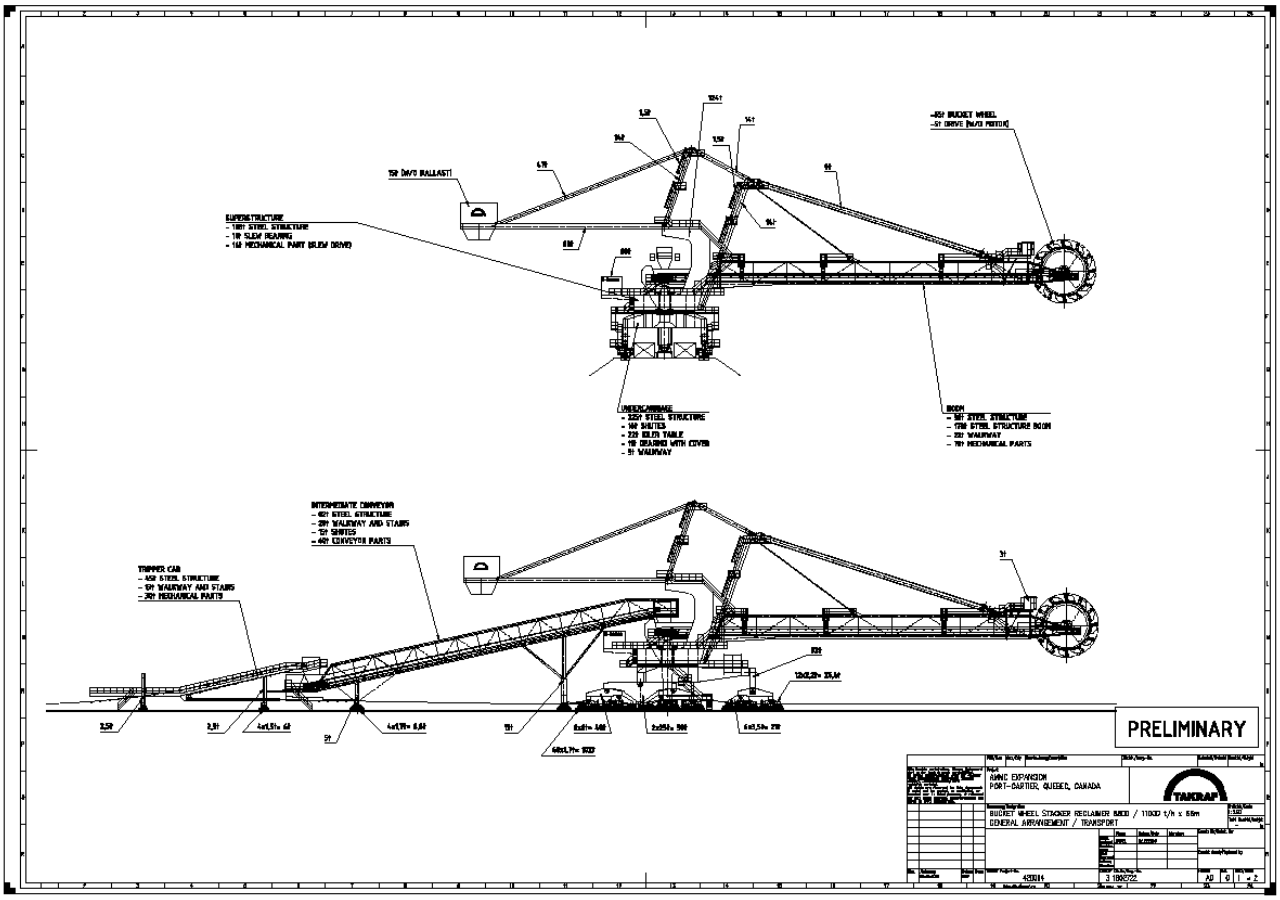

Figure A-6: Bucket Wheel Stacker Reclaimer 8800 / 11000 t/h x 66 m Transport, Page 1

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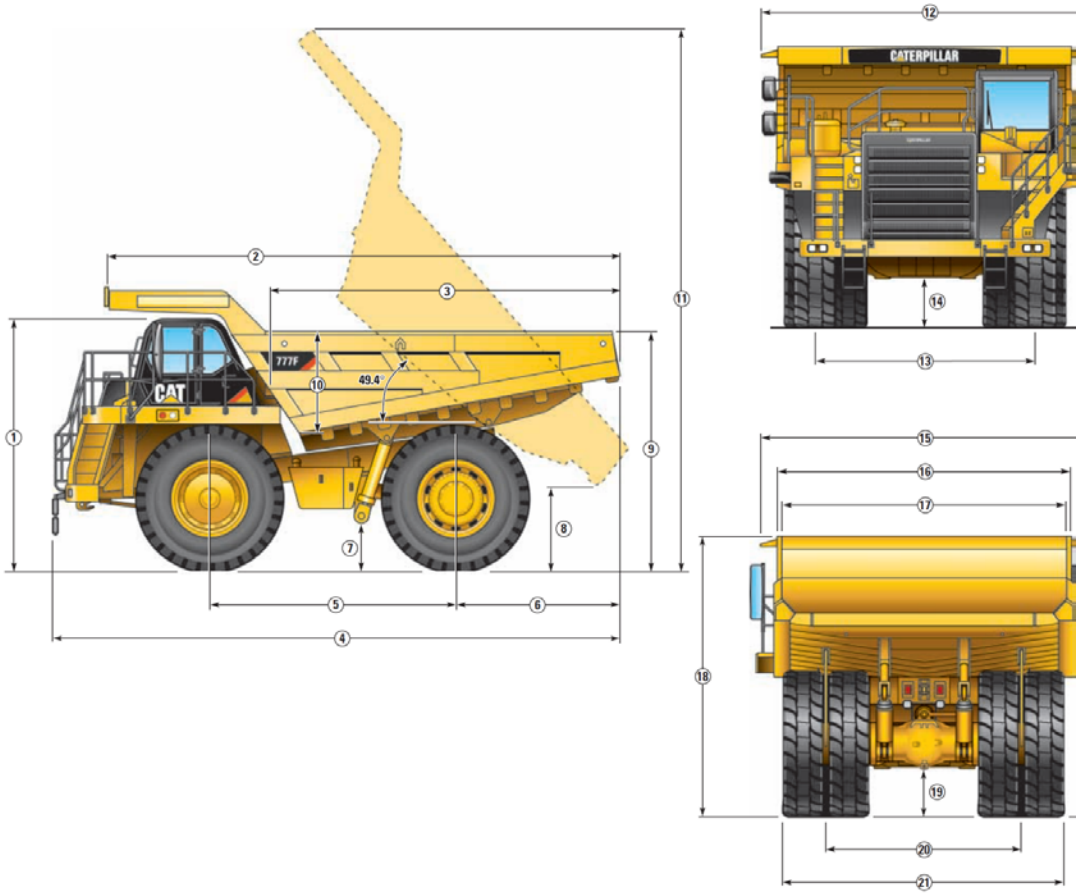
Dimensions

All dimensions are approximate.



1	Height to top of ROPS	4715 mm	15 ft 6 in
2	Overall Body Length	9830 mm	32 ft 3 in
3	Inside Body Length	6580 mm	21 ft 7 in
4	Overall Length	10 535 mm	34 ft 7 in
5	Wheelbase	4560 mm	15 ft
6	Rear Axle to Tail	3062 mm	10 ft 1 in
7	Ground Clearance	896 mm	2 ft 11 in
8	Dump Clearance	965 mm	3 ft 2 in
9	Loading Height – Empty	4380 mm	14 ft 4 in
10	Inside Body Depth – Max	1895 mm	6 ft 3 in
11	Overall Height – Body Raised	10 325 mm	33 ft 11 in

12	Operating Width	6494 mm	21 ft 4 in
13	Centerline Front Tire Width	4050 mm	13 ft 3 in
14	Engine Guard Clearance	864 mm	2 ft 10 in
15	Overall Canopy Width	6050 mm	19 ft 10 in
16	Outside Body Width	5524 mm	18 ft 2 in
17	Inside Body Width	5200 mm	17 ft 1 in
18	Front Canopy Height	5170 mm	17 ft
19	Rear Axle Clearance	880 mm	2 ft 11 in
20	Centerline Rear Dual Tire Width	3576 mm	11 ft 9 in
21	Overall Tire Width	5223 mm	17 ft 2 in

Figure A-7: 777F Off-Highway Truck, Page 1

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Weight/Payload Calculation

(Example)

	Dual Slope					
	No Liner		Steel Liner (16 mm)		Rubber Liner (102 mm)	
Target Gross Machine Weight*	163 293 kg	360,000 lb	163 293 kg	360,000 lb	163 293 kg	360,000 lb
Empty Chassis Weight*	48 008 kg	105,839 lb	48 008 kg	105,839 lb	48 008 kg	105,839 lb
Body Weight	16 420 kg	36,200 lb	16 420 kg	36,200 lb	16 420 kg	36,200 lb
Body Liner	—	—	5767 kg	12,714 lb	6766 kg	14,914 lb
Empty Machine Weight	64 428 kg	142,039 lb	70 195 kg	154,753 lb	71 194 kg	156,953 lb
Attachments**	—	—	—	—	—	—
Fuel Tank Size	1136 L	300 gal	1136 L	300 gal	1136 L	300 gal
Fuel Tank – 90% fill	861 kg	1,898 lb	861 kg	1,898 lb	861 kg	1,898 lb
Debris Allowance	1921 kg	4,234 lb	1921 kg	4,234 lb	1921 kg	4,234 lb
Empty Operating Weight**	67 210 kg	148,173 lb	72 977 kg	160,885 lb	73 976 kg	163,085 lb
Target Payload*	96 083 kg	211,827 lb	90 316 kg	199,115 lb	89 317 kg	196,915 lb
Target Payload*	**96.1 tonnes**	**105.9 tons**	**90.3 tonnes**	**99.5 tons**	**89.3 tonnes**	**98.5 tons**

* Refer to the Caterpillar 10/10/20 overload policy
** Includes weight of all attachments

Figure A-8: 777F Off-Highway Truck, Page 2

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Gradeability/Speed/Rimpull

To determine gradeability performance: Read from gross weight down to the percent of total resistance. Total resistance equals actual percent grade plus 1% for each 10 kg/t (20 lb/ton) of rolling resistance. From this weight-resistance point, read horizontally to the curve with the highest obtainable gear, then down to maximum speed. Usable rimpull will depend upon traction available and weight on drive wheels.

Direct Drive
Torque Converter Drive
E – Typical Field Empty Weight
L – Target Gross Machine Operating Weight 163 293 kg (360,000 lb)

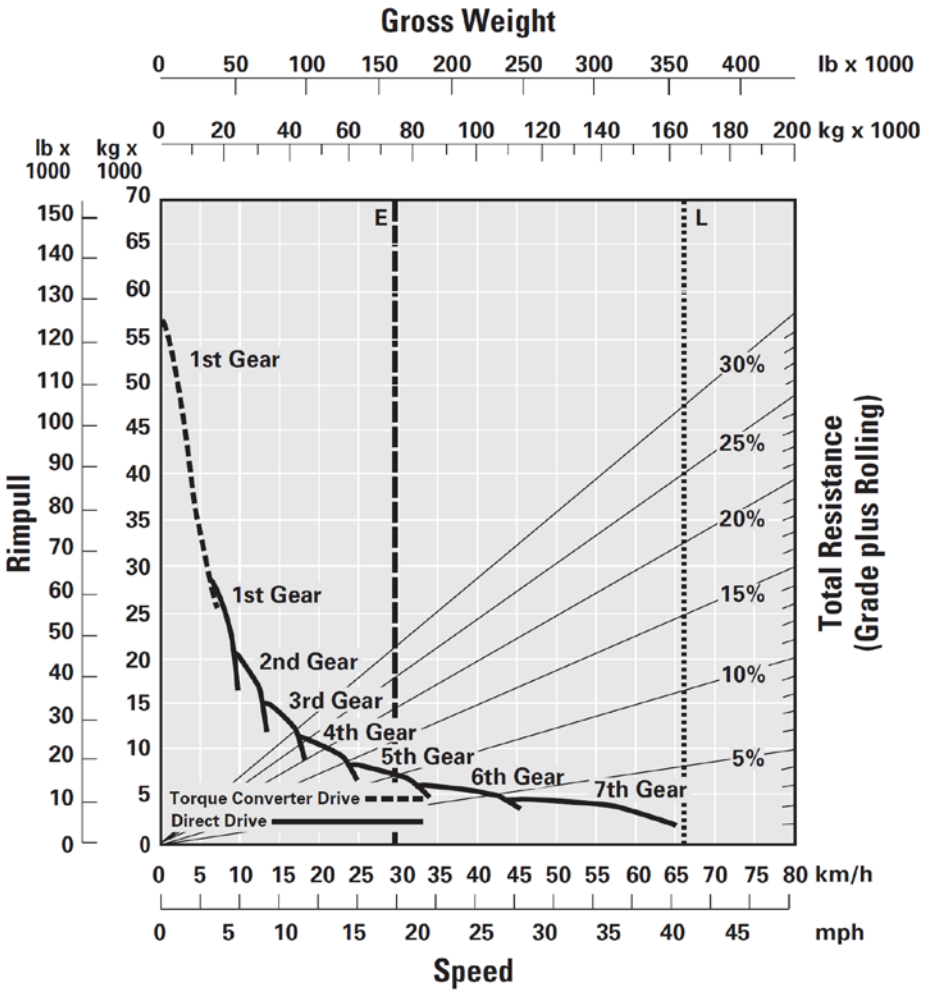

Figure A-9: 777F Off-Highway Truck, Page 3

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Sell used crawler crane 450 ton , used DEMAG crane Page 1 of 2

EC21

Sell used crawler crane 450 ton , used DEMAG crane Total 18 Related Items < Prev Next >

Date Posted : 2011/08/07
Category : General Industrial Equipment > Material Handling Equipment > Cranes
Offer Type : Sell
Add to Basket | Inquire Now >

View Larger Picture

Henan Anpu Construction Machinery Co., Ltd
Membership Type : Free member
Registration Date : 2008-07-15
Country/Region : China
Address : middle of anpu road Anyang Henan, China
Phone : 86-1593-7218309
Fax : 86-null-null
Contact : wangyong
View all selling leads of this member(18)
View all products of this member(15)
Order Credit Report

used crawler Crane DEMAG 450t in good working condition
(used crawler crane 450 ton , used DEMAG crane)
Brand: Demag Model: CC2800 Capacity:450ton Year:2004 Origin:Germany
Technical data
Maximum lifting capacity/radius: 500t at 9m
Superstructure engine: DaimlerChrysler OM 501 LA (315 kW / 420 HP)
Track width: 7,8 m Pad width: 1,2 / 1,0 / 1,5 m
Maximum transport width: 3,99 m Maximum counterweight: 120 t
Central ballast: 40t Superlift counterweight: 350t
Superlift counterweight center 200t Main boom SH: 24 - 84 m
Main boom SHLH: 42 - 108 m Main boom SSL: 36 - 84 m
Main boom SSLHLSL: 78 - 126 m
Fixed fly jib LF: 12 - 36 m, max. combination: 126 + 36 = 162 m
Luffing fly jib SW: 24 - 72 m, max. combination: 72 + 72 = 144 m
Luffing fly jib SWSL: 24 - 84 m, max. Kombination: 84 + 84 = 168 m
In perfect working condition

Our company welcome to contact us with requirement, and establish long cooperation with your esteemed company

Contact: Mr. Wang (speaking english)
Mobile Phone: 008618603069366 008615937218309
E-mail: yinfuchina(at)yahoo.com.cn
MSN: yinfuchina(at)live.cn
SKYPE:yinfuchina
Henan Yinfu Construction Machinery Co., Ltd
Address: anyang City, Henan Province, China

Related Keywords: cranes, crawler cranes, demag cranes, 450Tons cranes

Other Selling Leads of this member (17 more)

Sell 30T Used TADANO TL300E TRUCK HYDRAULIC CRANE
30T Used TADANO TL300E TRUCK HYDRAULIC CRANES Make:TADANO Model:TL300E YEAR:2000 Capacity:30T Nissan engine and chassis 4-section Boom Jib Length:15m Working hours:2159H Travelled distance:2873km Gross weight:26640kg Dimensions:11855*35...

Sell 50T TADANO TR500M-2-00103 ROUGH TERRAIN CRANE
55T TADANO TR500M-2-00103 ROUGH TERRAIN CRANE ORIGINAL JAPAN Origin: Japanese Year:2005 Capacity: 50ton, 2.5 meters radius CARRIER MODEL: NISSAN PE8T 290 PS boom: 9.7 ~ 41.2 meters Maximum angle: 83 ° JIB: 7.8 ~ 12.5 meters w/o winch ho...

http://www.ec21.com/offer_detail/Sell_used_crawler_crane_450--8955997.html 8/12/2011

Figure A-10: DEMAG 450 t crane

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