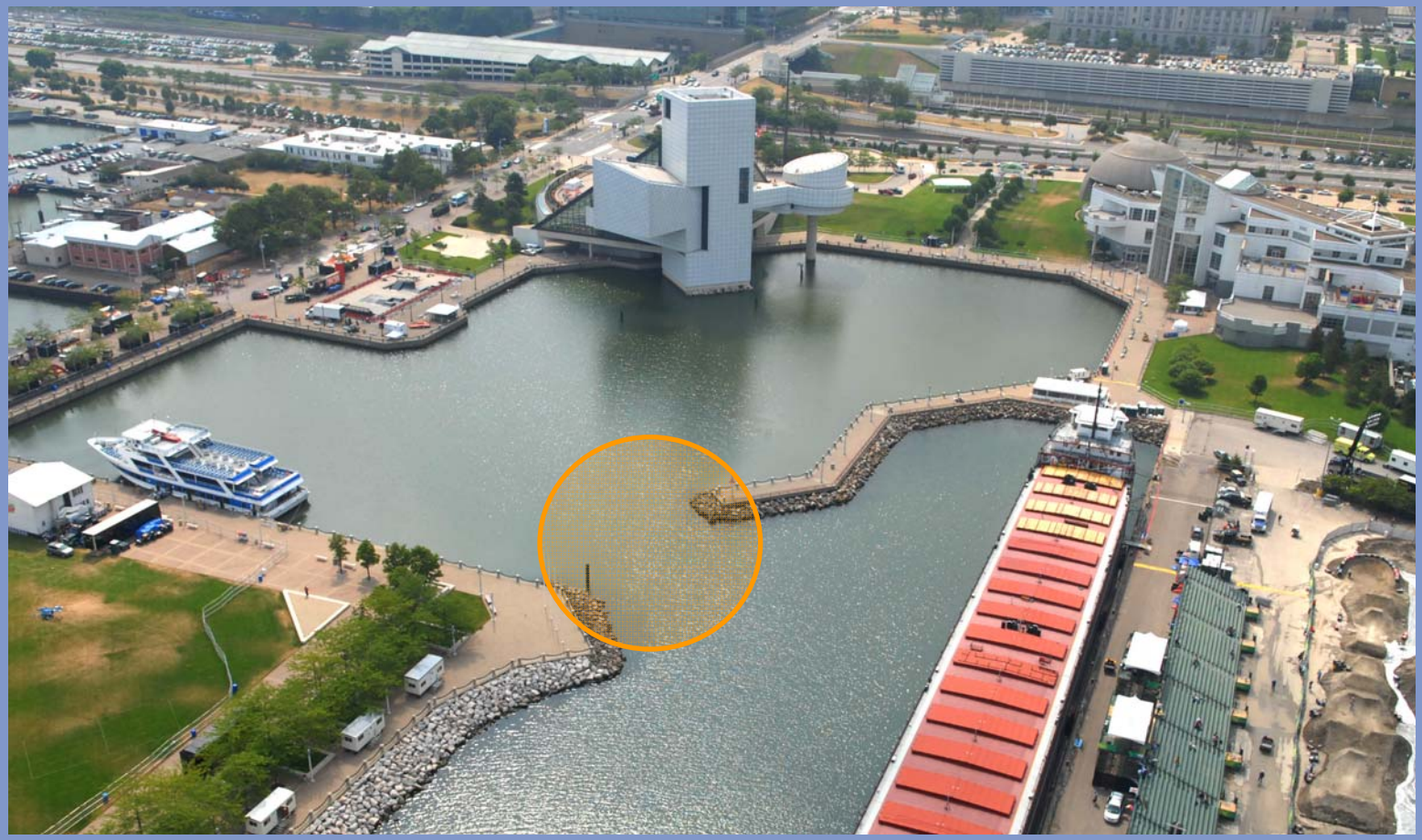
North Coast Harbor Pedestrian Bridge

City of Cleveland, Ohio



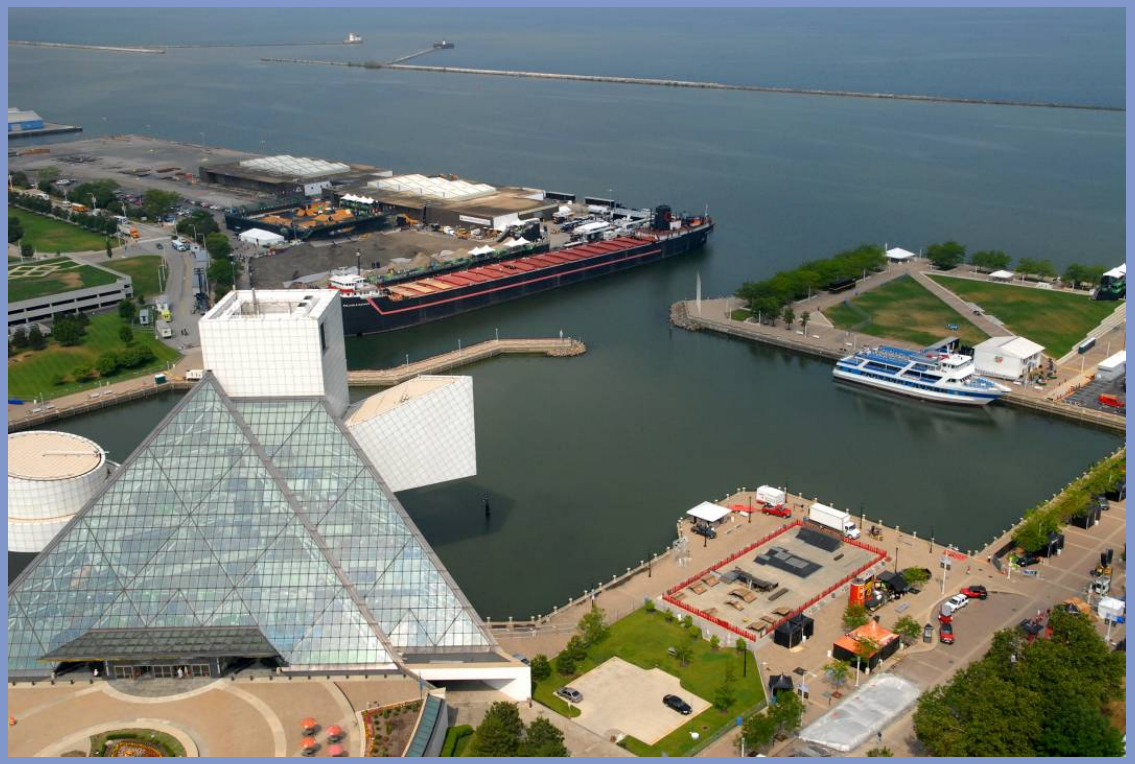
Wilbur Smith Associates / Rosales + Partners / SBP

BBC&M Engineering, Inc. / KS Associates, Inc. / Collins Engineers, Inc.

07.21.2009

Workshop Agenda

- Introduction
- Schedule
- Findings
- Conceptual Alternatives
- Alternative Matrix
- Feasible Alternatives



North Coast Harbor Pedestrian Bridge

Ohio Department of Transportation

City of Cleveland
Division of Engineering & Construction
Cleveland City Planning Division

Stakeholder Advisory Committee

Wilbur Smith Associates
Stephen Goodreau
Project Manager

Rosales + Partners
Miguel Rosales
Bridge Architect

Schlaich Bergermann & Partner
Michael Stein
Structural Engineer

BBC&M Engineering, Inc.
Mary Sharrett
Environmental Engineer

KS Associates, Inc.
Mark Yeager
Chief Surveyor

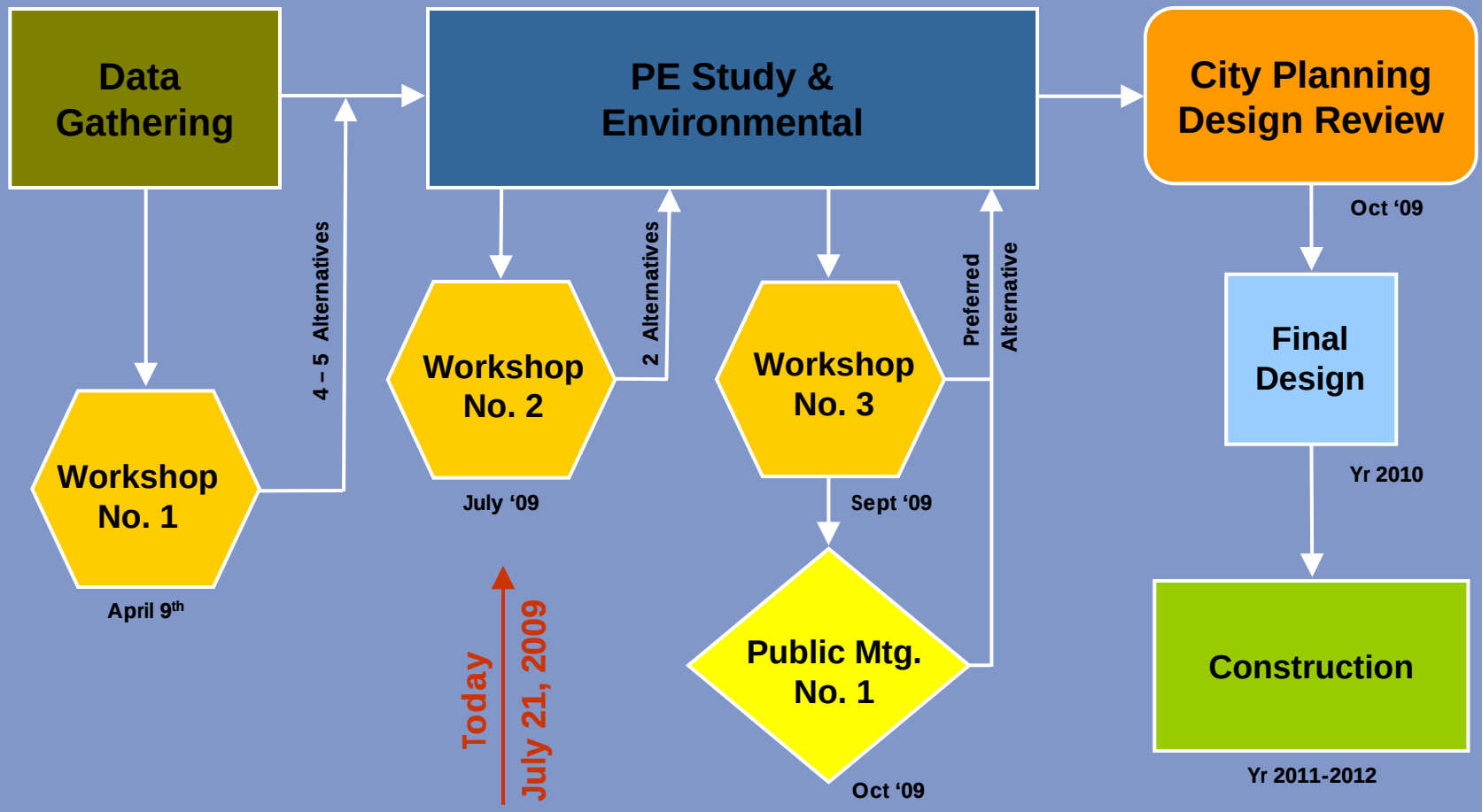
Collins Engineers, Inc.
Heath Pope
Underwater Inspection

Wilbur Smith Associates

Rosales + Partners

Schlaich Bergermann & Partner

Design Process



Environmental Findings:

- **ESA Screening**
  - ✓ No Additional ESA recommended
  - ✓ Lake Erie sediment has potential impact from Industrial and Marine use.
- **Ecological**
  - ✓ No listed species, Indiana Bat Roosts, and no mussel beds.
  - ✓ Permanent impact to Habitat due to foundation construction.
  - ✓ Temporary impacts to water quality during construction. Mitigated by Storm water pollution plan.
  - ✓ Minimal long-term impact to habitat and water quality.
- **Cultural Resources**
  - ✓ E. 9th Street Pier
  - ✓ Remaining portions cut off below grade from past construction
  - ✓ No significant impact anticipated.

Environmental Findings: Permitting

North Coast Harbor Pedestrian Bridge

Section 404

- ✓ USACE permit for fill/dredged material
- ✓ Nationwide permit since minor project

- **Section 401**
  - ✓ OEPA water quality certification (WQC)
  - ✓ Nationwide permit since minor project
  - ✓ WQC pre-certified under NWP

- **Section 10**
  - ✓ USACE permit for work in navigable waters.
  - ✓ USACE Buffalo District has jurisdiction
  - ✓ Processed jointly with the NWP
  - ✓ Application used to be same as 404 submittal.

- **Section 9**
  - ✓ US Coast Guard (USCG) Section 9 bridge permit
  - ✓ USCG District 9
  - ✓ The CE, WQC, and Section 404 permit submitted USCG

- **Costal Zone Management**
  - ✓ ODNR implements the Coastal Management Program
  - ✓ ODOT to coordinate with ODNR
  - ✓ Based on MOU, ODOT projects processed as a CE and use NWPs are considered consistent with the OCMP.

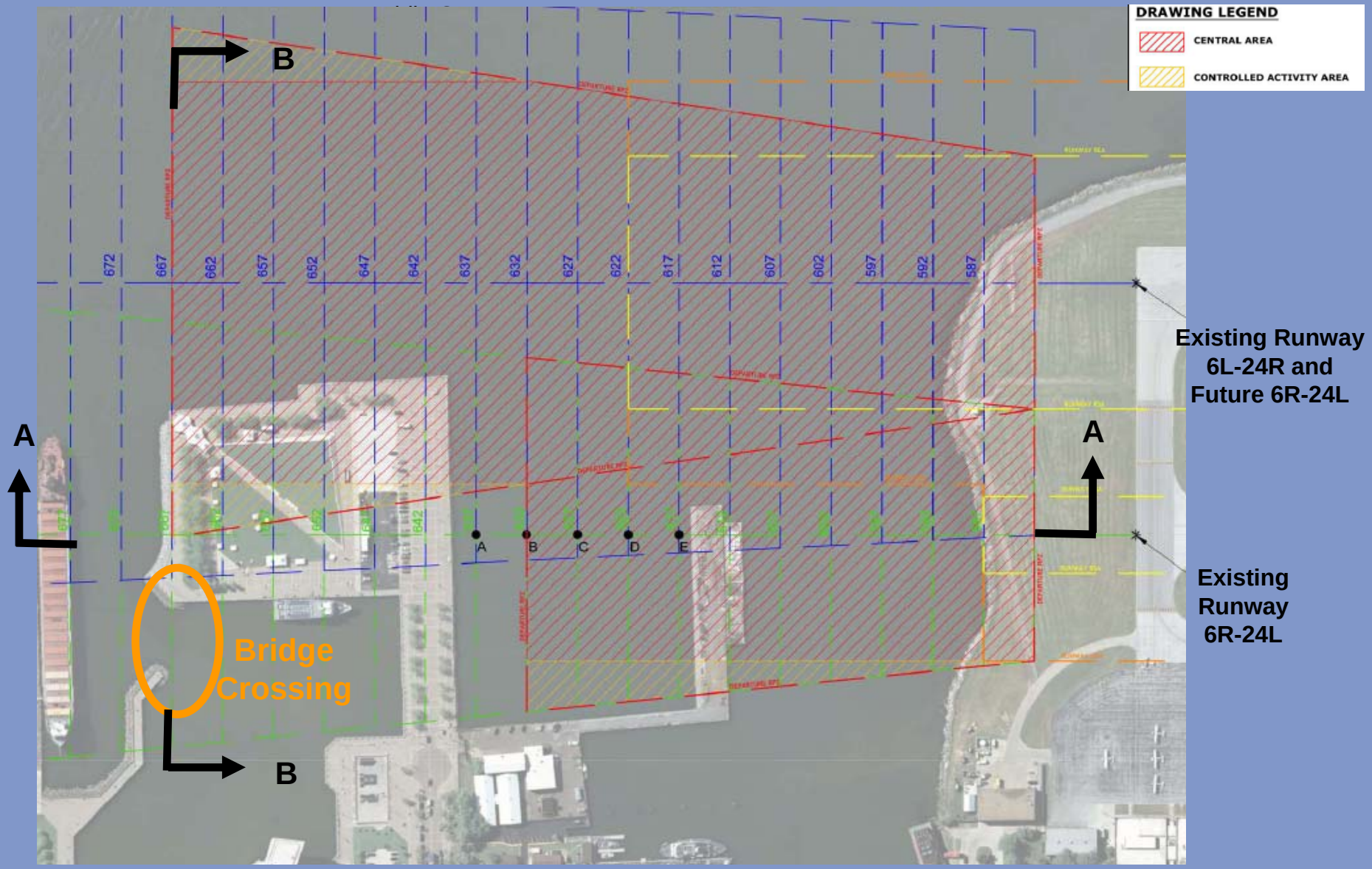
Preliminary Engineering:

US Coast Guard Criteria

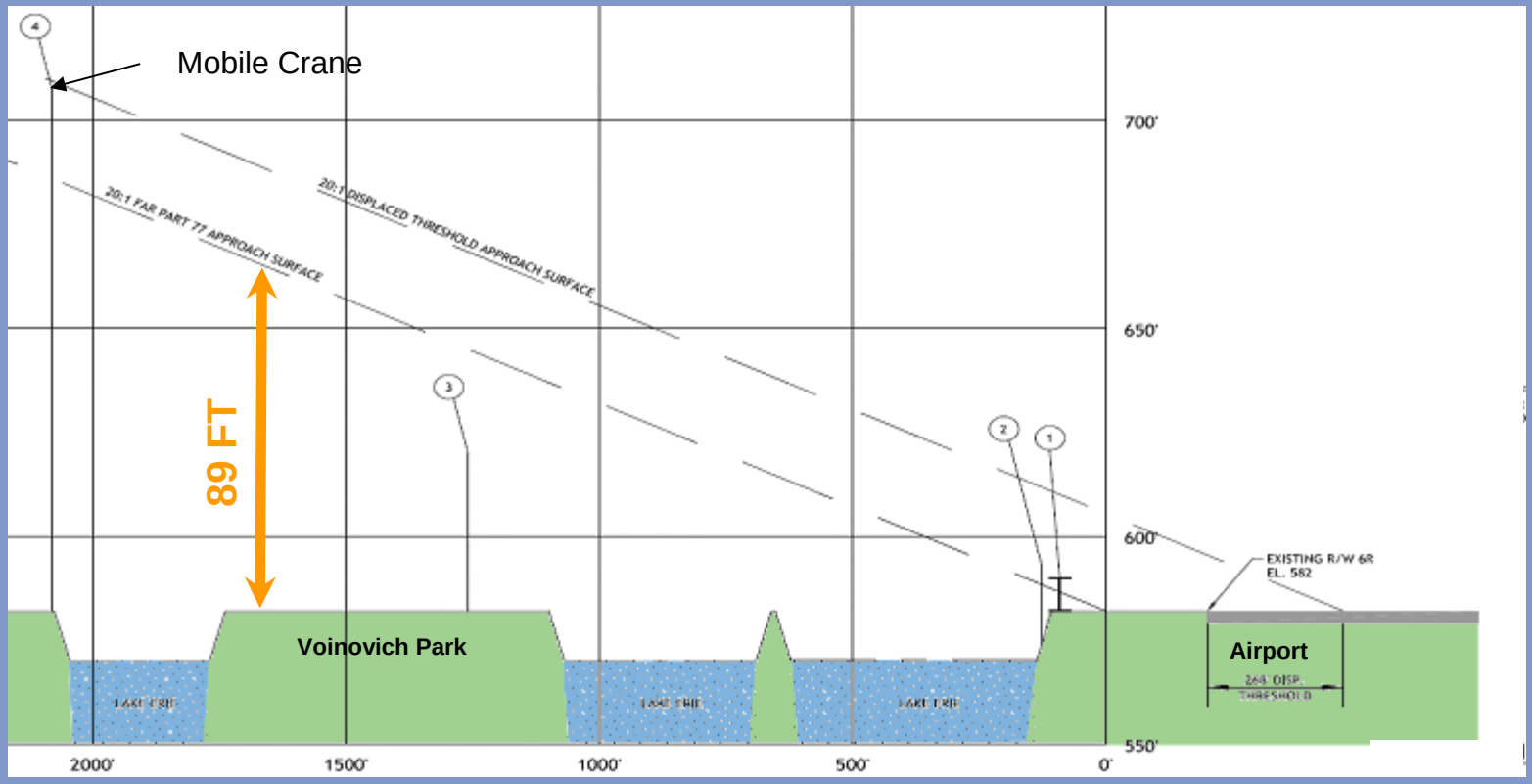
- 90 ft wide x 70 ft tall opening
- Relocate Navigate Light & Signs
- Timber Dolphins

Preliminary Engineering: FAA Surfaces

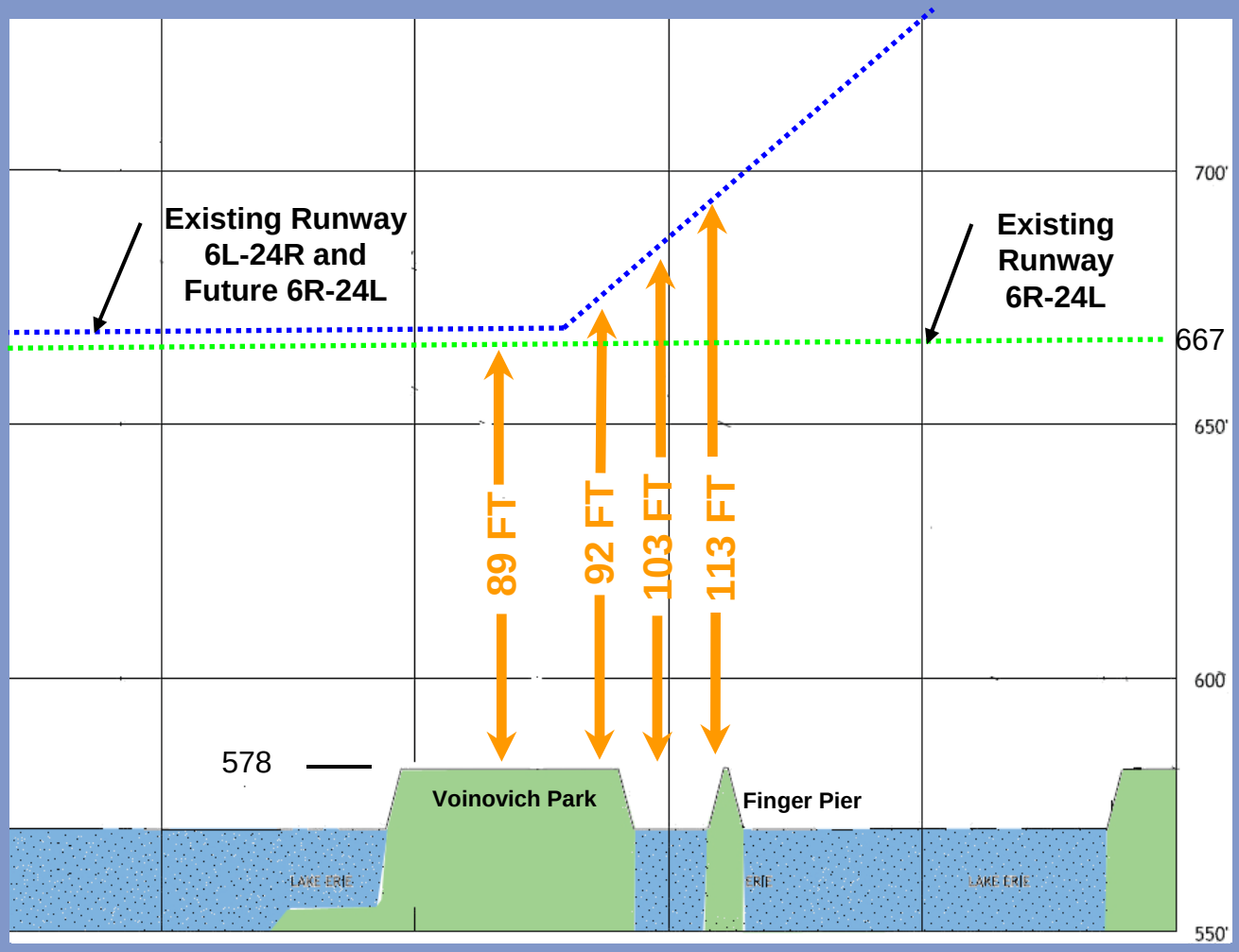
North Coast Harbor Pedestrian Bridge



Existing Runway 6R-24L



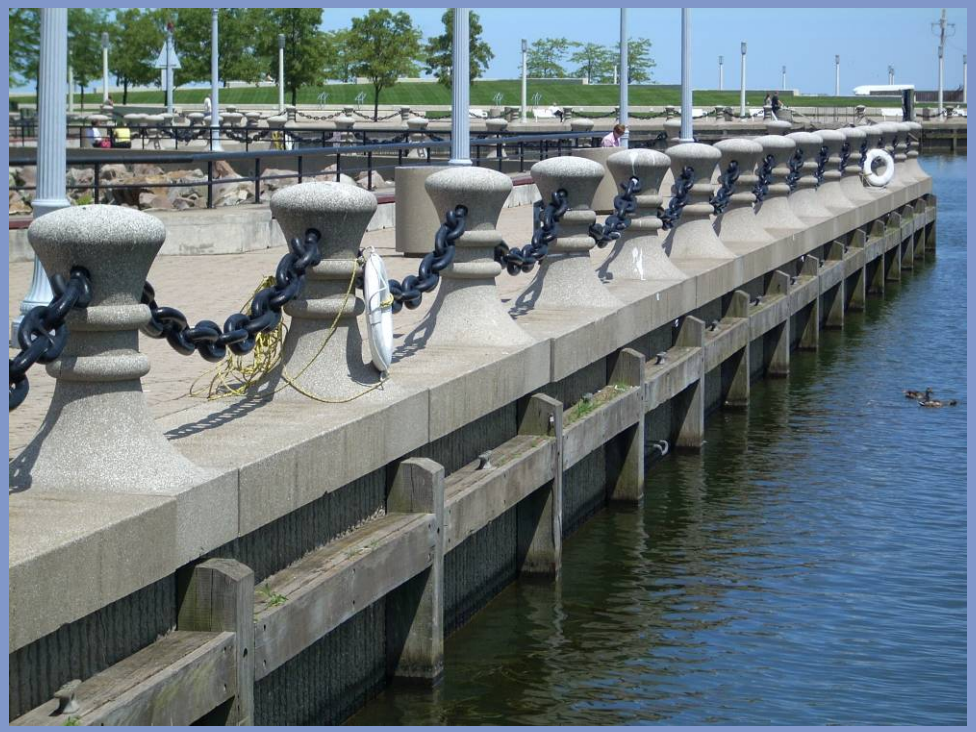
Section A - A

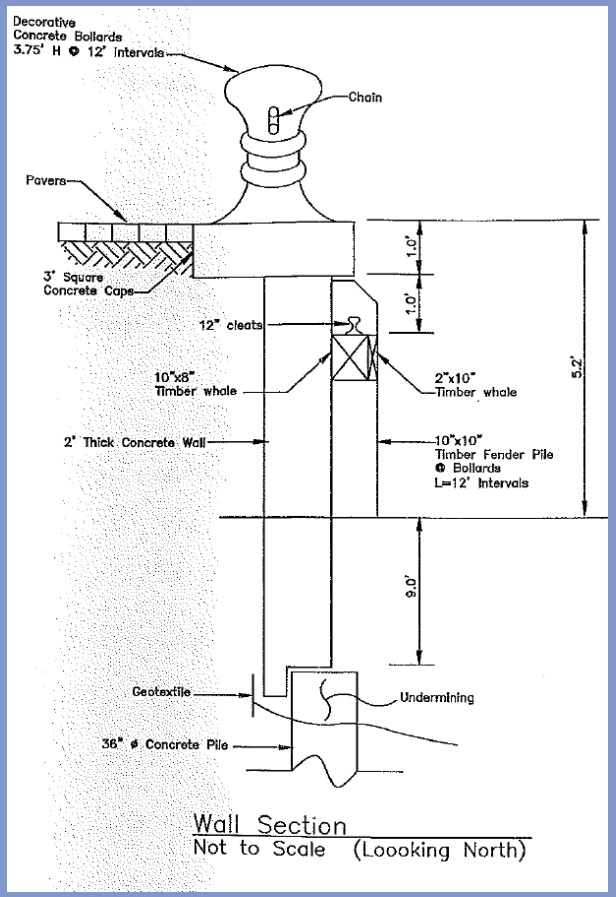

Existing Runway 6L-24R and Future 6R-24L
Existing Runway 6R-24L
700'
667
650'
600'
550'
89 FT
92 FT
103 FT
113 FT
578
Voinovich Park
Finger Pier
LAKE ERIE
LAKE ERIE
LAKE ERIE

Section B - B

Preliminary Engineering:

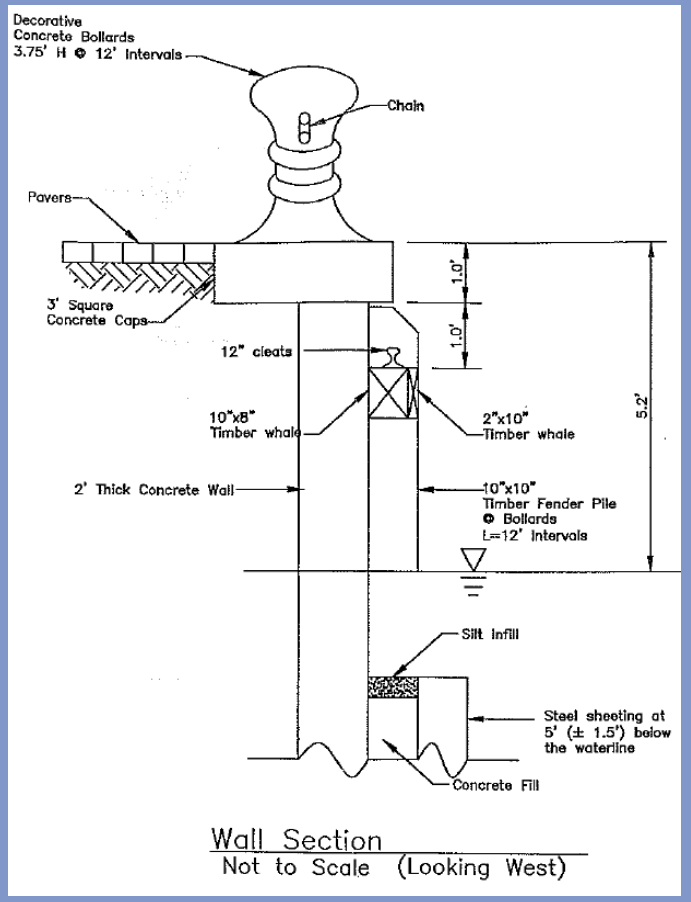
Underwater Inspection – Finger Pier





Preliminary Engineering:

Underwater Inspection – South Wall



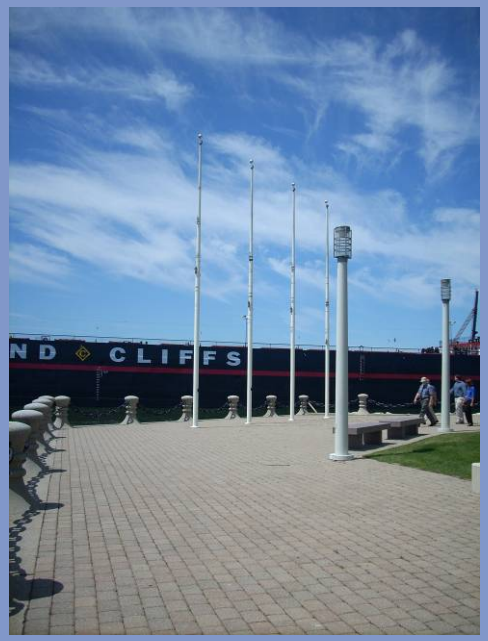
Preliminary Engineering:

Geotechnical

- **20 ft loose to firm Silty SAND fill**
- **76 ft to 82 ft Clayey SILT & Silty CLAY**
- **Shale 96 to 102 feet**
- **Water at 572 ft (Lake Level)**

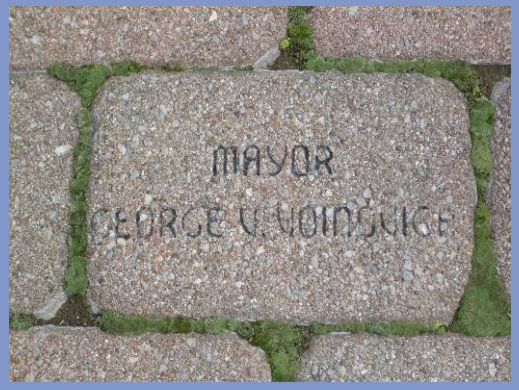
Preliminary Engineering:

Site Impacts – Voinovich Park



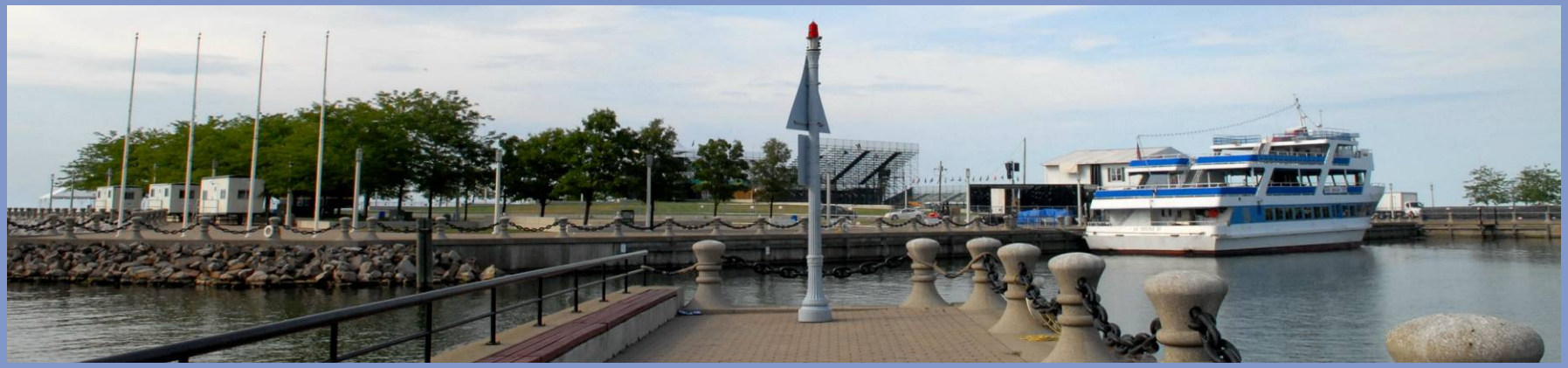
Preliminary Engineering:

Site Impacts – Finger Pier



Goals & Objectives:

- Provide secondary pedestrian access to / from Voinovich Park
- Provide an elegant and timeless structural expression that celebrates the crossing and enhances the City of Cleveland and its harbor
- Create a pleasant and safe experience for users crossing the bridge promoting connectivity for both pedestrians and bicyclists along the waterfront
- Optimize construction cost, structural efficiency and minimize bridge superstructure depth
- Provide accessibility and navigation to the inner harbor
- Respond to maintenance considerations and reduced life cycle cost
- A landmark bridge that reflects current technology and innovation



Design Criteria:

- Vertical clearance over the navigation channel is 70ft minimum
- Width of the bridge is 12 feet minimum
- Channel horizontal clearance is 90 ft minimum width
- ADA accessibility, 5% maximum slope
- Railing height is 42 inches minimum
- Pedestrian loading (Non-vehicular)
- Safety and aesthetic lighting will be provided
- FAA height restrictions 92’ to 113’ above ground surface elevation

North Coast Harbor Pedestrian Bridge

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Constraints & Issues

- **Construction Budget ($4.06 Million Federal)**
- **Cleveland Lakefront Bikeway**
- **FAA height restrictions**
- **Tall Ships & other public events**
- **Goodtime III**
- **Harbor of Refuge**
- **Operational issues**
- **Annual & long term maintenance**
- **Other**

North Coast Harbor Pedestrian Bridge

North Coast Harbor Pedestrian Bridge

Alignment Type 1

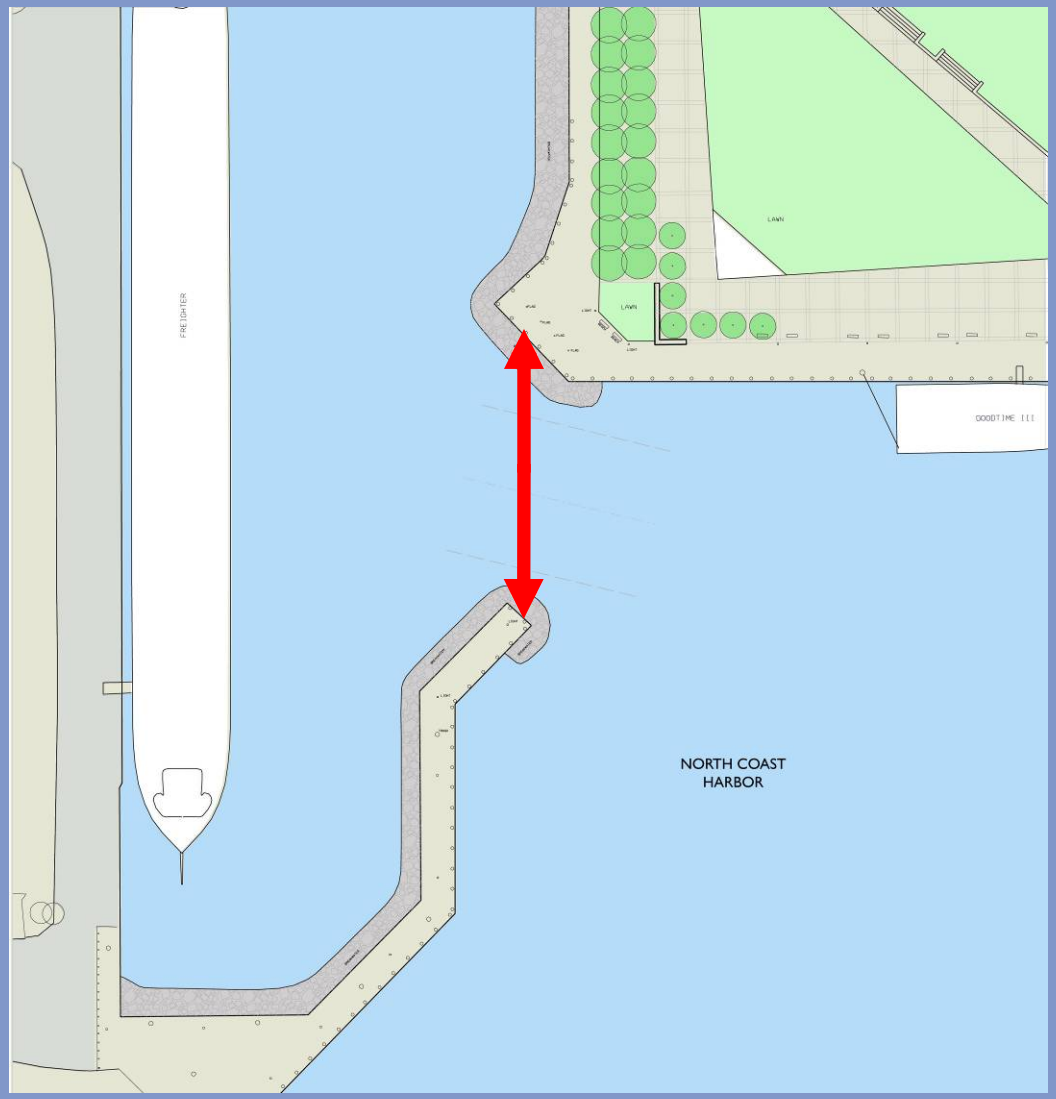
North Coast Harbor Pedestrian Bridge

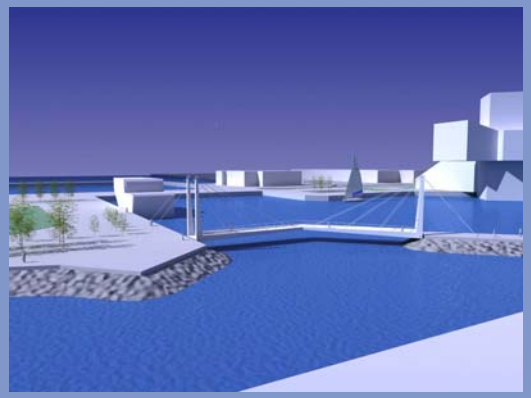
Alignment Type 2

North Coast Harbor Pedestrian Bridge

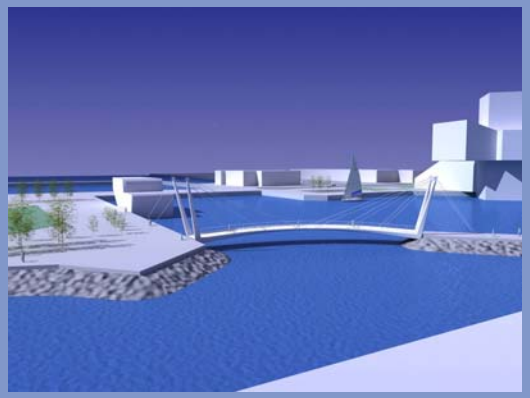
Alignment Type 3

North Coast Harbor Pedestrian Bridge

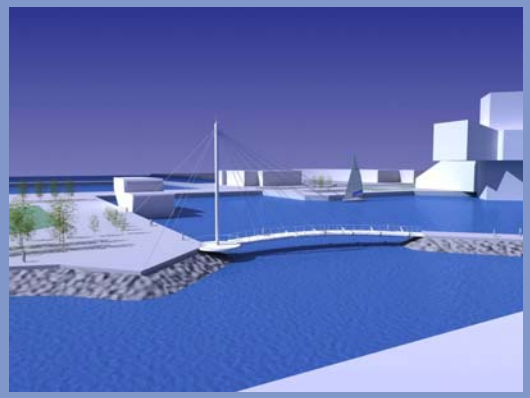




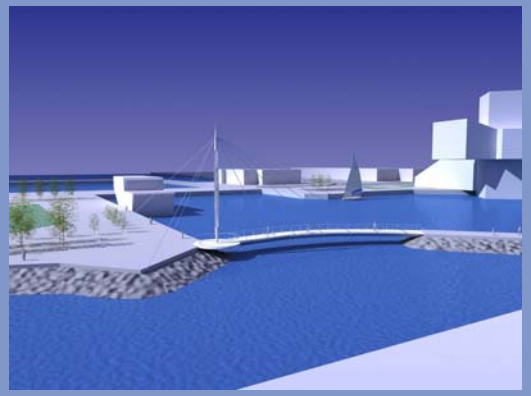
Concept A



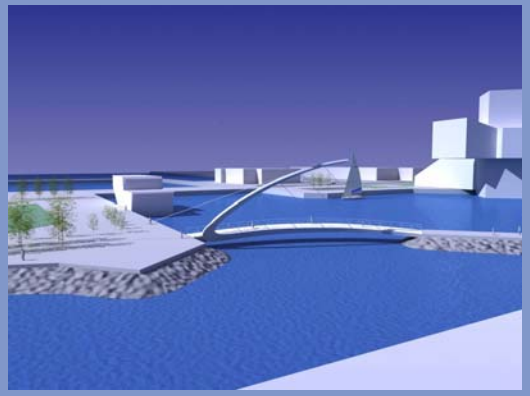
Concept B



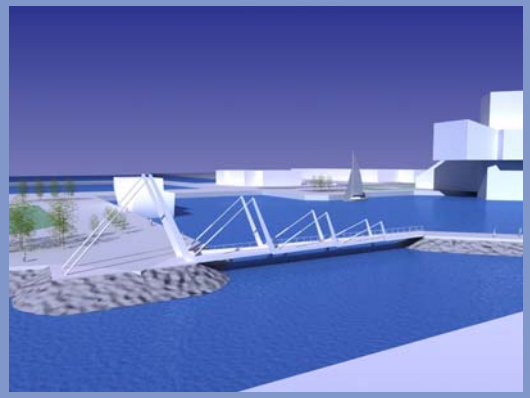
Concept C



Concept D



Concept E



Concept F