EARTHQUAKE READY BURNSIDE BRIDGE

Multnomah County is creating an earthquake-ready downtown river crossing.

BETTER – SAFER – CONNECTED

November 18, 2020

Urban Design and Aesthetics Working Group (UDAWG) – Meeting #5 Agenda

Project:	Earthquake Ready Burnside Bridge (EQRB)
Subject:	Urban Design and Aesthetics Working Group
Date:	Wednesday, November 18, 2020
Time:	1:00 PM – 3:00 PM
Location:	WebEx (see email for link)

WORKING GROUP MEMBERS

Randy Gragg, Executive Director, Portland Parks Foundation
Bill Will, Public Works Artist
Paddy Tillett, ZGF
Chris Herring, Artistic Director, Portland Winter Lights Festival
Megan Crosby, Urban Development + Partners
Ian Williams, Deadstock Coffee
Priscilla Macy, Oregon Outdoor Coalition
Izzy Armenta, Oregon Walks
Dave Todd, Portland Rose Festival
Brian Kimura, Japanese American Museum of Oregon

AGENCY GROUP MEMBERS

Patrick Sweeney, PBOT
Teresa Boyle, PBOT
Lora Lillard, BPS
Hillary Adam, BDS
Tate White, PPR
Justin Douglas, Prosper Portland
Bob Hastings, TriMet
Magnus Bernhardt, ODOT

PROJECT TEAM MEMBERS

Megan Neill, Multnomah County
Mike Pullen, Multnomah County
Heather Catron, HDR
Steve Drahota, HDR
Cassie Davis, HDR
Michael Fitzpatrick, HDR
Katy Segura, HDR
Jeff Heilman, Parametrix
Allison Brown, JLA
Carol Mayer-Reed, Mayer/Reed
Jeramie Shane, Mayer/Reed
Josh Carlson, Mayer/Reed
Anne Monnier, KPFF

COMMUNITY TASK FORCE OBSERVERS

Fred Cooper
Gabe Rahe
Peter Englander
Susan Lindsay

Purpose:

The purpose of the UDAWG is to serve as a technical resource body to the CTF for urban design and aesthetics by:

- *Providing informed insights and opinions on the visual features for each type selection option*
- *Recommending measures to enhance aesthetic opportunities or mitigate potential visual impacts*
- *Representing urban design and aesthetic interests*
- *Reflecting the character of Portland by suggesting place-making opportunities*

Outcomes:

The outcomes for the UDAWG group are to:

- *Inform a set of feasible bridge type options for the CTF's consideration*
- *Inform a project-specific Visual Performance Standard for use during the Type Selection and Final Design phases*
- *Recommend visual and aesthetic evaluation criteria for consideration by the CTF*

Agenda:

Time	Session	Lead
12:45 p.m.	**Early Arrivals** • WebEx meeting platform will be available for folks that want to join early and test computer functions before meeting start	Katy Segura
1:00 p.m. (15 min)	**Welcome, Intros, Pre-Meeting Info, and General Comments** • Introductions • Pre-mtg information • Purpose and Outcomes • Project Update • General Comments	Allison Brown
1:15 p.m. (35 min)	**West Approach Study** (… continued from last meeting) • Views and Vertical Clearances • Street Scape Study	Steve Drahota / Michael Fitzpatrick
1:50 p.m. (50 min)	**Menu of Bridge Types** • Lift Type Study • Bascule Type Study • Operator's House Study	Steve Drahota / Michael Fitzpatrick
2:40 p.m. (10 min)	**Type Selection Evaluation Criteria** • Homework Assignment	Carol Mayer-Reed
2:50 p.m.	**Next Steps and Closing Remarks** • UDAWG Mtg #6: Total Bridge Composition • Open Dialogue / Questions	Allison Brown / Steve Drahota

EARTHQUAKE READY BURNSIDE BRIDGE

Urban Design and Aesthetics Working Group Mtg #5

Attendees join meeting via WebEx link in calendar invite

Department of Community Services
Transportation Division

November 18, 2020

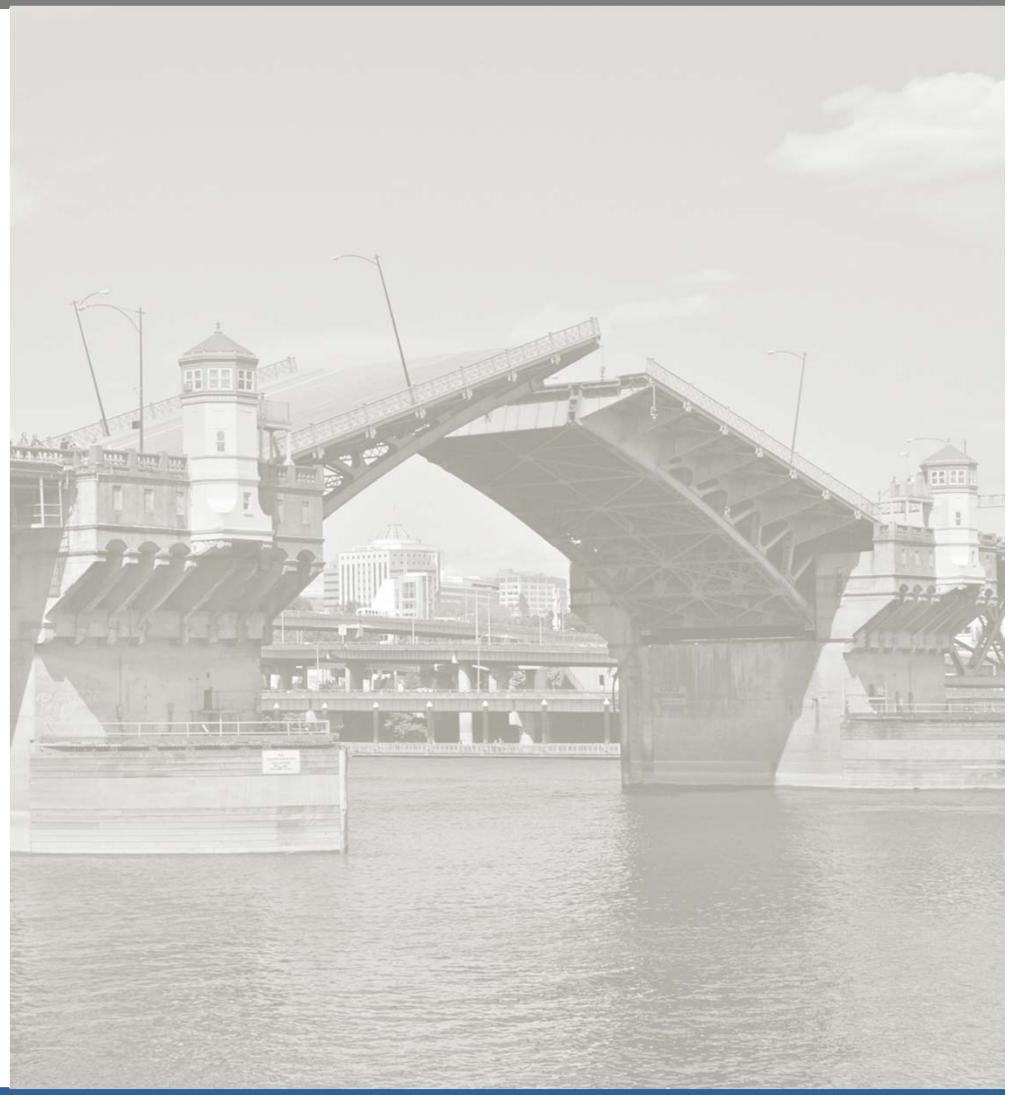
Meeting Protocols

Using WebEx participation features

For WebEx tech support call or email Katy Segura:
(503) 423-3709
Katy.Segura@hdrinc.com

Agenda

1. Welcome, Introductions, and Pre-Meeting Info
2. West Approach Study (cont.)
   - Views & Vertical Clearances
   - Street Scape Study
3. Menu of Bridge Types
   - Movable: Lift Type Study
   - Movable: Bascule Type Study
   - Operator's House Study
4. Homework: Type Selection Evaluation Criteria Review
5. Next Steps and Closing Remarks



Pre-meeting Information Packet

Content

Online UDAWG Library:

https://multco.us/earthquake-ready-burnside-bridge/urban-design-and-aesthetics-working-group

UDAWG Meeting #4 Materials:

- UDAWG Mtg #4 Notes
- UDAWG Mtg #5 Agenda
- UDAWG Mtg #5 Presentation
- UDAWG Mtg #5 Homework (Draft Type Selection Evaluation Criteria)

Urban Design & Aesthetics Working Group

UDAWG Purpose and Outcome

Outcomes: To provide input on the following products for the CTF's consideration:

- A set of feasible bridge type options
- A project-specific Visual Design Guidelines
- Recommendations for visual and aesthetic evaluation criteria

UDAWG Meetings

General Focus

We are HERE

	UDAWG Meeting Number and Date								
	#1 (9/30)	#2 (10/14)	#3 (10/28)	#4 (11/4)	#5 (11/18)	#6 (12/2)	#7 (12/16)	#8 (3/10)	#9 (6/2)
Character of Portland and the Burnside Bridge									
Visual Design Principles									
Visual Design Guidelines							2		
Technical Design Criteria									
Menu of Bridge Types									
Range of Feasible Bridge Types						1			
Evaluation Criteria Topic(s)									
Evaluation Measures							3		
Input on CTF's Eval Criteria									
Input on CTF's Rec Bridge Type									

Today:
Movable Bridge Focus

Full Bridge Composite +
Type Selection Evaluation Criteria

UDAWG Input to CTF

Project Update

Key Activities

- Community Task Force (CTF) Meetings
  - Past: Nov 9th (Criteria Topics)
  - Future: **Nov 23rd** (Bridge Types; Type Selection Criteria Topics)
- Working / Focus Groups
  - Eastbank Esplanade connection options (ongoing)

GENERAL COMMENTS

West Approach Focus:

Bridge Type Assessment (cont'd)

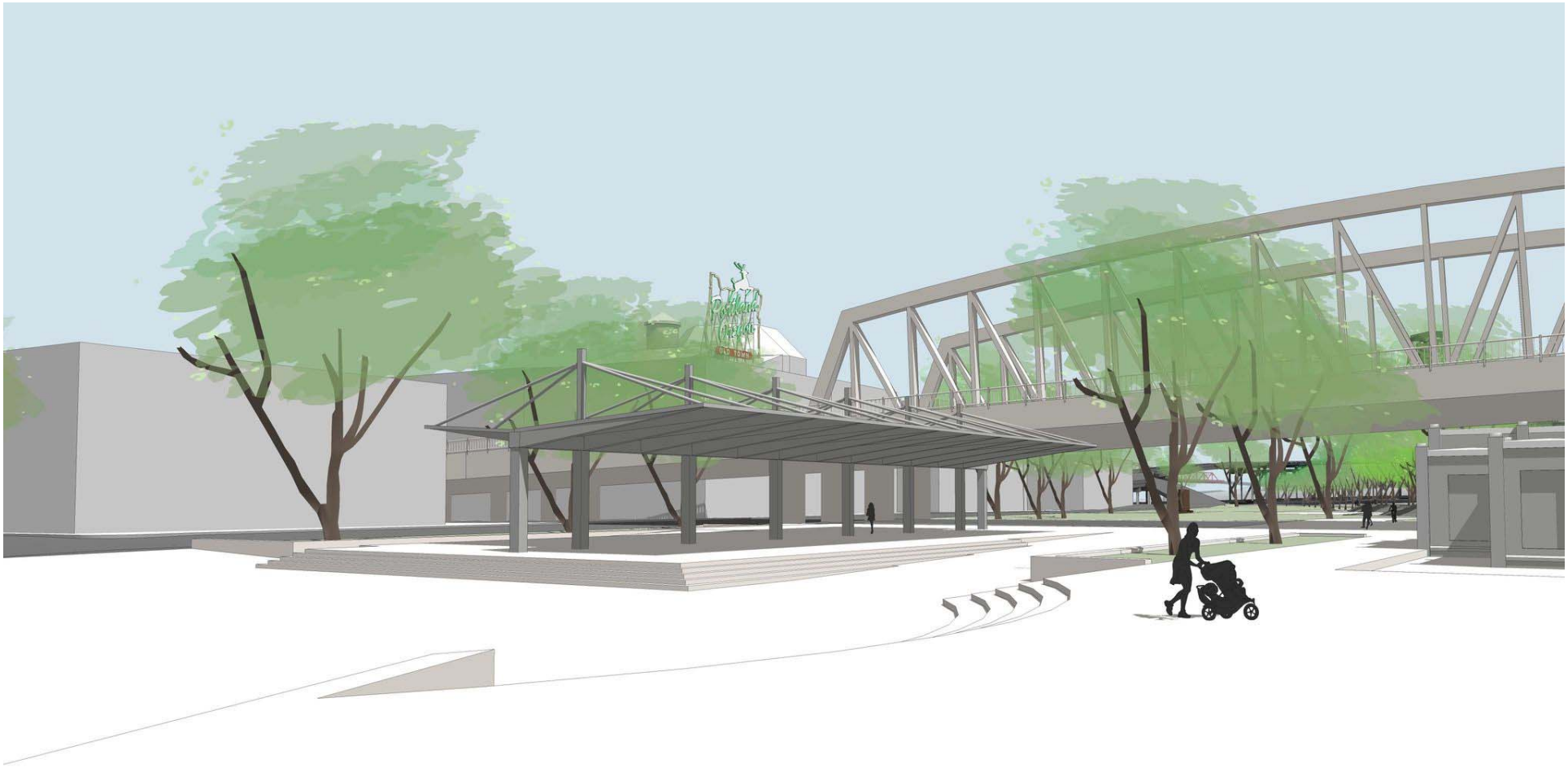
Westside Study

EARTHQUAKE READY BURNSIDE BRIDGE

Existing

Westside Study

Truss Option



Westside Study

Tied Arch Option

Westside Study

Cable Stayed Option

Westside Study

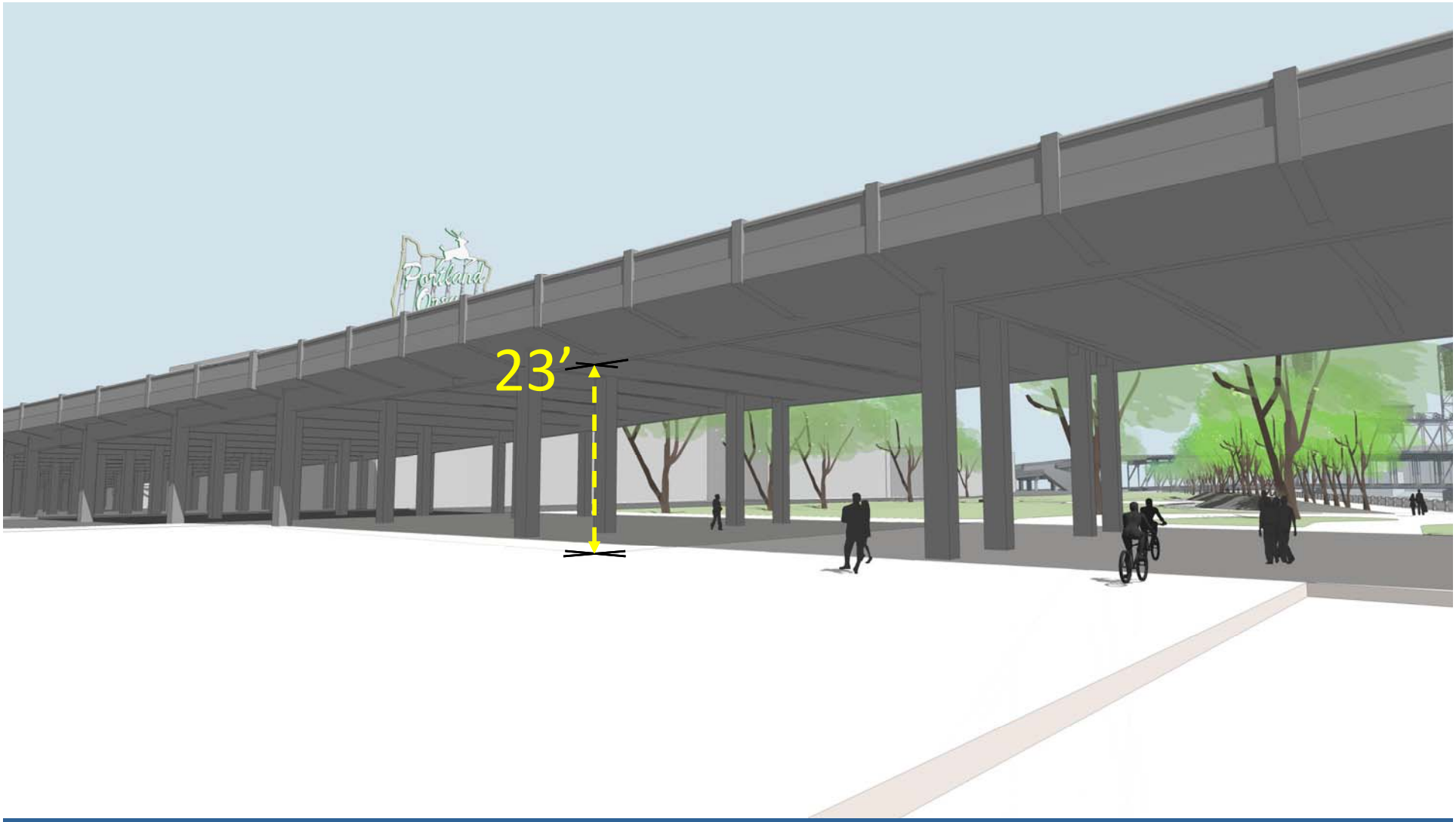
Girder Option (columns at Naito Parkway)

Westside Study

Girder Option (columns within Waterfront Park)

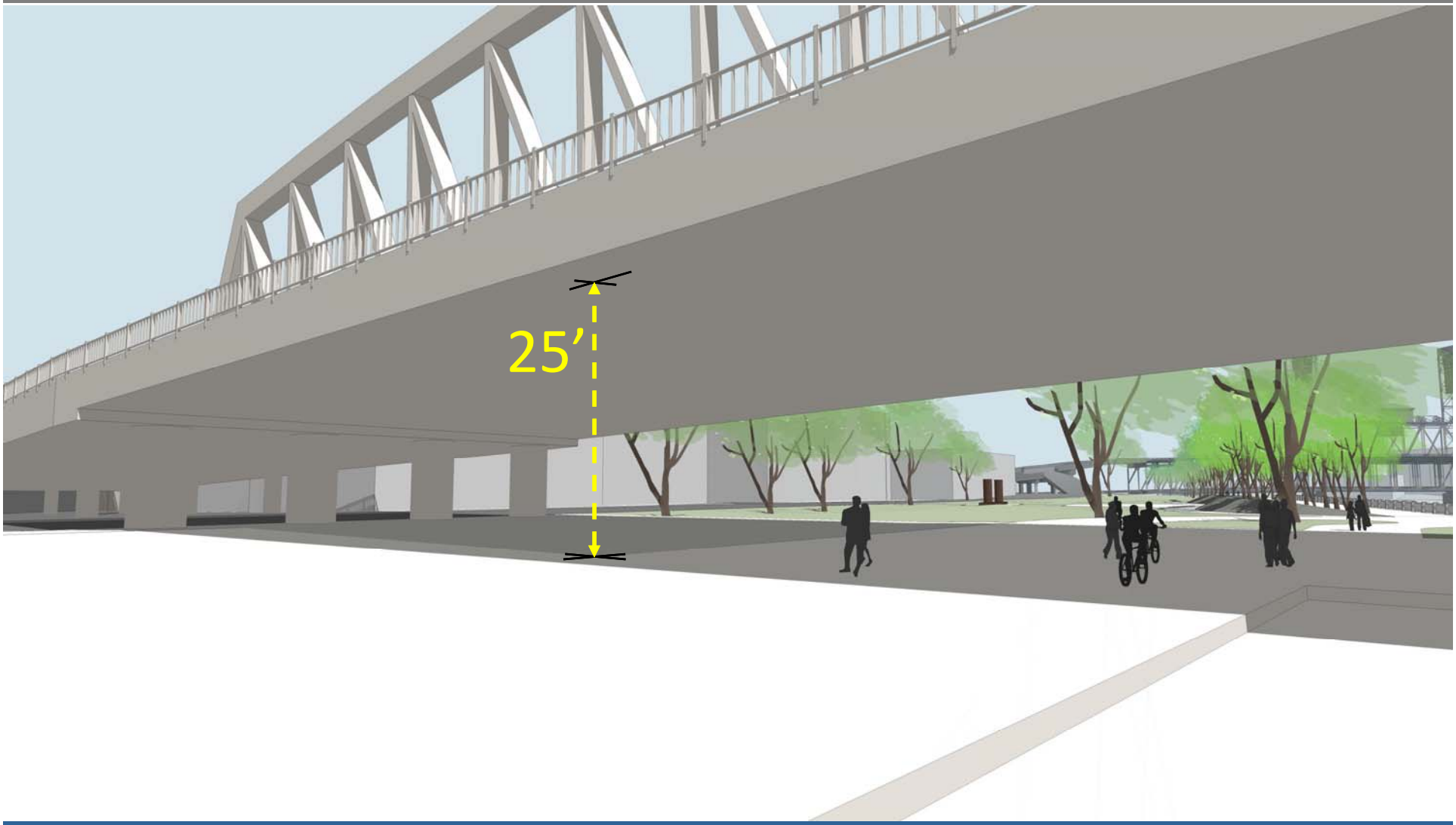
Westside Study

Existing



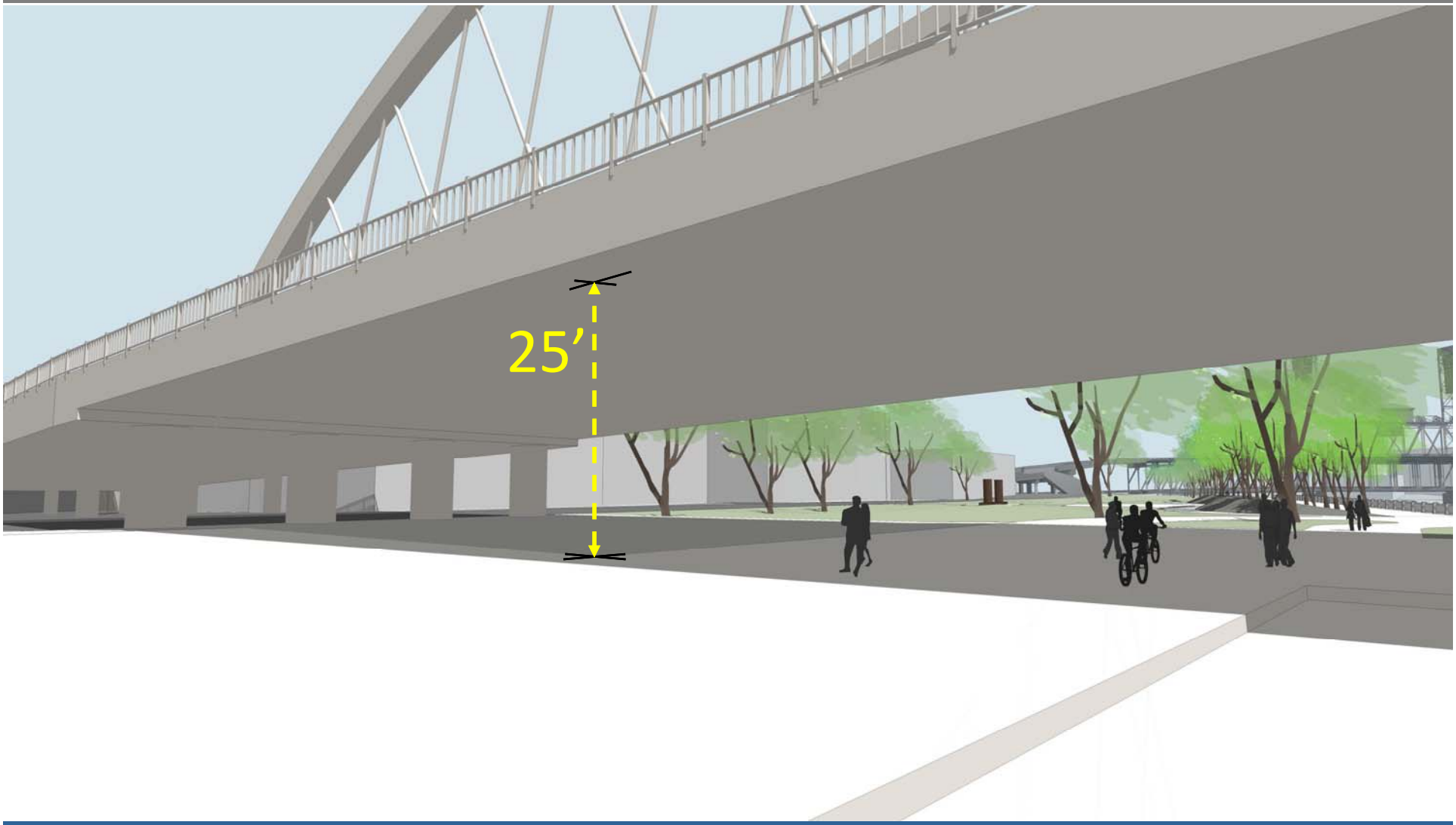
Westside Study

Truss Option



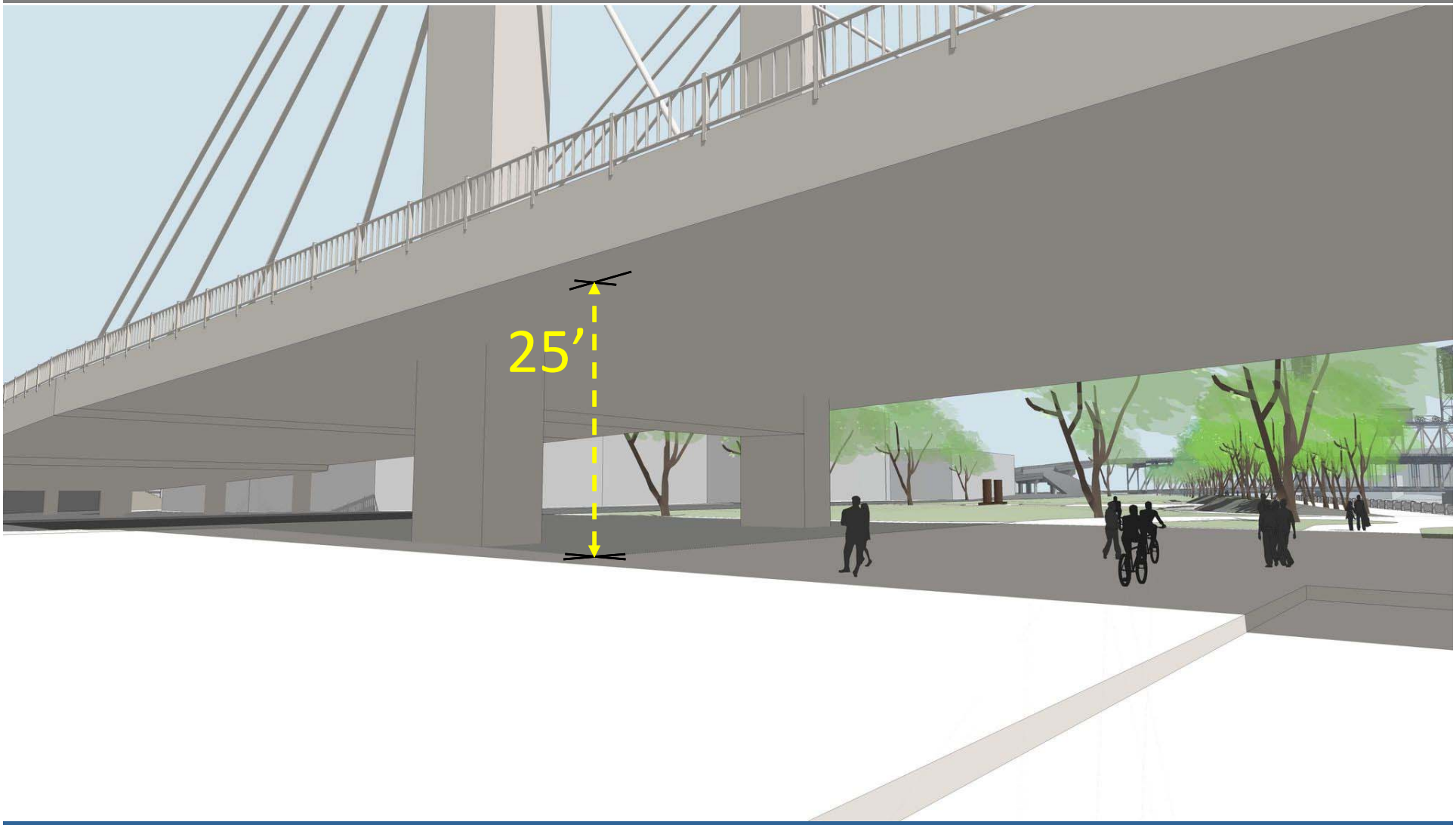
Westside Study

Tied Arch Option



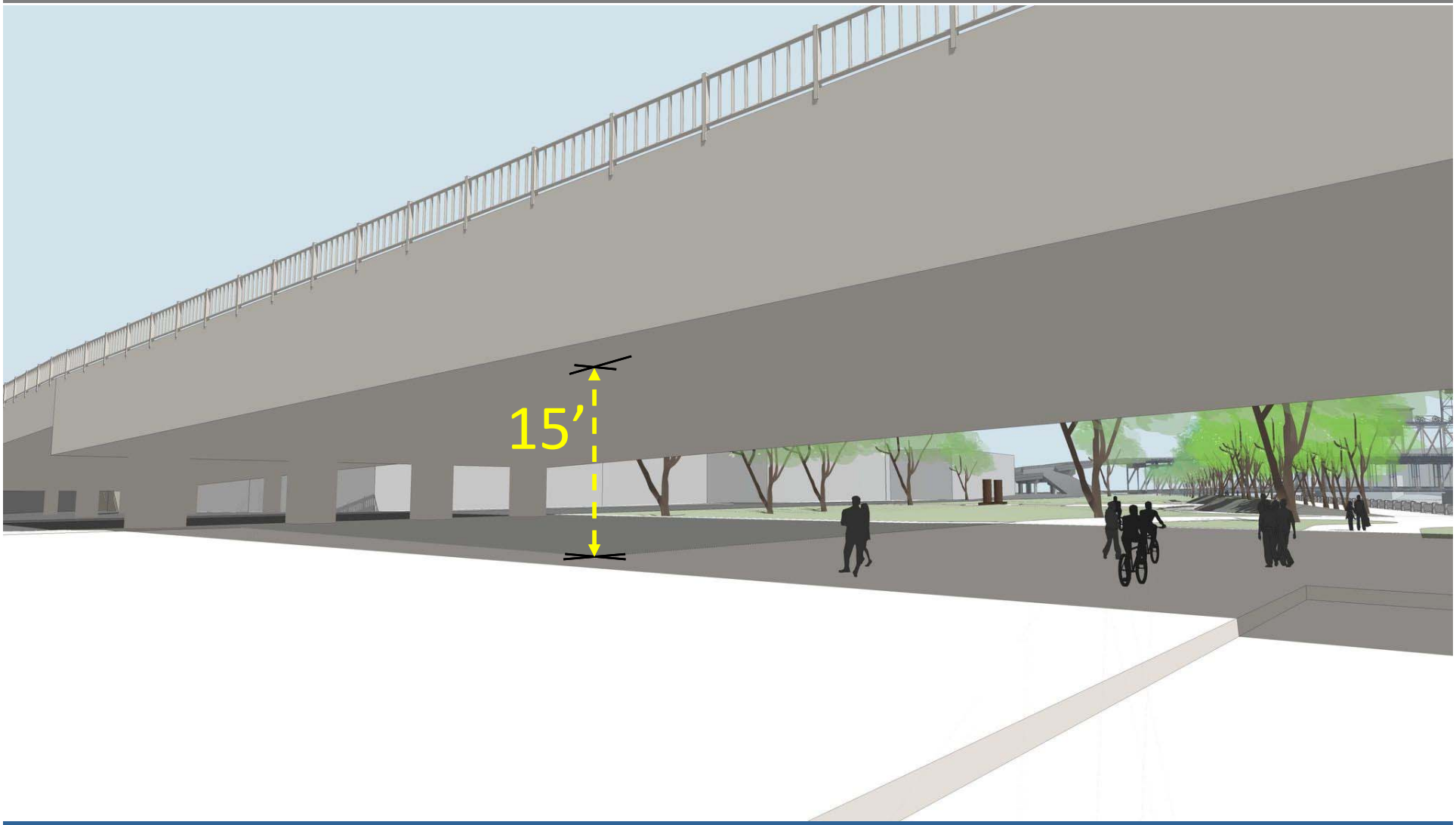
Westside Study

Cable Stayed Option



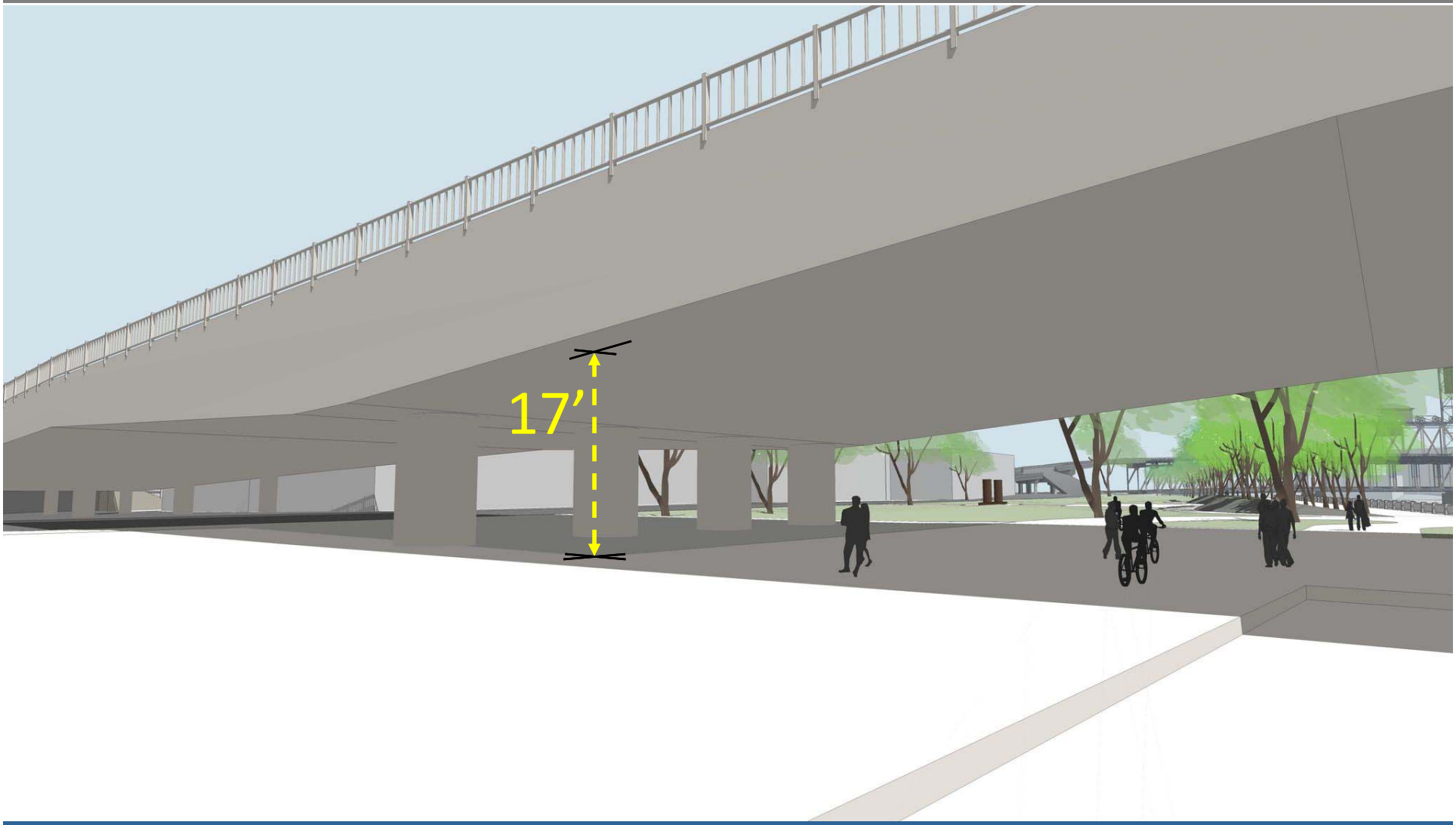
Westside Study

Girder Option (columns at Naito Parkway)



Westside Study

Girder Option (columns within Waterfront Park)



Westside Study

Tied Arch Option

Westside Study

Cable Stayed Option

Westside Study

Girder Option (columns at Naito Parkway)

Westside Study

Girder Option (columns within Waterfront Park)

Westside Study

Existing

Westside Study

Truss Option

Westside Study

Tied Arch Option

Westside Study

Cable Stayed Option

Westside Study

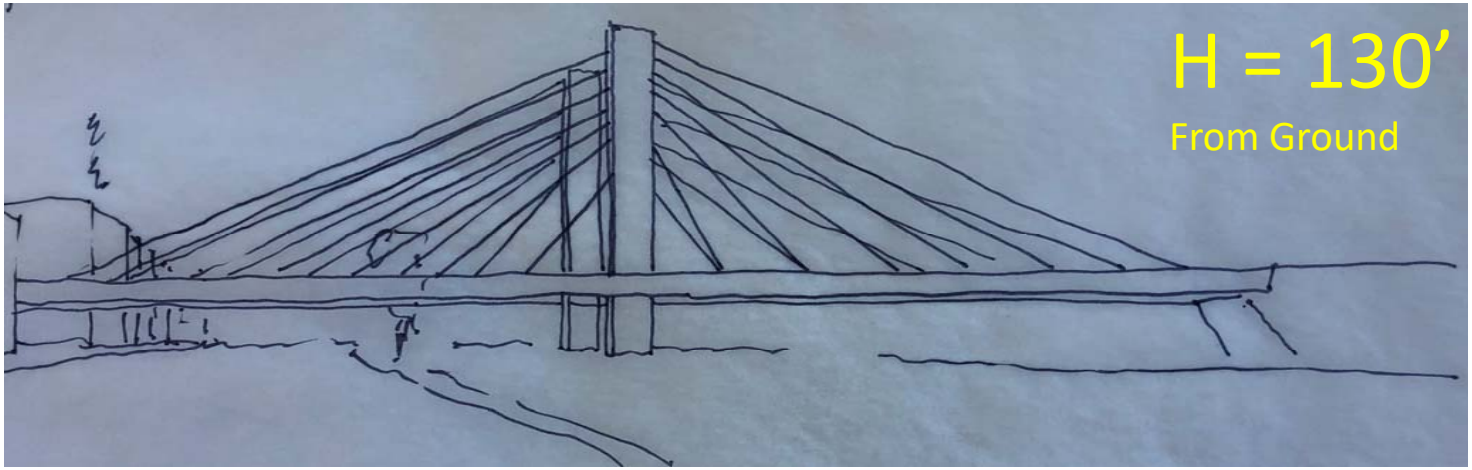
Girder Option (columns at Naito Parkway)

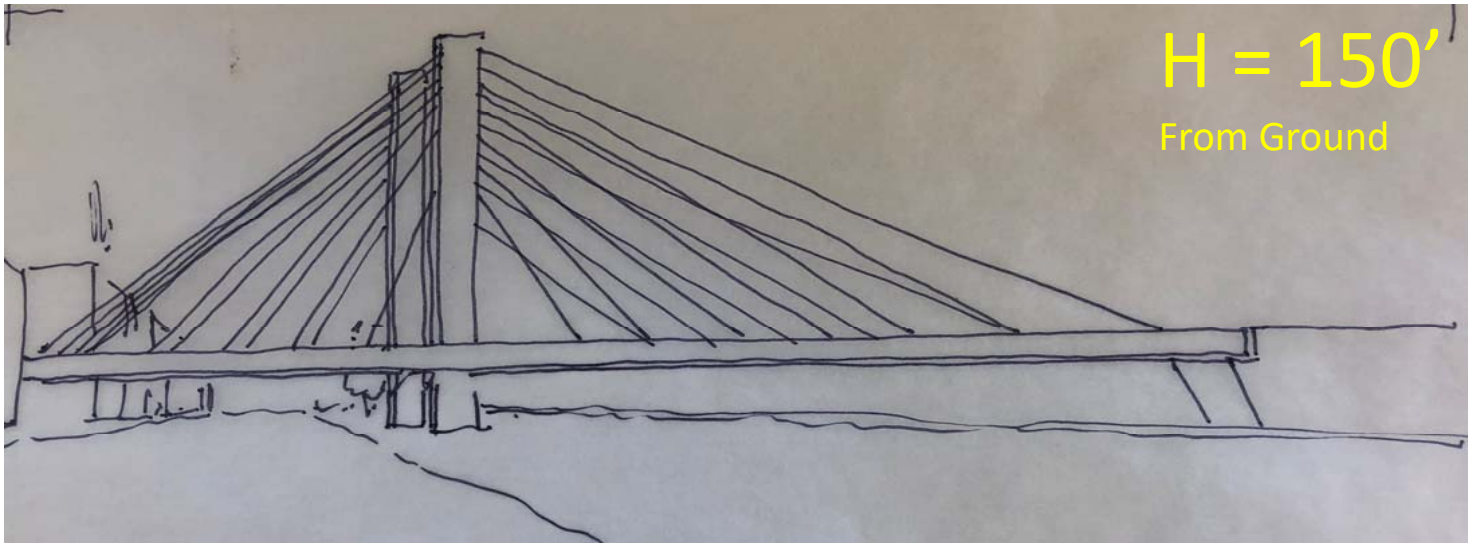
Westside Study

Girder Option (columns within Waterfront Park)

Westside Study

Adjusted Waterfront Park Tower Placement





Street Scape Study

Westside Study

Street Scape - Existing

Westside Study

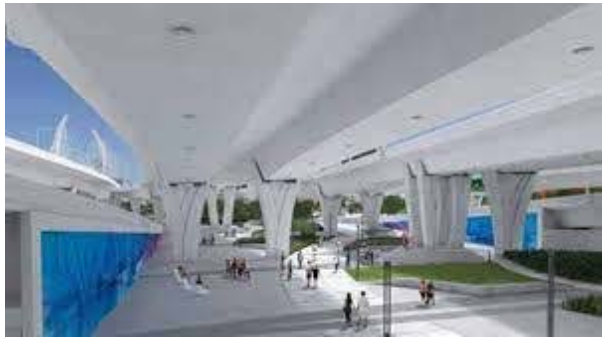
Street Scape - Toronto

Westside Study

Street Scape - Mumbai

Westside Study

Street Scape - I-395 in Miami



Westside Study

Street Scape - Seville and Los Angeles

Westside Study

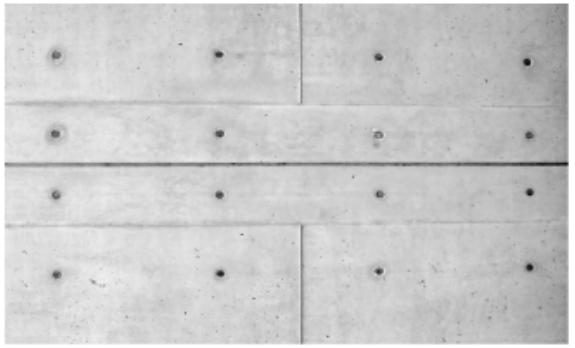
Street Scape - Chicano Park, San Diego

Westside Study

Street Scape - Holland

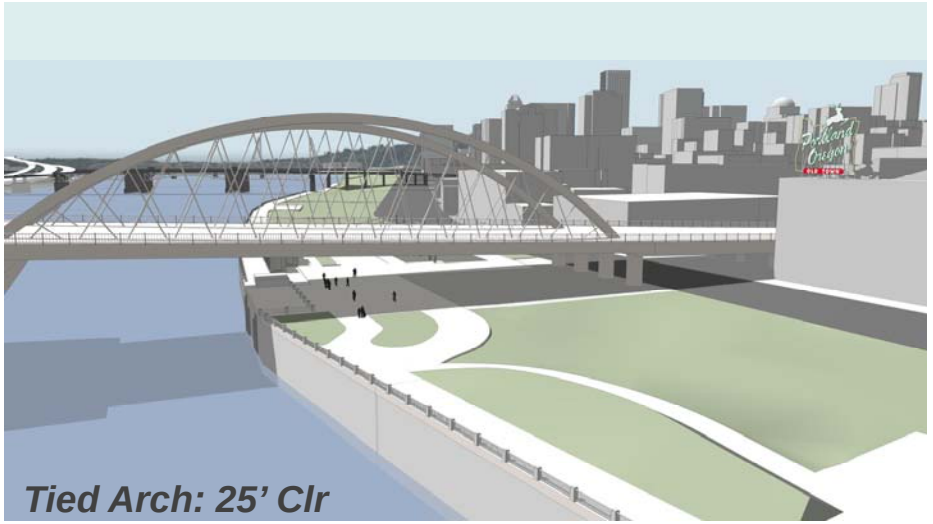
Westside Study

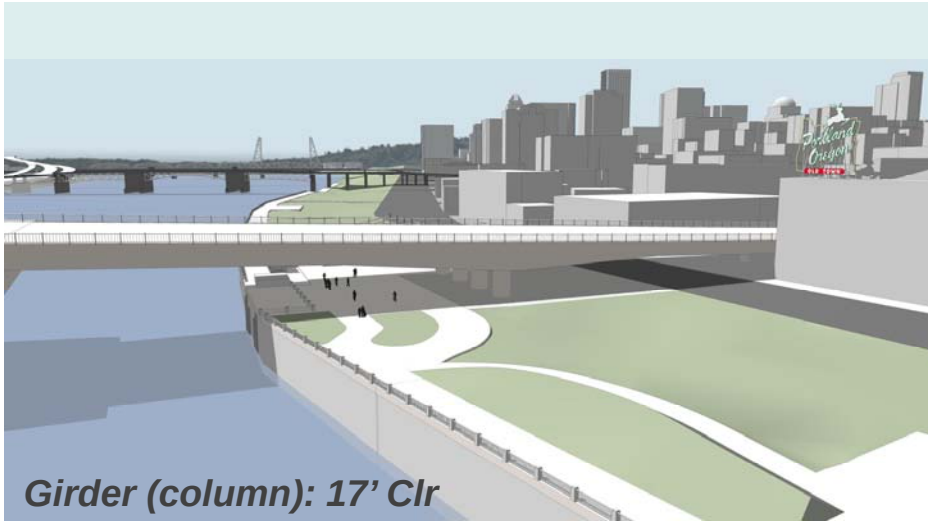
Street Scape - Concrete Texture

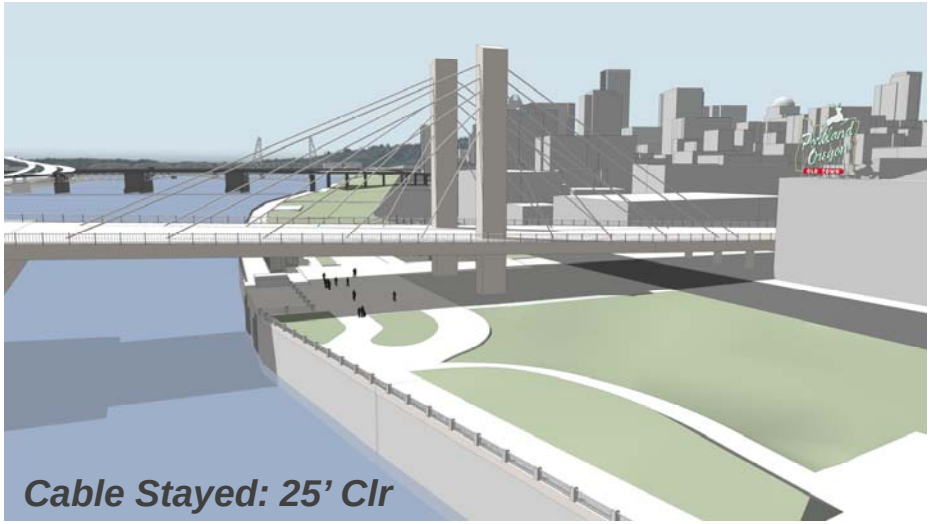


Westside Study

Group Discussion







Menu of Bridge Types:

Movable Bridges

Input / Feedback Opportunity

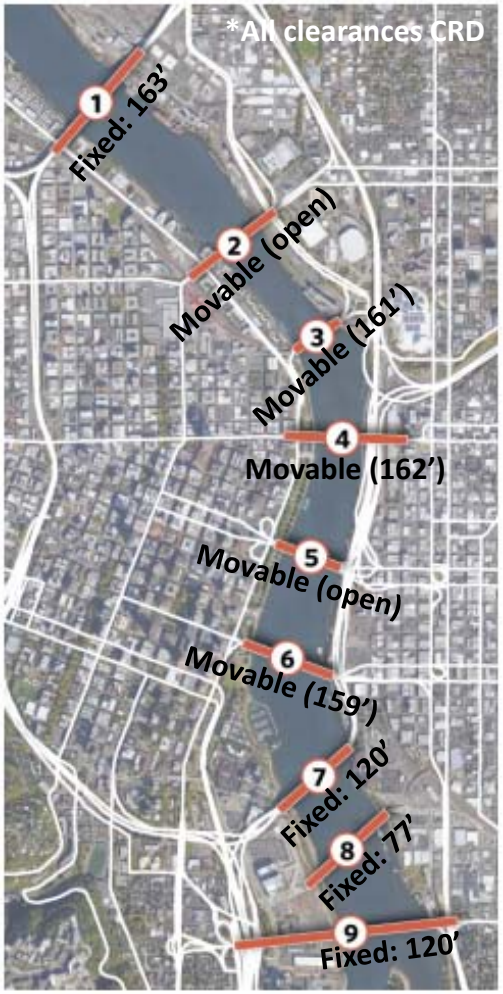
Topics to consider during the presentation …

- Achieving balance: symmetry vs. asymmetry
- Composition of bridge components
- Civic scale - east vs. west
- Elements of human scale
- Iconic landmark...or not?
- Lift bridge or bascule opening?
- Use of different structural systems in a tri-part bridge?
- Innovation
- Coherency

Existing Willamette River Bridges

EARTHQUAKE READY BURNSIDE BRIDGE

Downtown Portland Area



① Fremont Bridge

② Broadway Bridge

③ Steel Bridge

④ Burnside Bridge

⑤ Morrison Bridge

⑥ Hawthorne Bridge

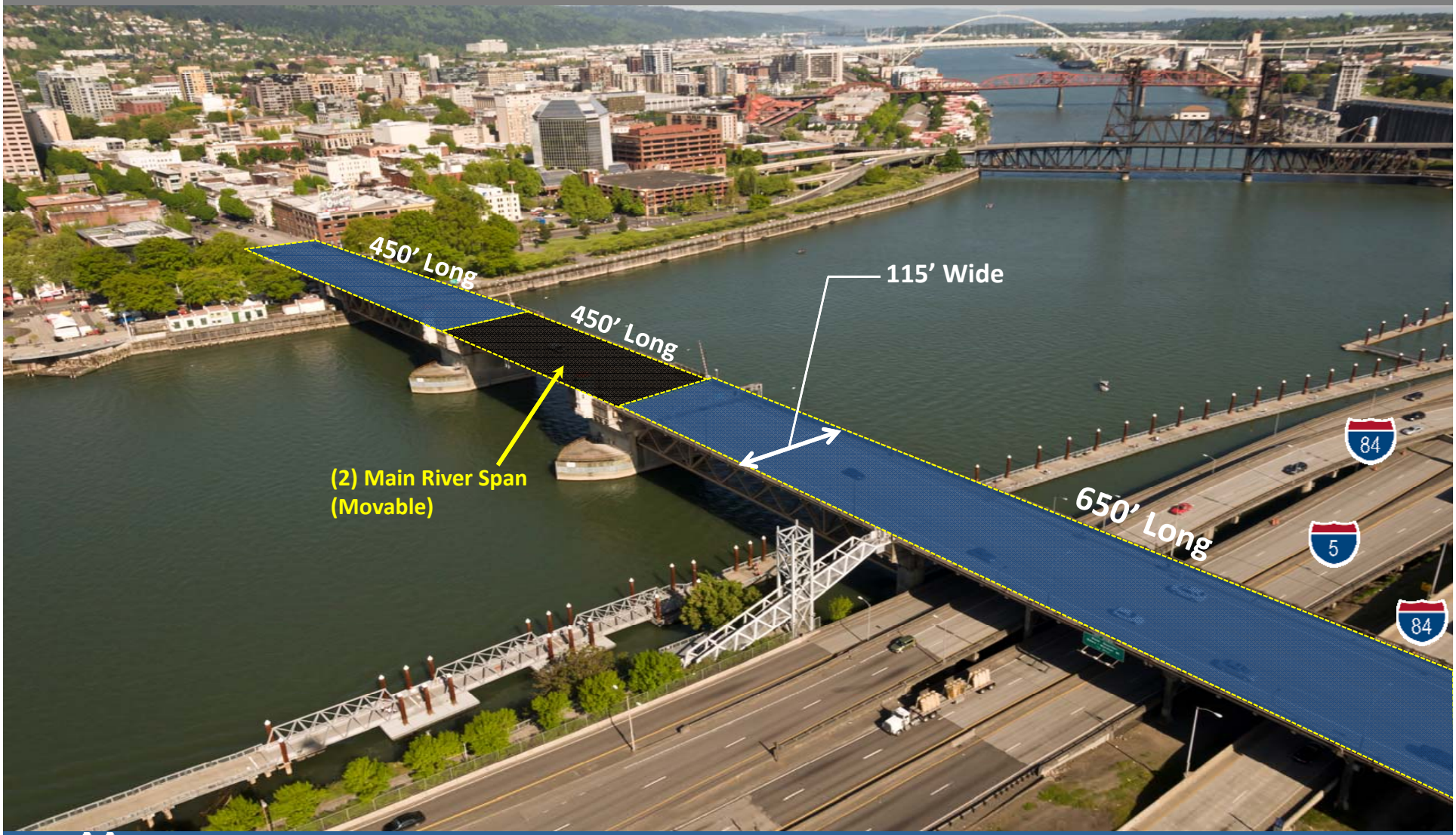
⑦ Marquam Bridge

⑧ Tilikum Crossing

⑨ Ross Island Bridge

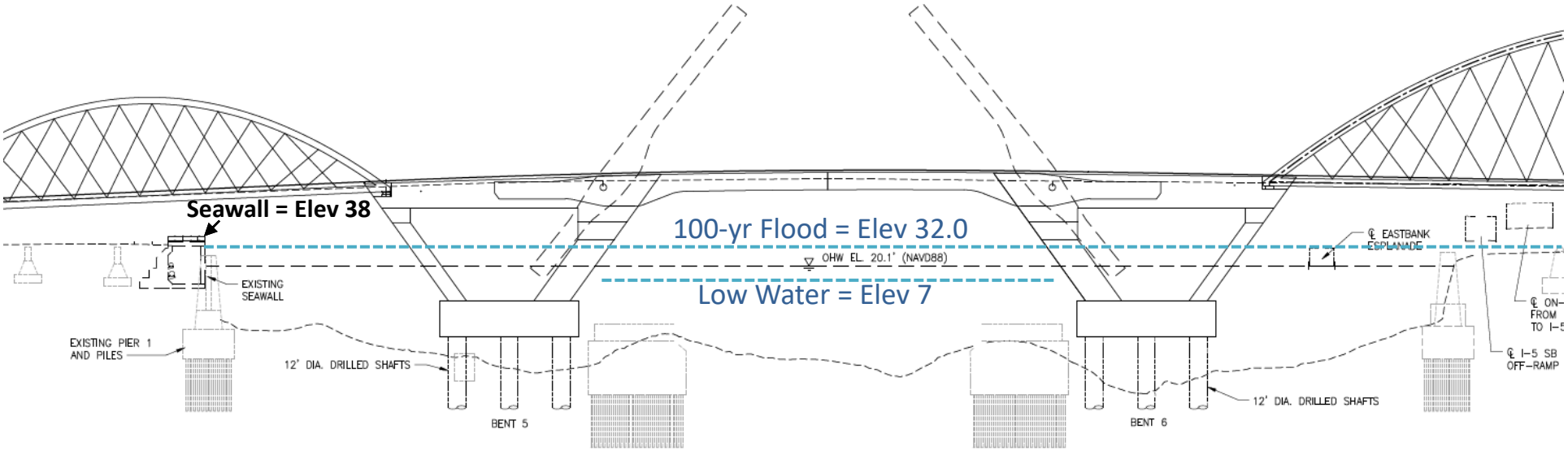
Long-span Alternative

“Three bridges in one”



River Hydraulics

Variable Water Surface Elevations



Historic Crests (at Morrison Br)

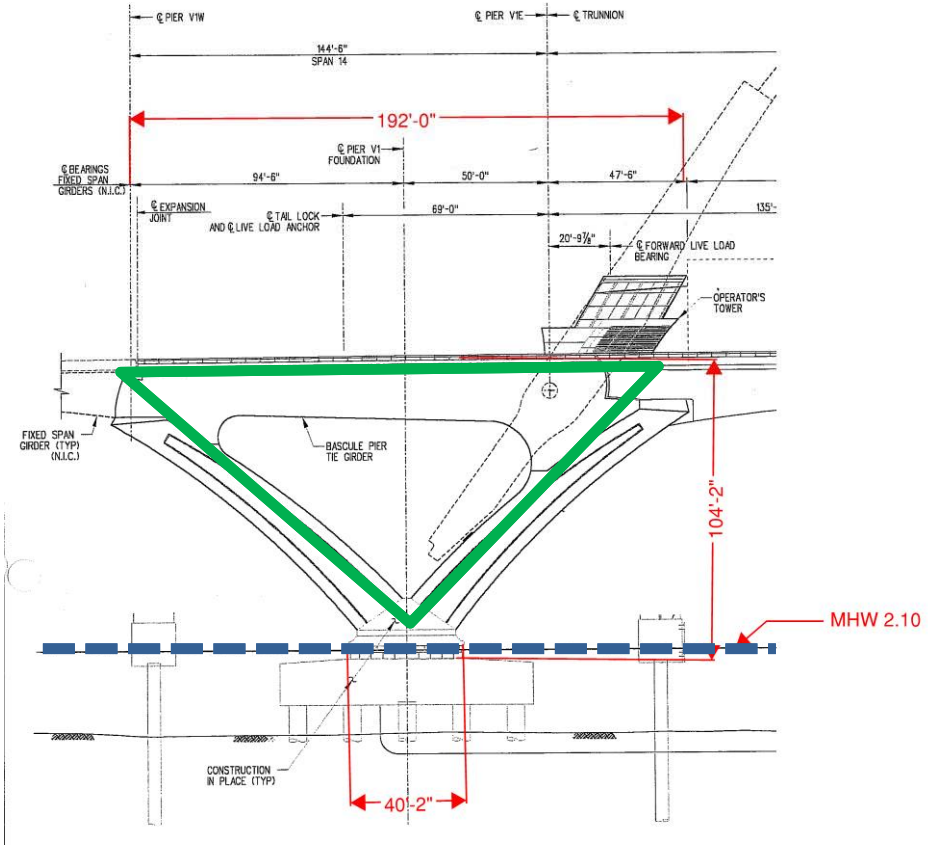
- 1894 Flood: Elev 38.0 ●
- 1948 Flood: Elev 35.0
- 1996 Flood: Elev 32.8

● Note: Prior to Seawall Construction

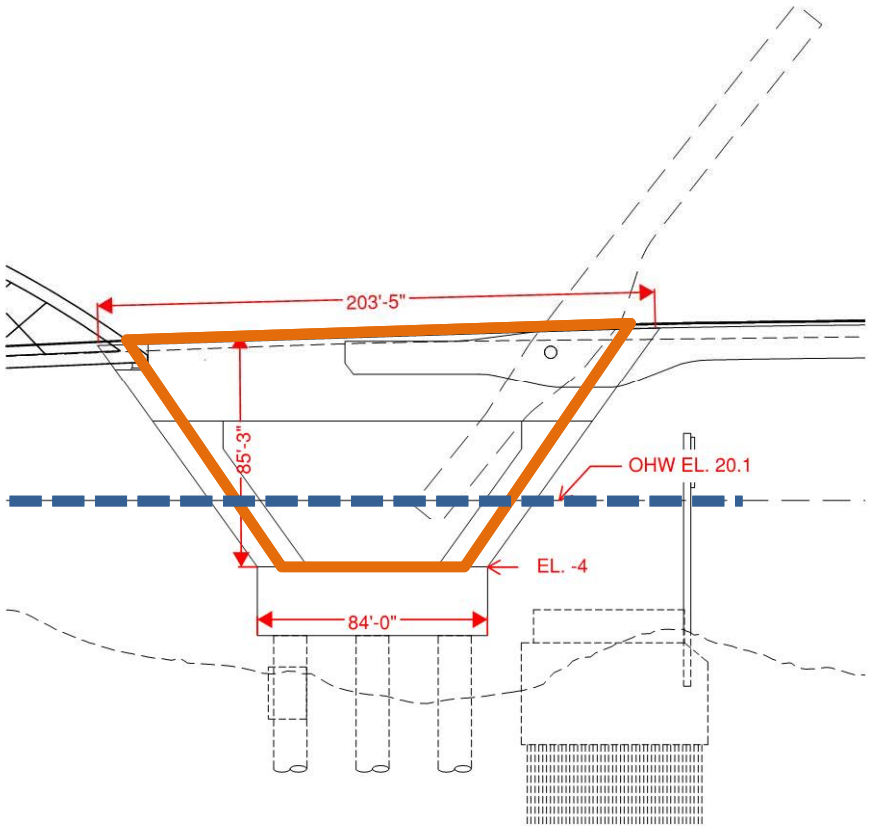
Note: 500-yr Flood = Elev 37.0

Movable Bridge Type - Bascule

Bascule Type for the Burnside Bridge: “Delta Pier”



Woodrow Delta Pier



Burnside Delta Pier

Movable Bridge Span (Summary)

Technically Feasible Types

Lift

- 180 ft tall towers
- Individual or strong truss tower
- Sheave direction options
- Single or split towers

Bascule

- Delta pier
- Twin leaf
- Rustic or modern style

Menu of Bridge Types


Main Street Bridge, Florida


Triborough (Harlem River) Bridge, New York


Tower Bridge, CA

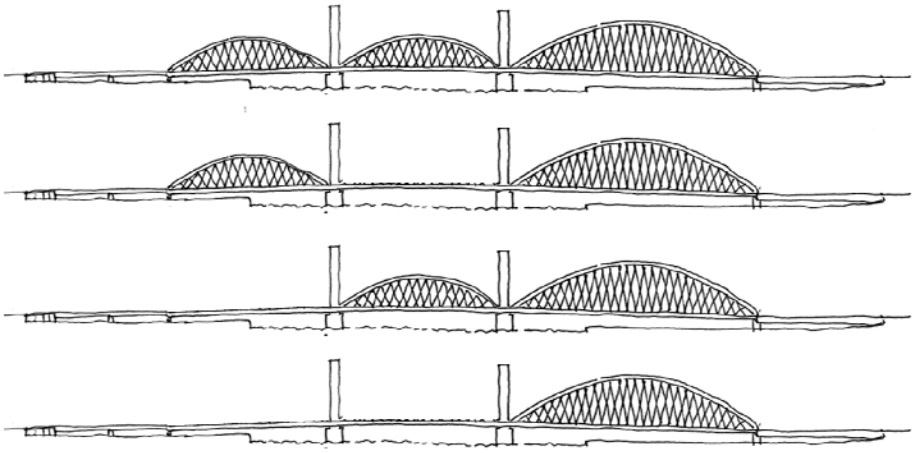

Broadway Bridge, Oregon


Hawthorne Bridge, Oregon

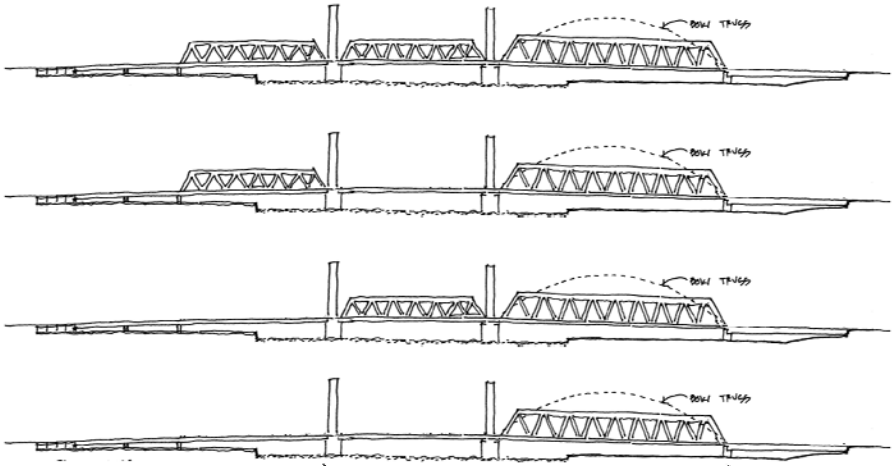
Study: **Lift Bridge Type**

Movable Bridge Type - Lift

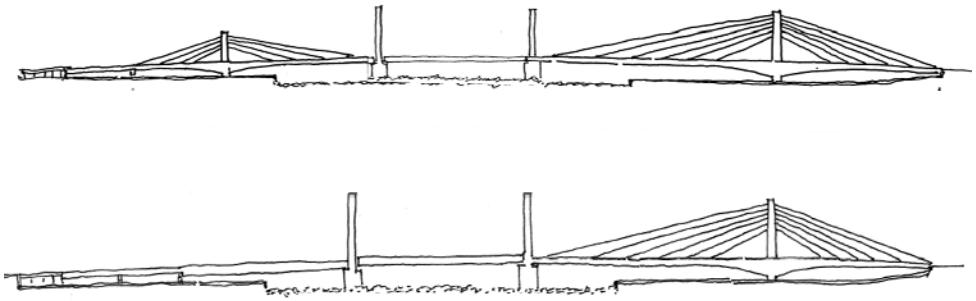
Lift Scale and Configurations (Lift tower height ~ 180')



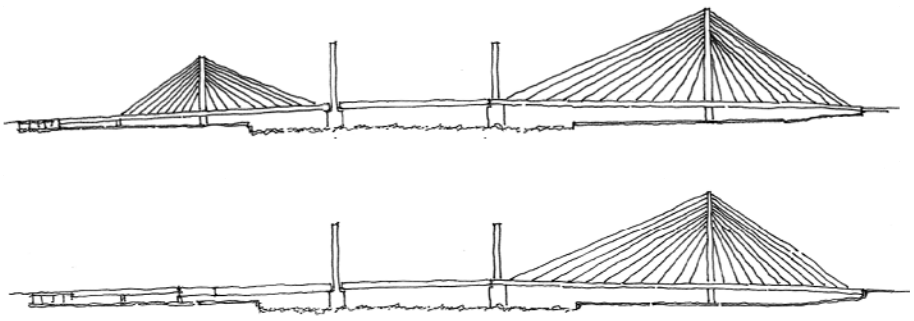
Tied Arch



Truss



Extradosed



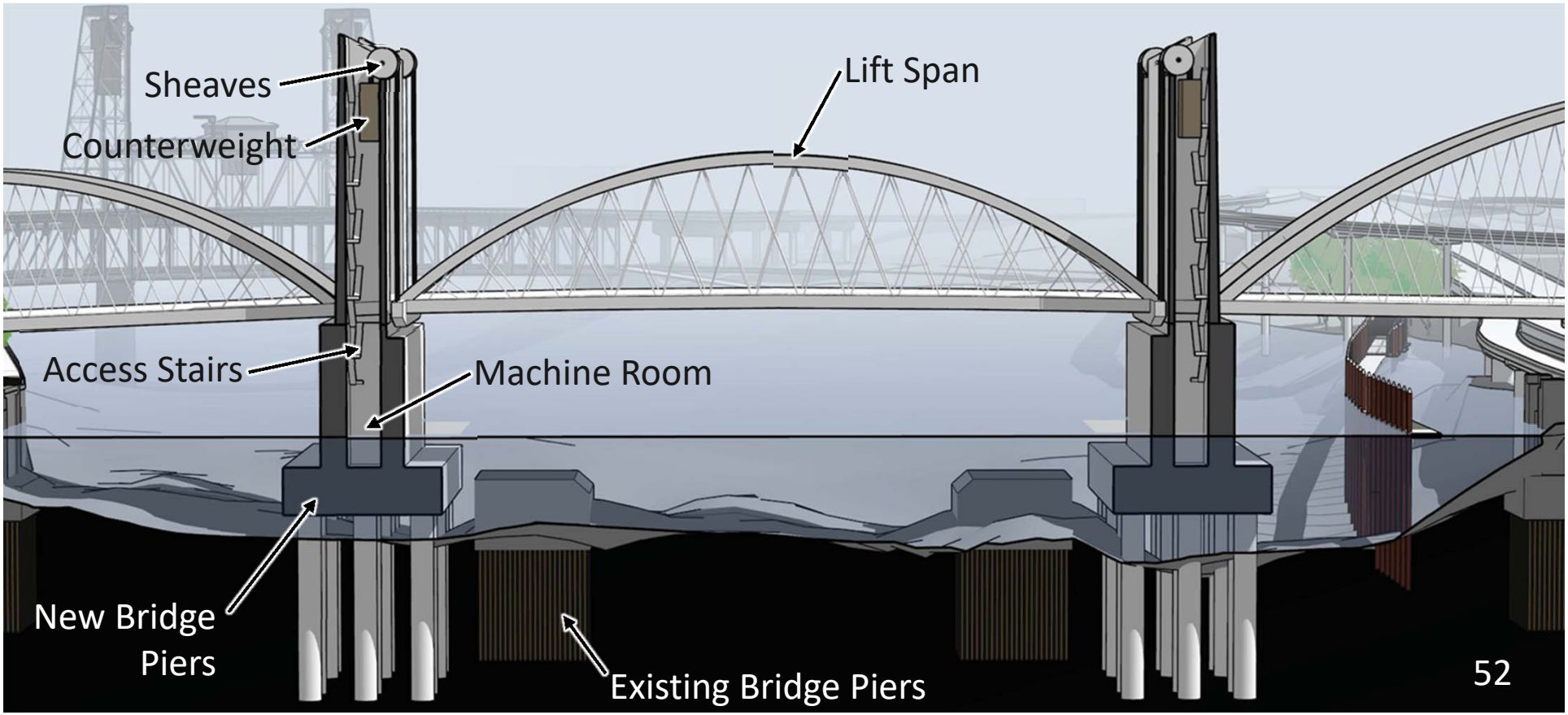
Cable Stayed

Movable Bridge Type - Lift

Lift Type for the Burnside Bridge

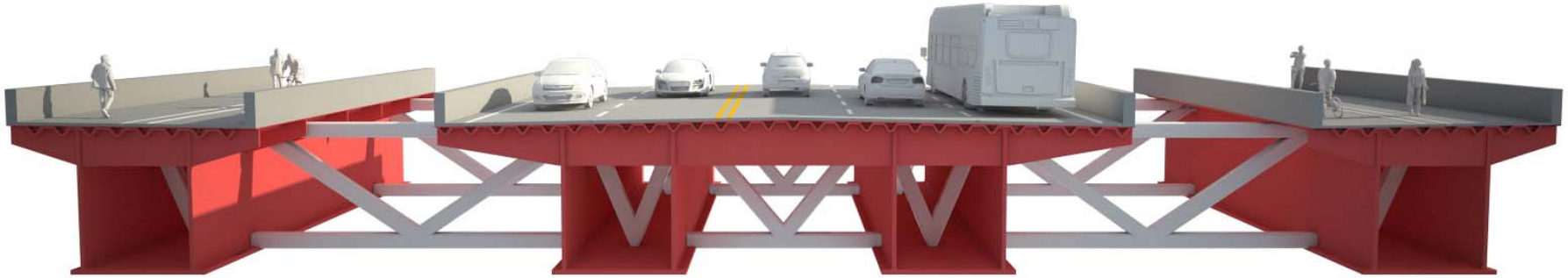
Key Attributes:

- **Lift Span:** Can be above or below deck
- **Pier Locations:** West and east of the existing piers to avoid foundation conflicts
- **Pier Sizing:** Needs to accommodate counterweight movements, machine room, and stairs
- **Sheaves Placement:** Towards main channel span to raise span



Movable Bridge Type - Lift

Lift Span Type – "Girder" type is Technically Feasible



Burnside Bridge Cross Section of Lift Span
(Below deck option)

Movable Bridge Type - Lift

EARTHQUAKE READY BURNSIDE BRIDGE

Technically Feasible Lift Option: Modern Truss Tower Style


Tower Bridge, Sacramento


Fore River Bridge, Quincy, Massachusetts


Chelsea St Bridge, Massachusetts

Movable Bridge Type - Lift

Technically Feasible Lift Option: Modern Truss Tower Style

Pont Jacques Chaban Bridge, Bordeaux France

Sarah Mildred Long Bridge, Maine – New Hampshire

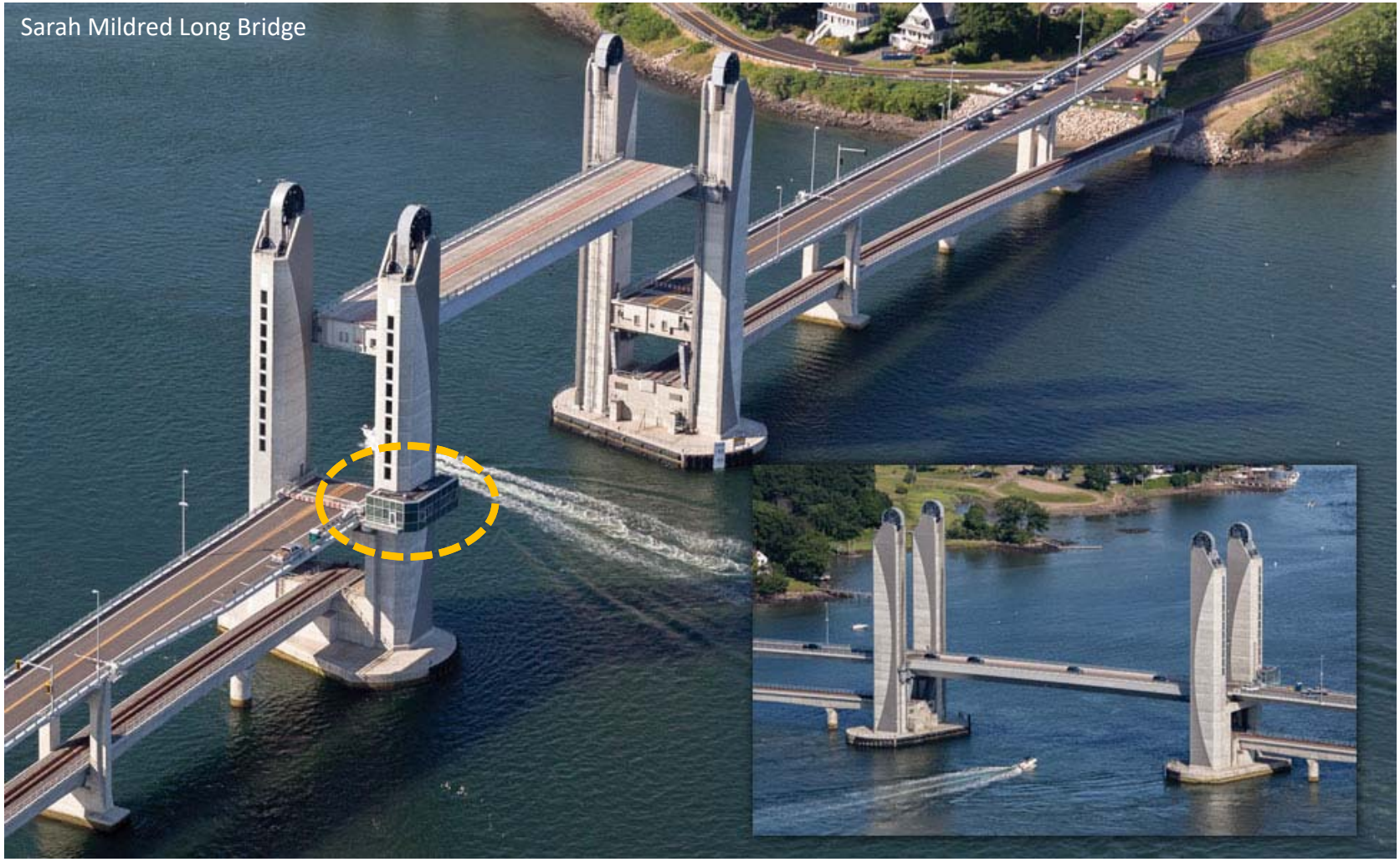
"I" St Bridge Sacramento, CA

Movable Bridge Type - Lift

Technically Feasible Lift Option: Individual Tower Style

Movable Bridge Type - Lift

Technically Feasible Lift Option: Individual Tower Style



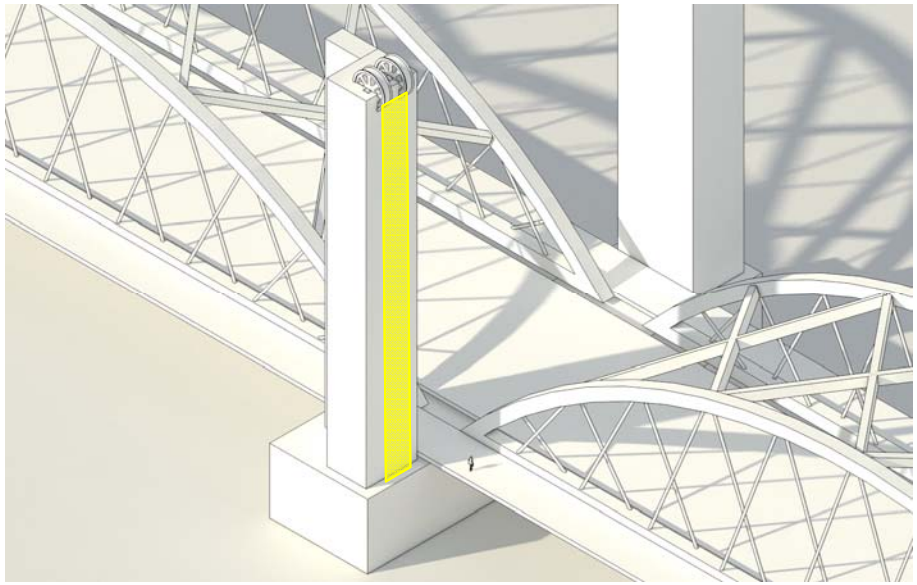
Movable Bridge Type - Lift

Technically Feasible Lift Option: Individual Tower Style

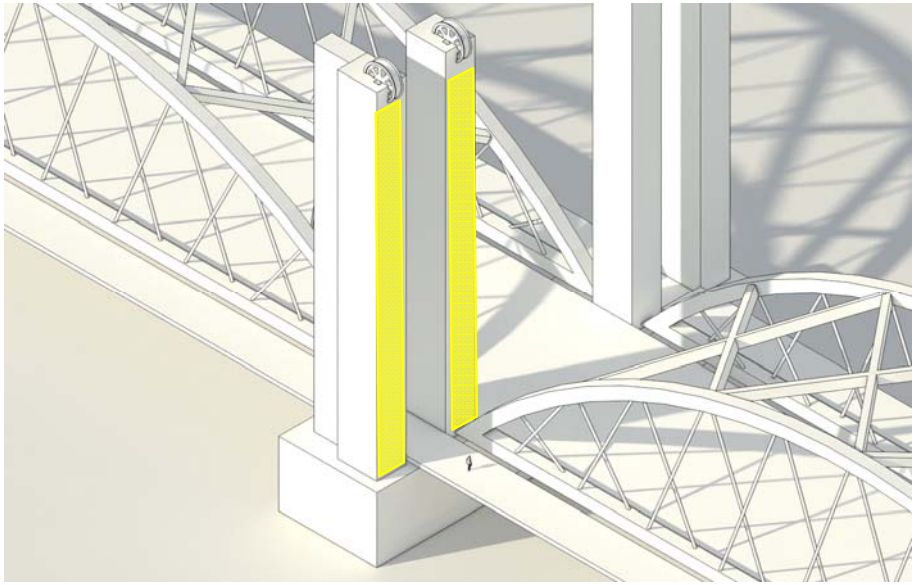
"I" St Bridge Sacramento, CA

Movable Bridge Type - Lift

Tower Types: Single Tower versus Split Towers



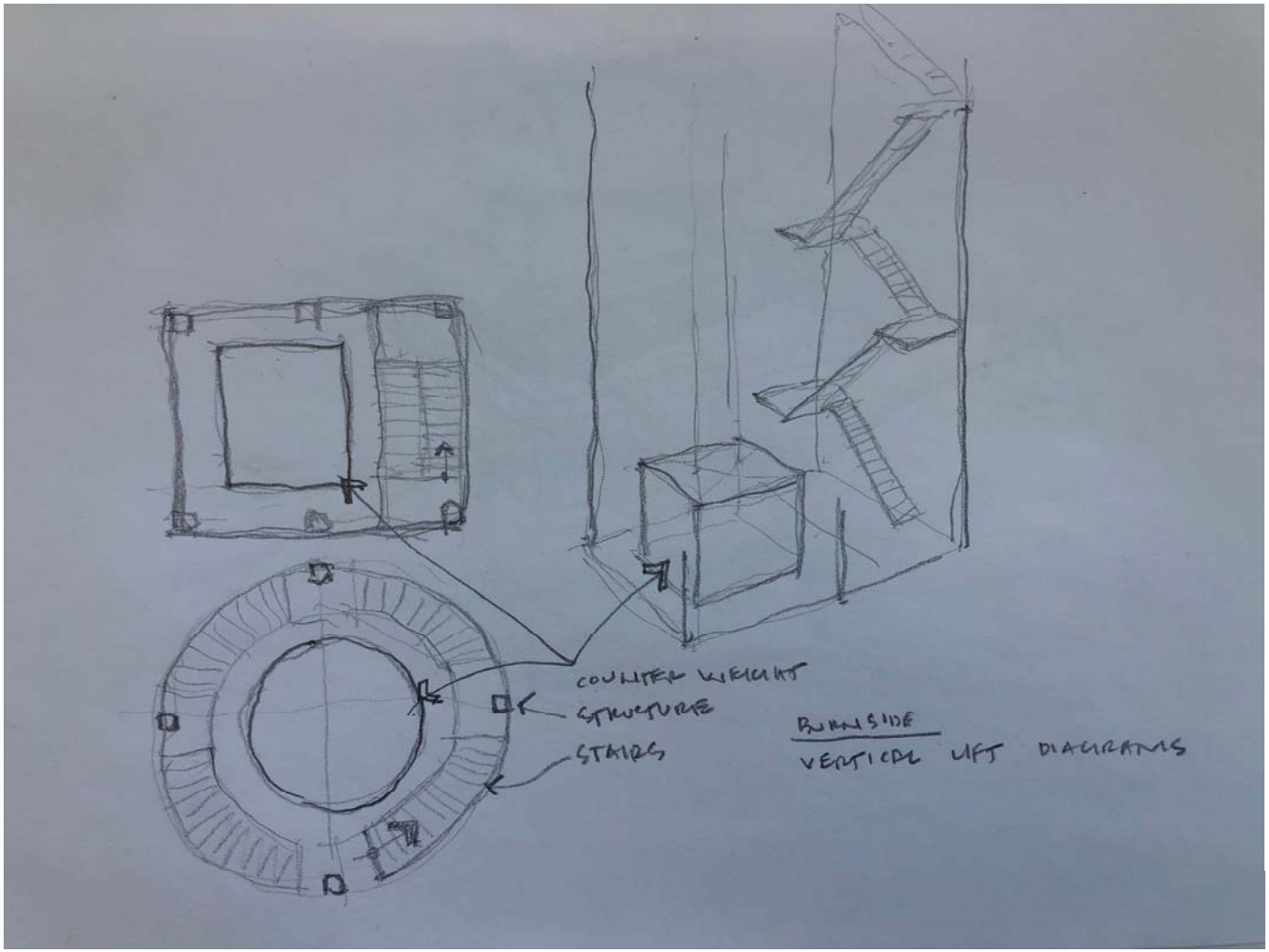
Single Tower



Split Tower

Movable Bridge Type - Lift

Vertical Towers - Internal Needs

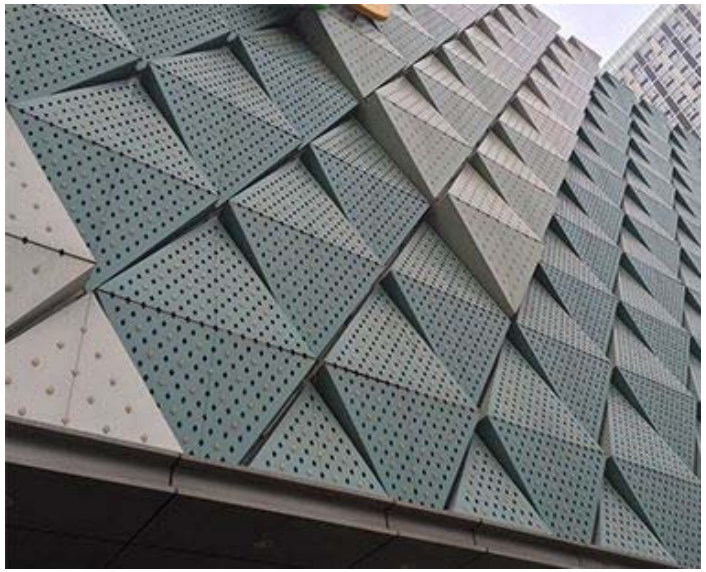


Movable Bridge Type - Lift

Lift Tower Alternatives – University of Pennsylvania

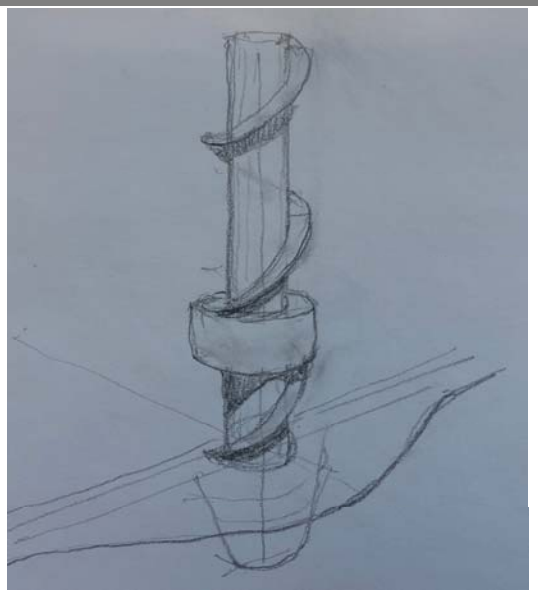
Movable Bridge Type - Lift

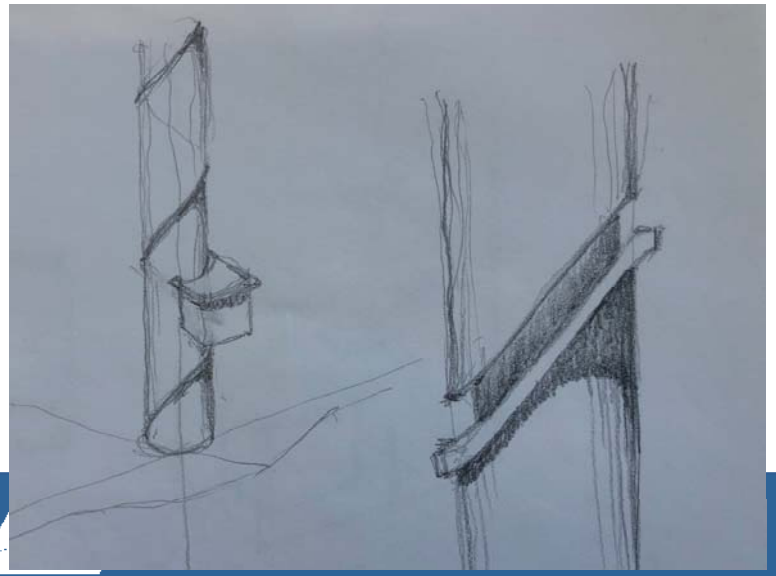
Lift Tower Alternatives – Perforated Metal Panel



Movable Bridge Type - Lift

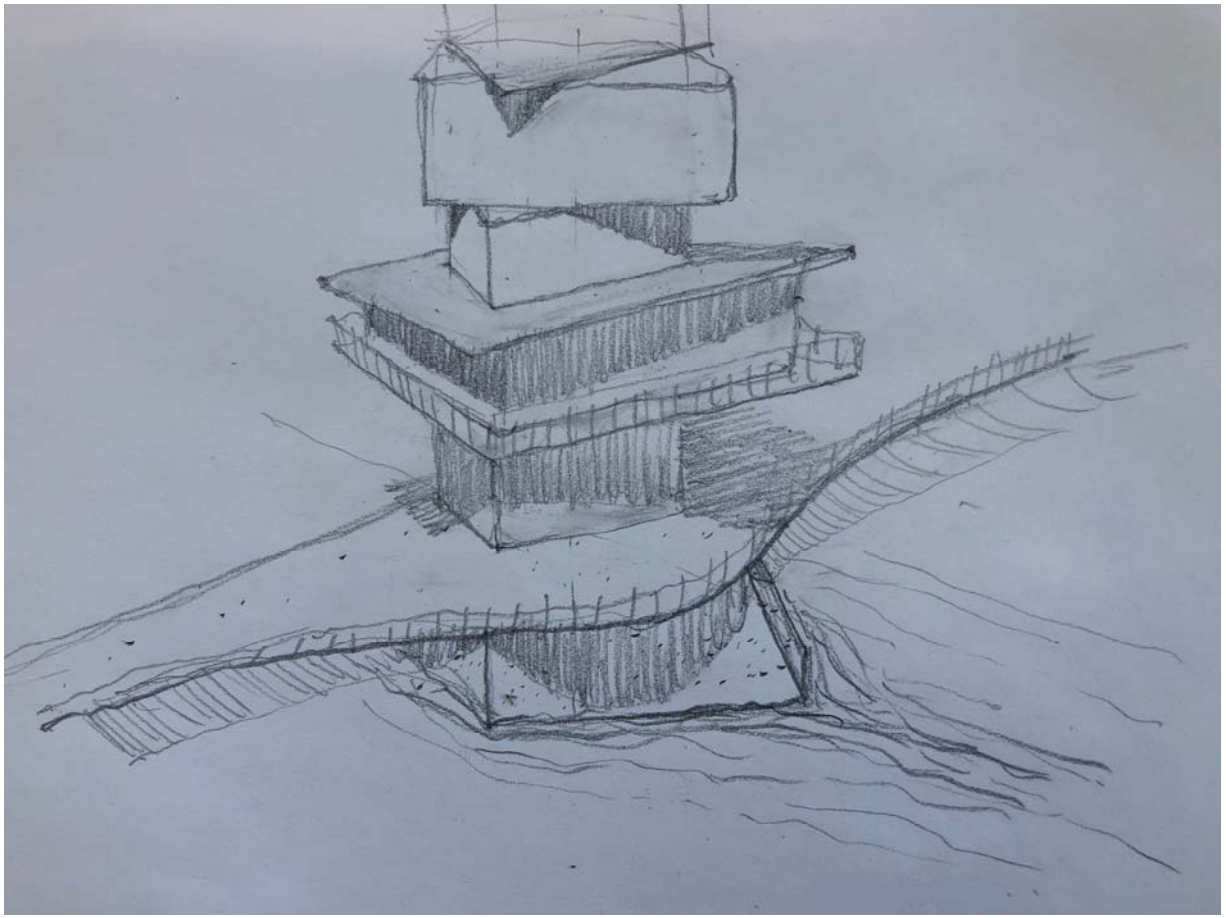
Lift Tower Alternatives – Tower Shape

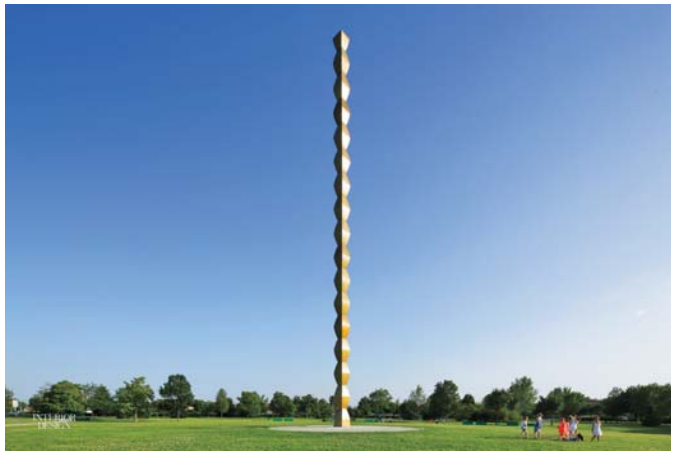




Movable Bridge Type - Lift

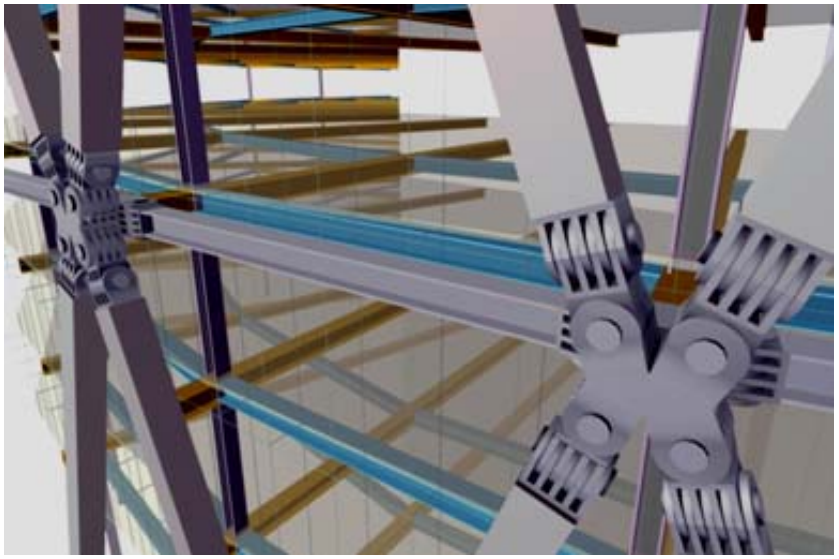
Lift Tower Alternatives – Tower Shape





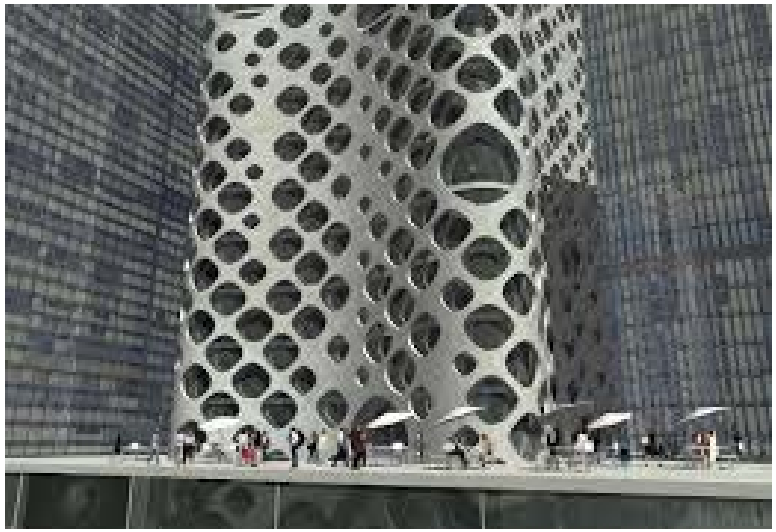
Movable Bridge Type - Lift

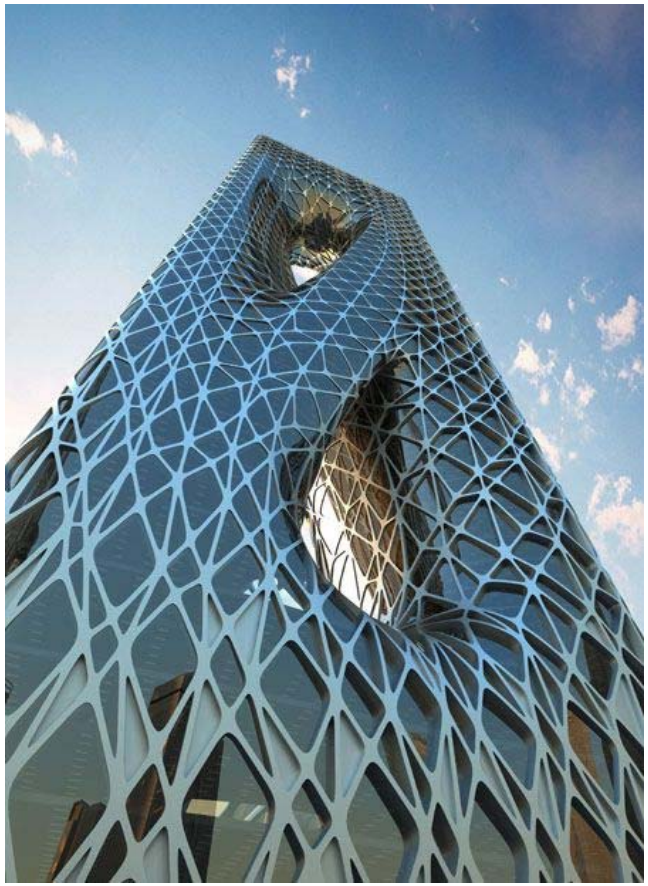
Lift Tower Alternatives – Tower Shape (Diagrid Exoskeleton)



Movable Bridge Type - Lift

Lift Tower Alternatives – Towers





Menu of Bridge Types


South Park Bridge, Washington


Harbor Bridge, Spain

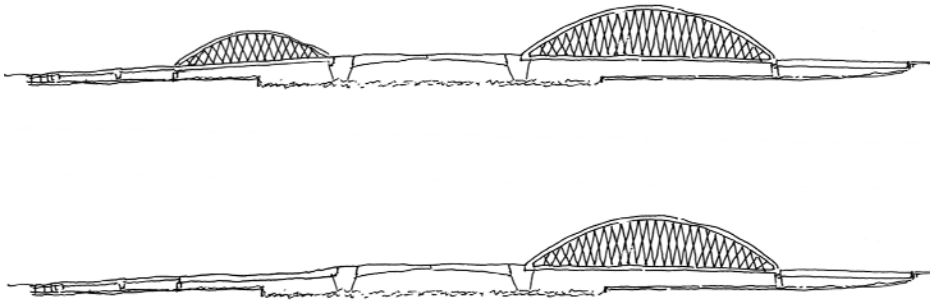

New Johnson St. Bridge, Canada


Woodrow Wilson Bridge, Maryland

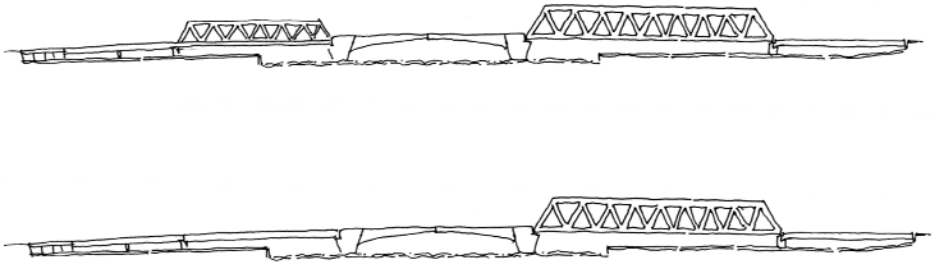
Study: **Bascule Bridge Type**

Movable Bridge Type - Bascule

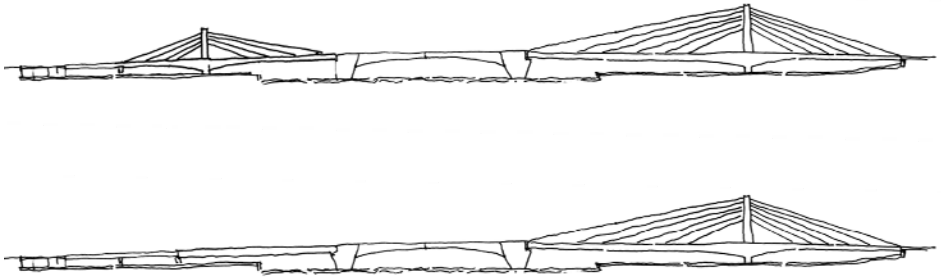
Bascule Scale and Configurations



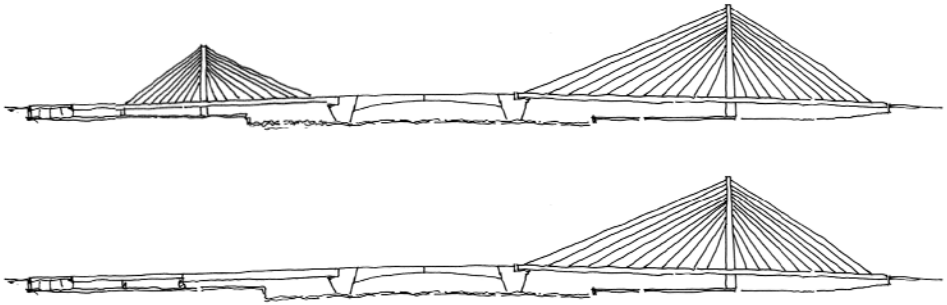
Tied Arch



Truss



Extradosed



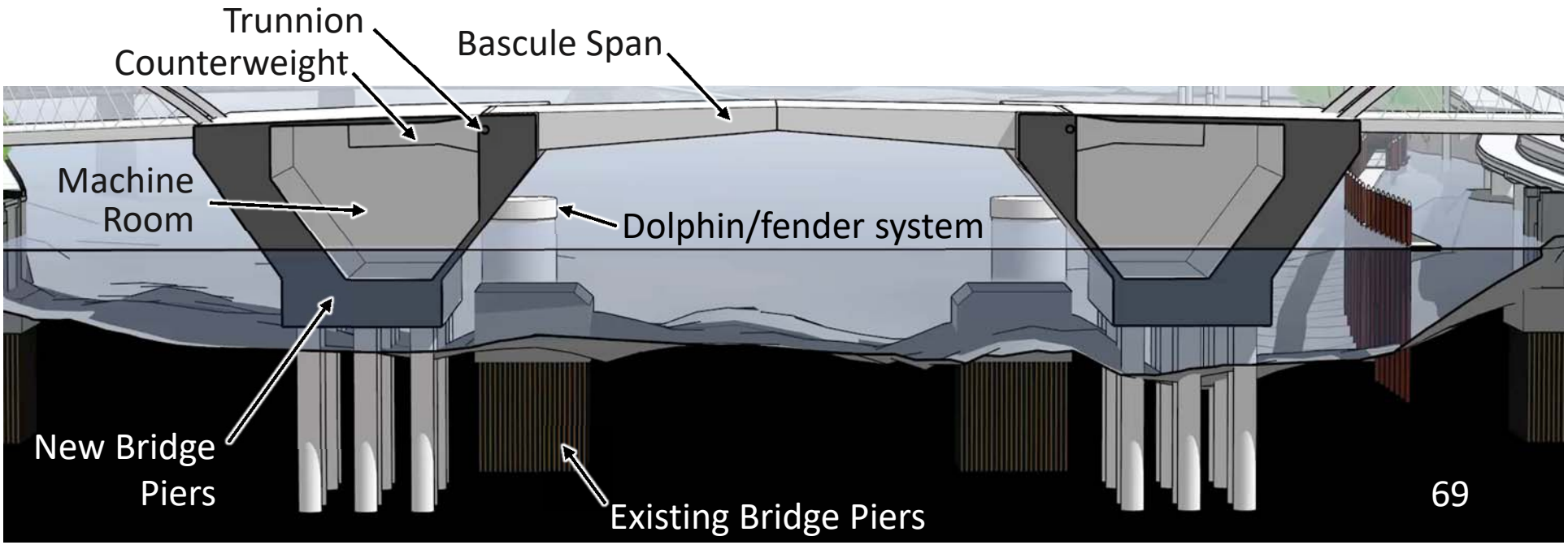
Cable Stayed

Movable Bridge Type - Bascule

Bascule Type for the Burnside Bridge: "Delta Pier"

Key Attributes:

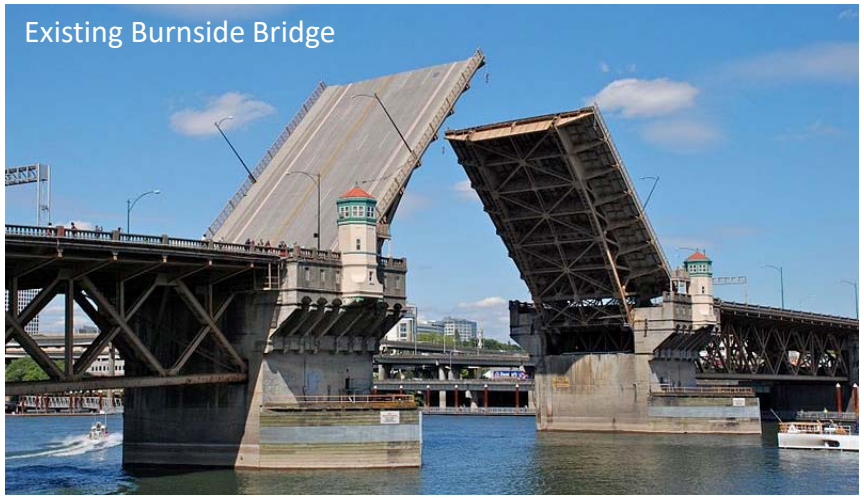
- **Bascule Span:**
  - "Split-leaf" (2 halves) type due to opening length
  - Can be above or below deck
- **Pier Locations:** West and east of the existing piers to avoid foundation conflicts
- **Pier Sizing:** Needs to accommodate counterweight movements and machine room
- **Trunnion Placement:** Towards main channel span to reduce bascule leaf length
- **Vessel Collision Protection:** Likely requires a fender or dolphin system for large ships



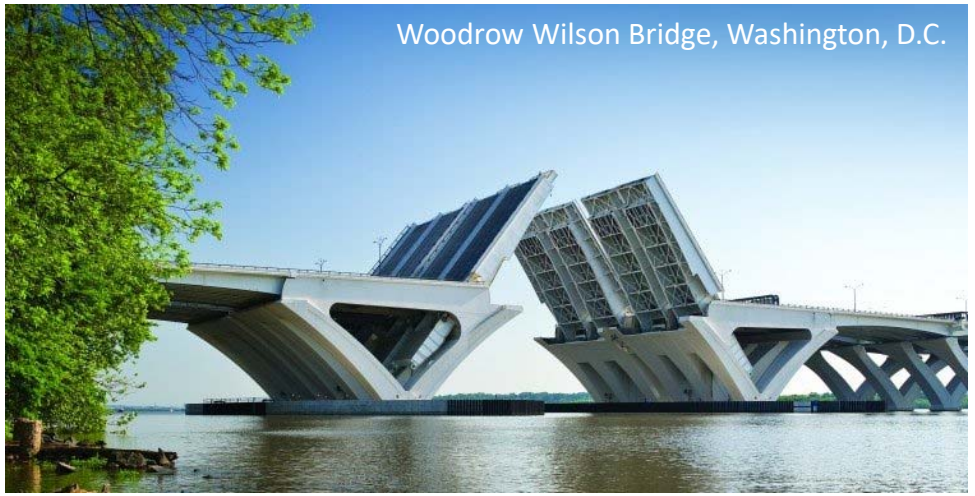
Movable Bridge Type - Bascule

Example Bascule Bridge Types

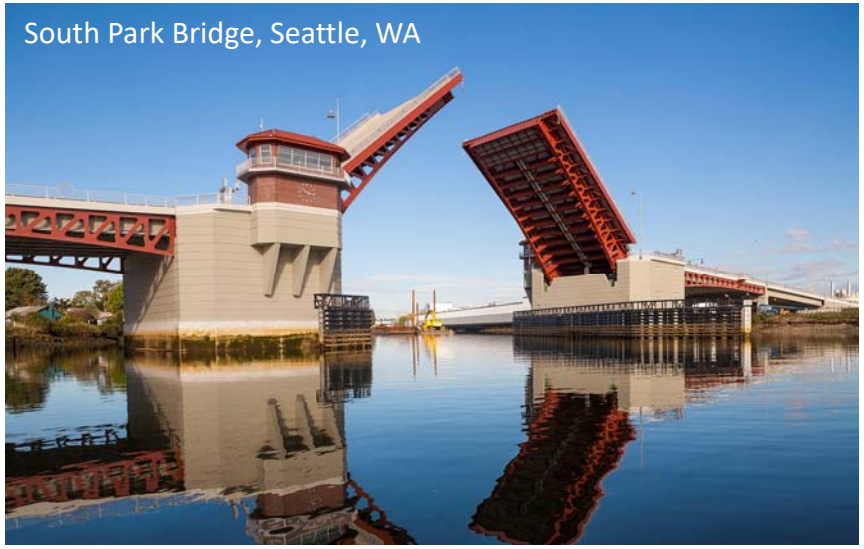
Existing Burnside Bridge



Woodrow Wilson Bridge, Washington, D.C.



South Park Bridge, Seattle, WA



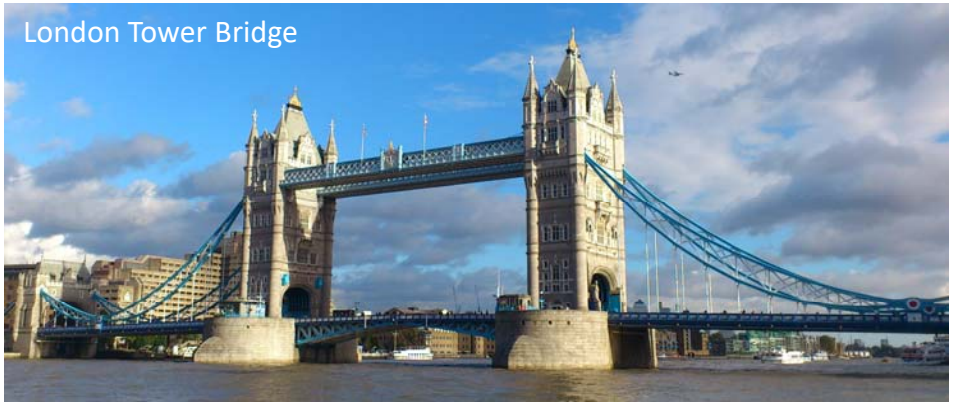
Franklin St Bridge, Chicago

Movable Bridge Type - Bascule

Example Bascule Bridge Types

New Johnson St Bridge, Victoria, Canada

London Tower Bridge



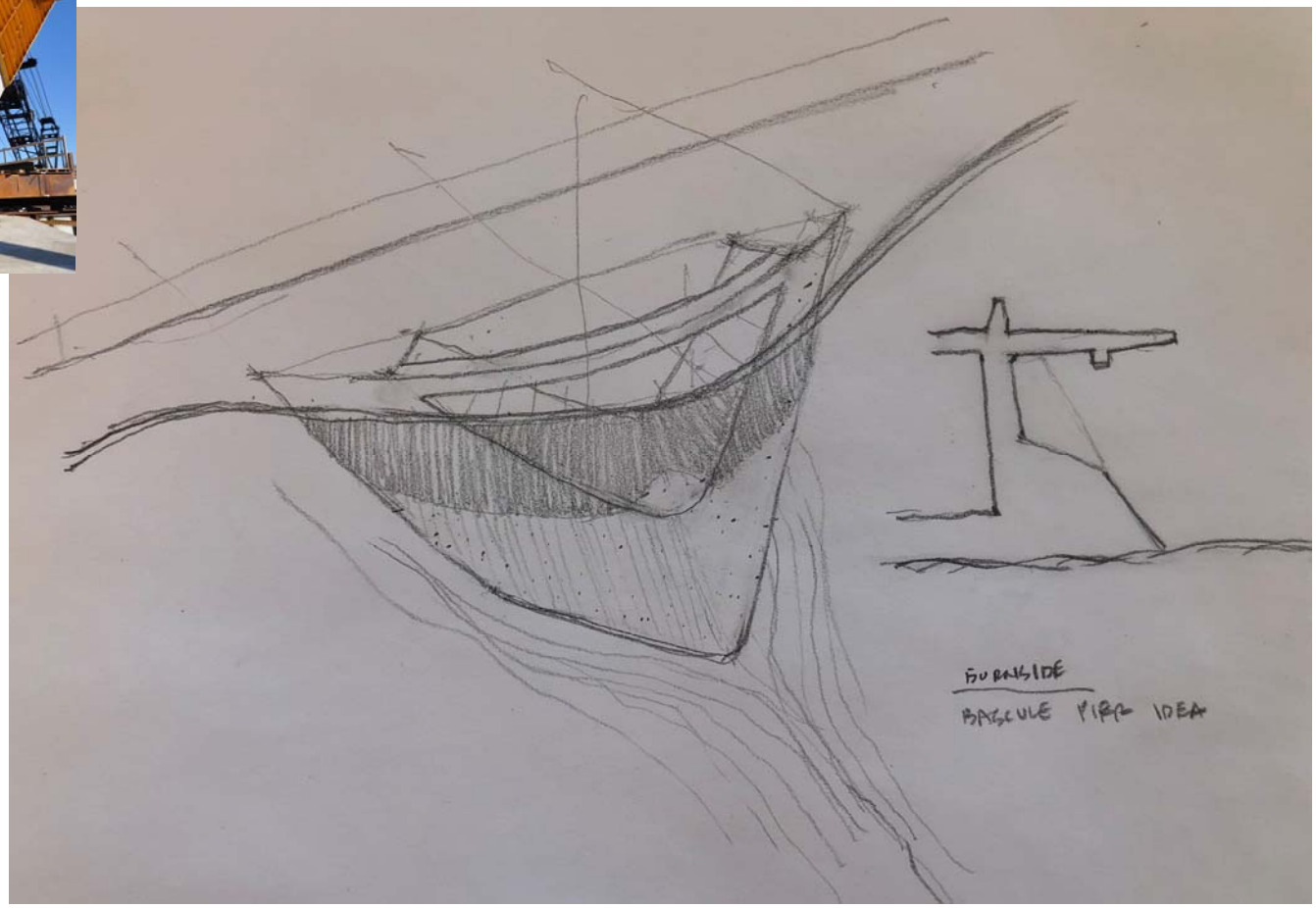
Harbor Bridge, Barcelona

Teregganu Bridge

Lagenbro Bridge Copenhagen, Denmark

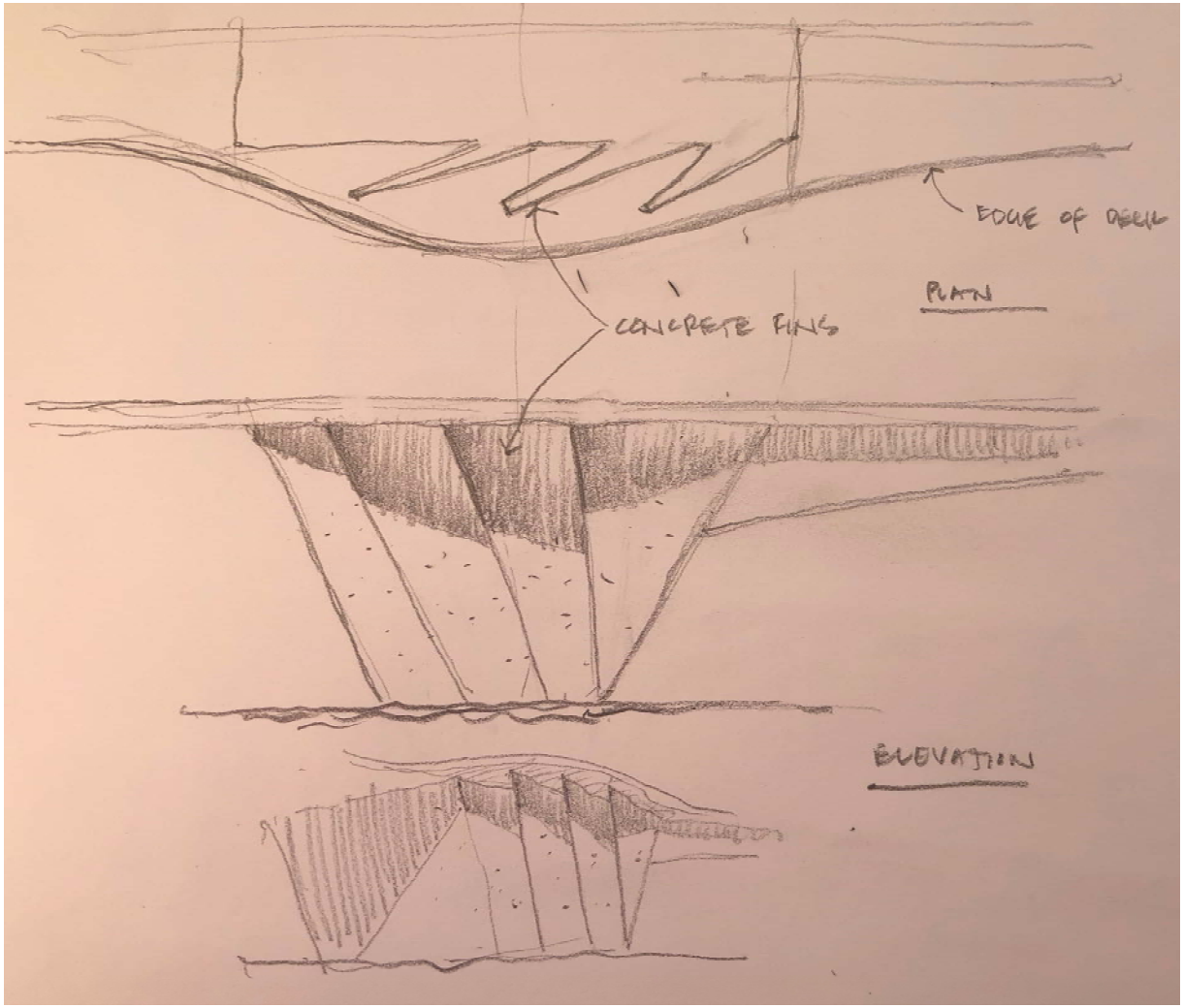
Movable Bridge Type - Bascule

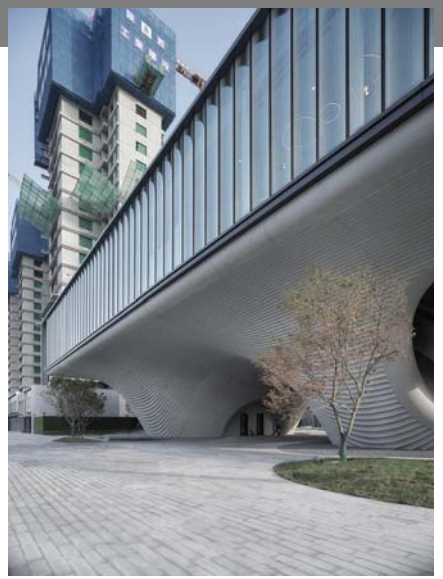
Delta Pier Alternatives – Shape



Movable Bridge Type - Bascule

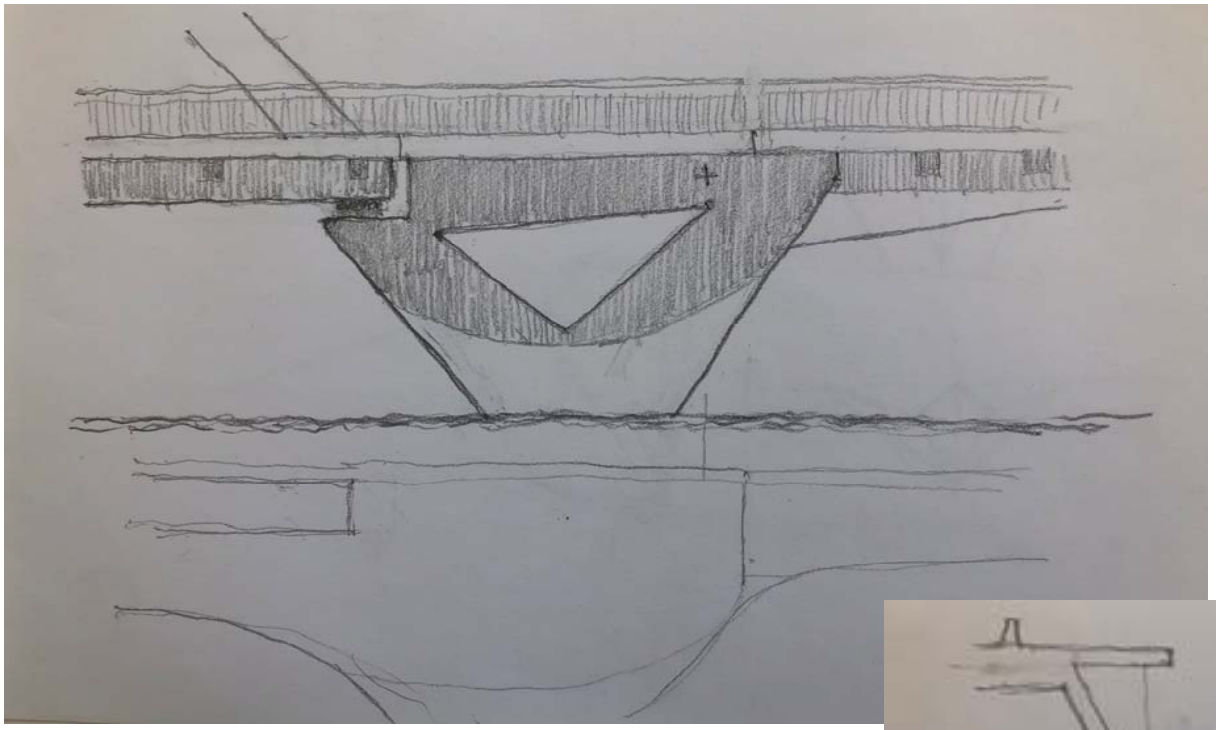
Delta Pier Alternatives – Shape

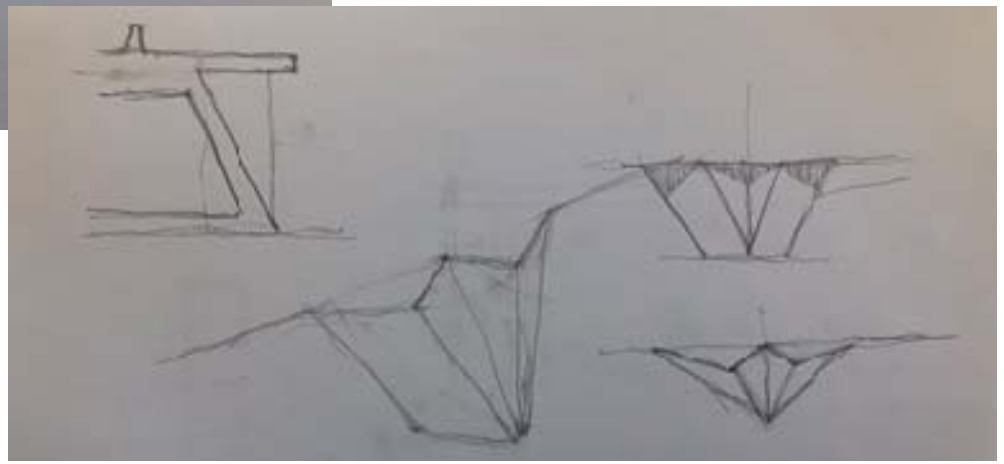




Movable Bridge Type - Bascule

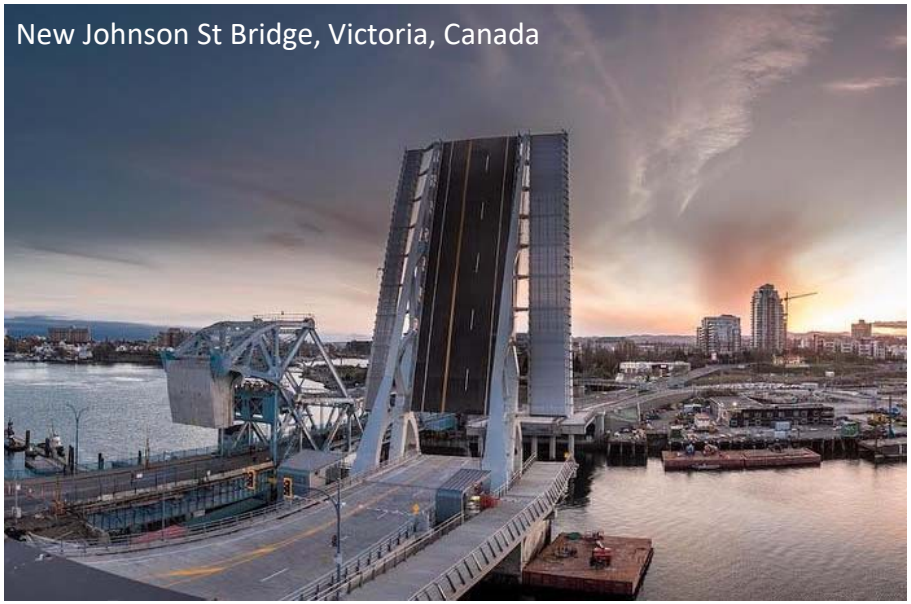
Delta Pier Alternatives – Shape with Tied Arch

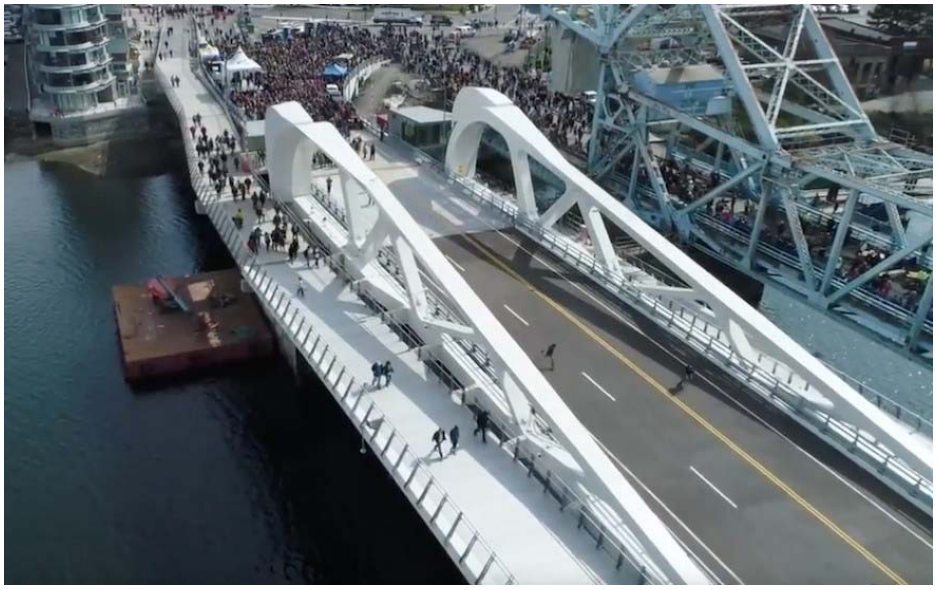




Movable Bridge Type - Bascule

Delta Pier Alternatives – Modern Style

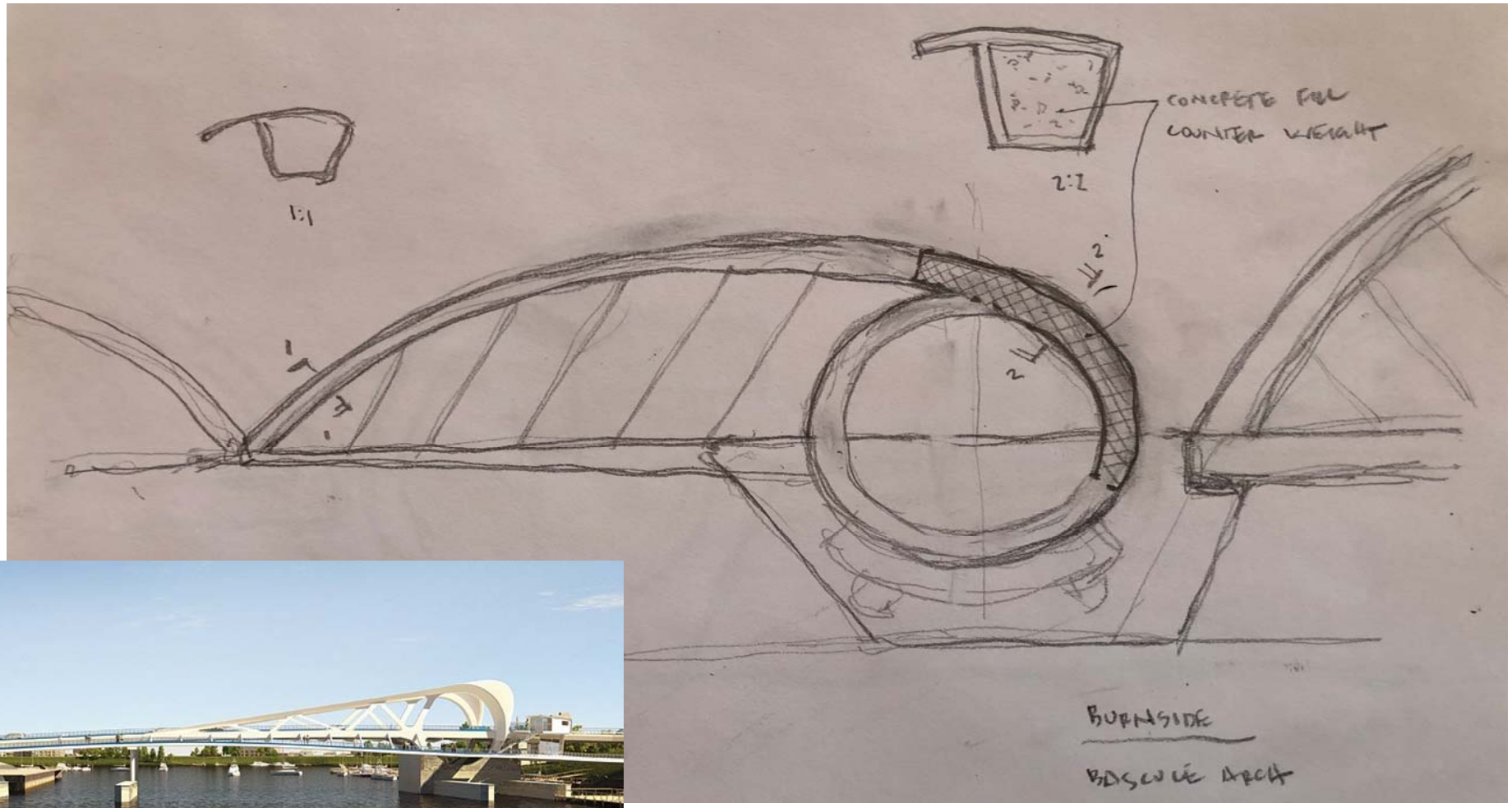

New Johnson St Bridge, Victoria, Canada



Movable Bridge Type - Bascule

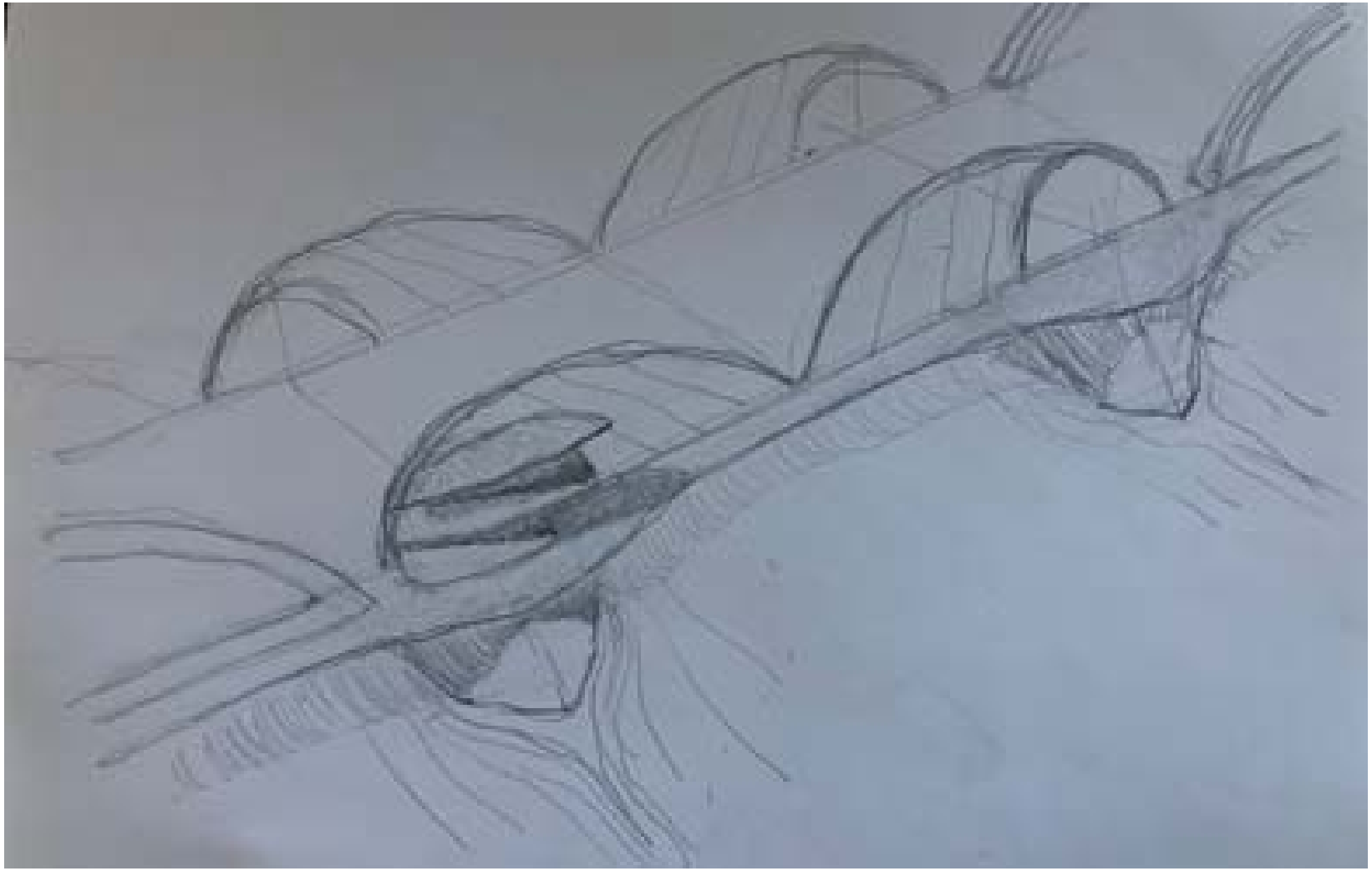
EARTHQUAKE READY BURNSIDE BRIDGE

Delta Pier Alternatives – Modern Style with Tied Arch Approach Spans



Movable Bridge Type - Bascule

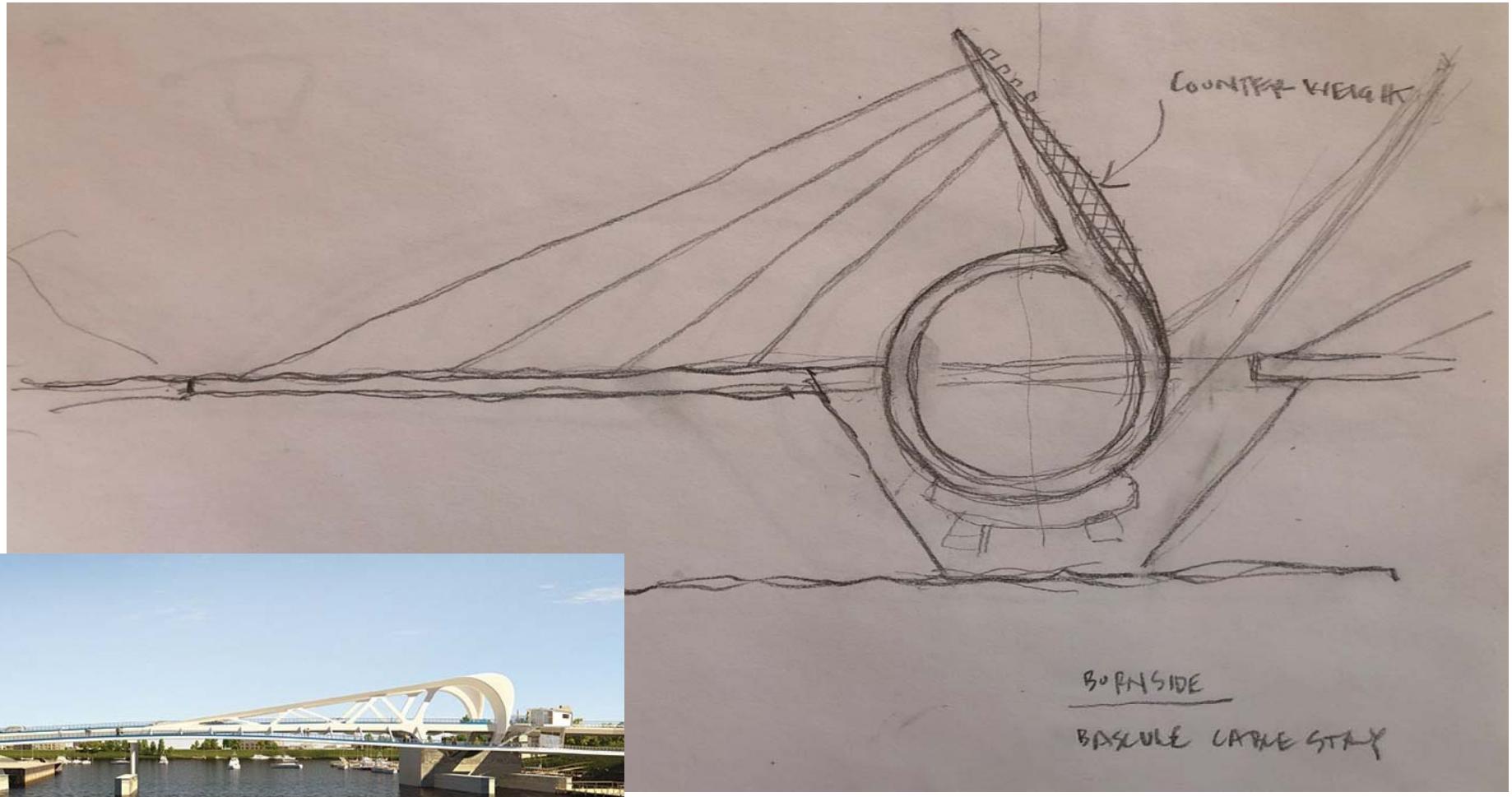
Delta Pier Alternatives – Modern Style with Tied Arch Approach Spans



Movable Bridge Type - Bascule

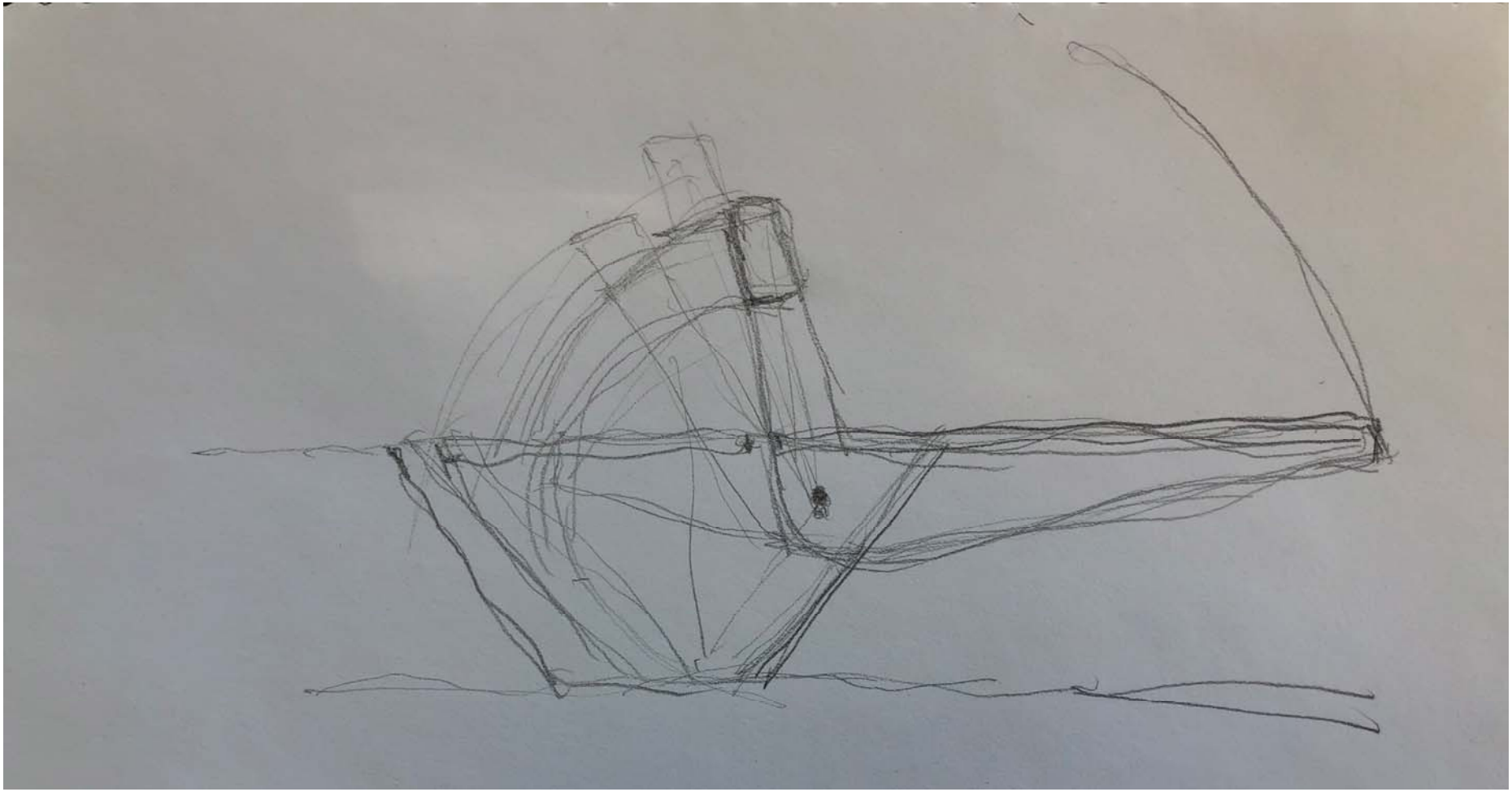
EARTHQUAKE READY BURNSIDE BRIDGE

Delta Pier Alternatives – Modern Style with Cable Stayed Approaches



Movable Bridge Type - Bascule

Delta Pier Alternatives – Modern Style with counterweight above deck



Movable Bridge Design Feature:

Operator's House

Movable Bridge Type – Design Feature

Operator House Examples











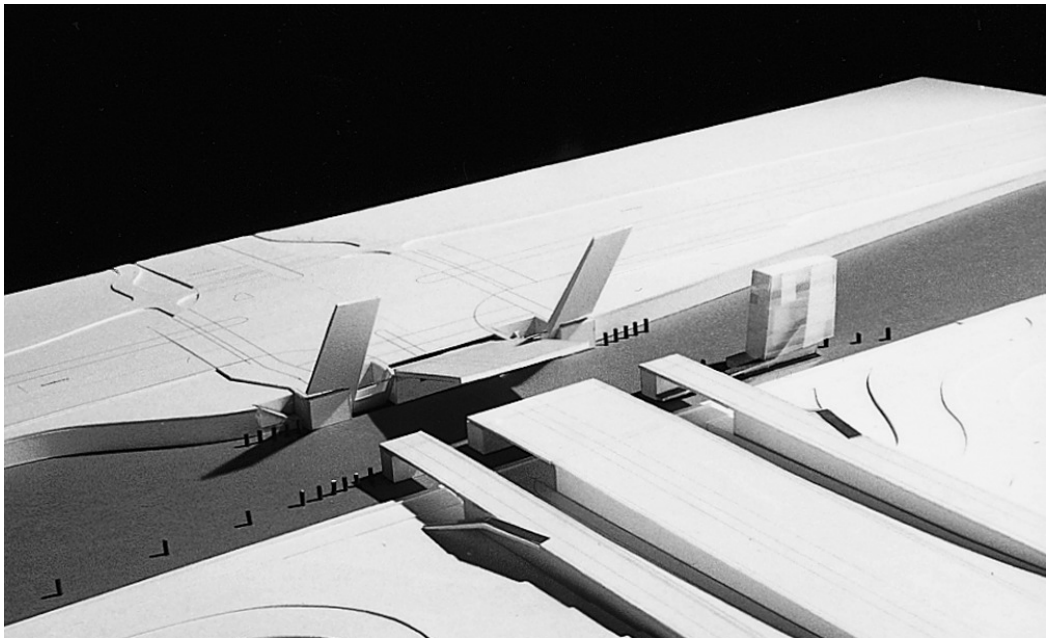
Movable Bridge Type – Design Feature

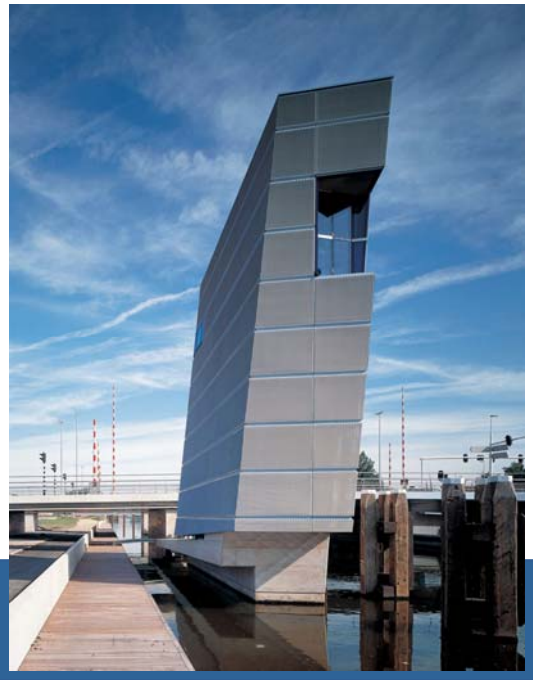
Operator's House Example: Royal Park Bridge

Movable Bridge Type – Design Feature

EARTHQUAKE READY BURNSIDE BRIDGE

Operator's House Example: Purmerend, Netherlands

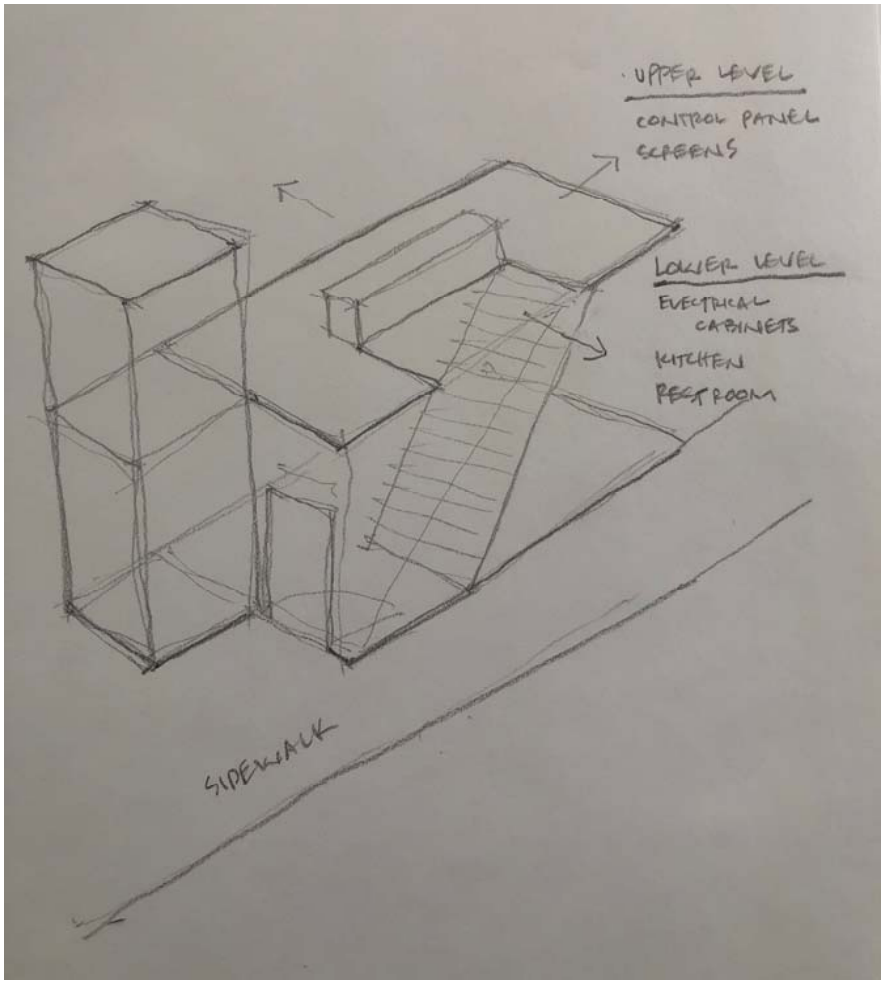




Movable Bridge Type – Design Feature

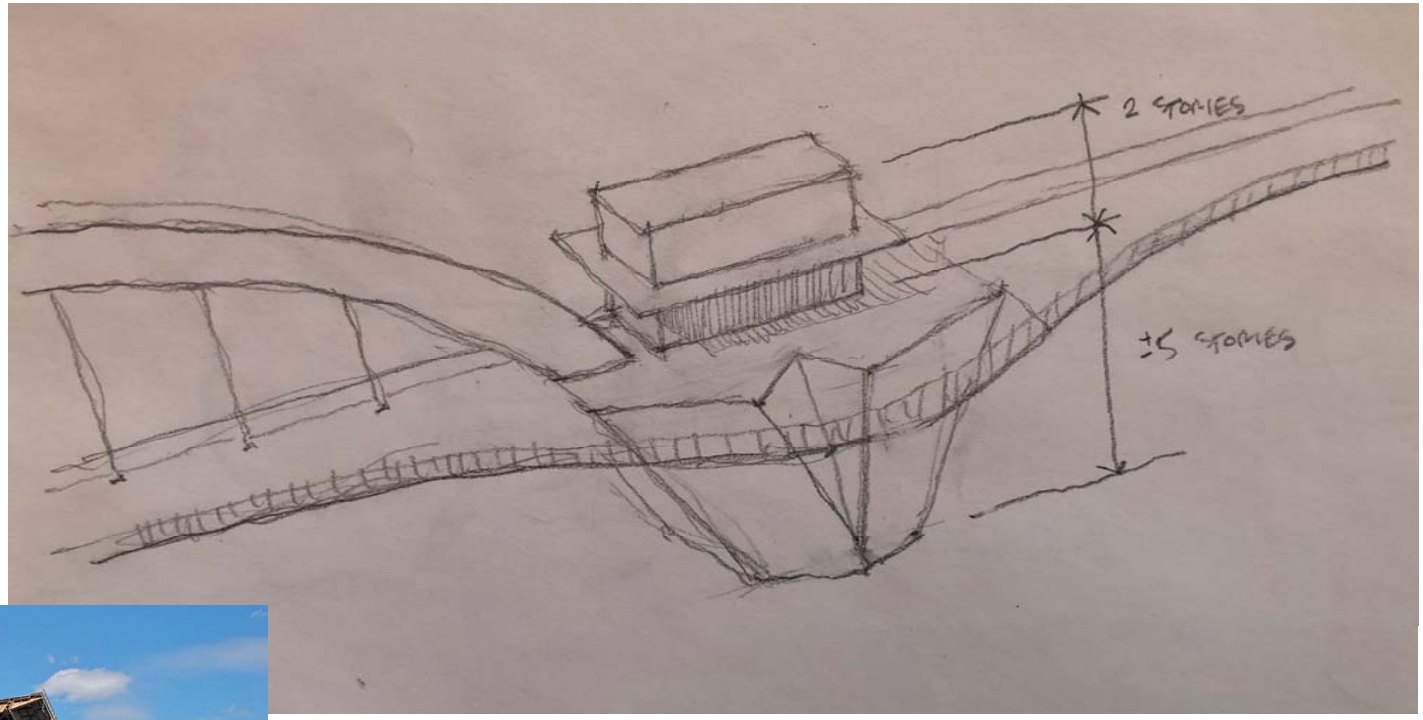
EARTHQUAKE READY BURNSIDE BRIDGE

Operator's House Concept



Movable Bridge Type – Design Feature

Operator's House Concept



Homework

(yay!)

Type Selection Evaluation Criteria

Does this reflect your input?

Type Selection Evaluation Criteria

… to review the draft Type Selection Evaluation Criteria

Instructions.
Please read and provide comments on the draft Urban Design and Visual criteria Part I "Urban Context and Experience" and Part II "Visual and Aesthetics".

Questions to you.

- Do the criteria within Parts I and II reflect the UDAWG's key Urban Design and Aesthetic topics needed to recommend a bridge type? If not, how would you modify the criteria to do so?
- Would you recommend advancing these criteria to the CTF for their use in recommending a bridge type? If not, how would you change the criteria to do so?

Suggestions from you.
Email your responses to Katy Segura (Katy.Segura@hdrinc.com) by **11/29/20**.
We will compile and bring your input to UDAWG Mtg #6 on 12/2/20.

Next Steps

Proposed Meeting Sequence

Proposed Meeting Dates and Durations:

- **Mtg #6 (2 hrs) – Wed 12/2/20 (Comprehensive Bridge Composition)**
  - Key Topics: Range of Feasible Alternatives; Preliminary Evaluation Criteria Review
- **Mtg #7 (2 hrs) – Wed 12/16/20 (Input and Recommendations to CTF)**
  - Key Topics: Input on the Range of Feasible Alternatives and Visual Design Guidelines; Recommended Type Selection Evaluation Criteria

---------- Planned Break until March, 2021 ----------

- Mtg #8 (2 hrs) – Wed 3/10/21
- Mtg #9 (2 hrs) – Wed 6/2/21

GENERAL COMMENTS

Questions

EARTHQUAKE READY BURNSIDE BRIDGE

Thank you!