

Panel I: “An Automated Terminal is a Green Terminal”



“Is the Semi-Automated or Automated Rail Mounted Gantry Operation a *Green Terminal*?”



Milan B. Lazic



January 11 – 13, 2006
Jacksonville, Florida

“A conference is a gathering of important people who singly can do nothing, but together can decide that nothing can be done.” *

*** Fred Allen, quoted in the Johannesburg Business Day**

Present Situation at US Ports

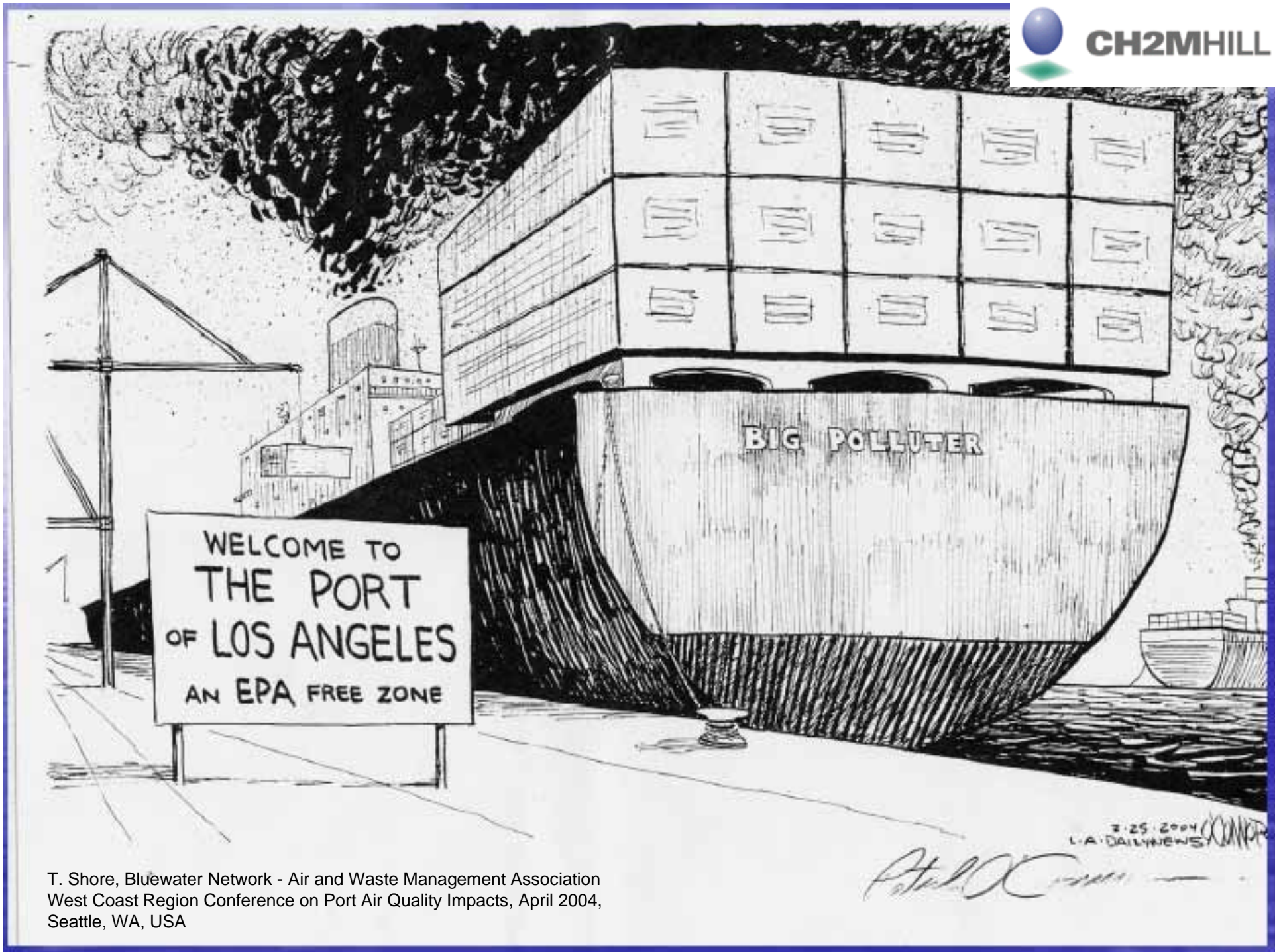
- Container cargo volume is constantly growing
- Ports experiencing growth in the double digits
- No land for expansion - No lateral expansion, only vertical

Ports Business Objectives

- Improve container capacity per acre
- Densify their terminals
- Deployment of hi-density operations
 - Rubber Tired Gantry (RTG)
 - Rail Mounted Gantry (RMG)
 - Overhead Bridge Cranes (OBC)

Present Environmental Encounter at Ports

- Ports are considered to be one of the biggest polluters
- Public and community challenges - fighting over impact of terminal growth and operations
- CA Environmental organizations delaying marine and intermodal terminals - *“Ports haven’t been doing enough!”*



T. Shore, Bluewater Network - Air and Waste Management Association
West Coast Region Conference on Port Air Quality Impacts, April 2004,
Seattle, WA, USA

Ports Investment into Green Initiatives

-  Protect communities from harmful port operation impacts
-  Distinguish themselves as a leader of environmental stewardship
-  Engage and educate the community and activists groups

Rail Mounted Gantry Cranes (RMG) Operation



**Advantages of the
Rail Mounted Gantry
automated or semi-automated
terminal operation over
conventional ones from the
environmental perspective**

Why RMG

- Electrically powered
 - Efficient operation
 - Land utilization
 - Less travel distance for street trucks at terminals
-
- Deployment: Semi-automated or automated
 - **Environmentally friendly**

Matson Facility – California

(1981)





Courtesy of D. Reiss, Automated Terminal Systems, Inc.

How RMG Operation Benefits Environmental Perspective

- Emissions are not produced
- Very low operating noise levels
- Low light requirements

Air Emissions

-  Electrically powered - no diesel emissions like with present operating equipment
-  Improves air quality in ports

Noise Pollution

- Electric powered operation much quieter than any diesel powered operation
- Automated operation considered - almost noiseless operation

Light Pollution

- Light fixtures mounted under the frame
- Bright light used only when required
- No light poles throughout yard
 - Only perimeter for security reasons
 - At client's delivery side

Speaker's statement:

The Rail Mounted Gantry Operation is the *Green Terminal* !



Thamesport,
England

RMG Operational Benefits Compared to RTG

- Regenerate power back to the network - cost savings in energy consumption
- No diesel engine and related maintenance requirements
- Gantry speed (10 – 13 ft/sec)
- Accurate movements - Locate box in any given time, no GPS required
- RMG can be manned but can be easily fully automated if required or permitted

Additional Facts To Be Considered

- Infrastructure cost higher (electrification)
- Unit price of RMG is a bit higher than same span RTG (operation cost reduction - over compensate the additional cost)
- Fixed terminal design - fixed and fine tuned planning well before ordering cranes
- Equipment maintenance cost savings (diesel vs. electrical)

Rail Track Requirements

- Rail track support

- Piling

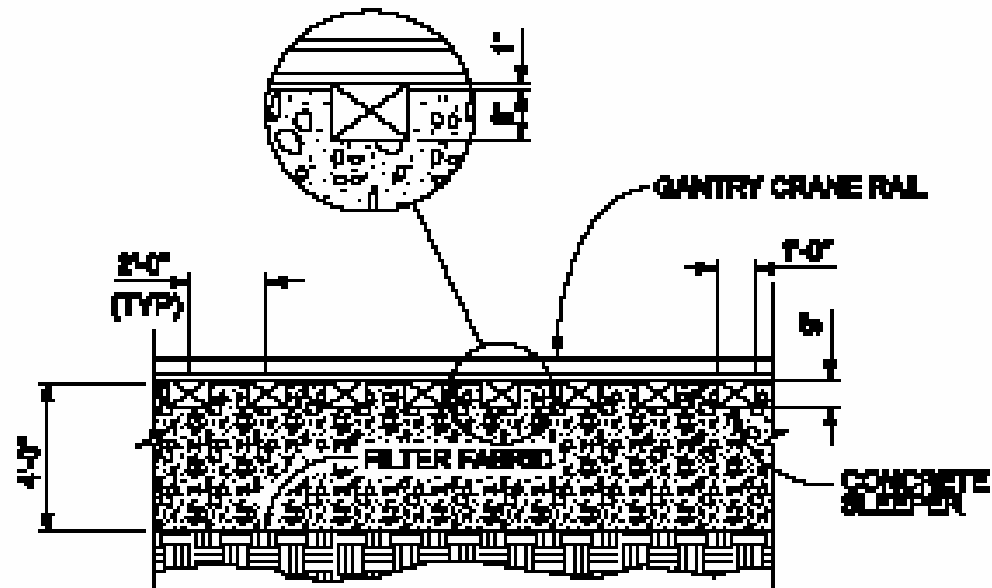
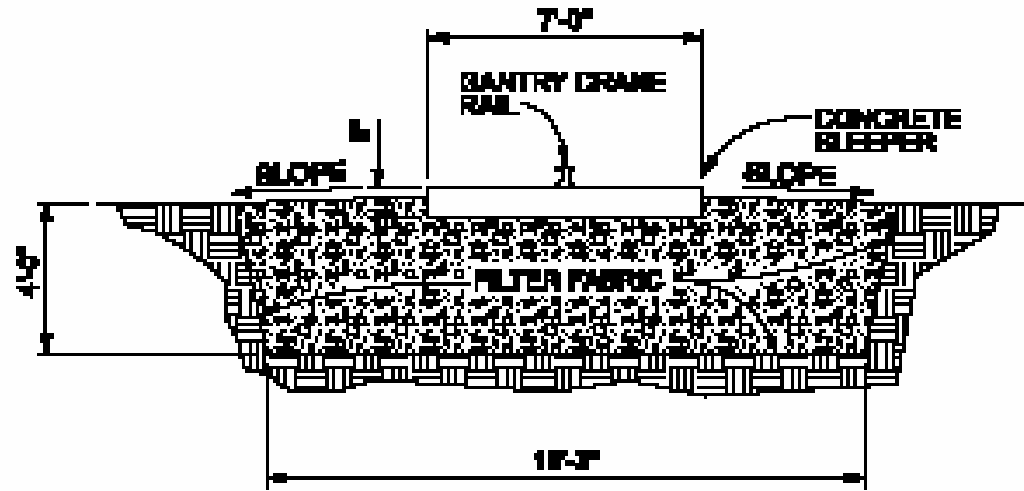
- Concrete “sleepers” in gravel bed

- Stringy manufacturer specified rail

tolerances (CTA – requested that RMG allow for 10 times limitation set in standard)

Concrete Sleepers





**RMG TRACK ANALYSIS
RAIL SLEEPER SYSTEM**

Rail Tolerances

Rail grade can be adjusted over time, as necessary, by raising the sleepers and compacting additional ballast under them.

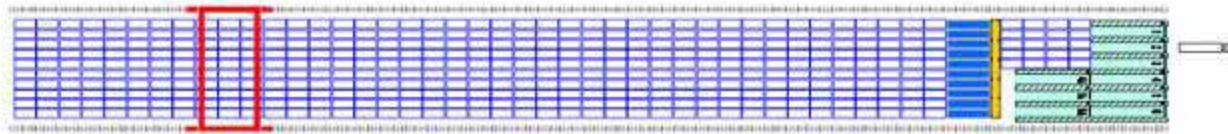


Container Blocks Area

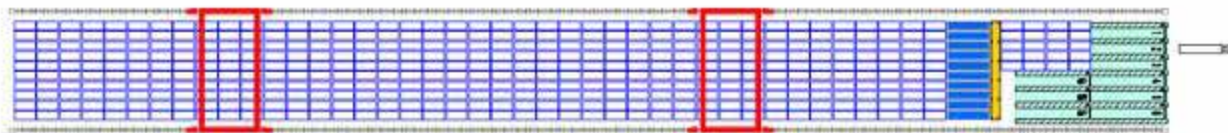
- Containers grounded on gravel or crushed stone curbed bed
- Reduces development cost - minimal maintenance cost
- Improved drainage with under drain system within the gravel bedding



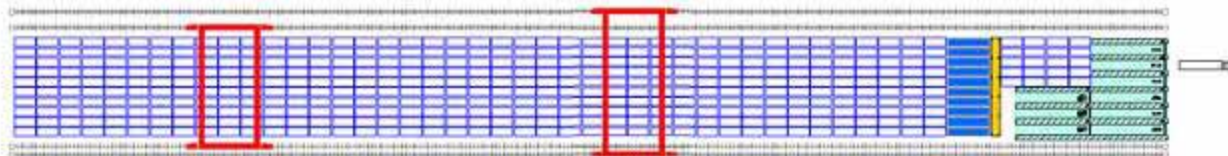
RMG Operation Types



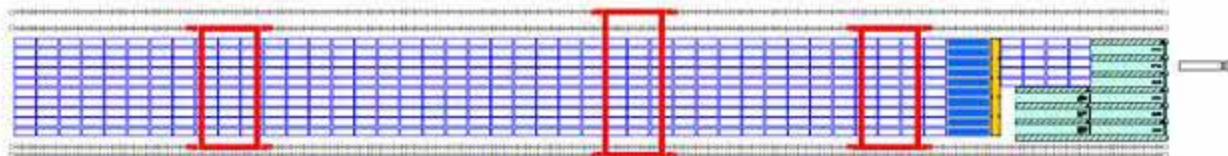
SINGLE RMG OPERATION



TWIN RMG OPERATION






CROSS OVER RMG OPERATION



TRIPLE RMG OPERATION

CH2M HILL Projects Utilizing RMG as the Operational Scheme

-  APMT - Portsmouth, VA
-  New York Container Terminal - Staten Island, NY
-  Port of Tacoma – Tacoma, WA

APMT



NYCT - Parcel C





NYCT – Parcel C Facts:

- Container Terminal: 36 acres
- RMG semi-automated operation
- Block size: 10W / 6H (1 / 5)
- Annual throughput: 435,000 TEU
- Lifts / Acre / Annually: 12,000 TEU / acre
- Estimated capital cost: \$ 210 M (includes cost of all operating equipment)
- ROIC (if completed by 2008): Year 2030

Port of Tacoma

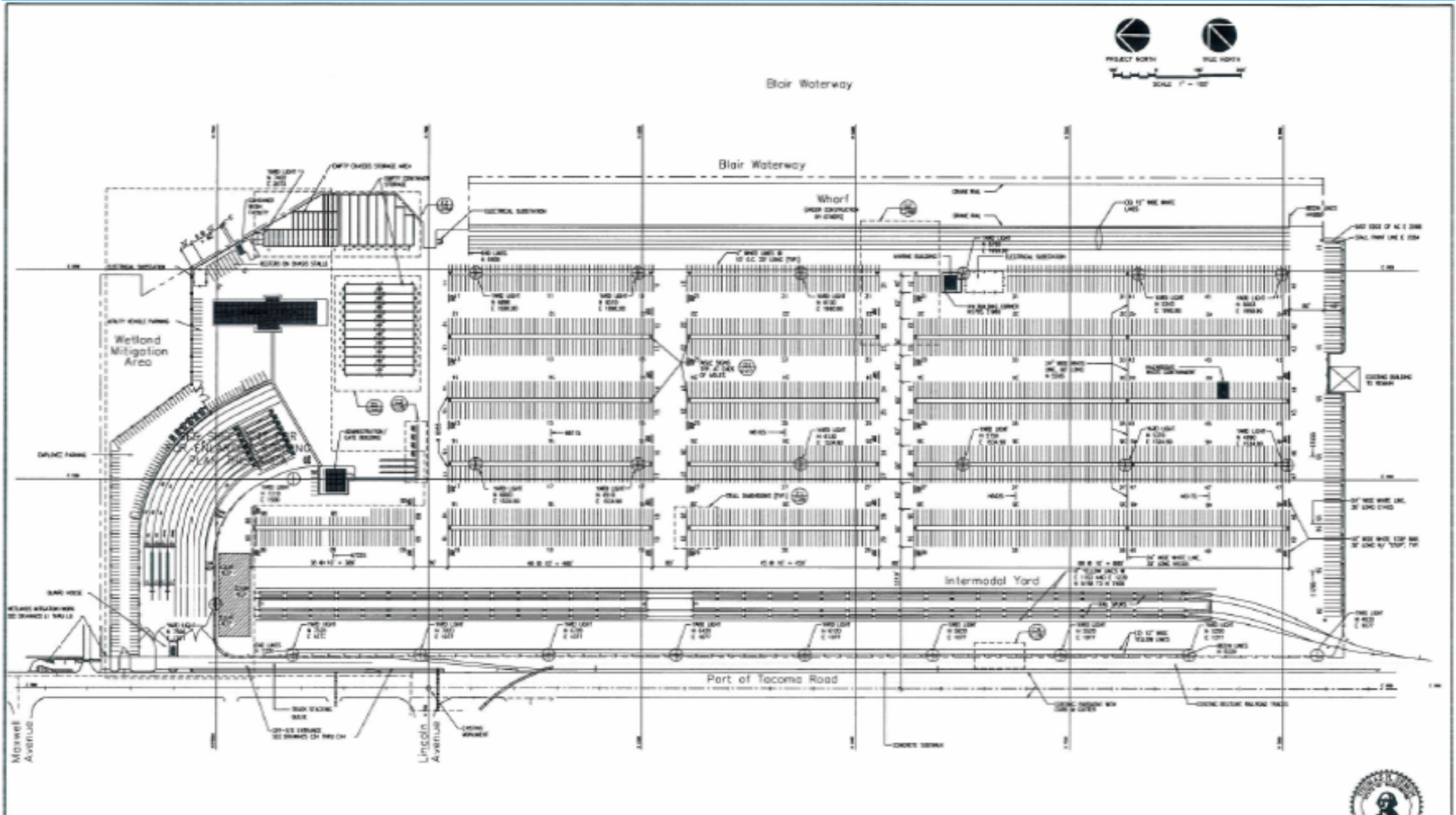
Washington United Terminal

Densification Study

Deployment of RTG or RMG Operation

- Maximum capacity
- Annual throughput
- Required infrastructure upgrade
- Capital cost requirements
- Construction phasing

WUT - Existing Site Plan



15 DECEMBER 1998
RECORD DRAWING
 Based on "Record for Construction" drawing dated 3/11/98
 as revised to show 100000 construction modifications
 compiled by WA. Sepp, Inc. and the Port of Tacoma, U.S.A.
 ISSUED FOR CONSTRUCTION 3/11/98



PORT OF TACOMA
 P.O. BOX 1837 TACOMA, WASHINGTON 98401
 (252) 383-1841

CONSULTANT
SITTS & HILL ENGINEERS, INC.
 CIVIL & STRUCTURAL ENGINEERING
 1001 1st Avenue, Tacoma, WA 98401

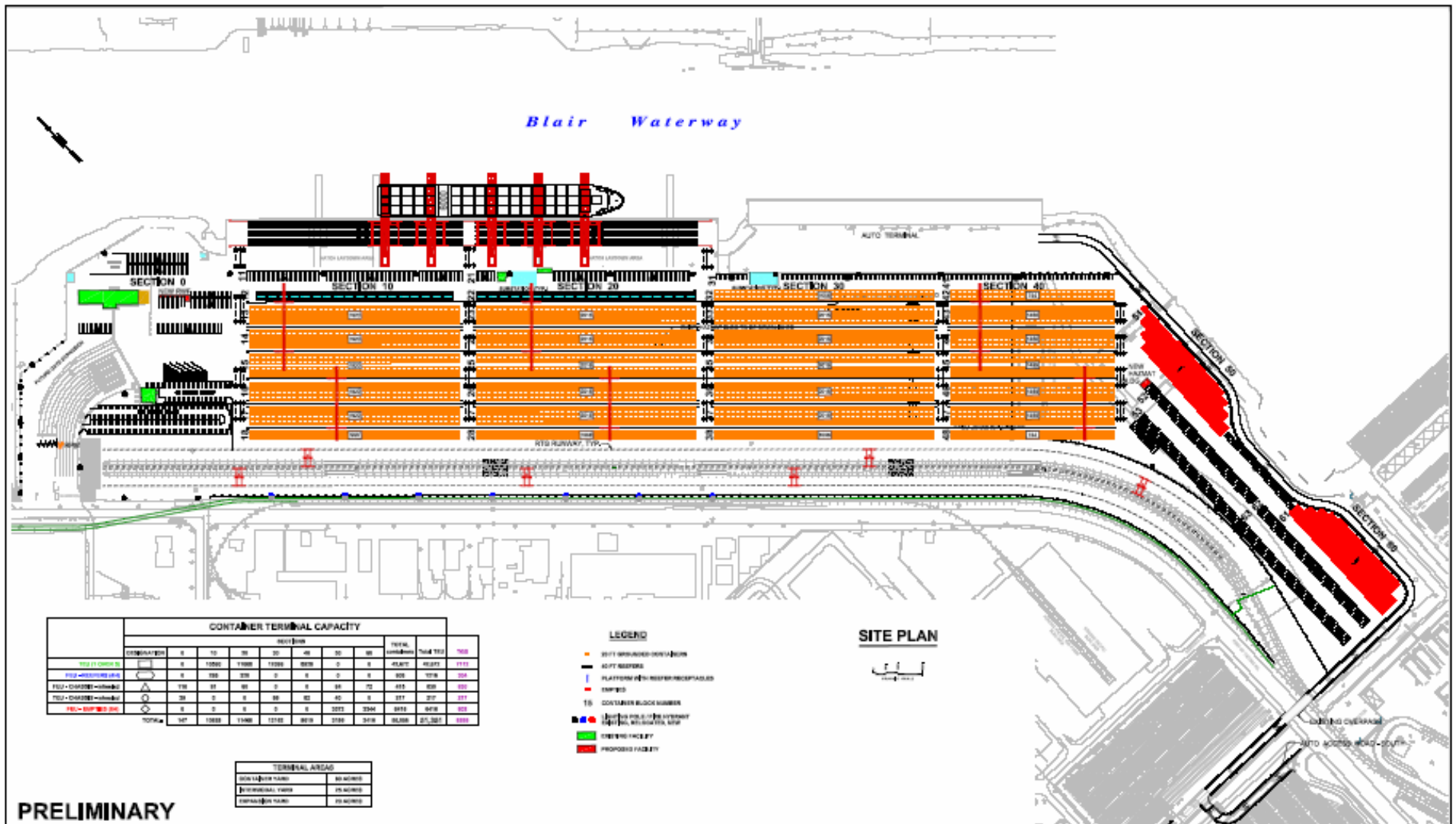
SCALE: _____
 APPROVED: _____
 DATE: _____

DESIGNED BY	DATE	CHECKED BY	DATE
DRAWN BY	DATE	APPROVED BY	DATE
SCALE	DATE	DATE	DATE

HYUNDAI TERMINAL
 SITE STRIPING PLAN

AUTOCAD FILE NUMBER: 5920
 C9
 DRAWING NO. EP-5020-25
 CONTRACT NO. 978051
 SHEET NO. 13 OF 105

WUT – RMG Site Plan



PRELIMINARY

WASHINGTON UNITED TERMINAL
RMG LAYOUT
OPTION 2



PORT OF TACOMA, P.O. BOX 1807
TACOMA, WA 98401 250434611

WUT (80 acre CY) Facts

Operating System	Capacity (TEU)	TGS (TEU)	Annual Throughput (TEU) - Yard
Chassis	6,141	6,141	448,300
RTG	24,300	5,093	1,412,600
RMG	41,081	7,412	2,687,300



CH2M HILL Services to Clients for Assessment of Impacts

-  Technical
-  Economical
-  Environmental
 -  Emissions
 -  Pollutions



Challenges for “Total Green Terminal”

Trucks

-  Hustlers - container and rail yard
-  Street trucks




Vessels

-  Integrate slow approach to ports into sailing schedules
-  Shore Power “Cold ironing”



Muuga Container Terminal - Estonia

Conclusion

-  Do our best in the process to plan and build the greenest terminal possible
 -  Work together to make the environment safer for us and future generations
-
-  *“What have you done today to make a green terminal?”*

Thank You!



Speaker Contact Information

Milan B. Lazic

Ports & Maritime Group

CH2M HILL

99 Cherry Hill Road

Suite 200

Parsippany, NJ 07054-1102

Phone: 973.316.9300

Fax: 267.675.4566

mlazic@ch2m.com

www.ch2m.com