

The Port of Virginia

Norfolk International Terminals South Wharf Renovation

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The Port of Virginia

Cargo Trends – The Big Picture

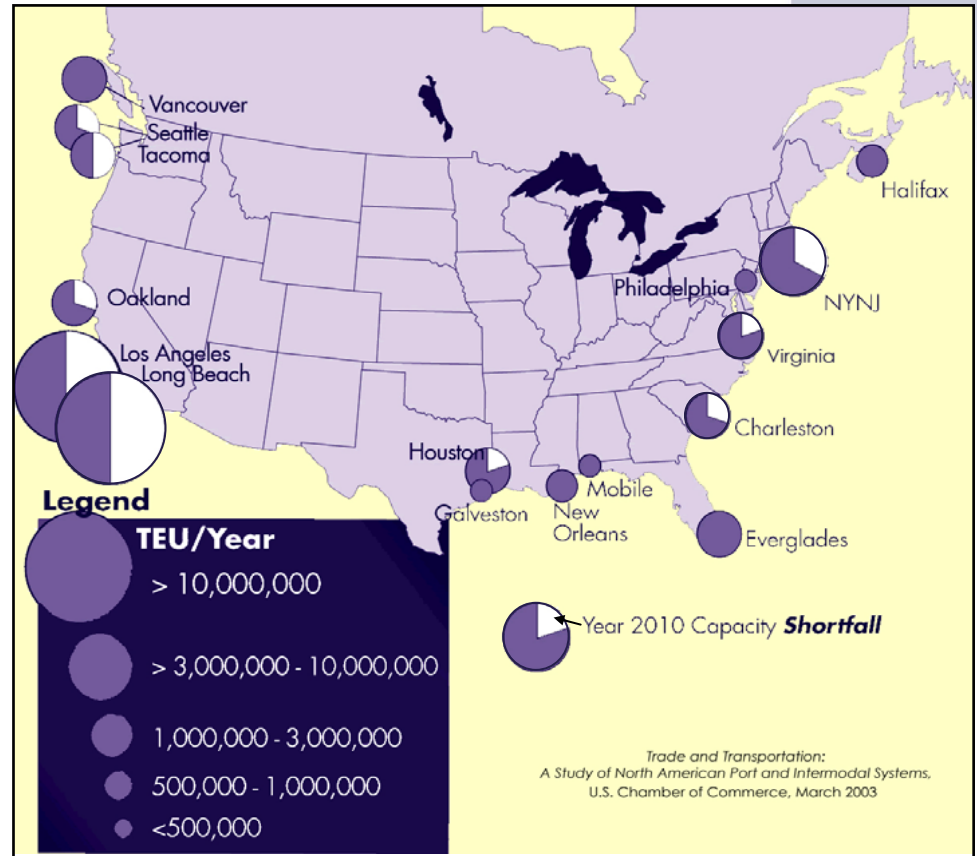
Introduction to NIT South History,
Infrastructure & Operations

How the NIT South Renovation
Project Met the VPA's Goals

Summary

National Cargo Trends

- **U.S. Cargo Will Double in Volume by 2020**
- **Panama Canal Commission Forecast East Coast Cargo to Triple by 2020**
- **Latin American Trade and Transportation Study (2001)**
 - ⊕ **13 Southern US States Will Reach Capacity Between 2008 and 2012**

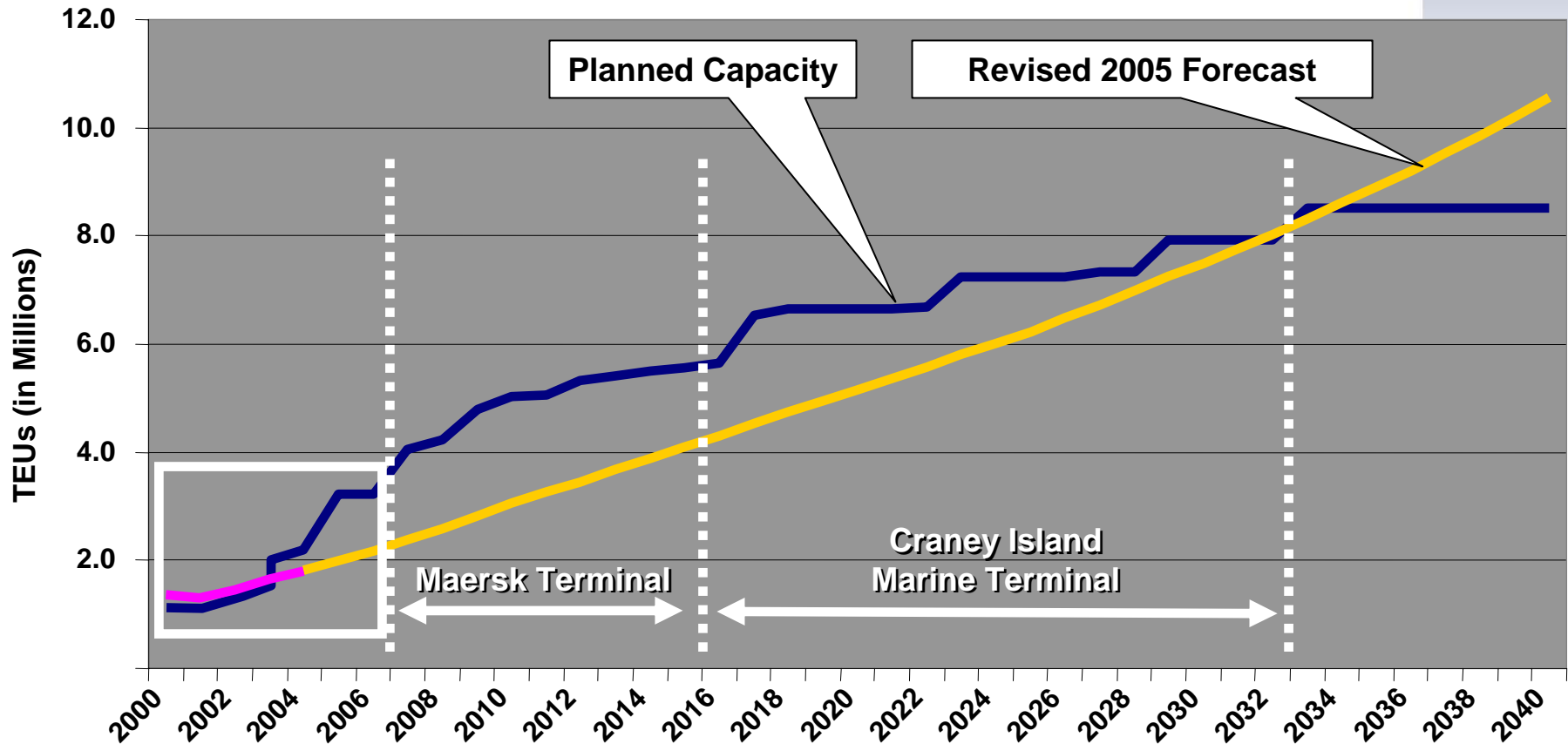


The “China Factor”

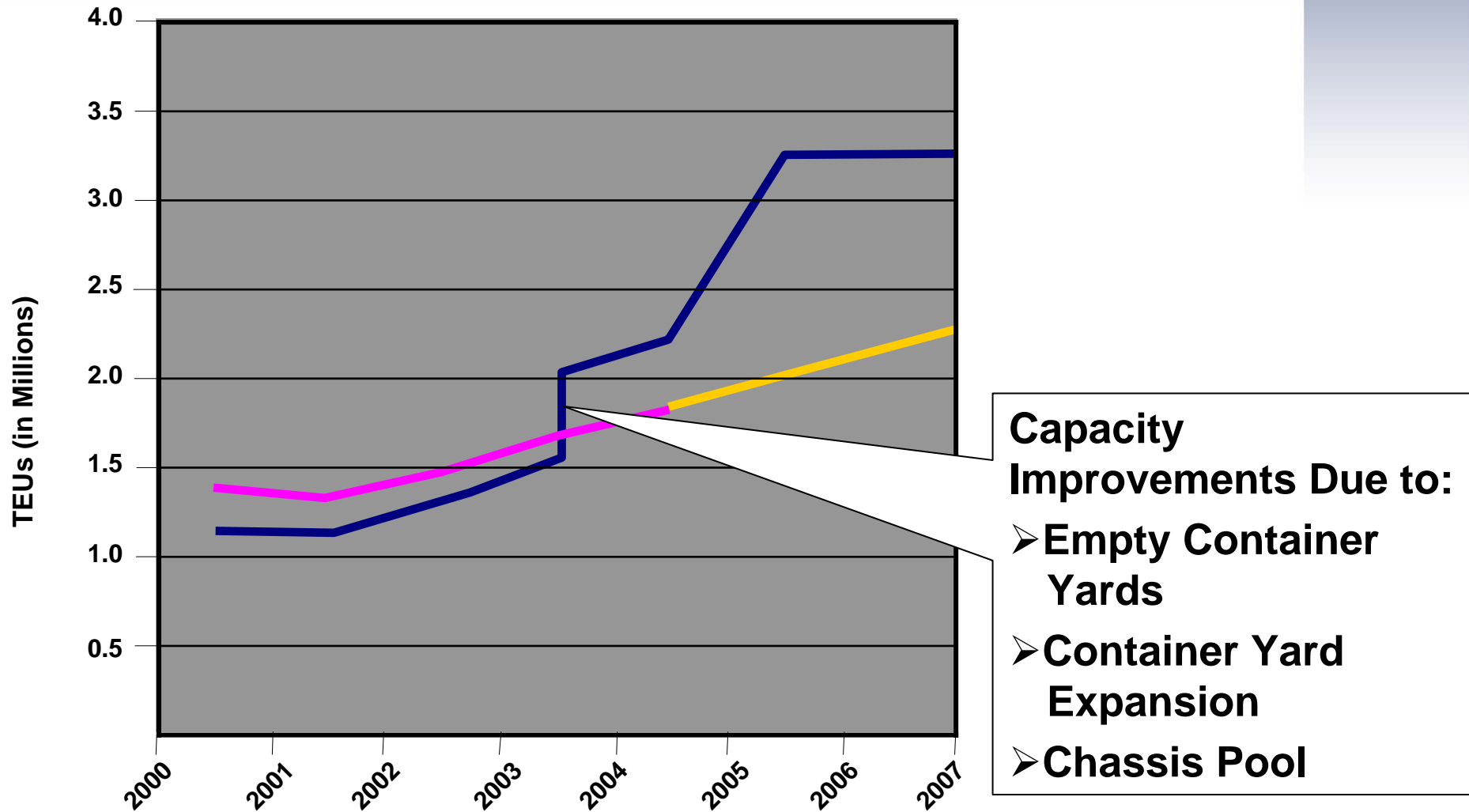
- **The Nation’s Ports as a Whole are Experiencing a 12.2% Increase in Container Trade with Asia**
- **East Coast Ports are Seeing a 31.7% Increase in Container Trade with Asia**
 - ⊕ **All-Water Shipping Routes Both Inexpensive and Stable**



Projected Cargo Demand and Planned Capacity



Projected Cargo Demand and Planned Capacity



Growth in Container Ship Sizes



➤ The *MSC Pamela* is Currently One of the Largest Container Ships in the World

⊕ 9,200 TEUs

⊕ 150 Feet Wide

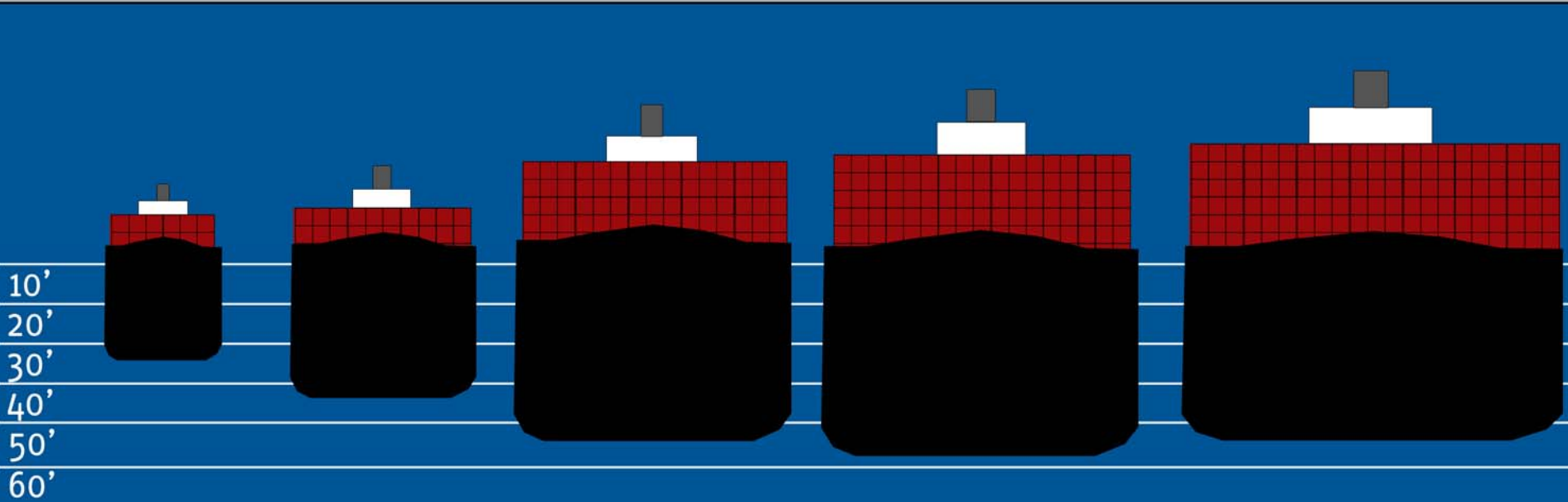
⊕ 1,053 Feet Long

⊕ 49-Foot Draft



Container Ship Evolution

Pre-1970	1970-1985	1985-2000	2000-2010	Post-2010
1,700 TEUs	2,300 TEUs	4,800 TEUs	8,000+ TEUs	13,000+ TEUs
<10 Boxes Wide	10 Boxes Wide	13-16 Boxes Wide	17 Boxes Wide	21 Boxes Wide
<30' Draft	33' Draft	44' Draft	48' Draft	44' Draft
450' Length	620' Length	900' Length	1,150' Length	1,350' Length



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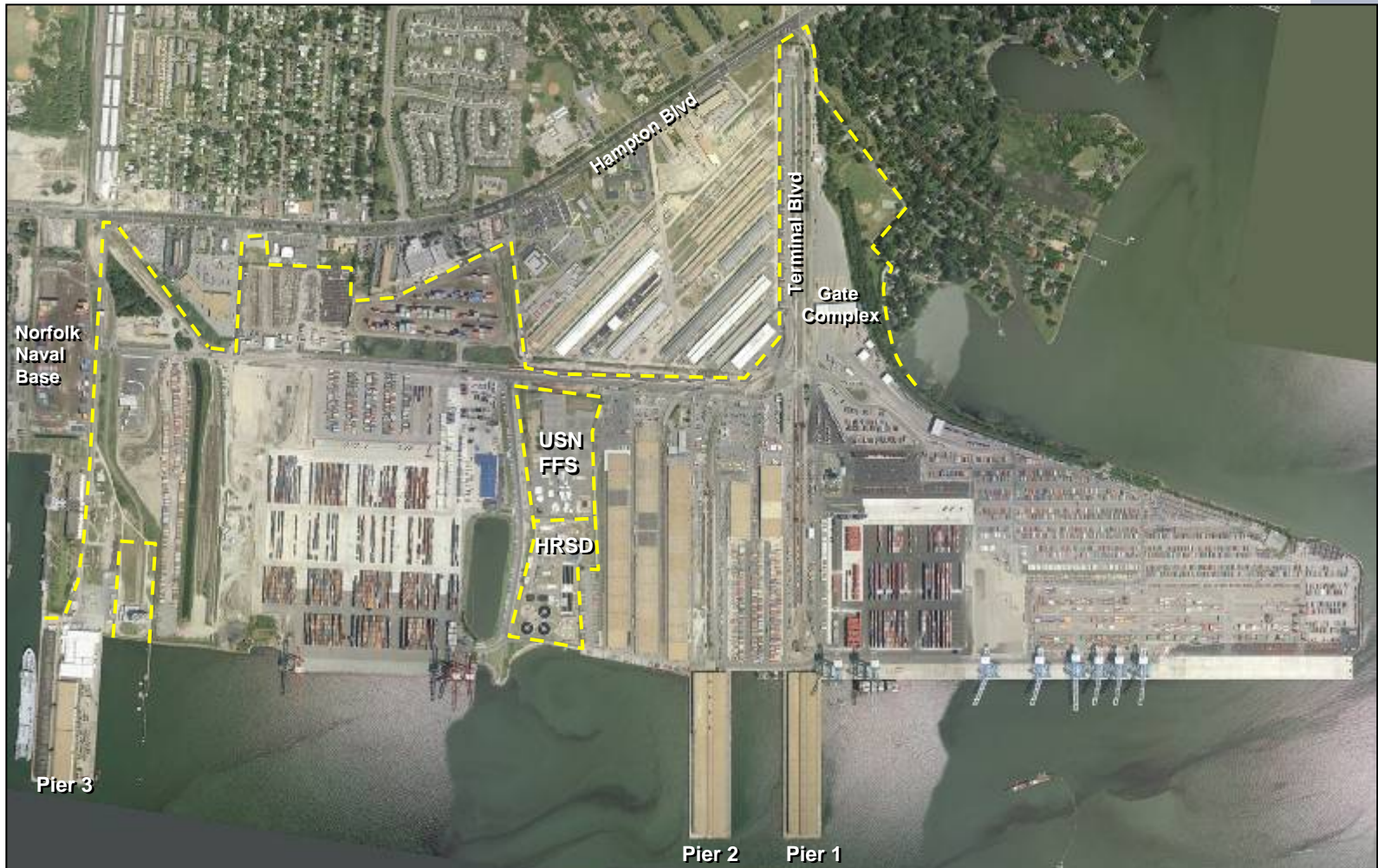
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Norfolk International Terminals



NIT South Timeline

- 1918 – Site Was a U.S. Army Quartermaster Depot**
- 1964 – Site Declared Surplus by Federal Government**
- 1965 – Acquired by City of Norfolk**
- 1967 – First Container Crane On Site (CB1)**
- 1969 – Two More Cranes Added (CB2)**
- 1972 – Site Acquired by VPA & Another Crane Purchased (CB3)**
- 1989 – VPA Purchased 3 More Cranes (CB4)**



NIT South



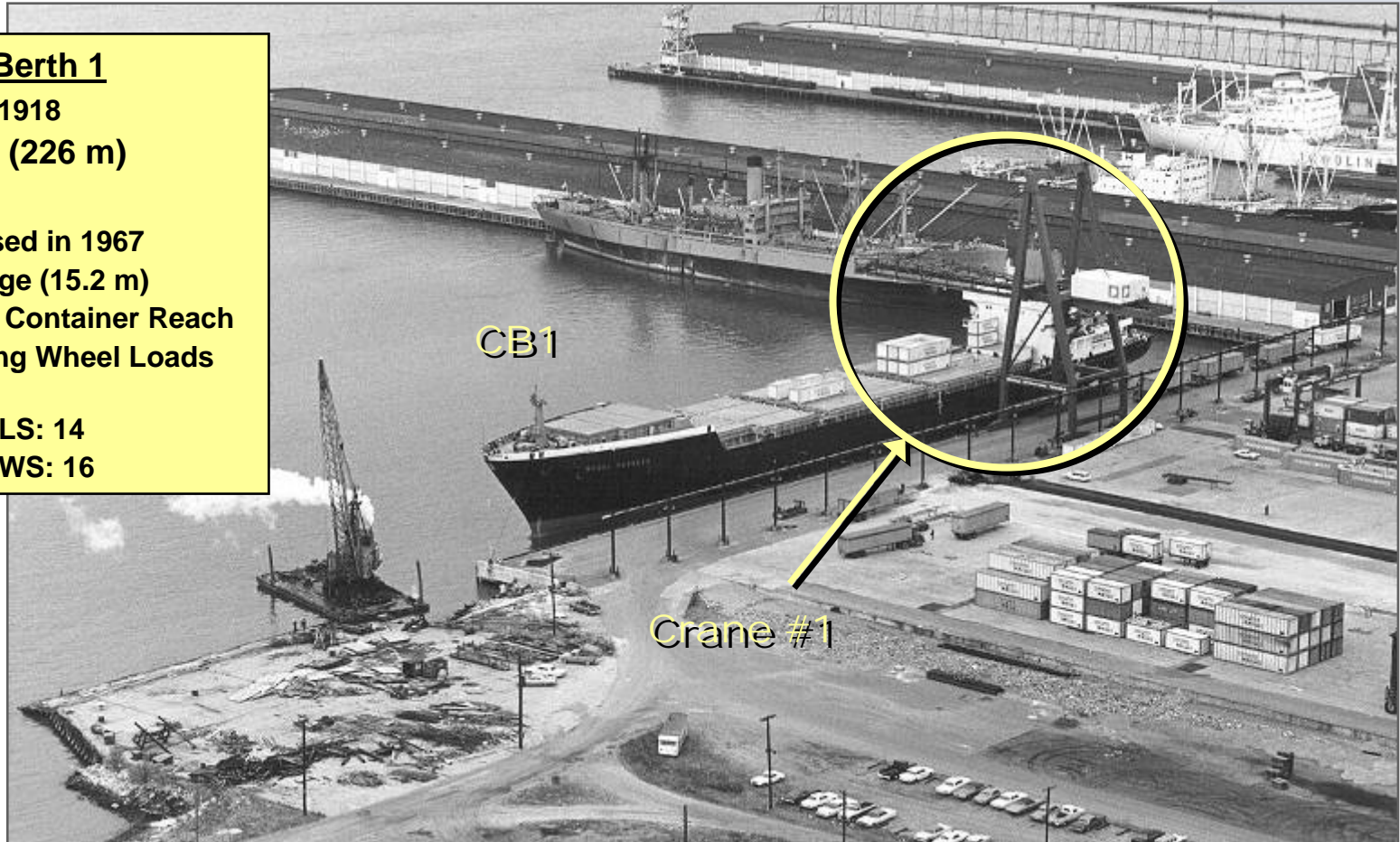
NIT Container Terminal Opened in 1967

➤ Container Berth 1

- Built in 1918
- 740-feet (226 m)

➤ Crane #1

- Purchased in 1967
- 50-ft Gage (15.2 m)
- 13-wide Container Reach
- Operating Wheel Loads (kips/ft)
 - ▲ LS: 14
 - ▲ WS: 16



NIT South

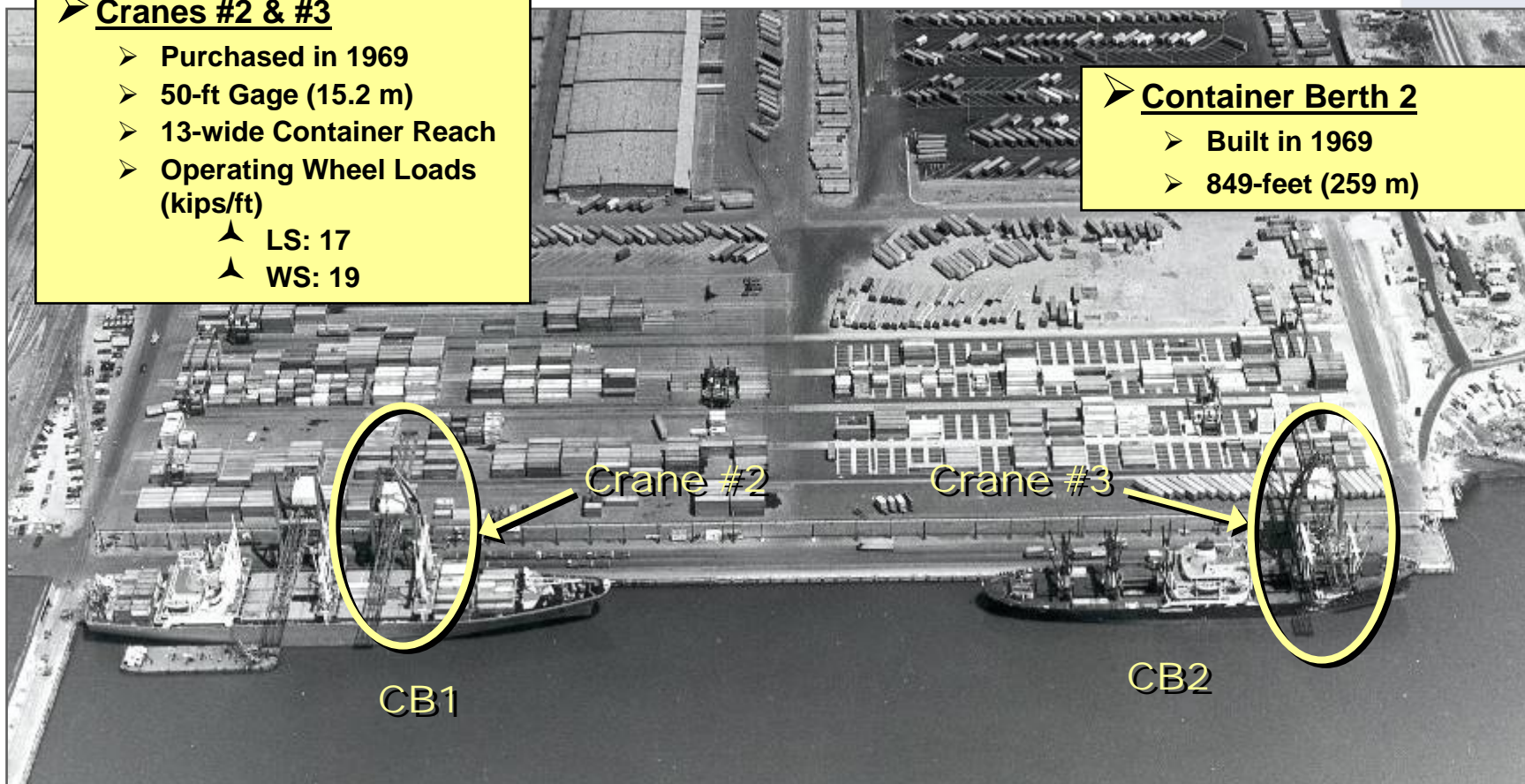
Terminal & Wharf Expansion in 1969

➤ Cranes #2 & #3

- Purchased in 1969
- 50-ft Gage (15.2 m)
- 13-wide Container Reach
- Operating Wheel Loads (kips/ft)
 - ▲ LS: 17
 - ▲ WS: 19

➤ Container Berth 2

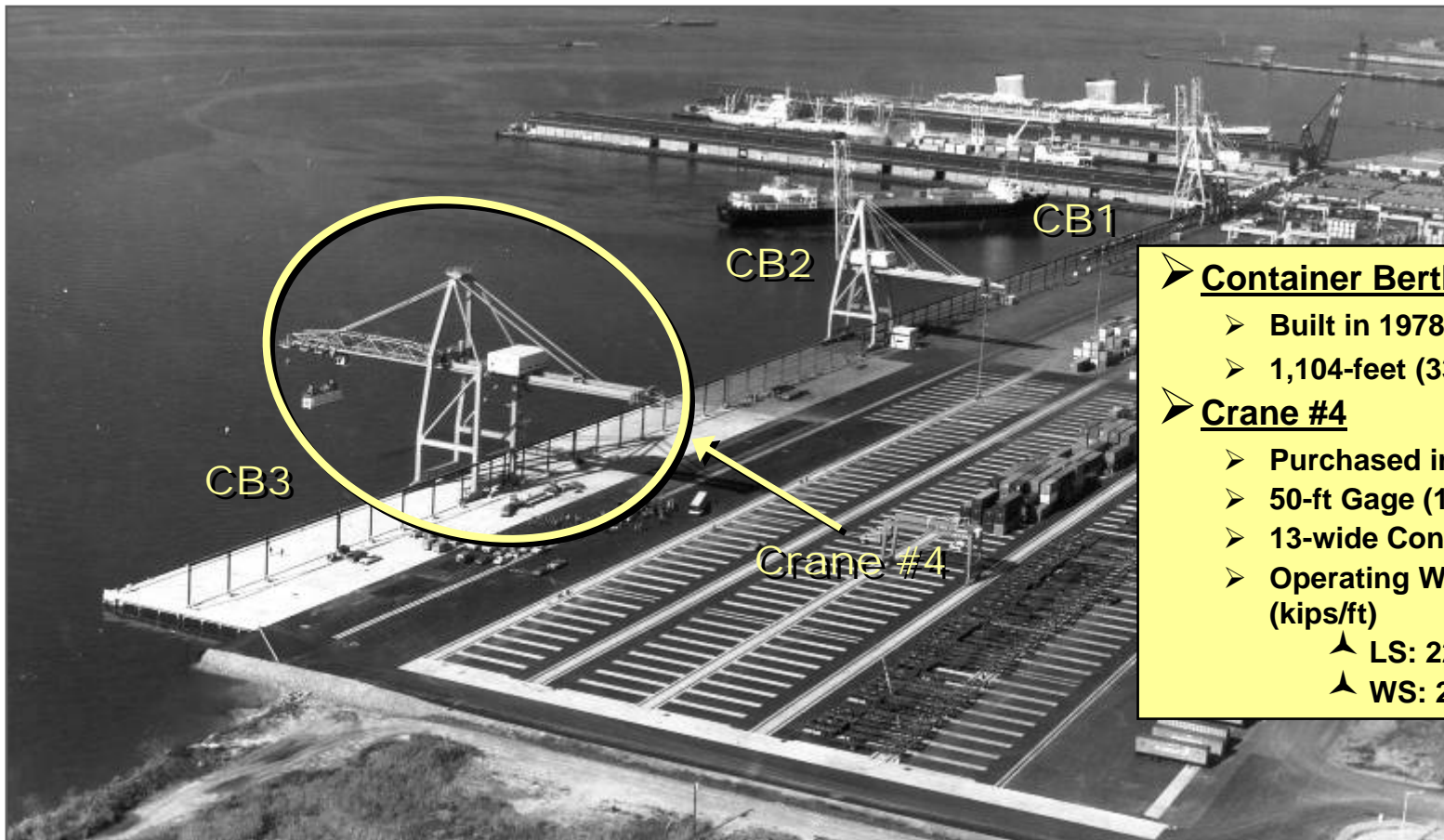
- Built in 1969
- 849-feet (259 m)



NIT South



Terminal & Wharf Expansion in 1978



➤ Container Berth 3

- Built in 1978
- 1,104-feet (336 m)

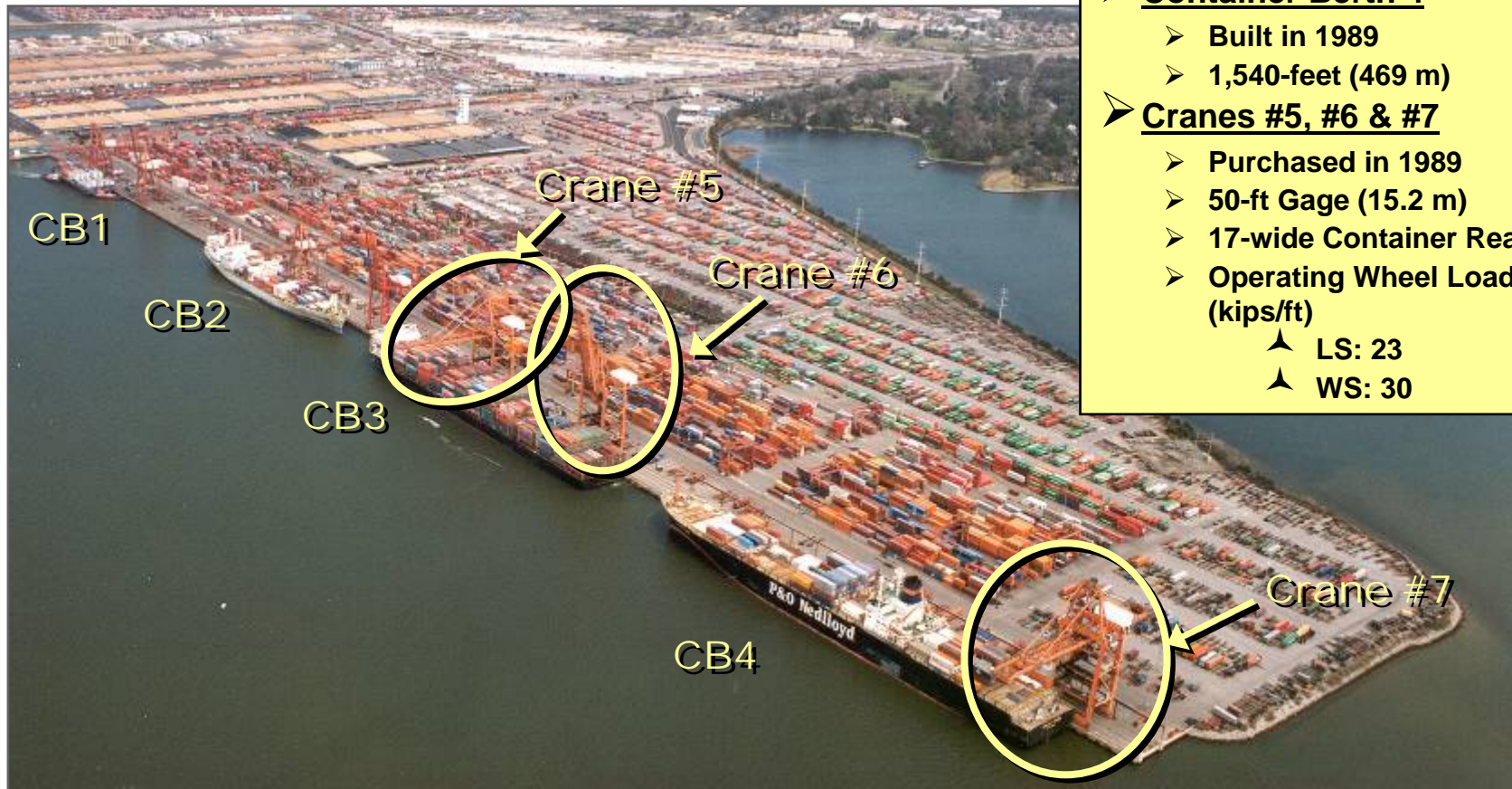
➤ Crane #4

- Purchased in 1978
- 50-ft Gage (15.2 m)
- 13-wide Container Reach
- Operating Wheel Loads (kips/ft)
 - ▲ LS: 22
 - ▲ WS: 20



NIT South

Terminal & Wharf Expansion in 1989



➤ Container Berth 4

- Built in 1989
- 1,540-feet (469 m)

➤ Cranes #5, #6 & #7

- Purchased in 1989
- 50-ft Gage (15.2 m)
- 17-wide Container Reach
- Operating Wheel Loads (kips/ft)

▲ LS: 23

▲ WS: 30

NIT North Straddle Carrier Operations



NIT South Existing Conditions Operations



- **Overhead
Busbars Not
Compatible With
Straddle Carrier
Operations**



NIT South Existing Conditions Operations



- **Yard Hustlers
Moved
Containers
From the Wharf**



NIT South Existing Conditions Operations



➤ RTGs Stacked Grounded Containers



NIT South Existing Conditions Operations



➤ Valet System Required Large Amounts of Space



NIT South Existing Conditions Infrastructure



- **Some Sections of Wharf Over 80 Years Old**
- **Oldest Container Crane Dated Back to 1967**



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NIT South Renovation

Overall Project Goals



- **Keep Pace With Containerized Cargo Forecasts**
- **Accommodate Increasing Container Ship Sizes**
- **Allow for Operational Conversions (Rubber-Tire Gantry v. Straddle Carrier)**
- **Full Renovation of NIT South Terminal**
 - ⊕ **4,230 Feet (1,289 Meters) of Wharf**
 - ⊕ **8 New Suez-Class Container Cranes**
 - ⊕ **140 Acres (57 Hectares) of Container Yard**



NIT South Renovation Specific Project Goals

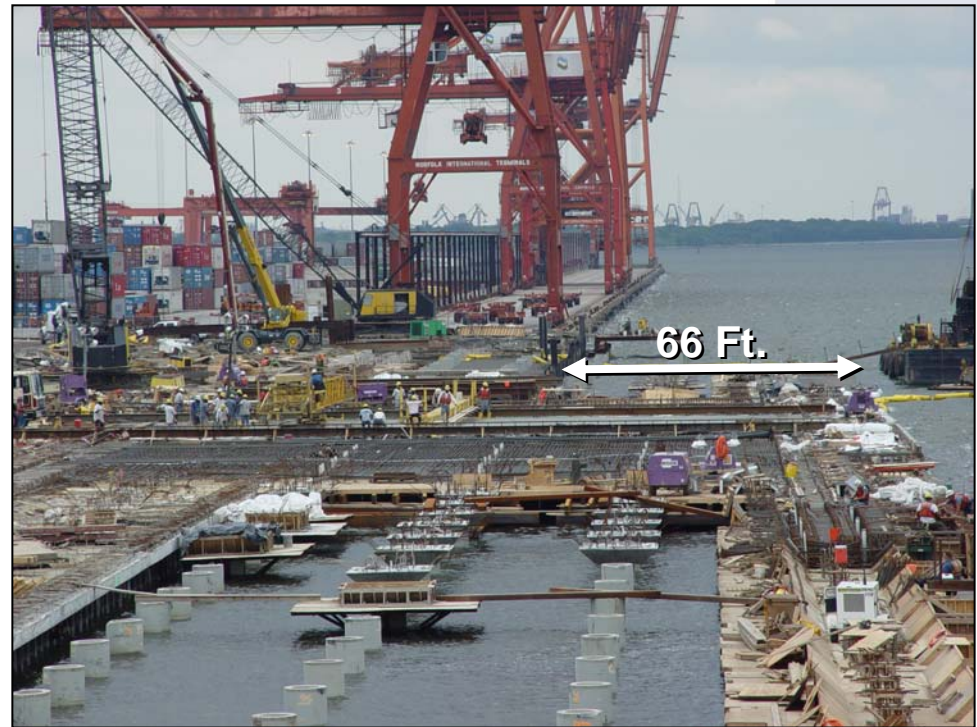


- 1. Increase the Width of the New Wharf Structure to Accommodate 100-Ft Gage Cranes**
- 2. Accommodate Dredge Depths to 60-Ft**
- 3. Minimize and Mitigate Environmental Impacts**
- 4. Re-Use Existing Structures Where Possible**
- 5. Accommodate Stormwater Run-Off with No Impacts to Container Operations**
- 6. Address Community Concerns About Noise and Pollution**
- 7. Maintain Three Operational Berths at All Times During Construction**



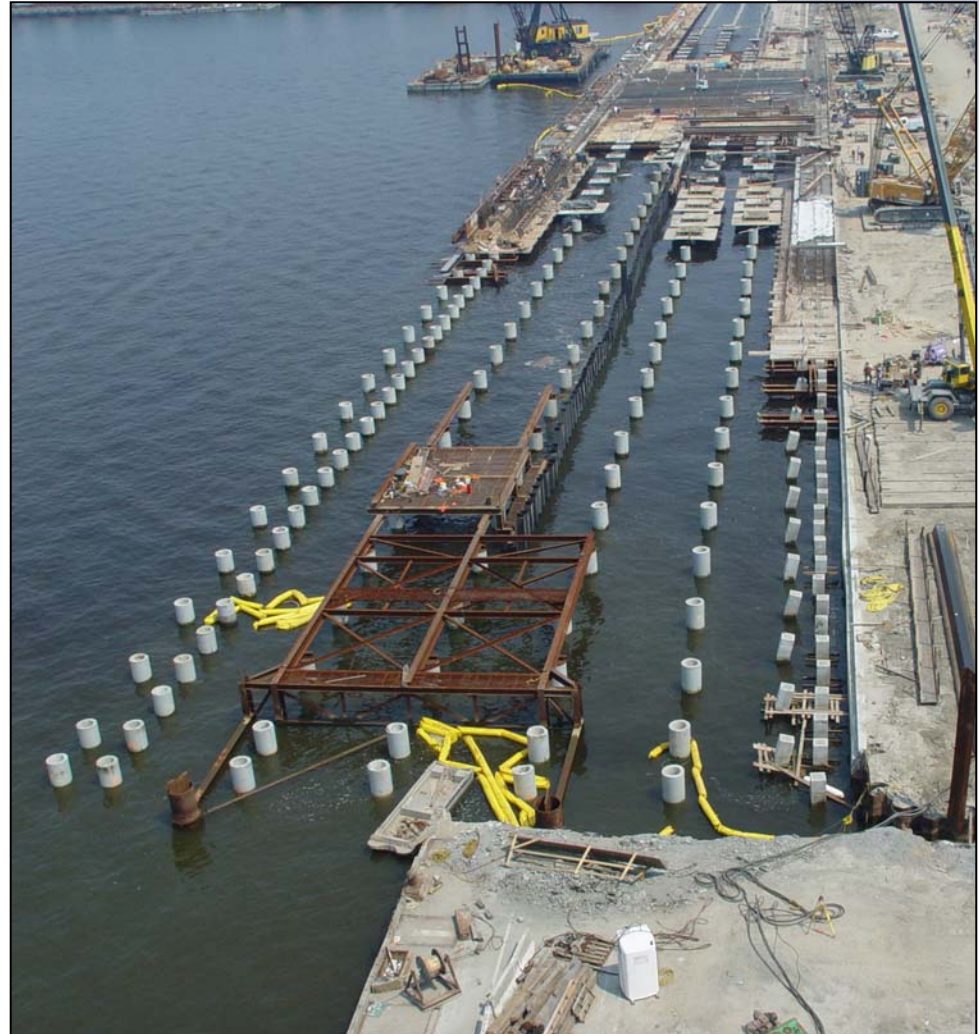
Wharf Structure

- **Face of New Wharf Placed 66 Feet Waterward of Original Structure**
 - ⊕ **Minimize Impacts to Yard Operations**
 - ⊕ **Flexibility in Meeting Dredge Depths**



Wharf Structure

- **Flat Plate Concrete Structure with Pile Capitals**
 - ⊕ **Keep Structure Out of Tide Zone**
- **Open Pile Layout**
 - ⊕ **Flexibility in Pile Driving Tolerances (2-Ft. in Any Direction)**



NIT South Renovation Specific Project Goals



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Dredge Depths

➤ Pile Sizes and Spacing

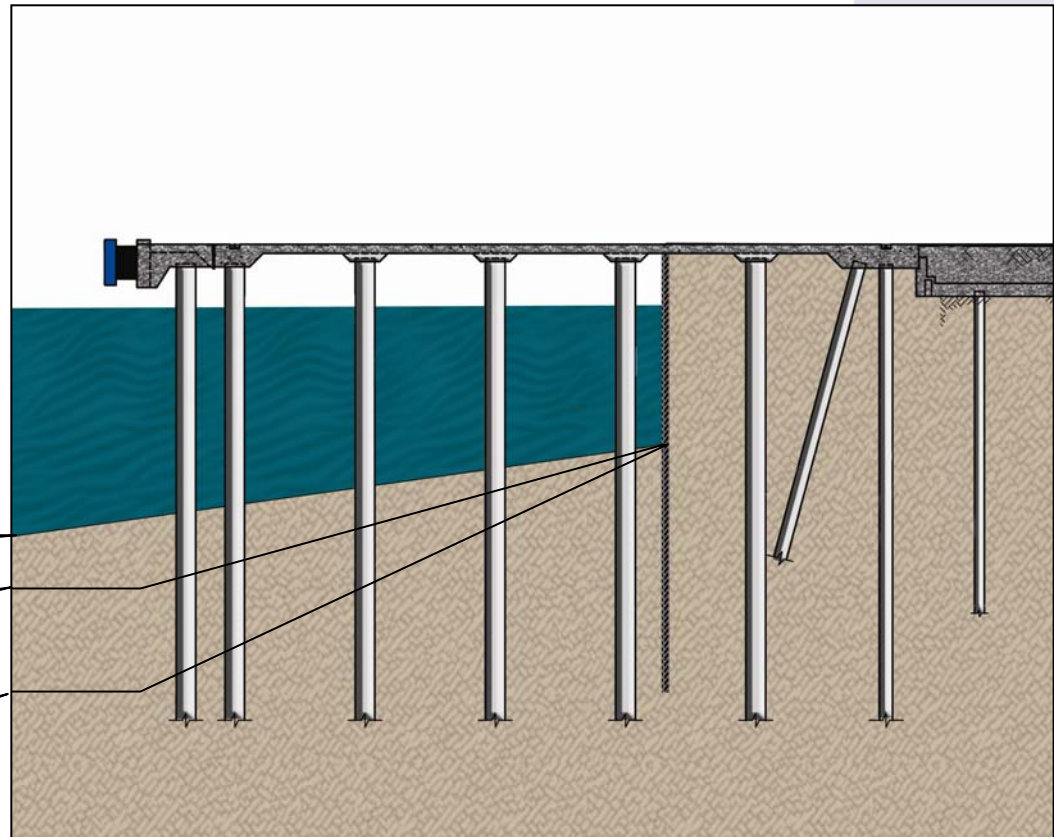
⊕ 36" Inch Cylinder Piles

⊕ 20' On Center

Existing Mudline
EL. - 45.0

Current Dredge Line
EL. - 50.0

Future Dredge Line
EL. - 60.0



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Environmental Impacts



- **Open Pile Structure on Same Alignment as Original Structure**
 - ⊕ **Minimized Need to Fill Additional River Bottom**
 - ⊕ **Created Only Additional “Shadowing”**
 - ⊕ **Under-Wharf Detention Basin Impounded Portion of River**

- **Environmental Impacts Requiring Compensatory Mitigation**
 - ⊕ **5.1 Acres of River Bottom**
 - ⊕ **.02 Acres of Vegetated Tidal Wetlands**



Compensatory Mitigation

- **VPA Believed NIT Renovation Project Deserved High-Profile Mitigation Project**
- **“Landscape Approach” Convinced Regulatory Agencies of Project Benefits**

Proposed Mitigation Type	Compensatory Mitigation Ratio	Required Mitigation for NIT Renovation Impact	Proposed Plum Point Compensation
Tidal Wetlands	2:1	10 acres	1 acre creation
Submerged Lands	1:1	5 acres	1 acre restored
Open Space Preservation	20:1	100 acres	5 acres preserved and enhanced



Plum Point Park Environmental Restoration



- **5-Acre Tract of Unused Land Along Norfolk's Urban Waterfront**
- **Eroding Shoreline**
- **Low Valued Vegetation**
- **Adjacent Waterway Littered With Debris**



Plum Point - April 2002



Plum Point Park Environmental Restoration



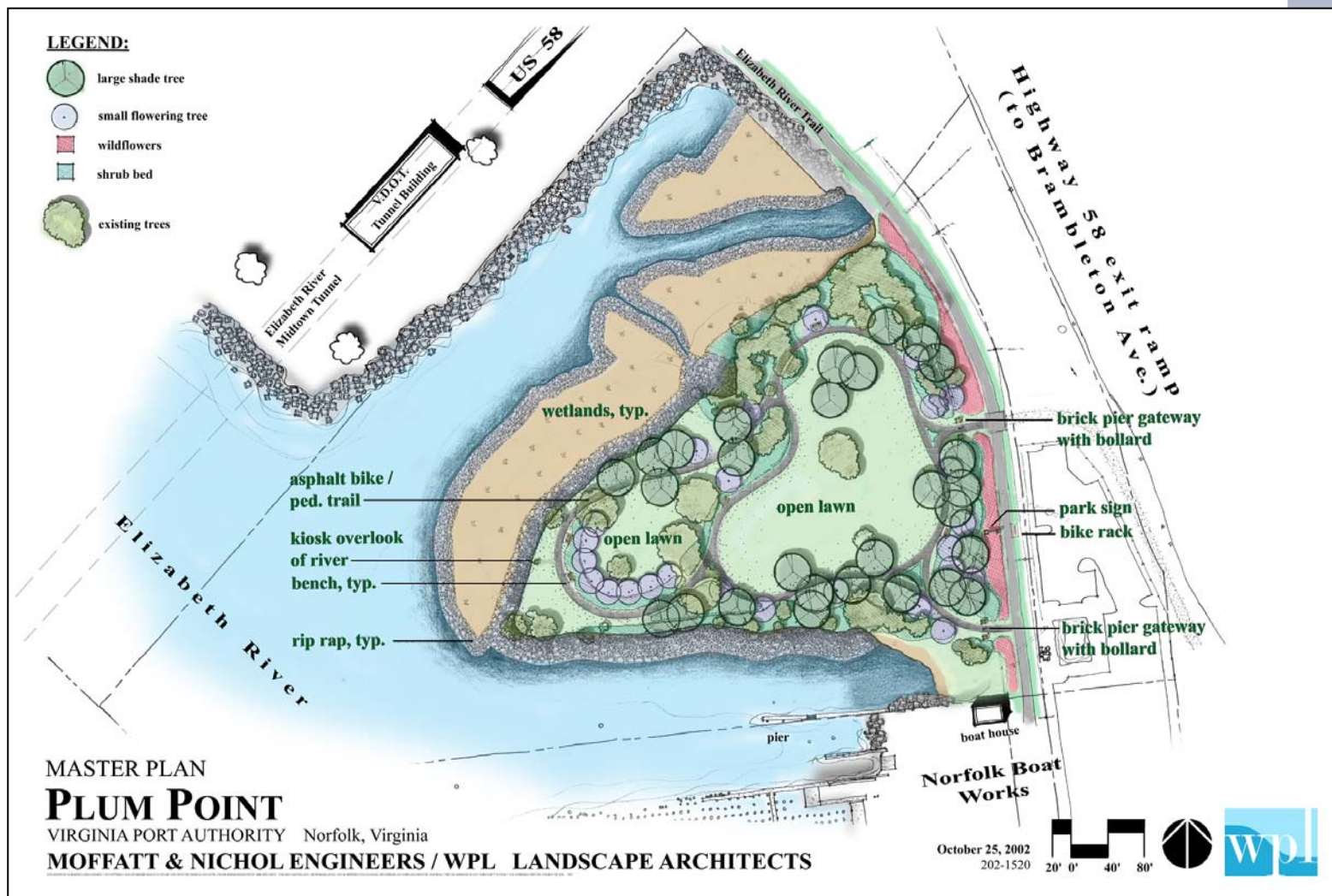
**Timber Piles
(Future River Clean-Up Area)
South Side of Plum Point
March 2002**



**Eroding Shoreline
(Future Wetlands Restoration Area)
North Side of Plum Point
March 2002**



Plum Point Park Environmental Restoration



Plum Point Park Environmental Restoration



- **1 Acre of Spartina Grass Wetlands Creation**
- **1 Acre of Submerged Bottom Land Restoration**
- **5 Acres of Open Space Preservation and Enhancement**



Plum Point – November 2005



Plum Point Park Environmental Restoration



**Rip Rap Shoreline Protection
(River Clean-Up Area)
South Side of Plum Point
May 2004**



**Wetlands Planting
(Wetlands Restoration Area)
North Side of Plum Point
May 2004**



Plum Point Park Environmental Restoration



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Reuse & Recycle



- **Fourth Berth
Incorporated into New
Structure**
 - ⊕ **Select Demo**
 - ⊕ **Phase 4 Completed
Quickly**
- **Demo Materials from
Berths 1, 2 & 3 Used as
Subbase Elsewhere on
Terminal**



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Treatment Options Considered



- **Conventional Pond**
 - ⊕ **Loss of 7 to 9 Acres of Container Handling Area**
- **Underground Collection Pipes**
 - ⊕ **Concerns About Collapse Due to Heavy Wheel Loads at Terminal**
- **Under-Wharf Detention Basin**
 - ⊕ **Located in Unused Area Below Wharf**
- **Supplemental Stormwater Treatment Devices**
 - ⊕ **Vortech[®] Units**

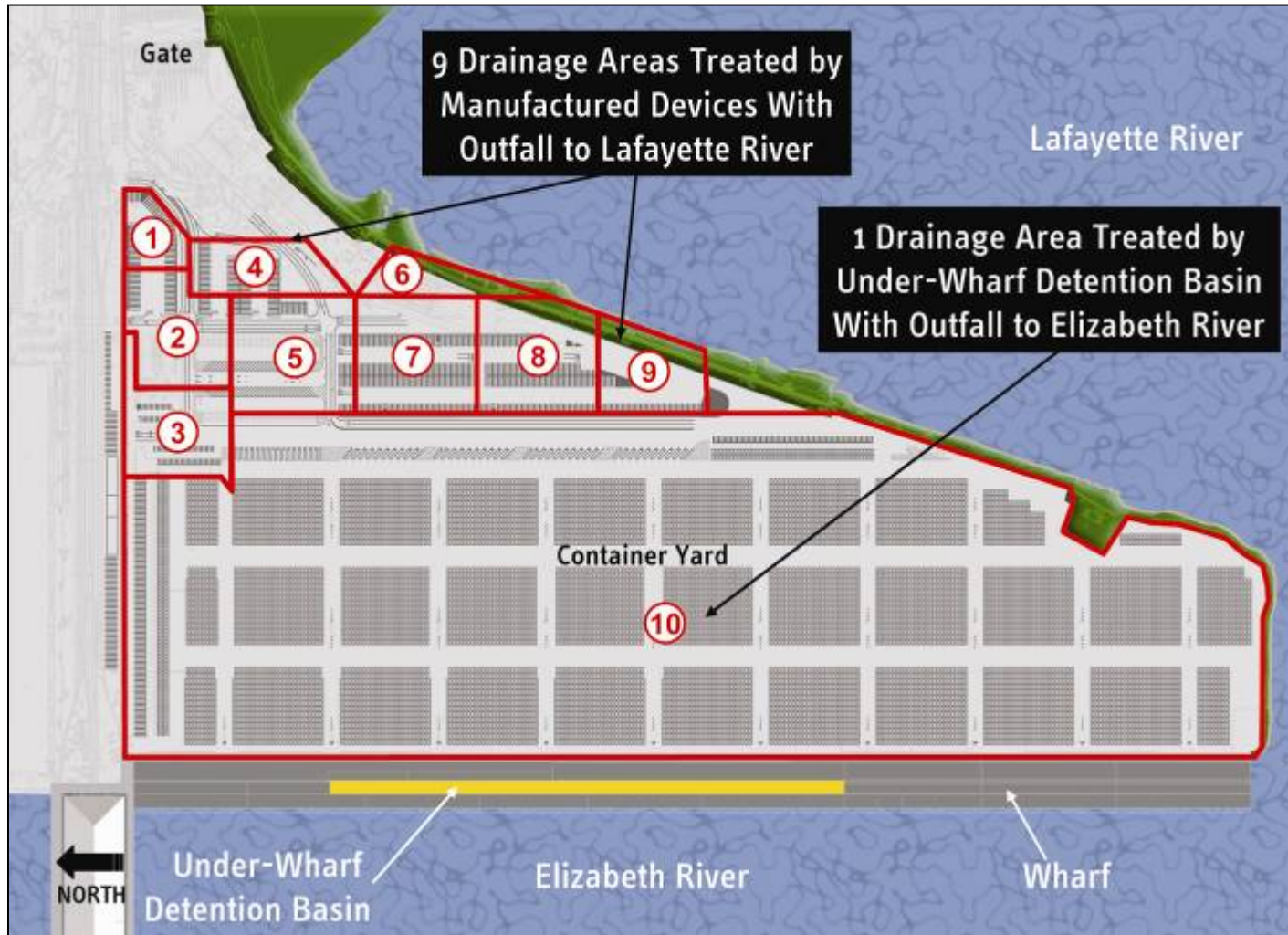


Pre-Project Conditions

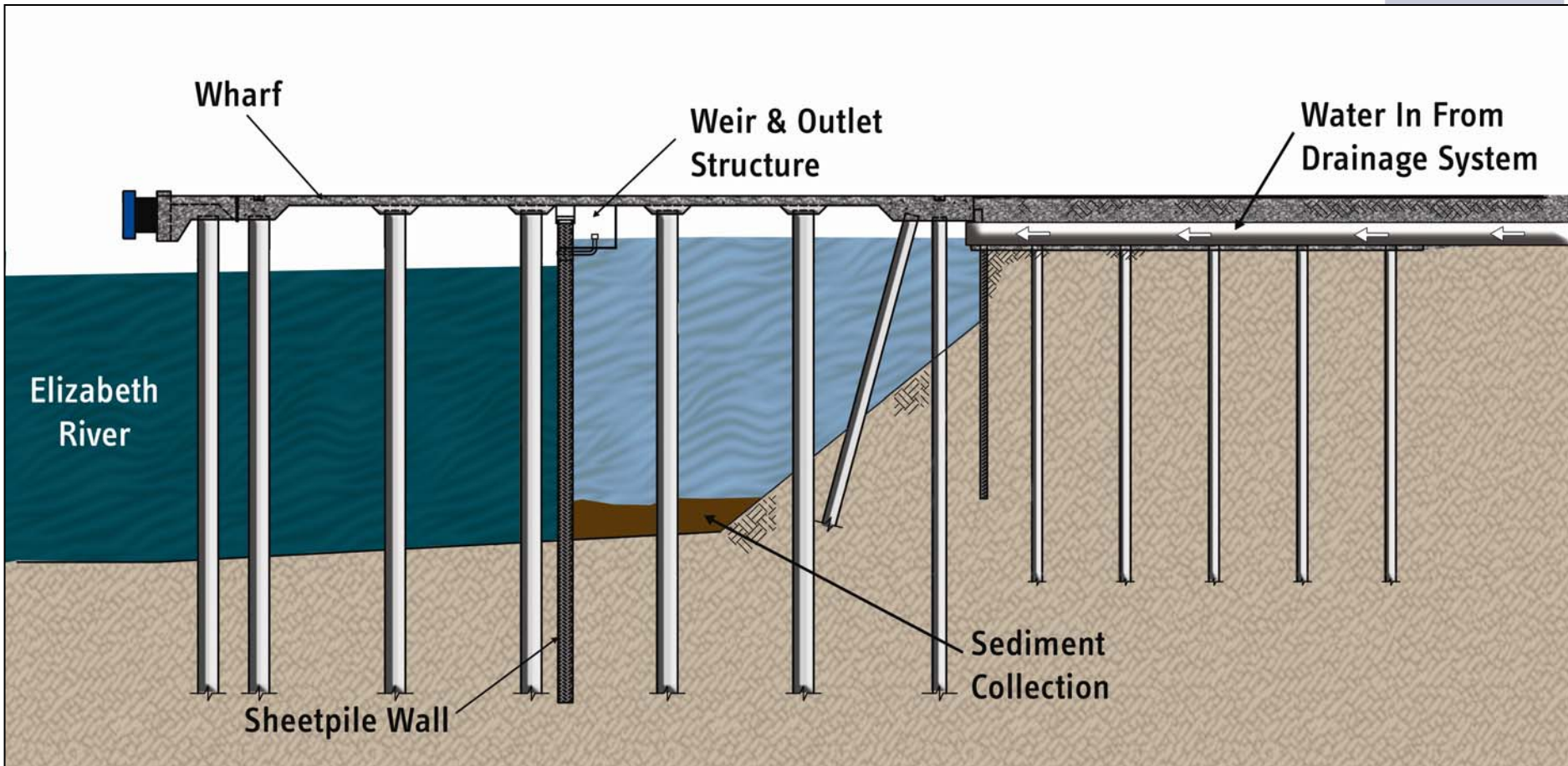
Hodgepodge Stormwater Drainage Areas



Selected Stormwater Treatment Strategy Consolidated Drainage Areas



Under-Wharf Detention Basin Section View



Under-Wharf Detention Basin

- **Met Treatment Requirements**
- **Located in Unused, Available Space Under Wharf**
- **Installation Concurrent with Wharf Construction**
- **Can Accommodate Sediment Volumes Anticipated Over the Life of the Structure**
- **Obviated Need for a Conventional Storm Water Treatment Pond**



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Proximity to Lochhaven



Community Concerns



- **Open Dialogue Between VPA, M&N & Community Leaders**
- **Construction Noise Concerns**
 - ⊕ **Specifications Prevented Night Time/Early Morning Pile Driving**
- **Environmental Concerns Regarding Health of Adjacent Waterway**
 - ⊕ **Educate Citizens About VPA's Stormwater Treatment System and Pollution Prevention Program**



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NIT South Wharf



**Berth 1 Under Construction
Berths 2, 3 & 4 Operational**



NIT South Wharf



Berth 1 Complete
Berth 2 Under Construction
Berths 1, 3 & 4 Operational



NIT South Wharf



Berths 1 & 2 Complete
Berth 3 Under Construction
Berths 1, 2 & 4 Operational



NIT South Wharf



Berths 1, 2 & 3 Complete
Berth 4 Under Construction
Berths 1, 2 & 3 Operational



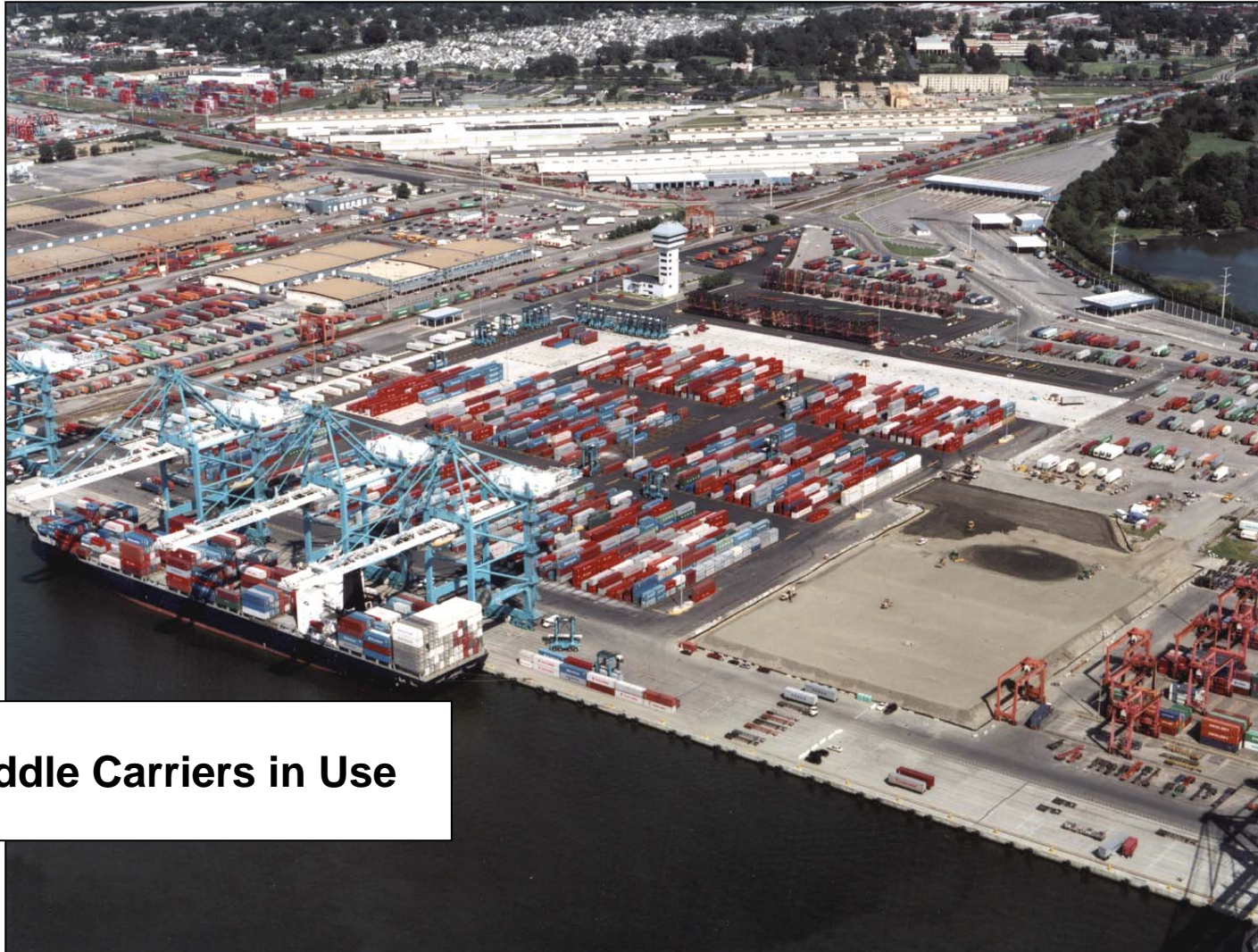
NIT South Wharf



**All Berths Complete
and Operational**



NIT South Operations



Straddle Carriers in Use



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Summary



- **NIT South Wharf Renovation Can Serve as an Example to the Port Industry**
 - ⊕ **Upgrade Aging Port Infrastructure**
 - ⊕ **No Negative Impacts to Operations**
 - ⊕ **Innovative Approach to Addressing Environmental Concerns**

- **VPA Now Has a State-of-the-Art Container Wharf Capable of Service the Industry for the Next 50 Years**



The Port of Virginia



400th Anniversary 1607 - 2007