

Welcome to the Dockside Container Crane Workshop

By:

Liftech Consultants Inc.
McKay International Engineers

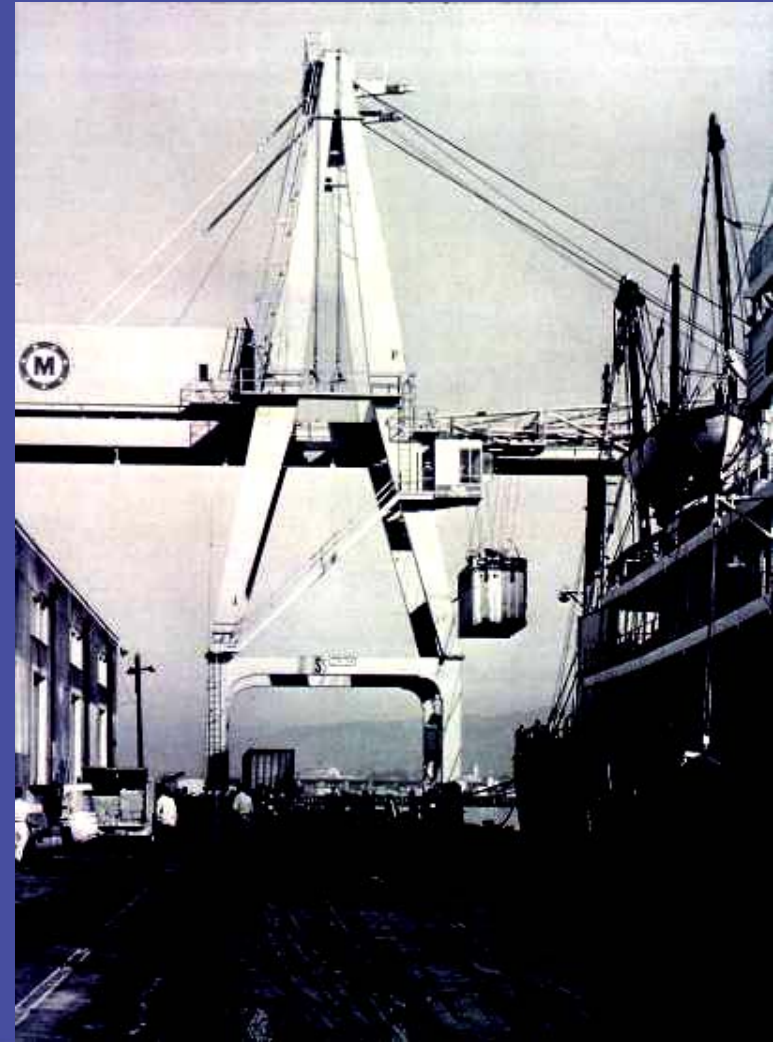
November 6, 2001
Oakland, California

Liftech
LIFTECH CONSULTANTS INC.



Workshop Speakers

Arun Bhimani, S.E.	Liftech
Michael Jordan, S.E.	Liftech
Larry Wright, M.E.	McKay
Robert Slater, M.E.	McKay





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Outline

Topic

Presenter

General

Arun Bhimani, Liftech

Mechanical &
Electrical

Larry Wright, McKay

Structural

Michael Jordan, Liftech

Procurement

Arun Bhimani, Liftech

Other

Arun Bhimani, Liftech

Dockside Container Crane Workshop

General

Arun Bhimani
Structural Engineer
Liftech Consultants Inc.

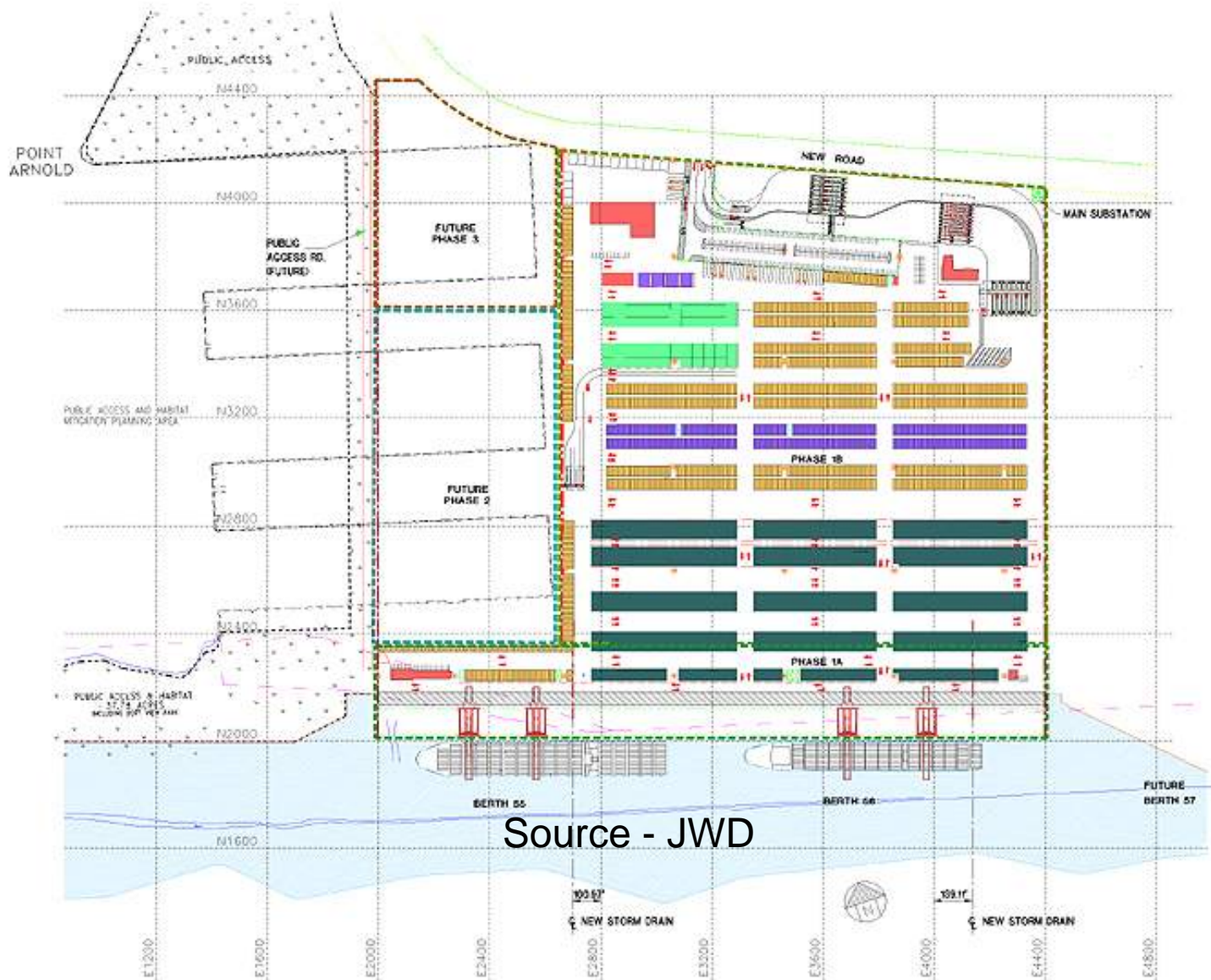


General Topics

- Crane Requirements
- Crane Types
- Geometry & Capacity
- Planning for Future

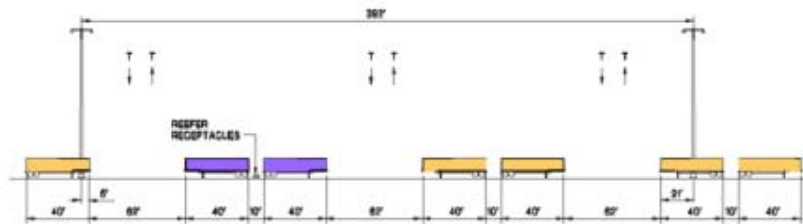
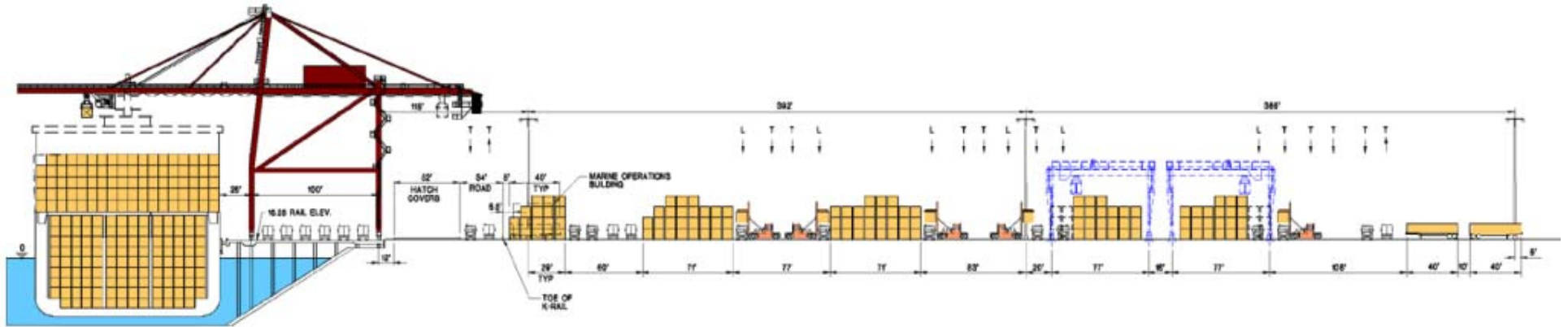


Crane Requirements

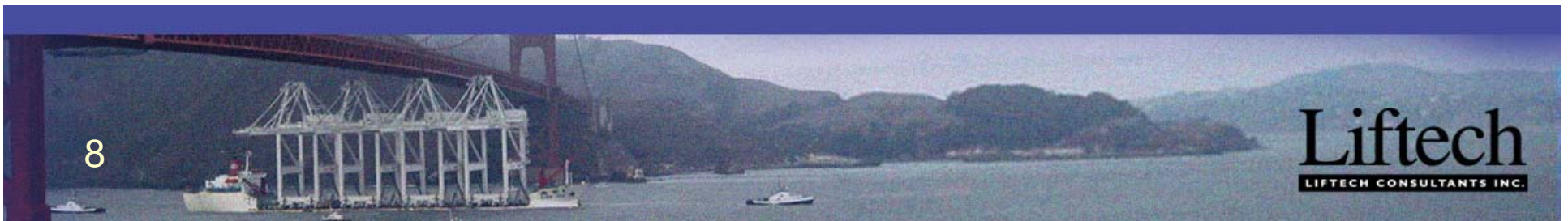


Source - JWD

Crane Requirements



Source - JWD

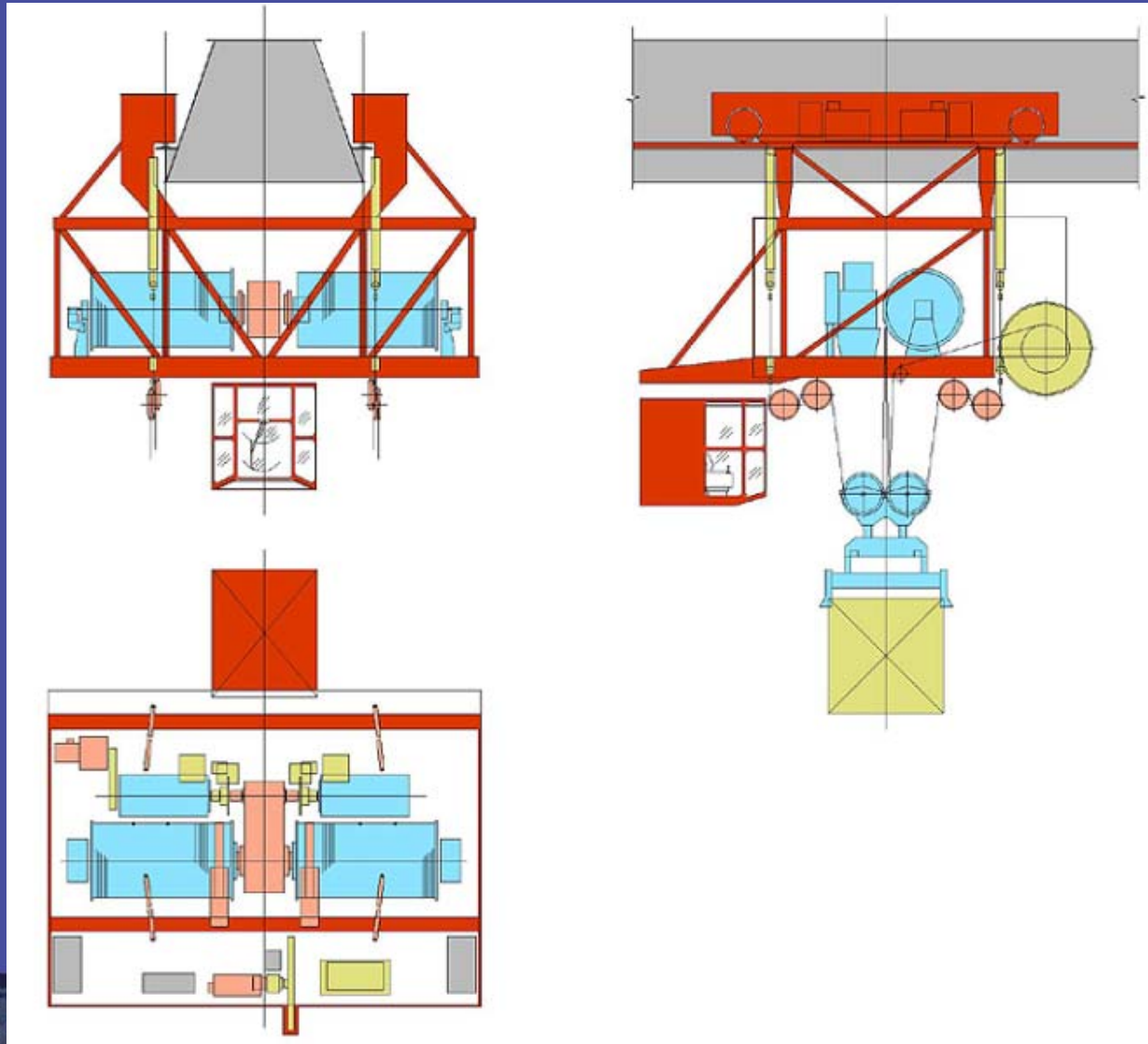


Crane Types

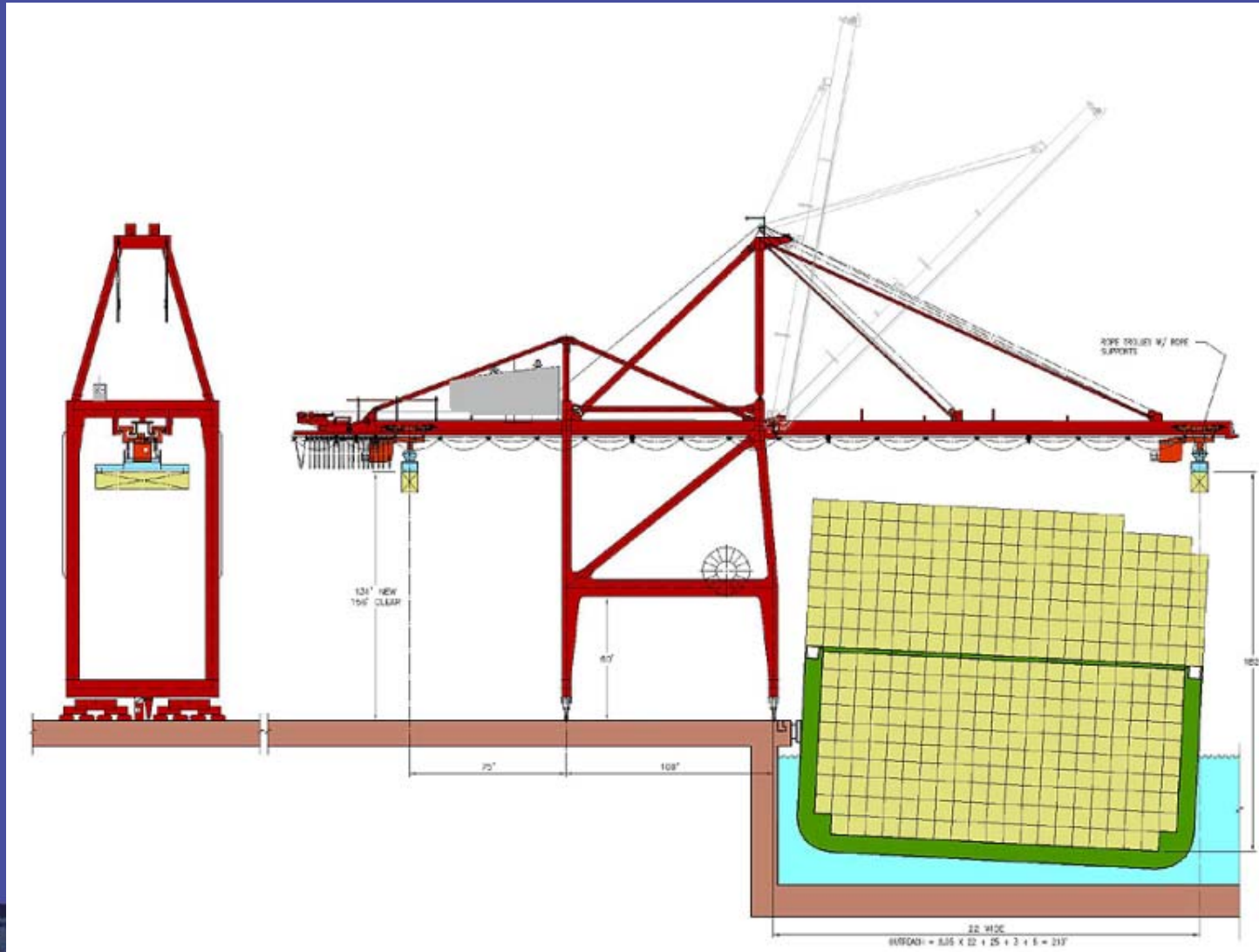
- Machinery Trolley vs. Rope Trolley
- Single Hoist vs. Dual Hoist



Machinery Trolley



Rope Trolley Crane



Dual Hoist Crane



Single Hoist vs. Dual Hoist

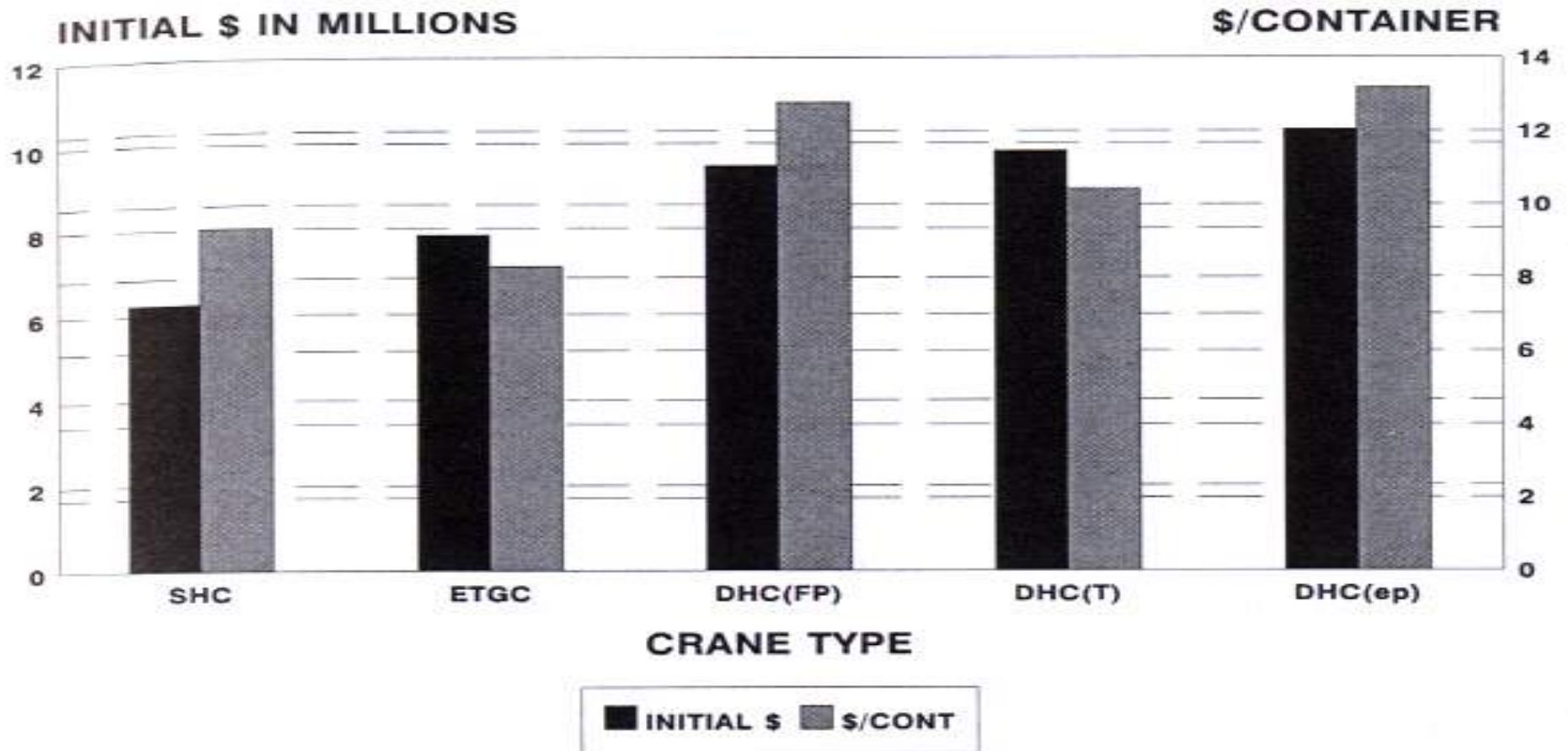
	Annual Capital Cost 20 yrs @ 8% (000's)	Labor Cost 3000 hours @ \$25/hr (000's)	Maintenance Cost corrective & preventative (000's)	Energy Cost based on 3000 hrs/yr @ \$.1/kwh (000's)	Total Annual Cost based on 3000 hrs year (000's)
Single Hoist	\$642	\$105	\$110	\$30	\$887
Elevating Trolley Girder	\$754	\$105	\$120	\$52	\$1,030
Dual Hoist Shuttle Platform	\$907	\$210	\$135	\$61	\$1,312
Dual hoist Elevating Platform	\$1,049	\$210	\$144	\$67	\$1,470
Dual Hoist with Traverser	\$957	\$210	\$135	\$99	\$1,400

Summary of Annualized Crane Costs

Source: C. Davis Rudolf, III, *A Cost Comparison of Modern Container Cranes*



Single Hoist vs. Dual Hoist



Comparison of Purchase Price and per Container Costs

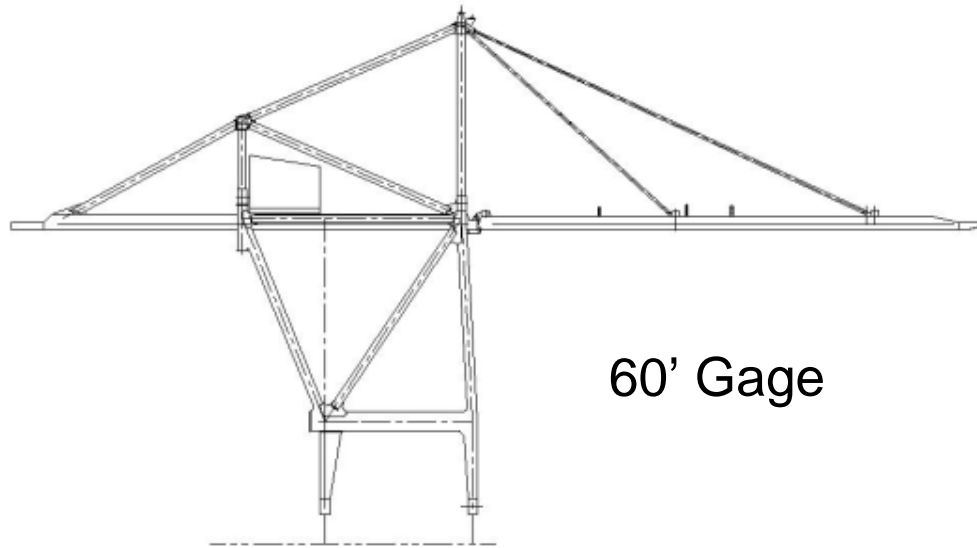
Source: C. Davis Rudolf, III, *A Cost Comparison of Modern Container Cranes*

Geometry

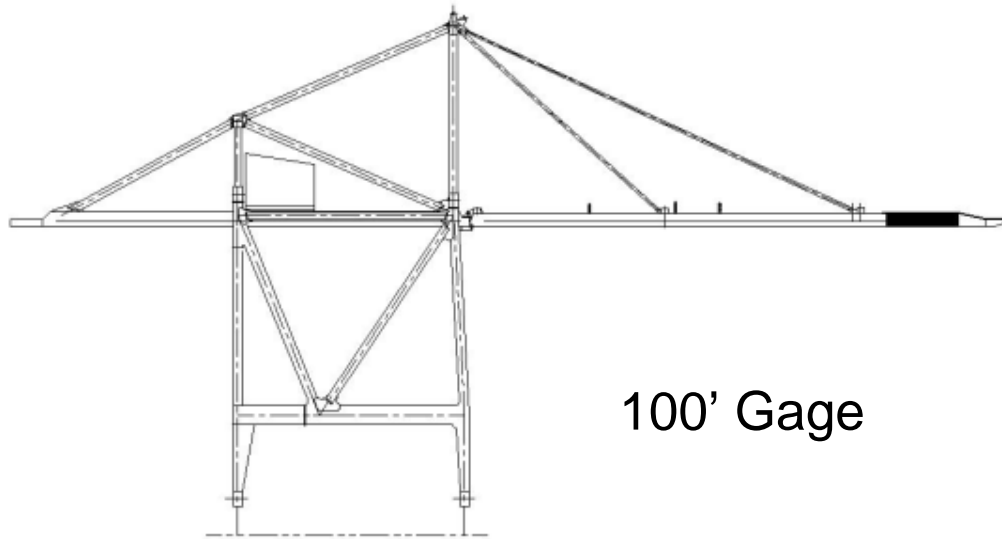
CRANE TYPE	ROPE TROLLEY					
	Panamax APL C9	Post Panamax C10	Regina Maersk	New Maersk Standard	Suez-max	Malacca- max
Typical values						
Containers across deck	13	16	17	22	23	24
Ship Draft, ft	38	41	45	50	56	69
Ship Beam, ft	105	129	137	178	165	180
Outreach, ft	117	150	212	210	220	227
Setback, ft	14	14	25	25	25	25
Gage, ft	50	100	100	100	100	100
Backreach, ft	30	50	30	50	50	50
Wheels per Corner/ spacing	8/5'	8/4.9'	8/4.9'	8/4.9'	8/4.9'	8/4.9'
Out-to-Out distance between bumpers, ft	88.5	88.5	88.5	88.5	88.5	88.5
Capacity, LT	30	40	50	60	65	60



Tacoma Crane Concept

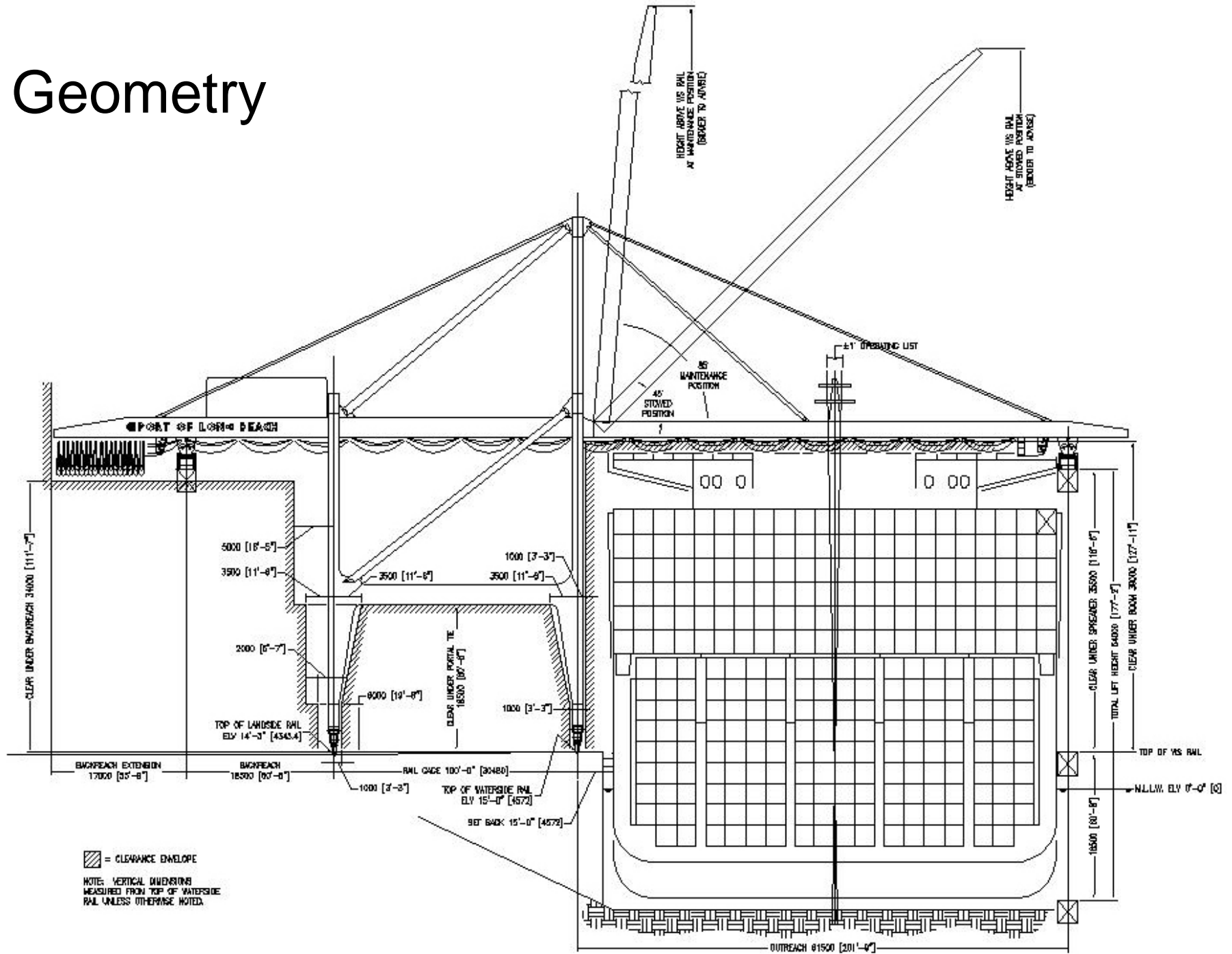


Before Extension



After Extension

Geometry



Geometry

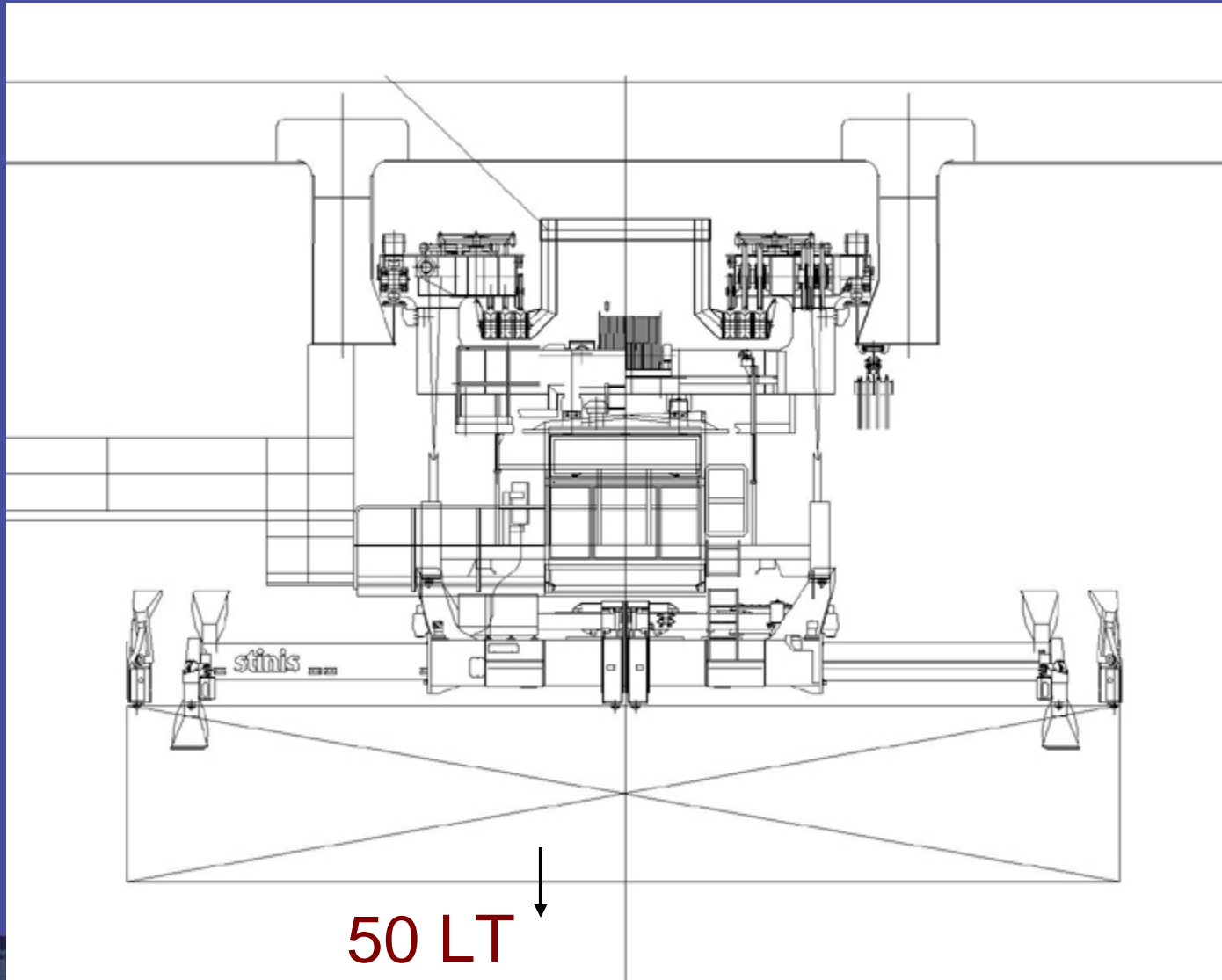


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Trend

- Number of Hoists – Single
- Trolley Type
 - Majority Rope Trolley
 - Increasing Machinery Trolley
 - Maersk, APL, Modern Terminals, HK, Europe

Capacity - Under Spreader



Capacity - Under Spreader

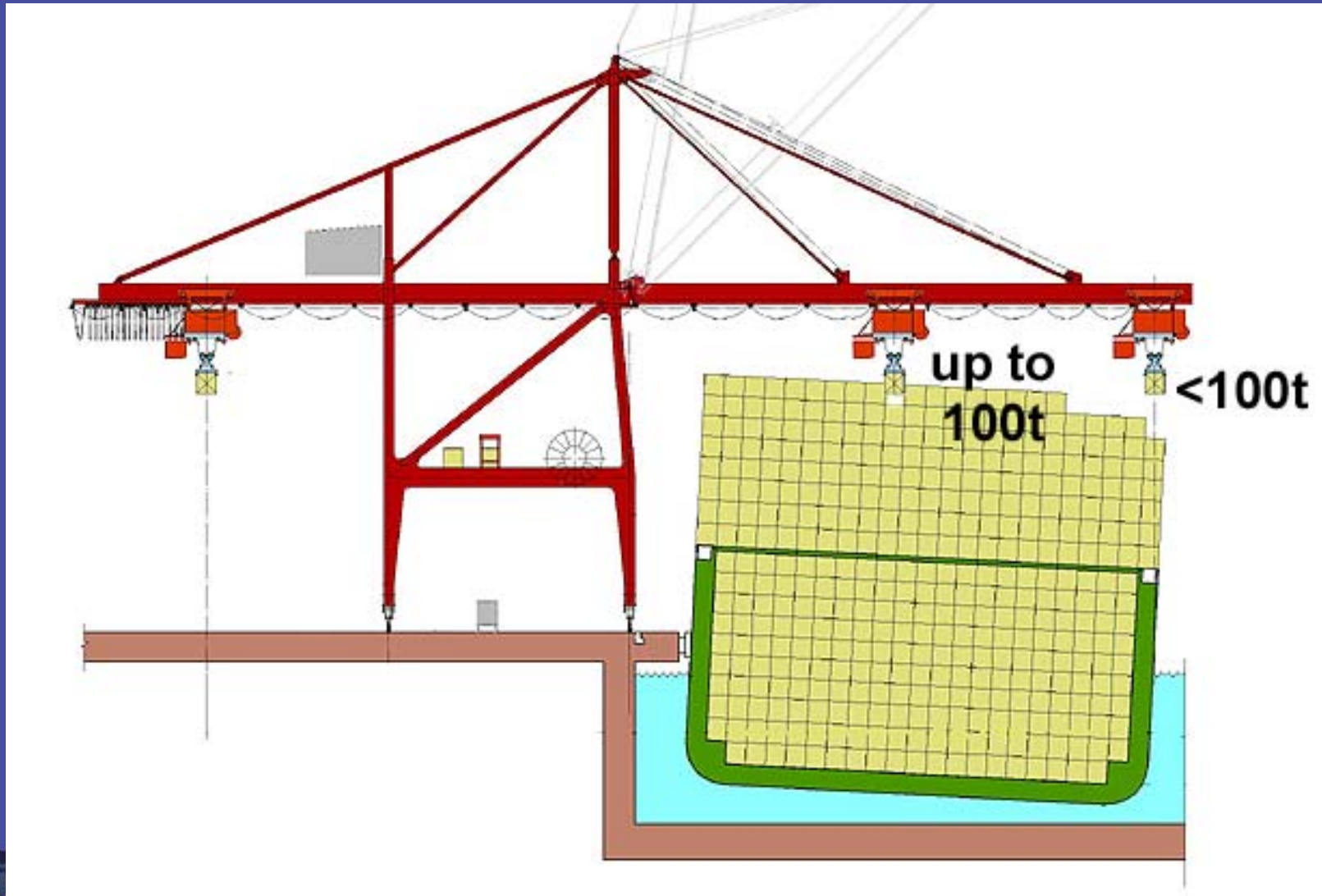


32.5 LT

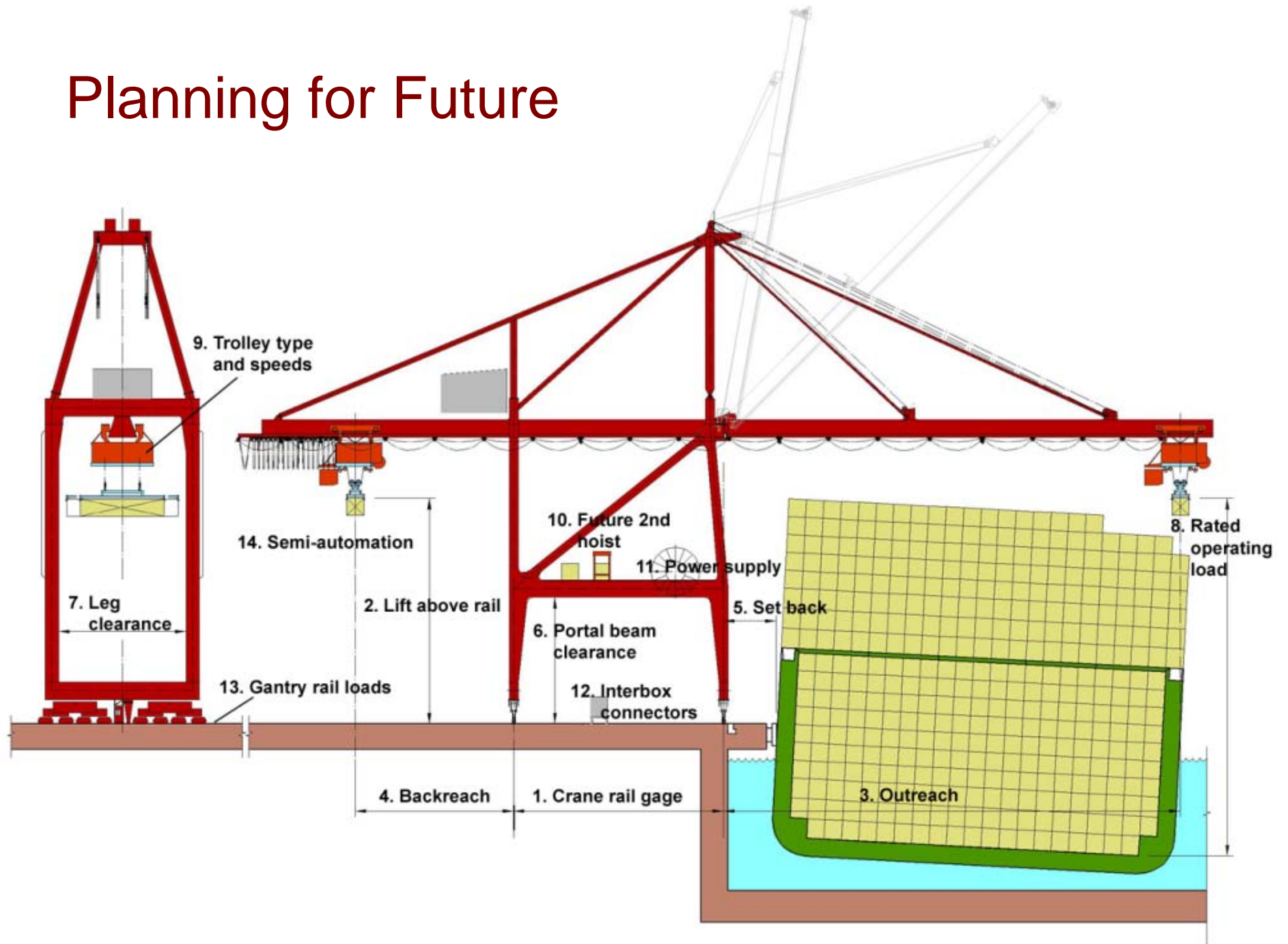
32.5 LT

65 LT total

Capacity - Under Cargo Beam



Planning for Future



End of General Session



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