Alaskan Way Viaduct
REPLACEMENT
PROGRAM

Colorado School of Mines
Underground Center for Construction and Tunneling
Nov. 13, 2013

U.S. Department of Transportation
Federal Highway Administration

WSDOT

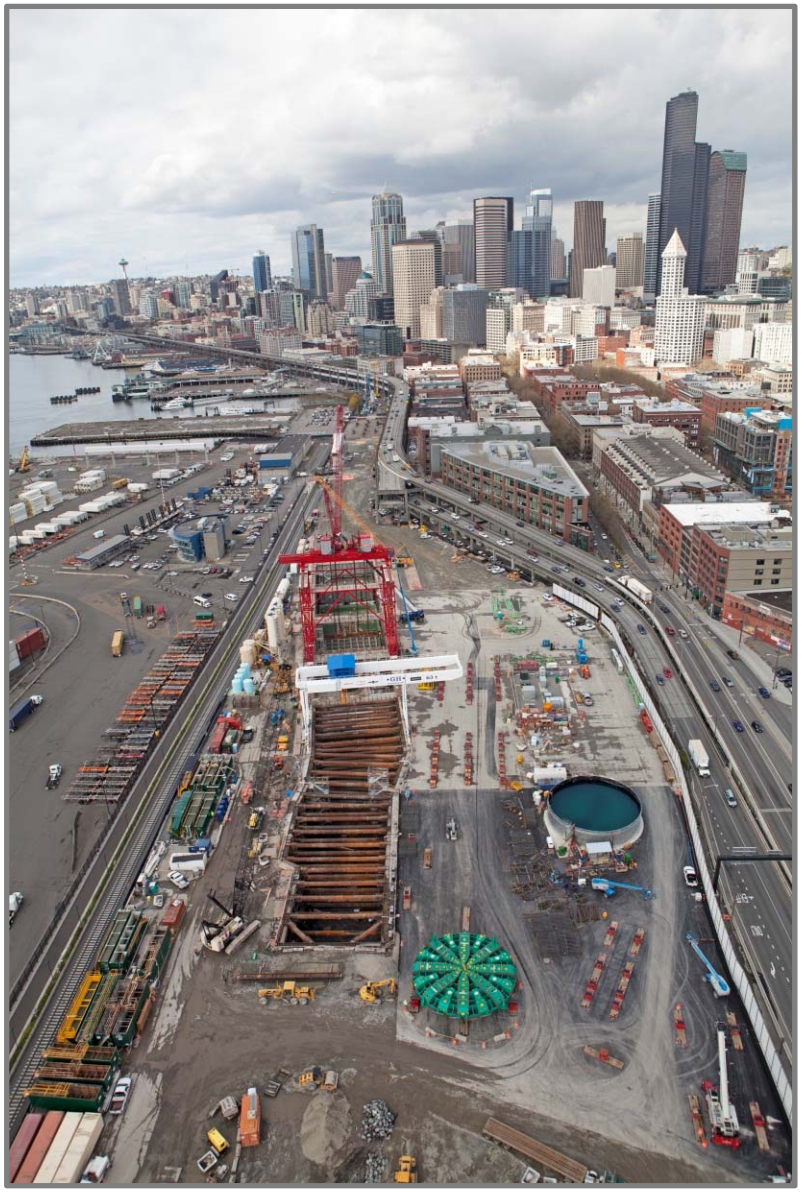
King County

Port of Seattle

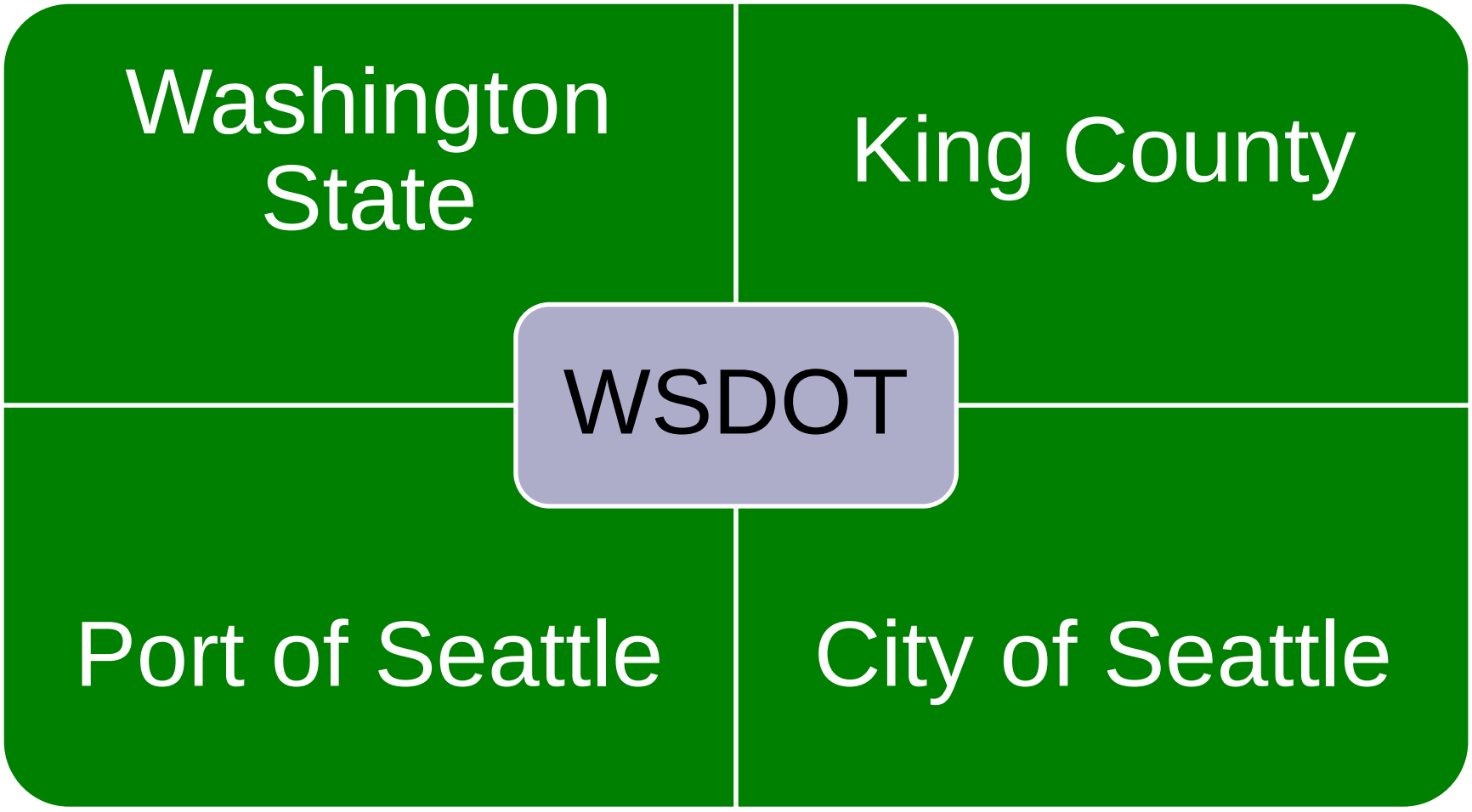
City of Seattle

Presentation Overview

- Design-build contracting.
- SR 99 Tunnel Project.
- Construction partnering.
- Risk management.
- Questions.



WSDOT Coordination



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SR 99 Tunnel Construction Contracts

South Access Project

North Surface Street Connections

SR 99 Tunnel Project

North Access Project

What is Design-Build Contracting?

Design-Build – a method of project delivery in which the owner executes a single contract ***with one entity*** (the Design-Builder) for design and construction services to provide a finished product.

VS.

Design-Bid-Build – traditional approach for delivery of transportation projects where the owner completes the design and accepts the lowest responsive bid for construction from qualified contractors.

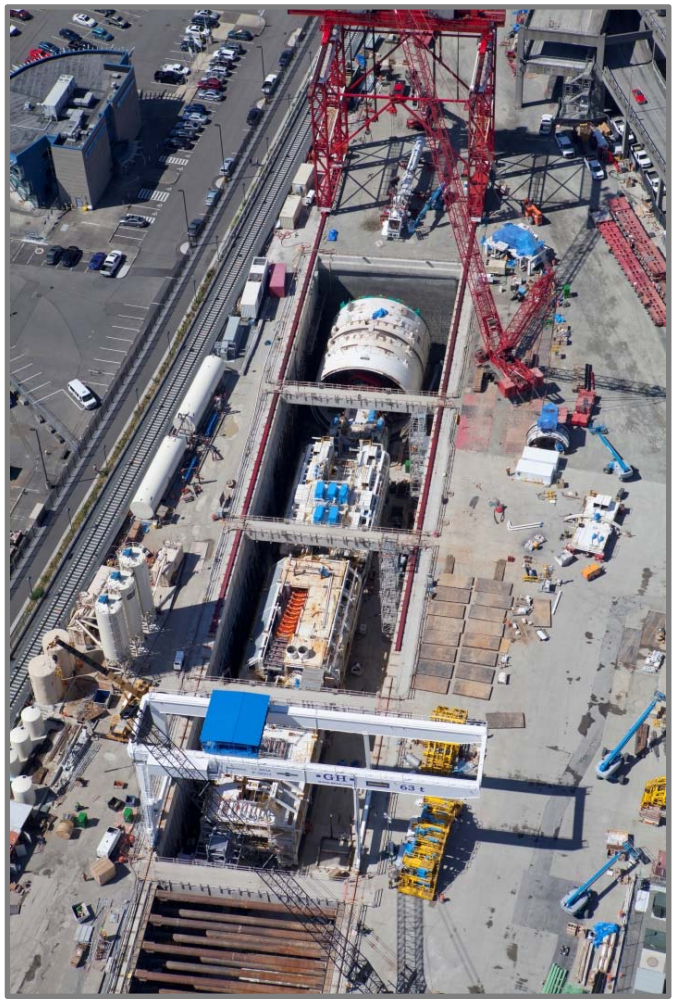
Design-Build Considerations

Time

- Allows construction to start without final design of all project elements.
- Design is tailored to contractors means and methods.
- Generally leads to earlier completion date.

Budget

- Requires fewer owner staff.
- Can lead to earlier cost certainty.
- Errors and omissions not owner's responsibility.
- Additional risk is assigned to contractor.

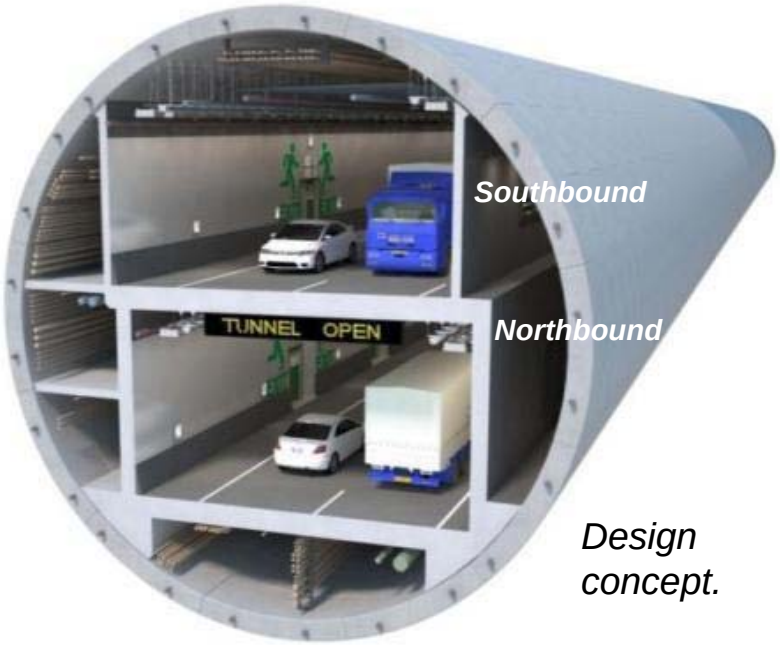


Design-Build Procurement Process

- **Request for qualifications**
  - Design-Build teams submit statements of qualifications (SOQ).
  - WSDOT evaluates SOQs and ranks based on predetermined scoring approach.
- **Short listed teams notified**
- **Request for Proposals (RFP)**
  - Short listed teams prepare proposals.
  - WSDOT evaluates proposals based on predetermined scoring approach.
- **Best value selection** = $\frac{\text{technical evaluation score x \$10,000,000}}{\text{\$ Price Proposal}}$

SR 99 Tunnel

- Approximately two miles long.
- Two lanes with eight-foot safety shoulder in each direction.
- State-of-the-art safety systems.



Design concept.

Design concept of tunnel interior.

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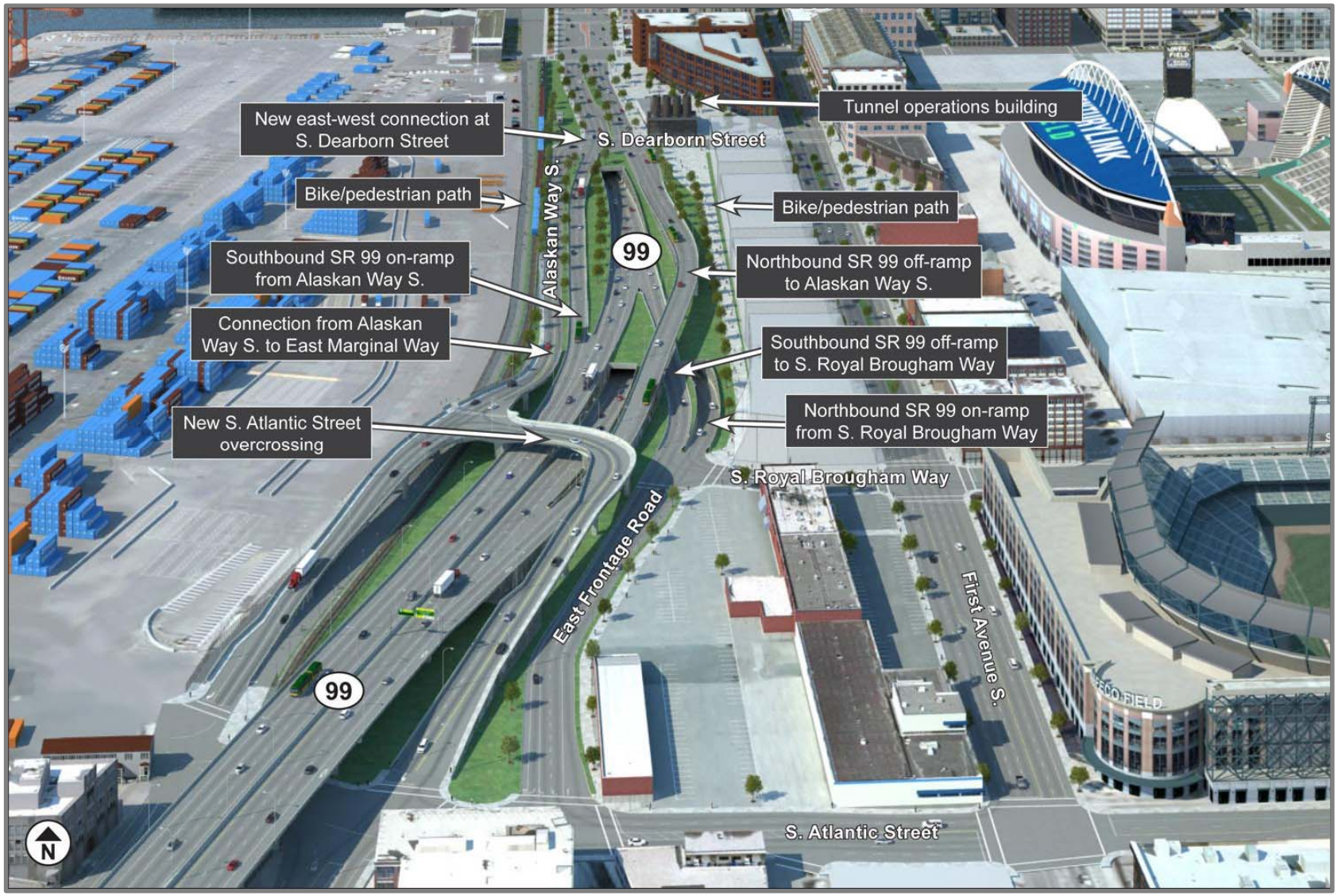
South Portal Design



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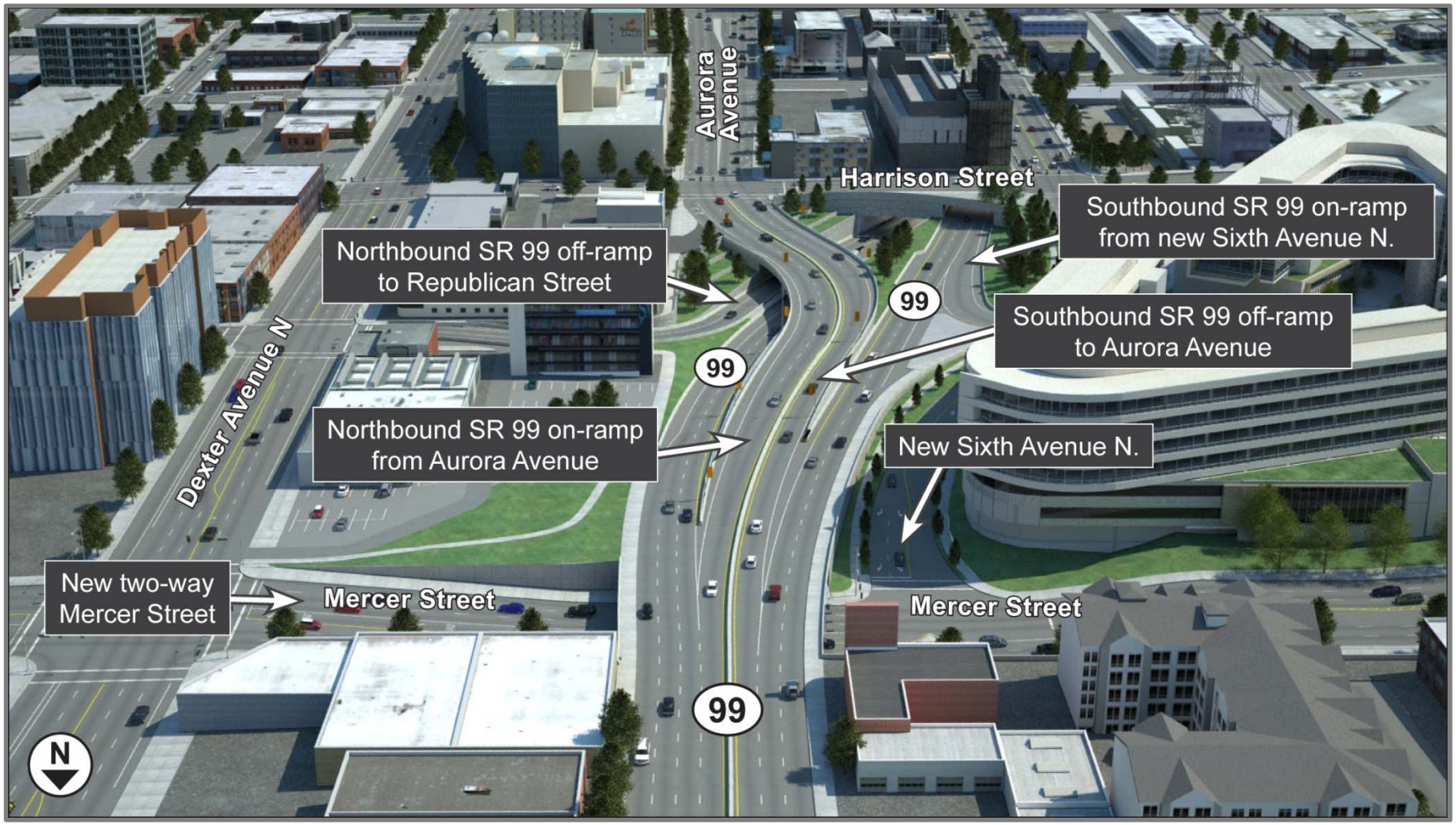
North Portal Design



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Building the SR 99 TBM*

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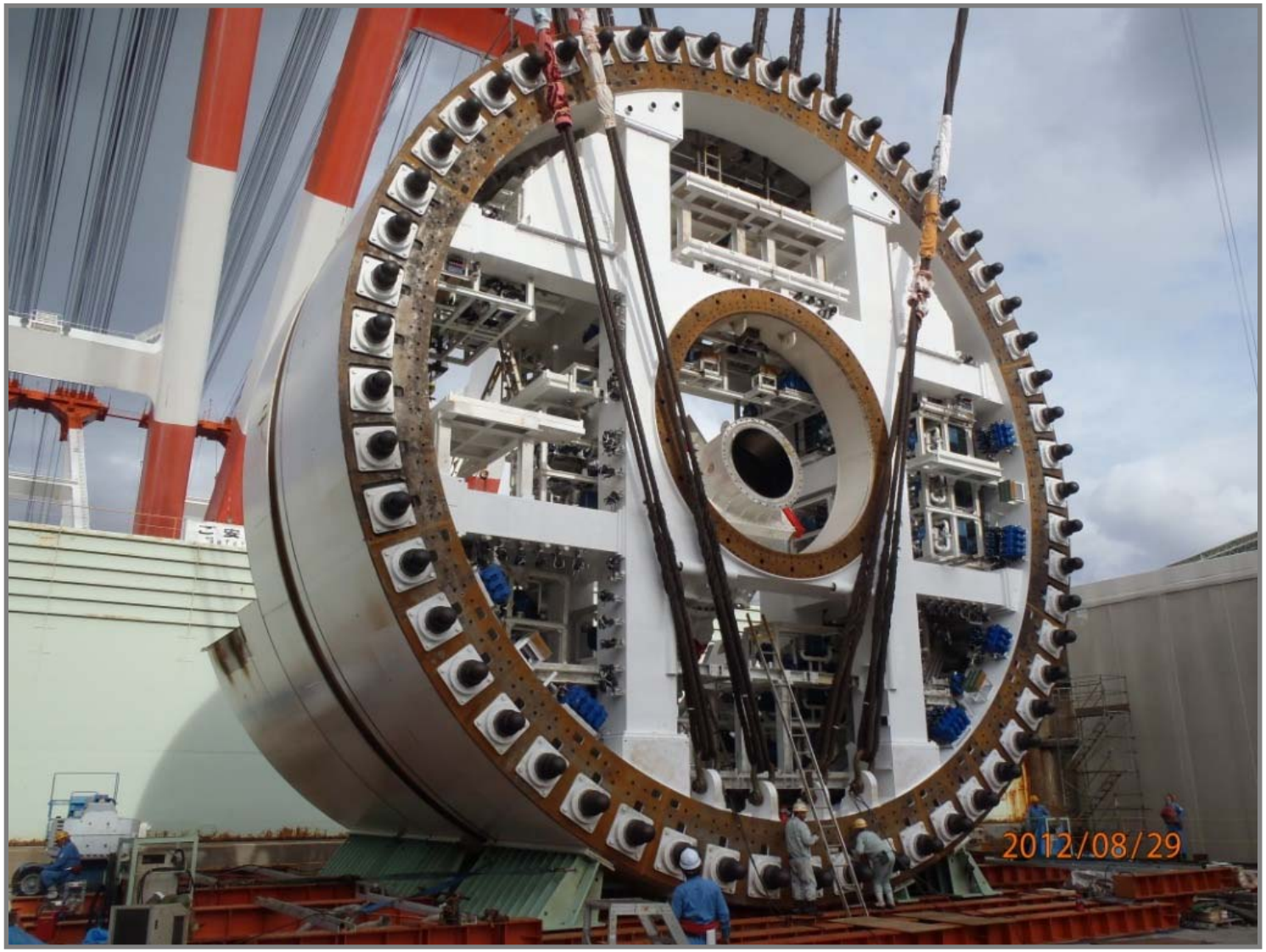
Building the SR 99 TBM



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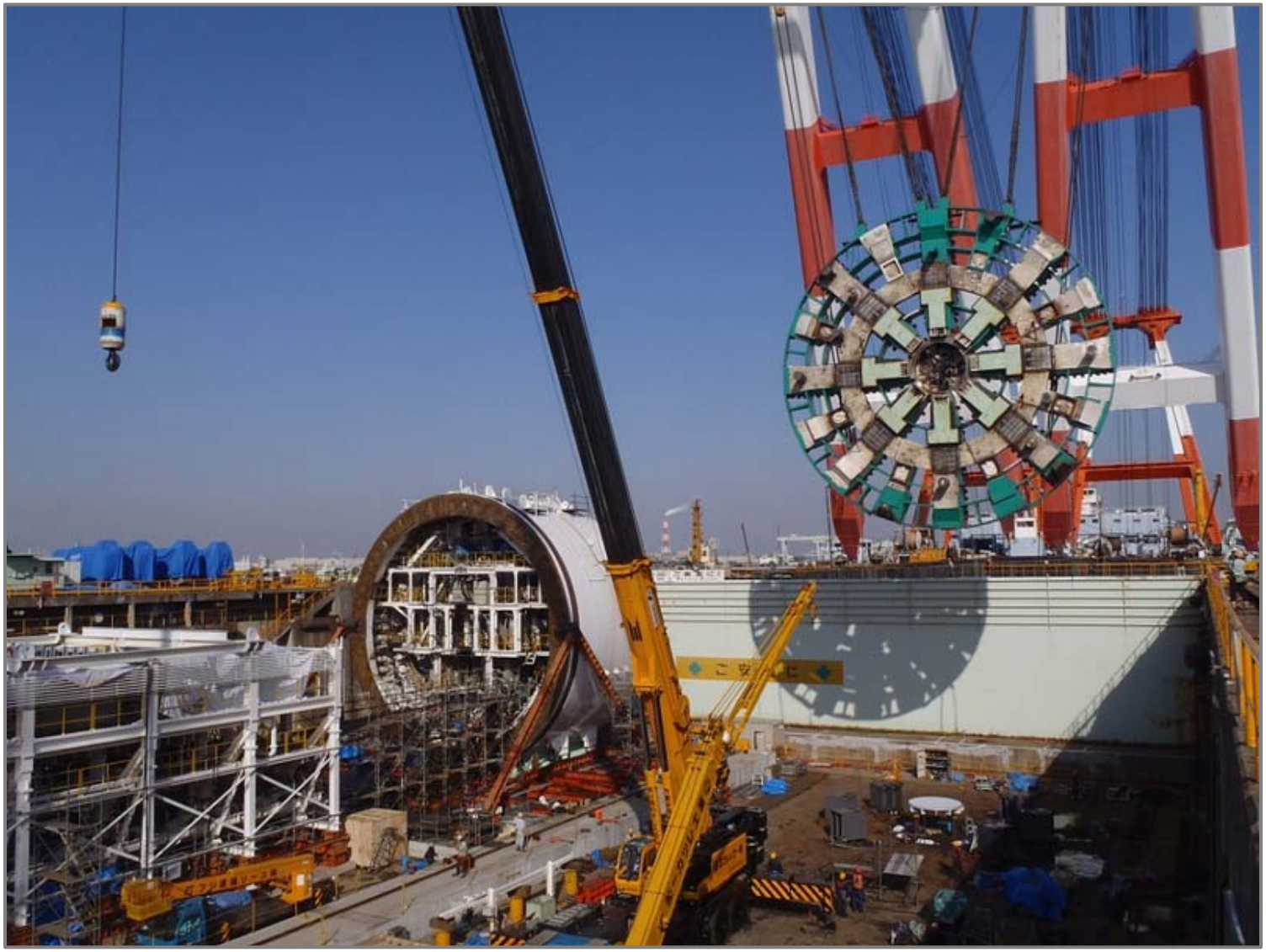

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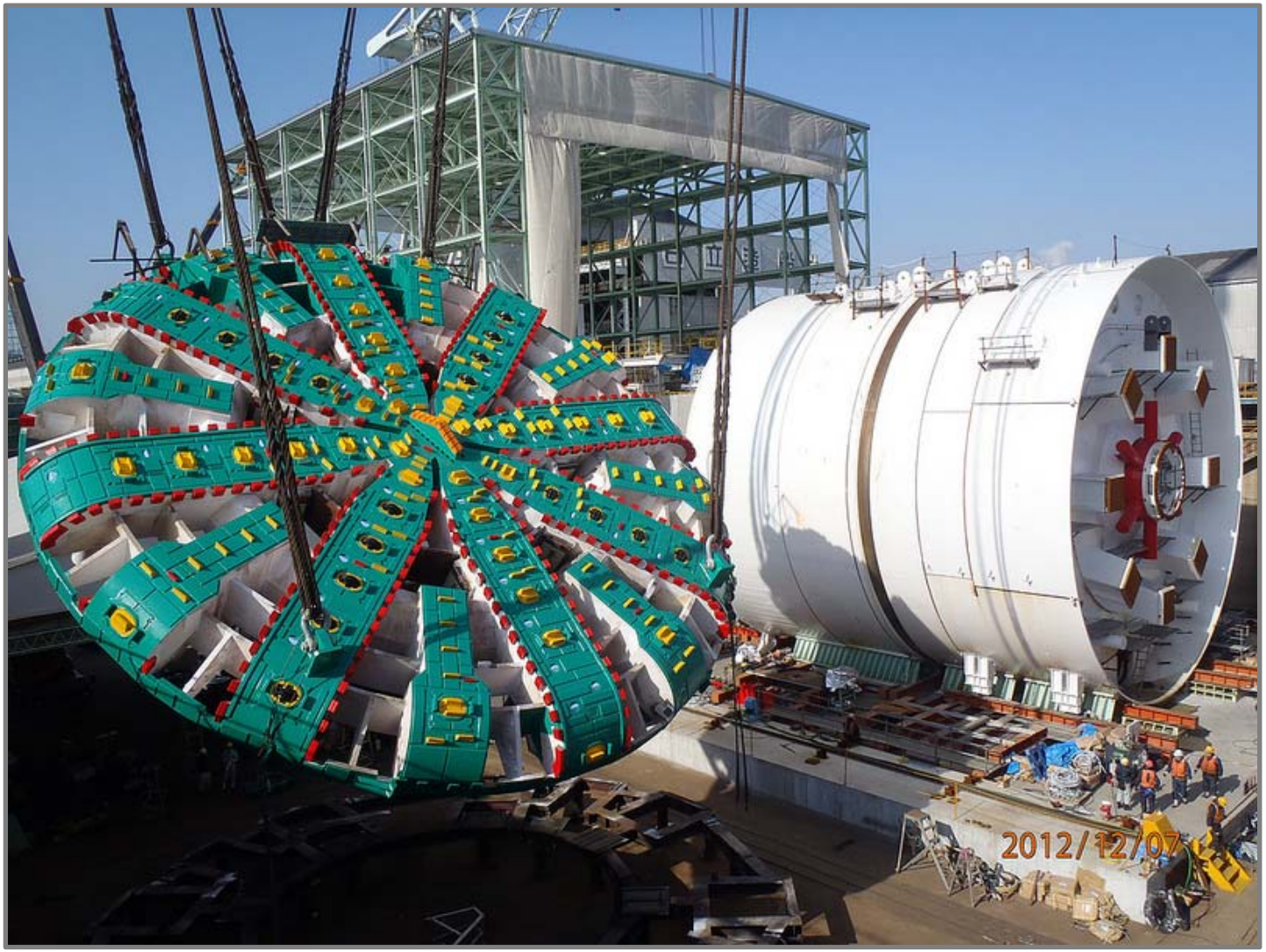

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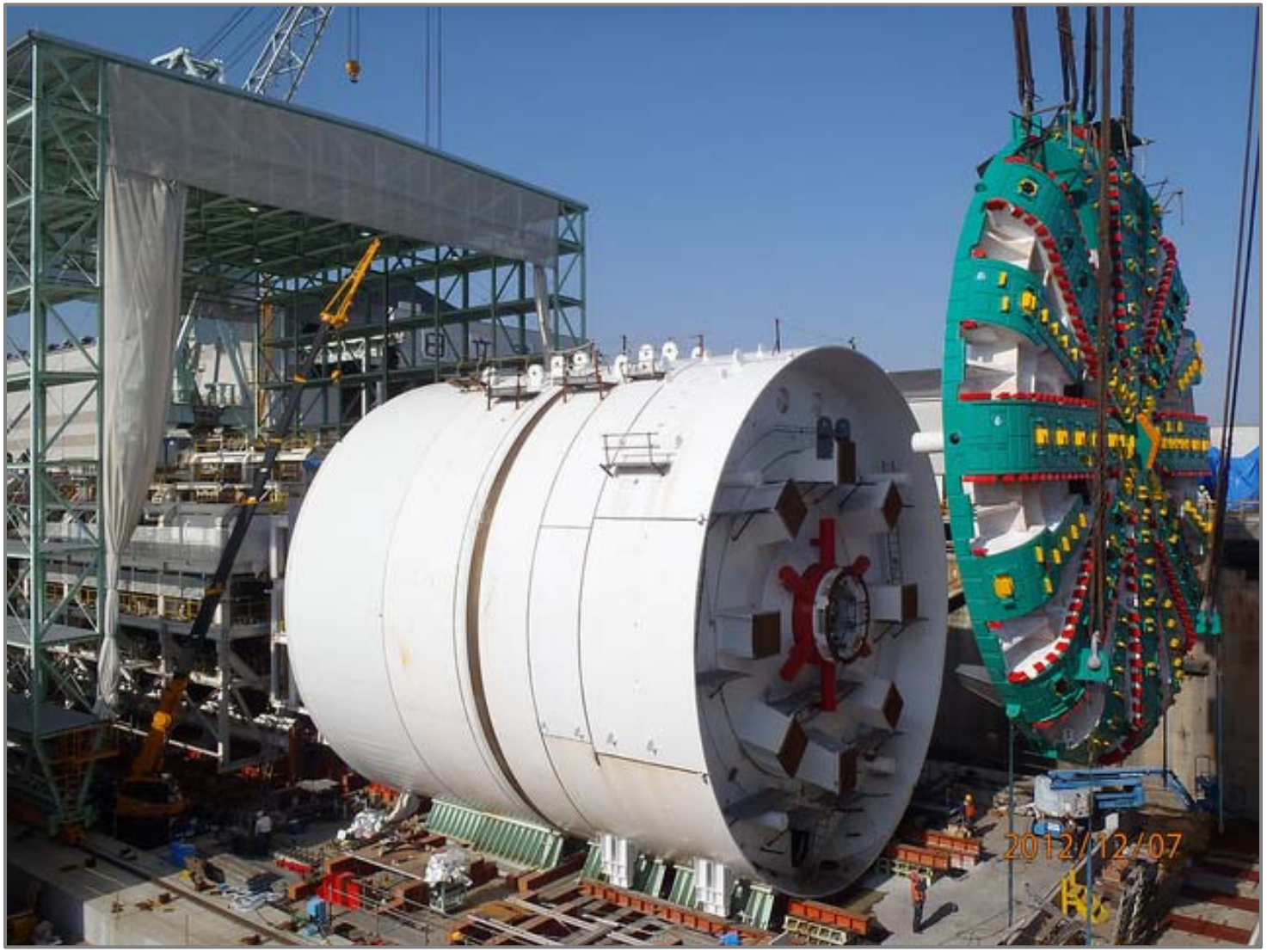

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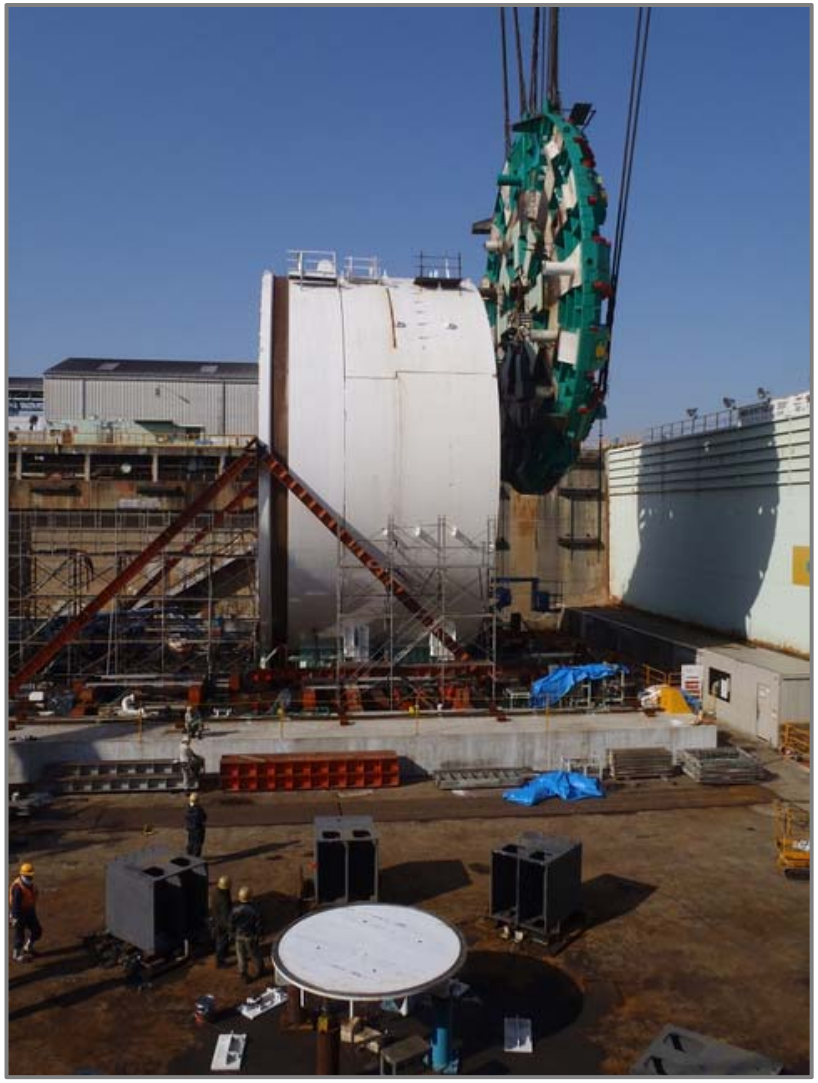

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Building the SR 99 TBM

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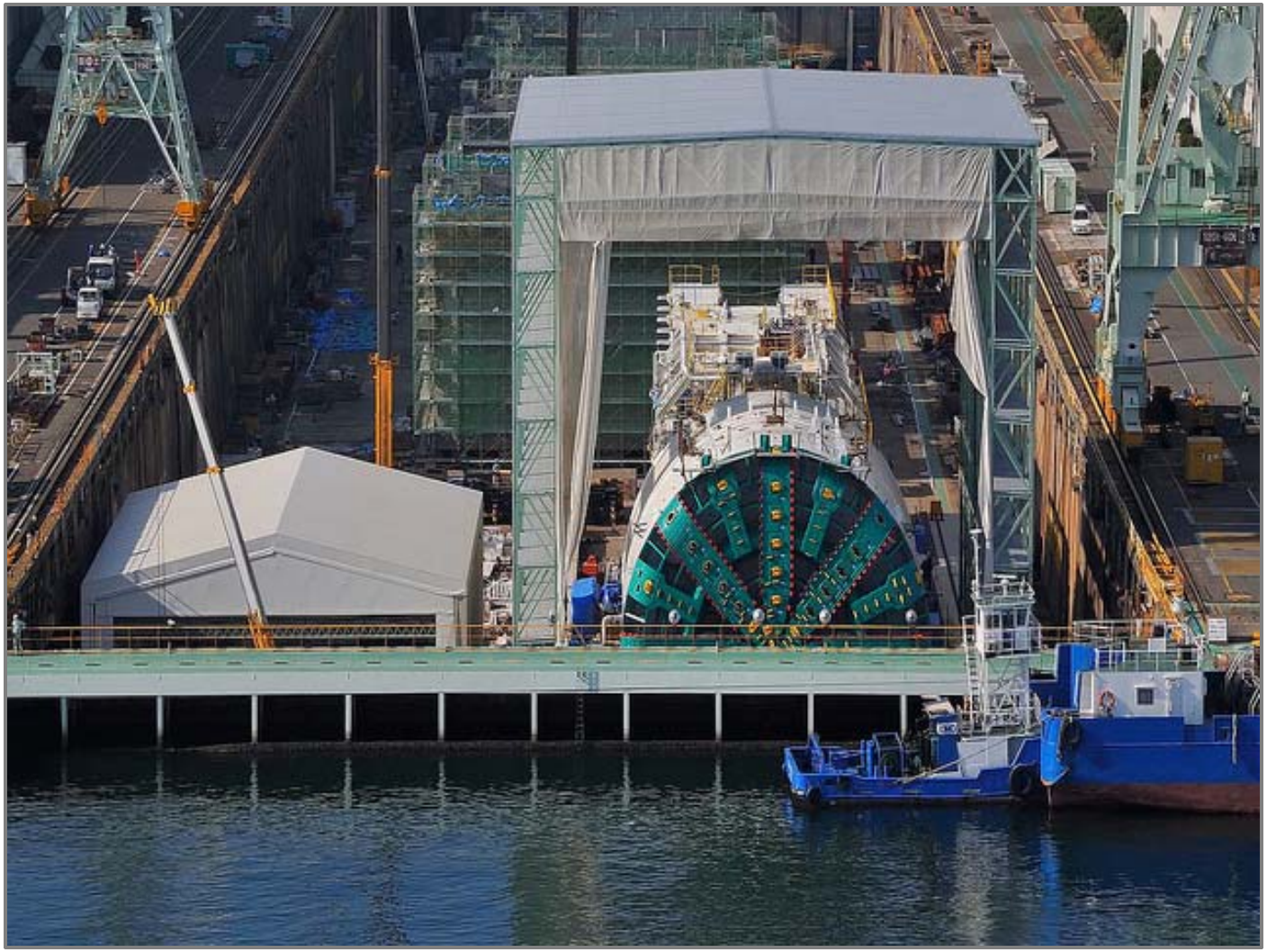

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TBM Arrival in Seattle

Unloading and Storing the TBM*

Unloading and Storing the TBM

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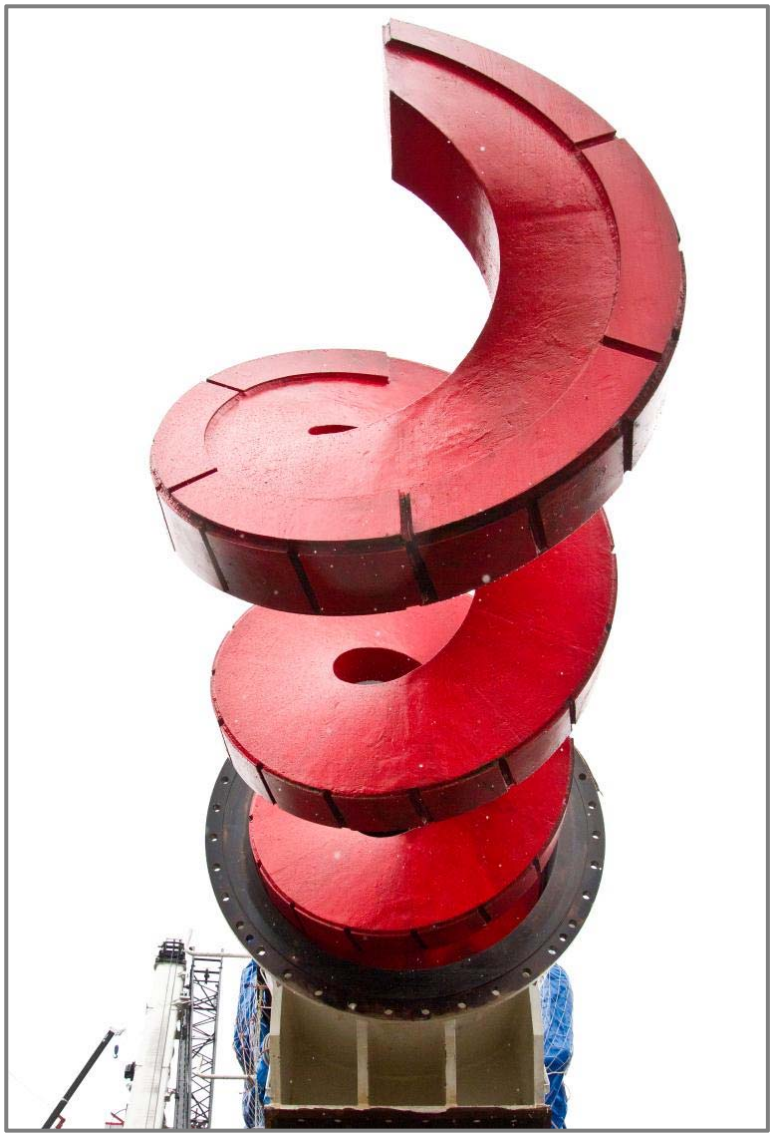

Unloading and Storing the TBM

Unloading and Storing the TBM

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Excavating the Launch Pit

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Building the Base Slab

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Assembling the SR 99 TBM

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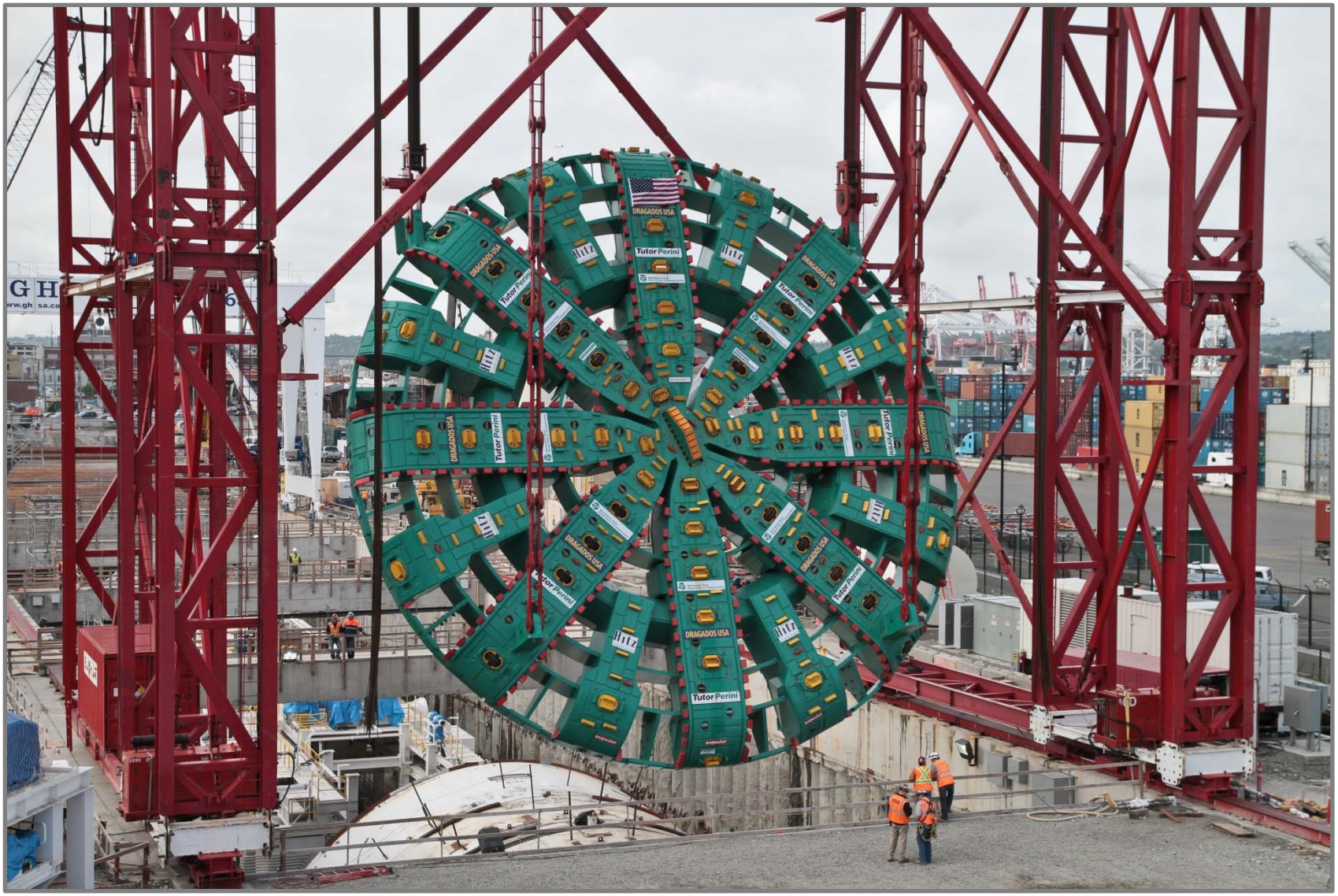
Lowering the Cutterhead



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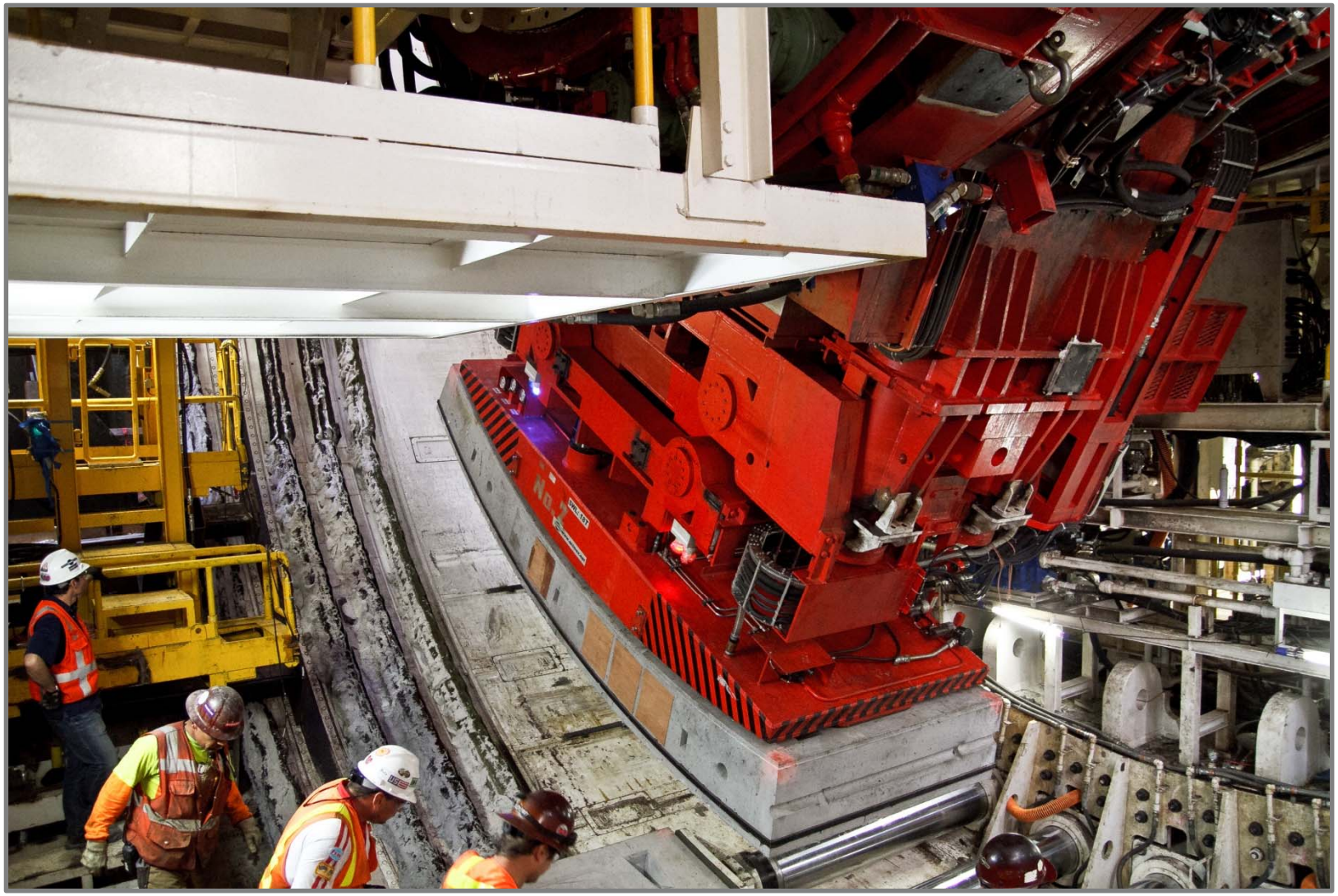
Testing the SR 99 TBM



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Inside the TBM's Control Room

Tunnel Spoils Conveyor Belt

Manufacturing Tunnel Liner Segments

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Launching the SR 99 TBM

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Inside the SR 99 Tunnel

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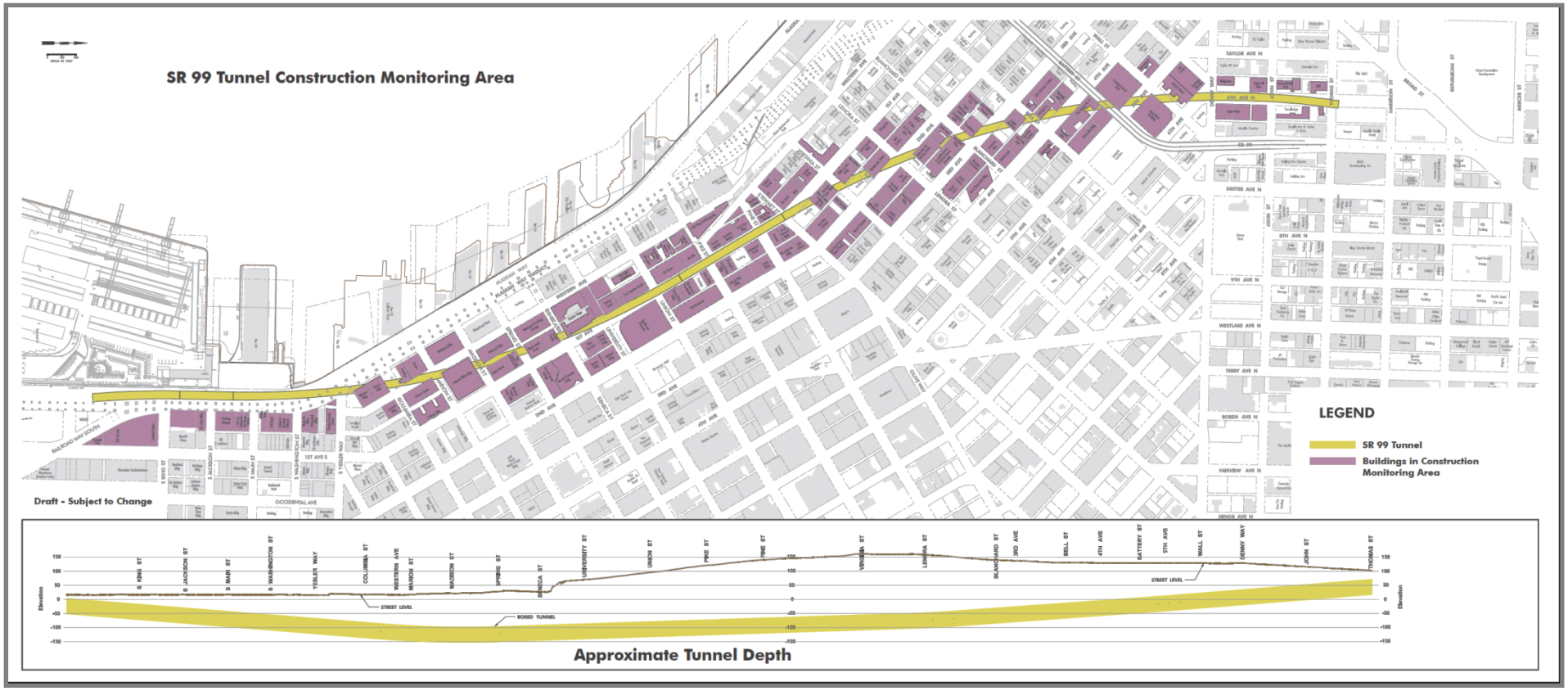
Construction Monitoring Area



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Protecting Structures Along the Tunnel Route

Monitoring equipment installed on a rooftop. Photo by Soldata.

- Pre-condition surveys of buildings and utilities.
- Install monitoring equipment on nearly 200 buildings.
- Install 700 instruments under streets and sidewalks to measure any ground changes.
- Track measurements of excavated material as tunnel boring machine progresses.
- Use satellite images to assess any changes in ground condition.

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Construction Timeline

Projects	2013	2014	2015	2016	2017
South Holgate to South King Street Replacement					
South Atlantic Street overpass		*Overpass open to traffic*			
SR 99 Tunnel Project					
Tunnel boring					
Begin interior roadway					
Tunnel portals, cut-and-cover sections and operations buildings				*Tunnel open*	
North access project					
South access project					
All ramps open					
North surface street connections					
Central waterfront viaduct demolition					

Construction

What is Construction Partnering?

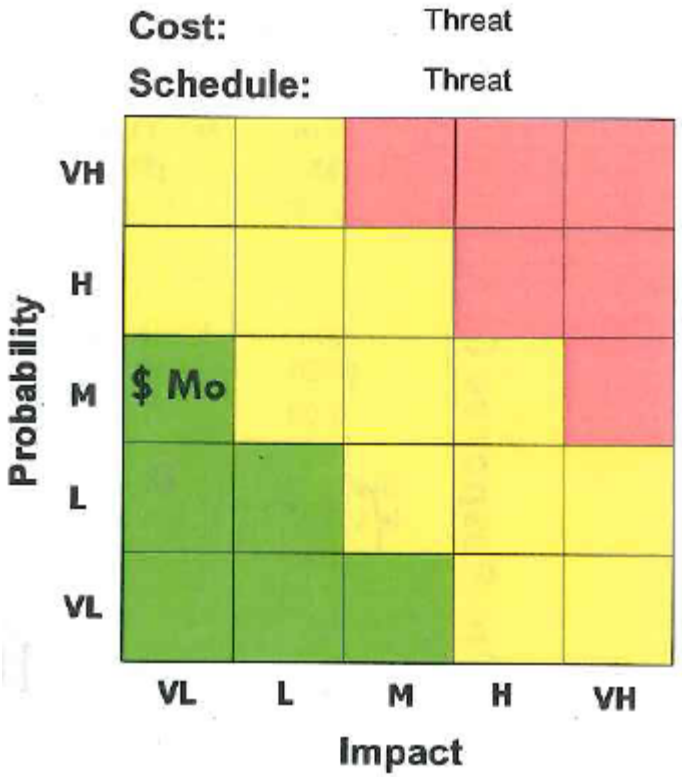
- Working together.
- Building relationships.
- Understanding the needs of the other parties' and a philosophy of teamwork.
- Committing to cooperation and communication.
- An attitude of goodwill and trust.
- Sharing risks with a "win-win-win" attitude.

Construction Partnering Benefits

- Total project costs were reduced by 10 percent.
- Profitability increased by 25 percent.
- Overall project completion time was reduced by 20 percent.
- Schedule changes were reduced by 48 percent.

Managing Risk

- Develop Project Risk Register and Update regularly
- Develop effective contracting structure.
- Account for risks and inflation in estimates.
- Manage project as a strong owner.
- Identify and develop risk management plans.
- Engage experts with national and international tunneling experience in urban environments.
- Take extensive soil samples so the contractor starts with a very good understanding of the soil conditions.



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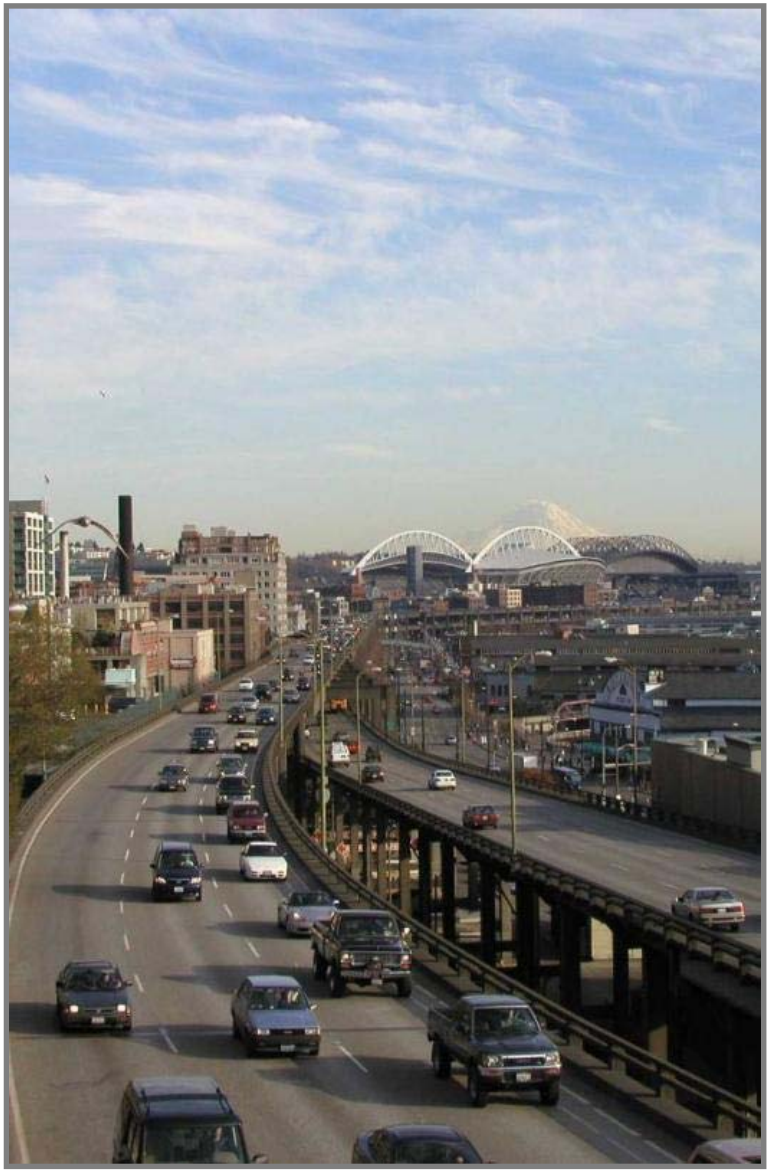

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