



Urban Design and Aesthetics Working Group Mtg #4

*Attendees join meeting via
WebEx link in calendar invite*

Department of Community Services
Transportation Division

November 4, 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. Menu of Bridge Types
 - Bridge Type Summary
 - Fixed Bridge Type Comparisons
 - West Approach Study
3. Movable Bridge Features
4. Next Steps and Closing Remarks



Pre-meeting Information Packet

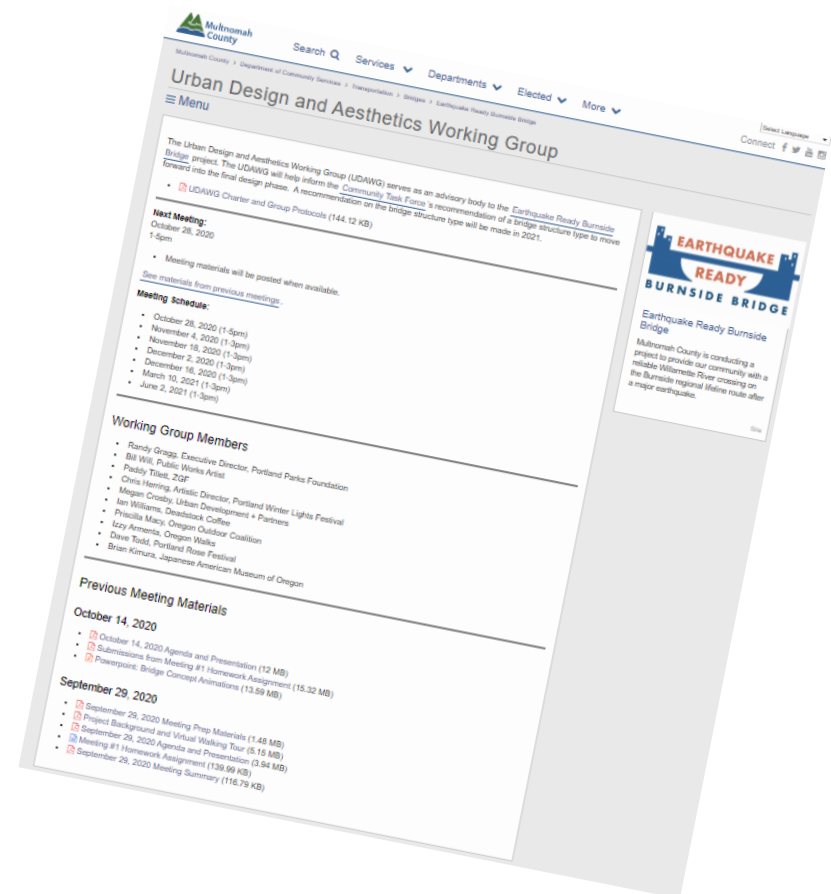
Content

Online UDAWG Library:

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

UDAWG Meeting #4 Materials:

- UDAWG Mtg #3 Notes
- UDAWG Mtg #4 Agenda
- UDAWG Mtg #4 Presentation



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					_____	★1 - - -			
Technical Design Criteria		_____							
Menu of Bridge Types			_____						
Range of Feasible Bridge Types					_____	★2 - - -			
Evaluation Criteria Topic(s)					_____				
Evaluation Measures					_____	_____	★3 - - -		
Input on CTF's Eval Criteria								_____	
Input on CTF's Rec Bridge Type									_____

Today: East / West Approach Bridge Focus

Next Mtg: Movable Bridge Focus + Range of Feasible Types

Visual Design Guidelines
Full Bridge Composite + Evaluation Measures



Key Activities

- Community Task Force (CTF) Meetings
 - Past: Oct 26th (Interests and Values)
 - Future: **Nov 9th** & 23rd (Selection Criteria Topics; Menu of Bridge Types)
- Working / Focus Groups
 - Eastbank Esplanade connection options (ongoing)





GENERAL COMMENTS

Menu of Bridge Types:

Prior Meeting Summary



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

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

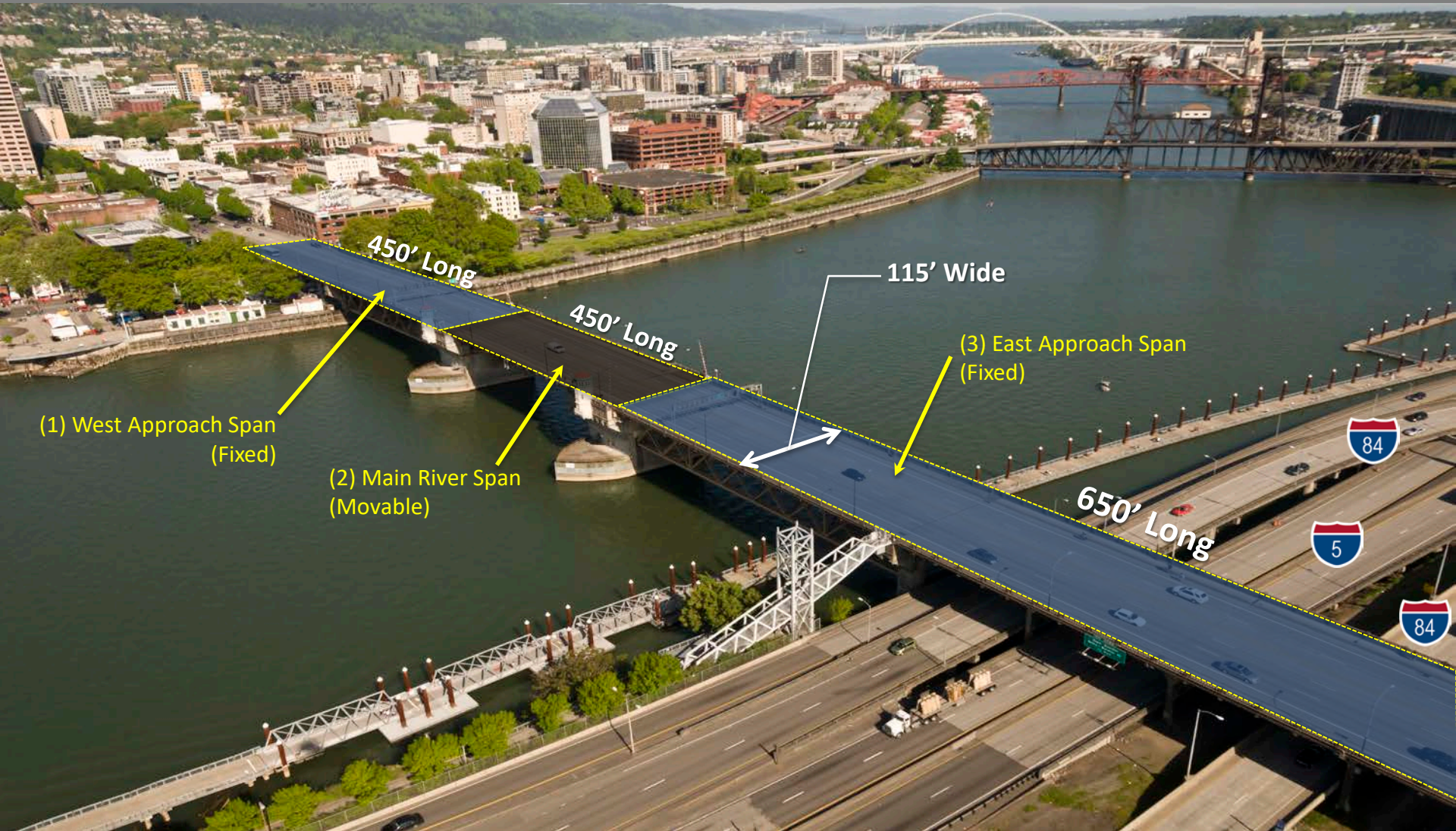


⑨ Ross Island Bridge



Long-span Alternative

“Three bridges in one”



Targeted Redevelopment

Page 15 from CC2035 Plan (Re-Adoption in April 2020)

“The Big Ideas”:

1. Celebrate Portland’s Civic and Cultural Life
2. Foster Creativity, Innovation and Productivity
3. Enhance the Willamette for People and Wildlife
4. Design Streets to be Great Places
5. Develop the Next Generation of Public Space:
The Green Loop
6. Increase the Resilience of the Central City



= Redeveloped / under development (near bridge)
 = to be developed (next to bridge)
 = Targeted redeveloped (away from bridge)



Urban Design Concept Diagram

Pages 93 and 99 from CC2035 Plan (Re-Adoption in April 2020)

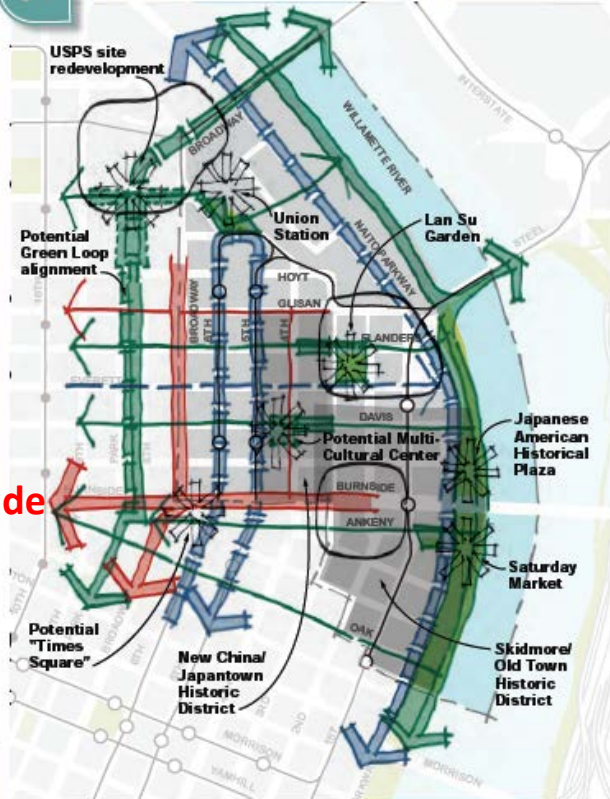
KEY ELEMENTS

- Highlight the intersection at NW Broadway and West Burnside
- Strengthen east-west connections between the North Park Blocks and the river
- Explore development of a multi-cultural history center
- Create a NW 4th Avenue main street

DIAGRAM LEGEND:

- Retail/commercial character
- Boulevard character
- Flexible character
- Key intersection, gateway or bridgehead location
- Potential new open space
- Attraction

OT URBAN DESIGN CONCEPT DIAGRAM



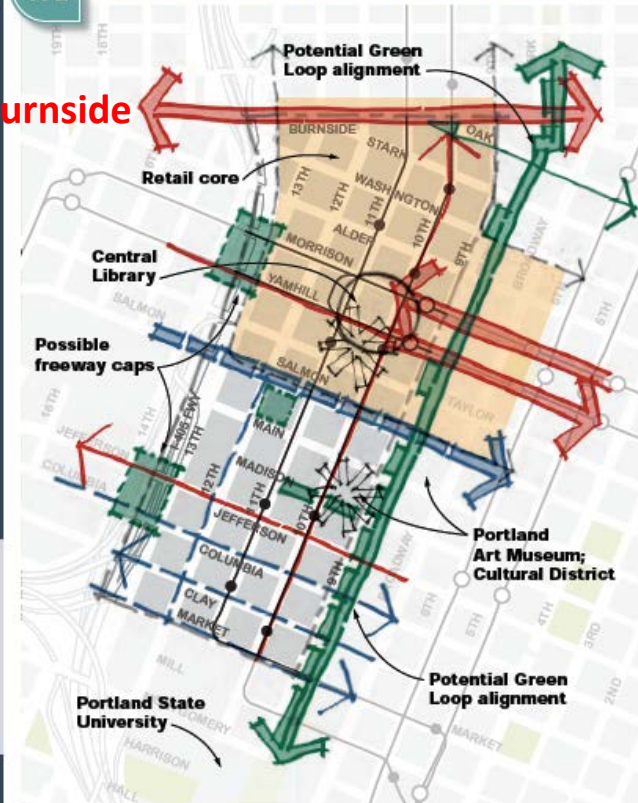
KEY ELEMENTS

- Strengthen Jefferson main street as a neighborhood-serving retail commercial corridor
- Integrate new development with historic fabric
- Explore freeway capping opportunities to better connect with Goose Hollow
- Highlight the MAX/Streetcar interchange as a civic place
- Re-envision SW 12th Avenue as a boulevard

DIAGRAM LEGEND:

- Retail/commercial character
- Boulevard character
- Flexible character
- Key intersection, gateway or bridgehead location
- Potential new open space
- Attraction

WE URBAN DESIGN CONCEPT DIAGRAM



Retail/commercial character



Menu of Bridge Options (Summary)

Movable Spans (Technically Feasible)



Lift

- Individual or Truss Tower
- Sheave direction
- Single or split towers



Bascule

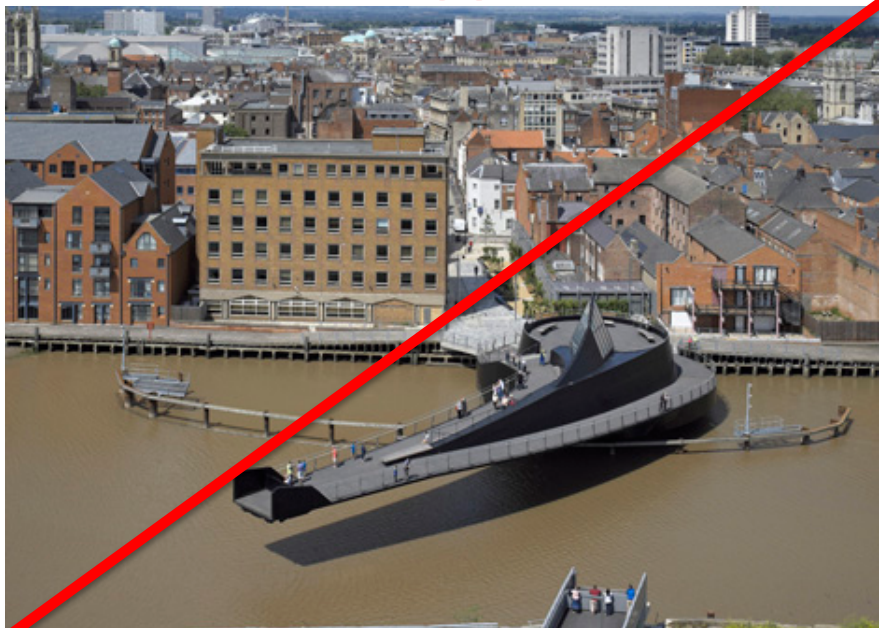
- Delta pier
- Twin leaf
- Rustic or modern style



Menu of Bridge Options (Summary)

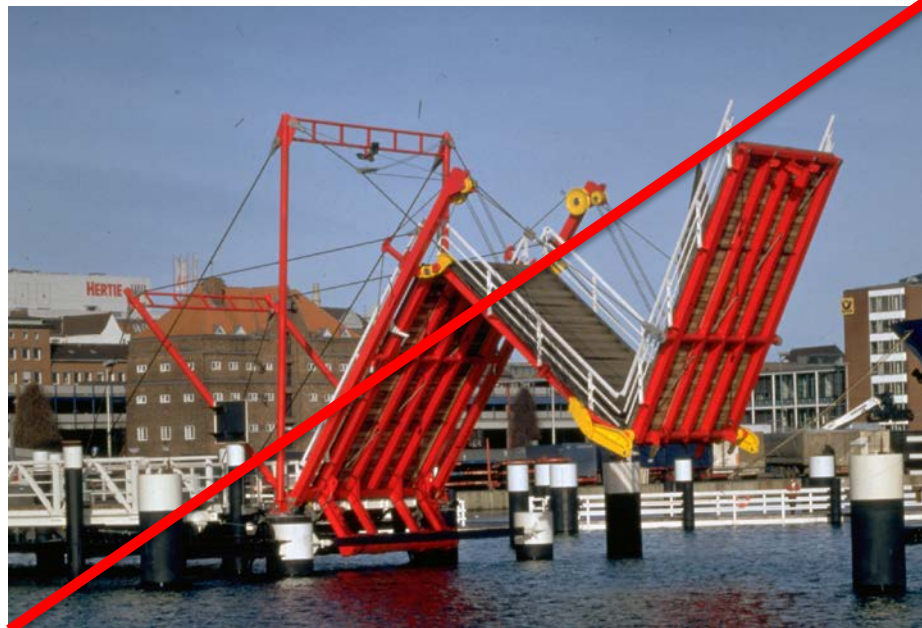
Movable Spans (Discarded)

X



Swing

X



Unique Movements



Menu of Bridge Options (Summary)

Approach Spans (Technically Feasible)



Tied Arch

- Conventional
- Cable stiffened
- With or without rib bracing



Truss

- Conventional towers
- Rustic, modern, or other styles



Menu of Bridge Options (Summary)

Approach Spans (Technically Feasible)



Cable Stayed

- Two towers / cable stay planes



Extradosed

- Two towers / cable stay planes



Menu of Bridge Options (Summary)

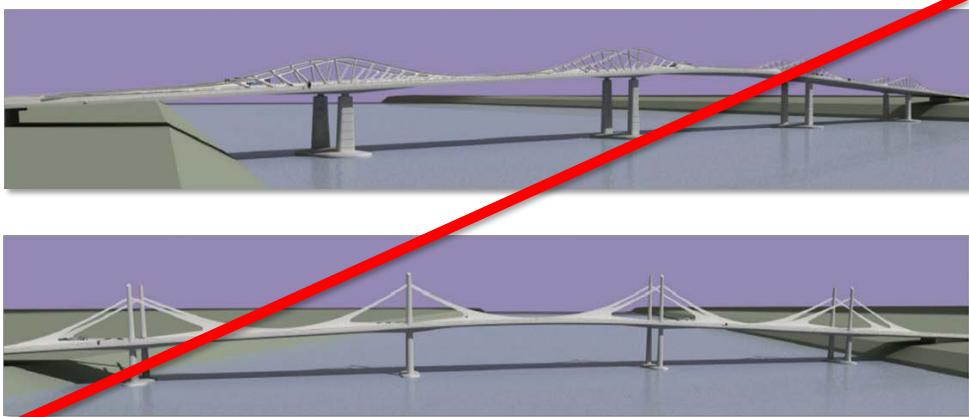
Movable Spans (Discarded)

X



Suspension

X



“Other”



Menu of Bridge Types

Fixed Approach Bridge Types



Main Street Bridge, Florida



Triborough (Harlem River) Bridge, New York



Tower Bridge, CA



Broadway Bridge, Oregon



Hawthorne Bridge, Oregon

Assessment: Truss compared to Tied Arch



Menu of Bridge Types

Fixed Approach Bridge Type: Truss

Technical trade-offs / comparisons:

- Truss requires cross-framing (i.e., roof) while a tied arch may not
- Truss vertical and diagonal members are larger than the tied arch
- Truss is considered more historic, although can look modern with care
- Truss is consistent with all existing downtown bridges except Fremont and Tilikum
- Trusses require a significant long-term maintenance program (repairs and painting)

Chelsea St Bridge, Massachusetts



Menu of Bridge Types

Fixed Approach Bridge Type: Truss

Main Street Bridge, Jacksonville, Florida

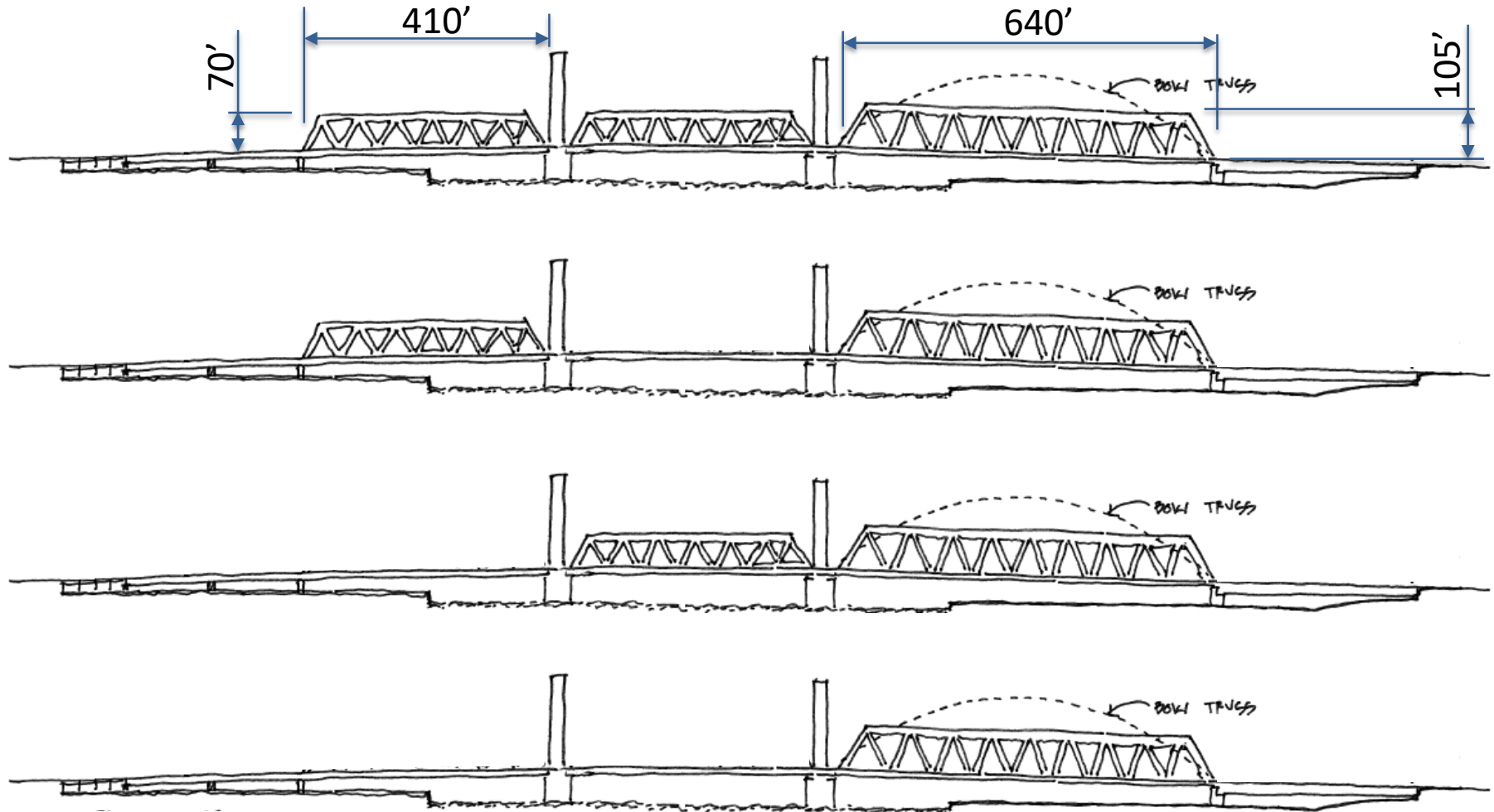


Triboro Bridge, New York, New York



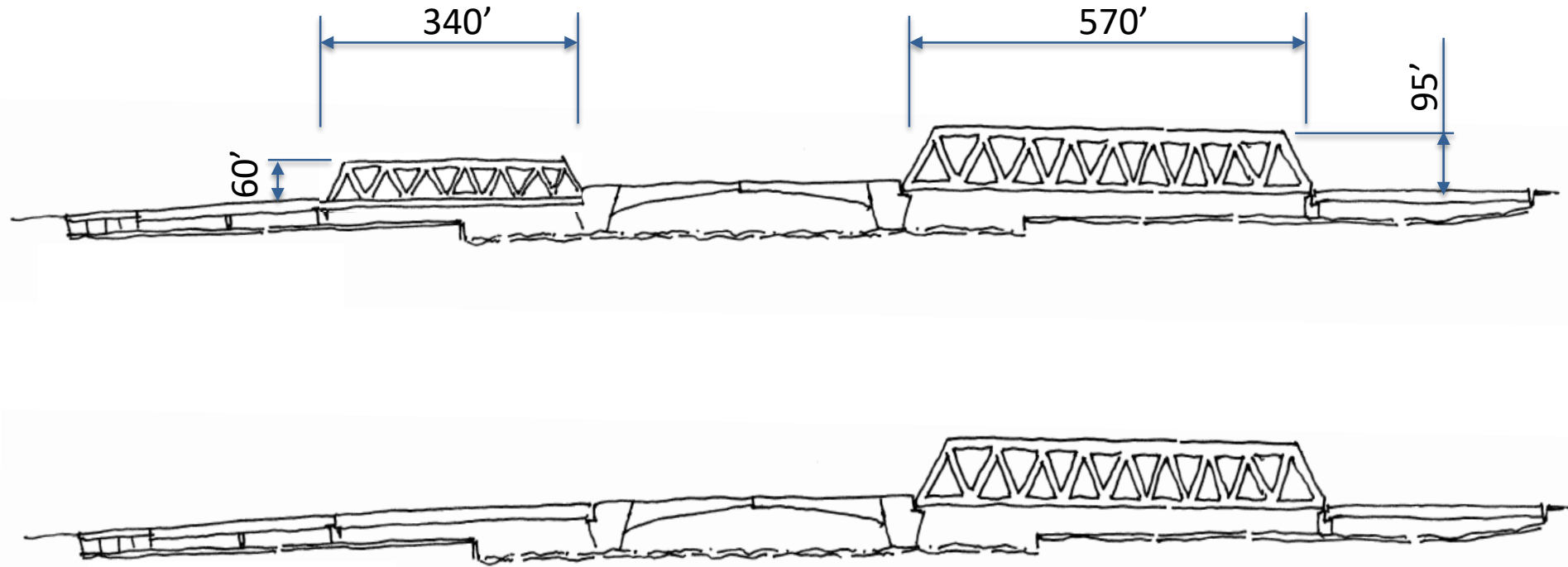
Menu of Bridge Types

Lift + Truss



Menu of Bridge Types

Bascule + Truss



Menu of Bridge Types

Truss compared to Tied Arch



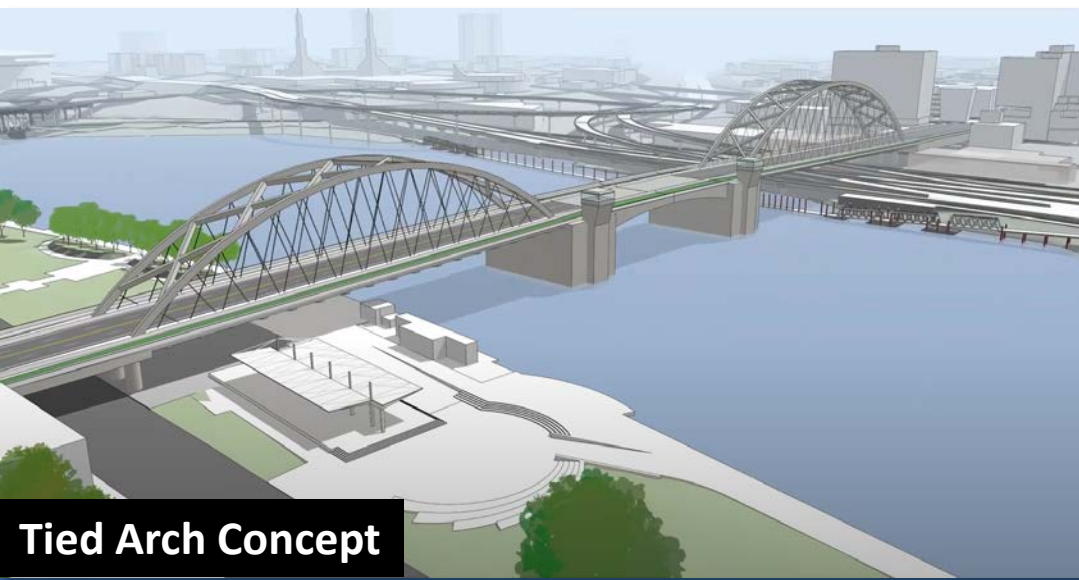
Menu of Bridge Types

Truss Concept compared to Tied Arch Concept



UDAWG Key Aspirations & Opportunities:

- Bridge represents forward-thinking: sets tone for next 100 years
 - Timeless in design yet represents its era
 - Appropriate scale for the location
 - Views in all directions
 - A celebration; a beacon
 - All modes considered, especially pedestrians & cyclists
 - Memorable, distinctive lighting
-
- Question of symmetry, asymmetry, and balance
 - Unique bridge that opens - exposed mechanisms or not



Fixed Approach Bridge Type: Extradosed

Assessment: Extradosed compared to Cable Stayed



Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed

Key Technical Trade-offs / Comparisons:

- Shorter towers = bulkier superstructure than cable stayed type
 - Larger in-water piers and foundations
 - Requires haunched superstructure for sufficient clearances
- West Approach:
 - Column placed in Waterfront Park
 - East Approach:
 - More expensive than cable stayed option

St Crix Bridge, Minnesota



Jiayue Bridge, China



Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed

Pearl Harbor Memorial Bridge, Connecticut



New Europe Bridge, Bulgaria



Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed

Himi Bridge, Japan

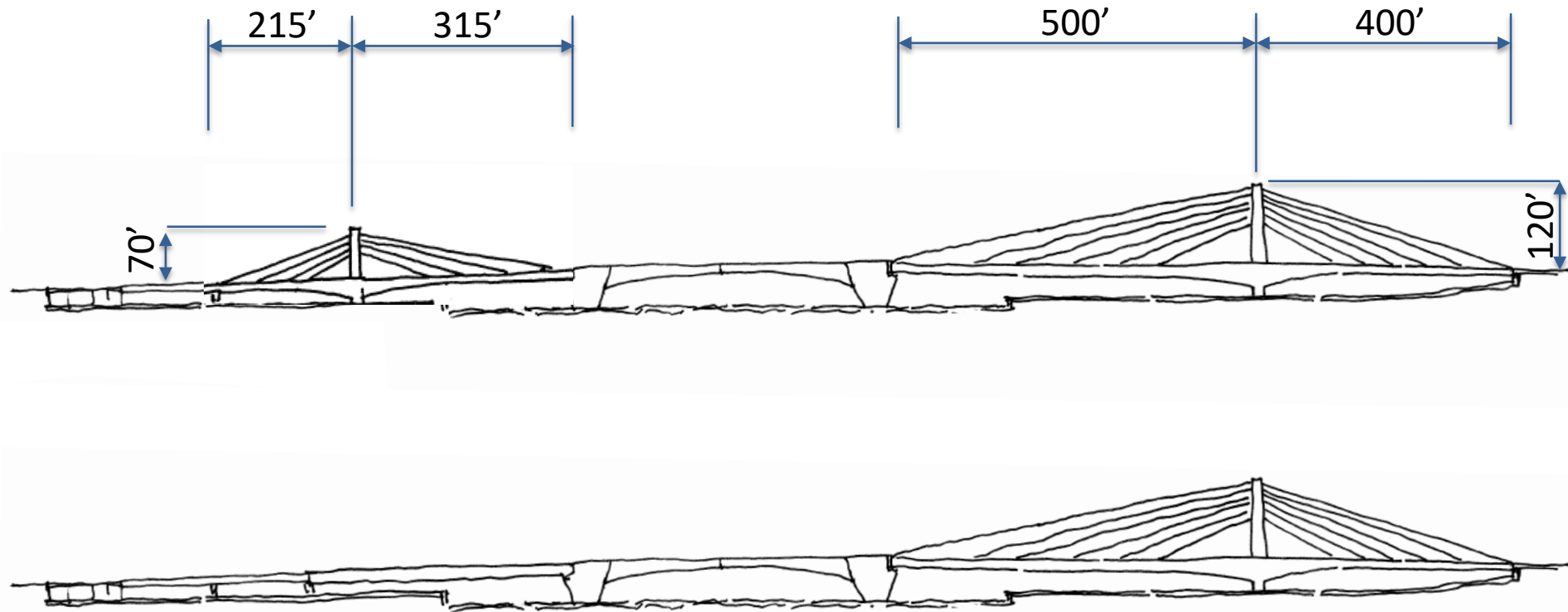


Nagoya Bridge, Japan



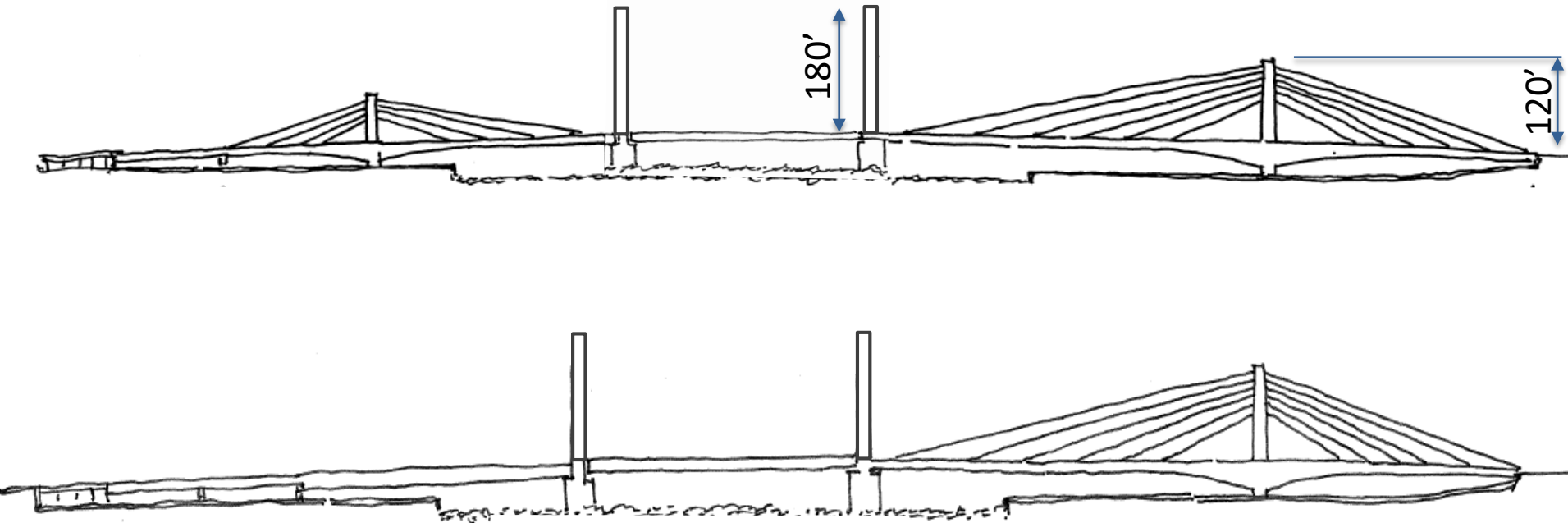
Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed



Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed



Menu of Bridge Types

Fixed Approach Bridge Type: Extradosed vs Cable Stayed

Generic Extradosed Type:

Depth = ~9'

100' (E)
50' (W)

Depth = ~12'

Generic Cable Stayed Type:

Depth = ~6'

200' (East)
100' (West)

Depth = ~6'

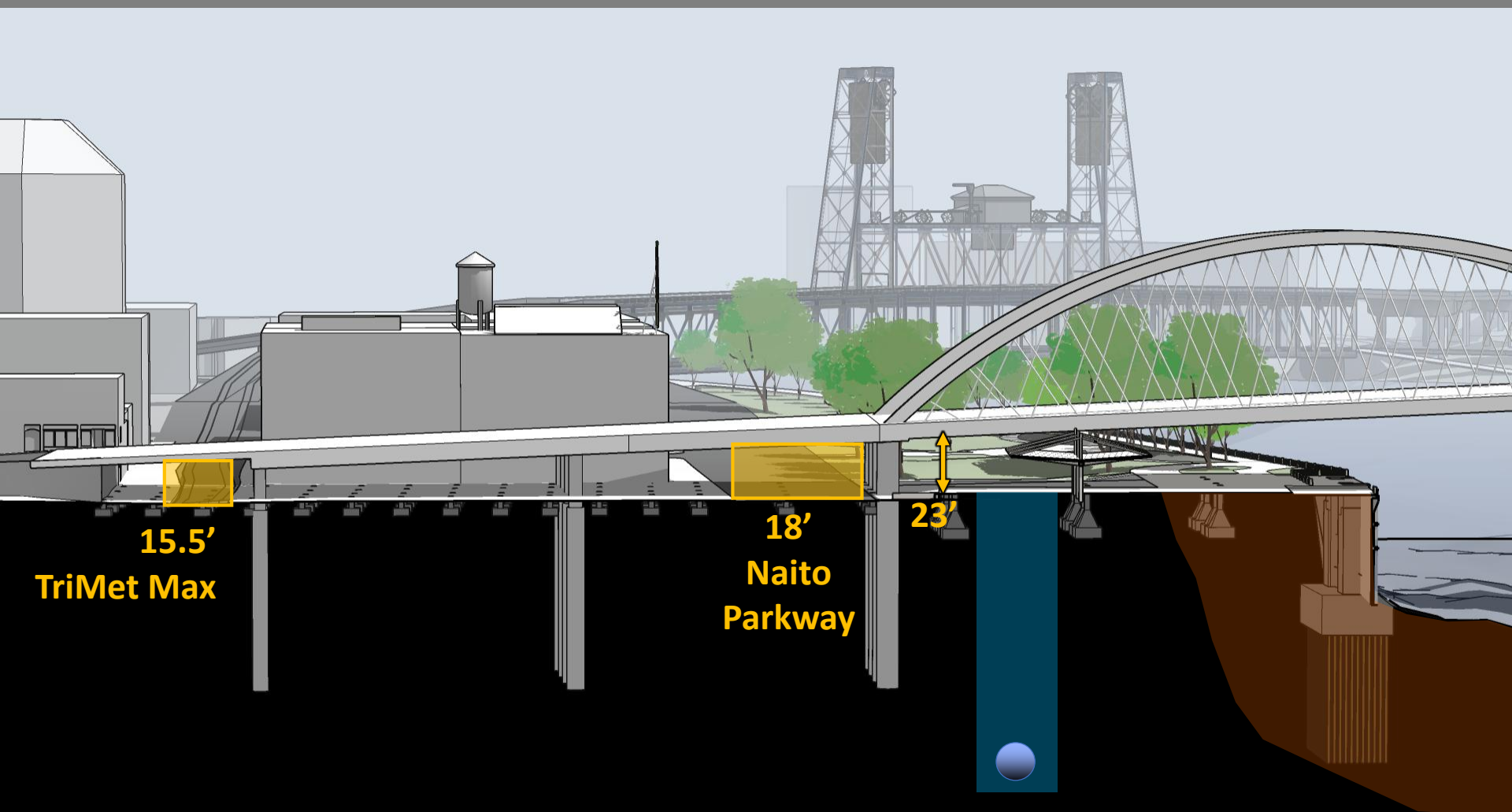


West Approach Focus:

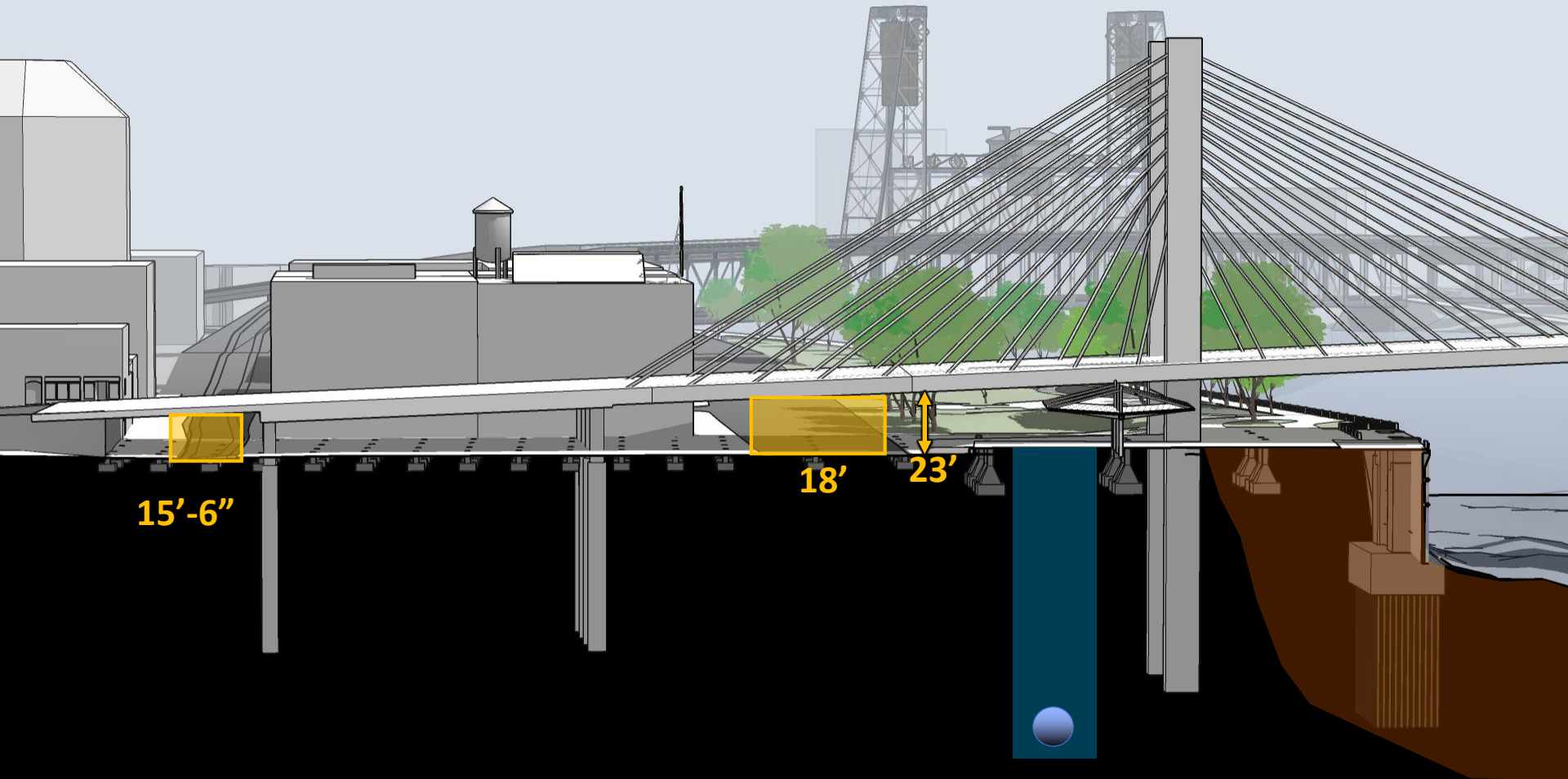
Bridge Type Assessment



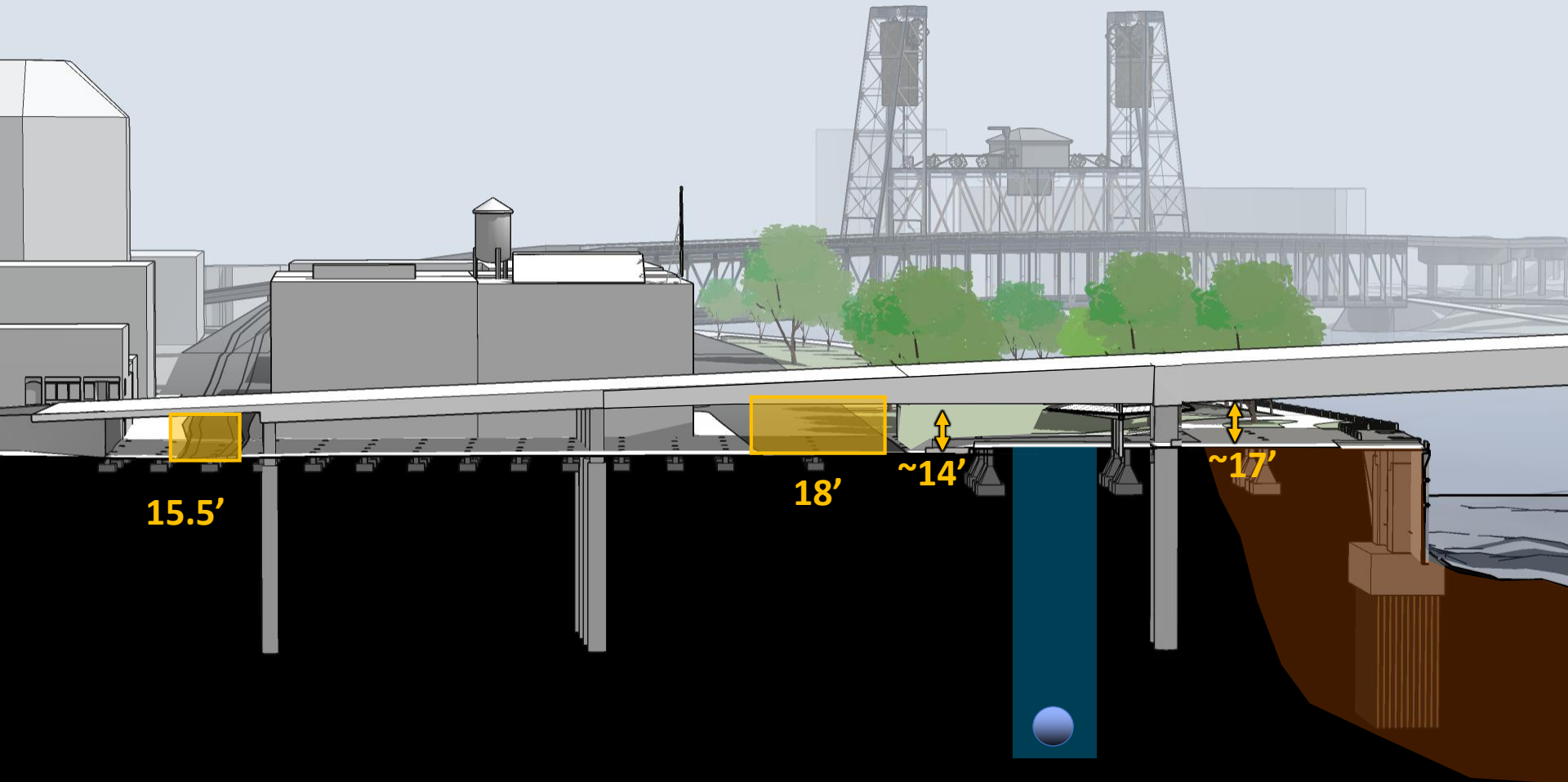
West Approach: Tied Arch Concept



West Approach: Cable Stayed Concept

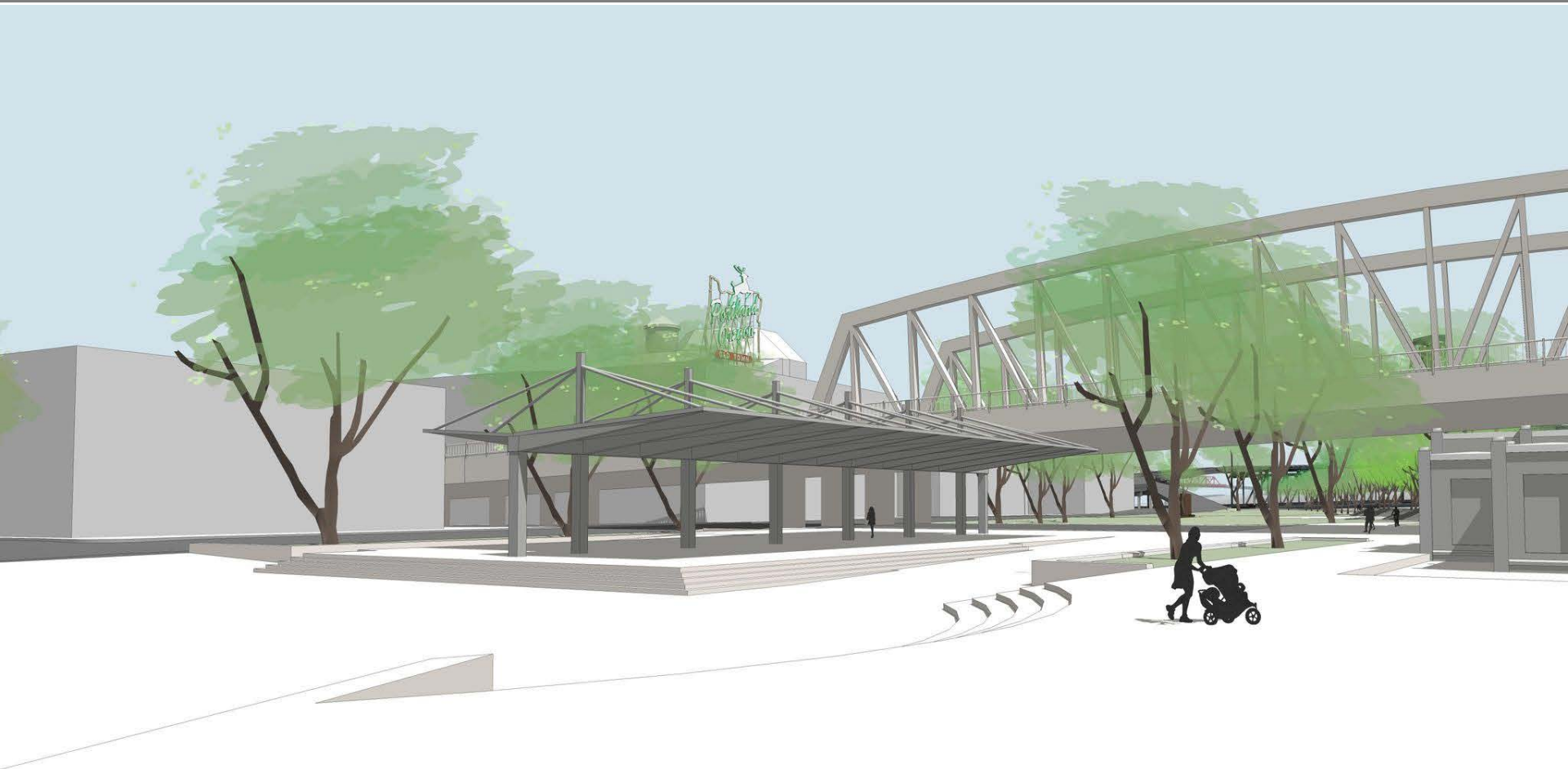


West Approach: Steel Girder Options



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

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

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)

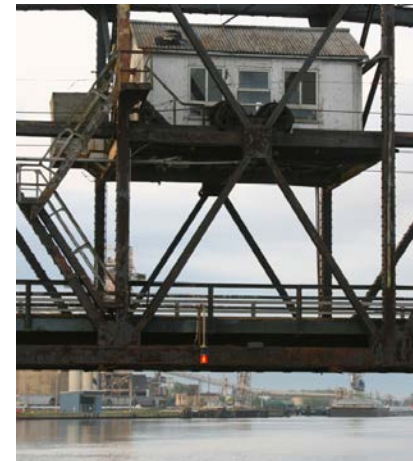


Movable Bridge Features: Operator's House and Lift Towers



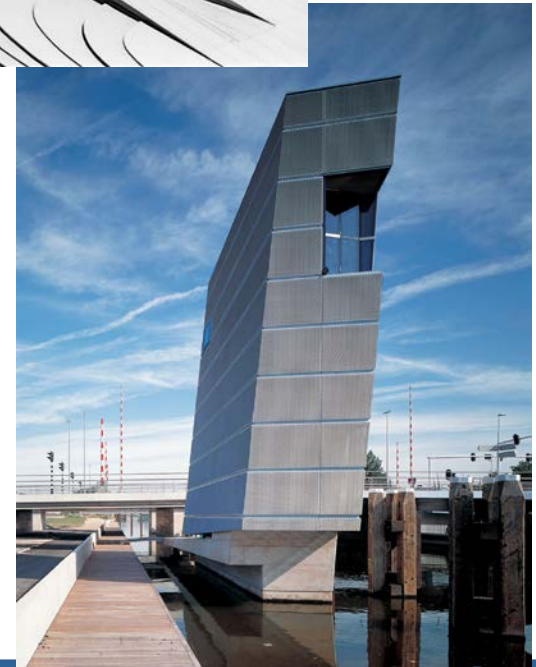
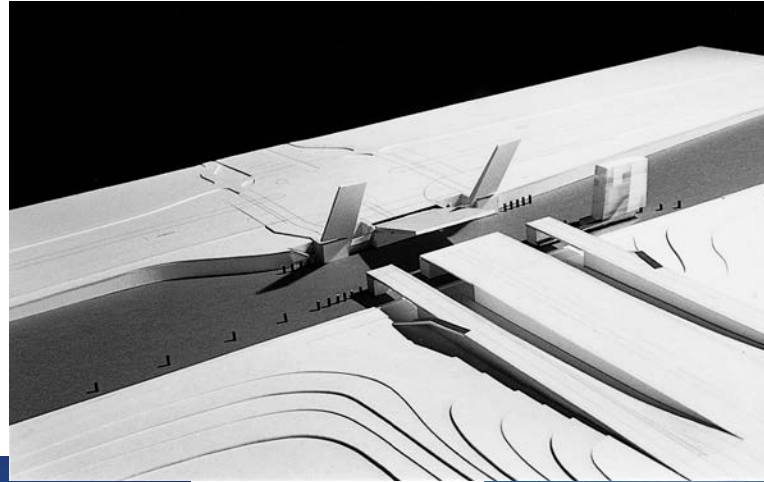
Operator Houses

Examples



Vertical Lift Tower Alternates

Bridgemaister's House - Purmerend, Netherlands



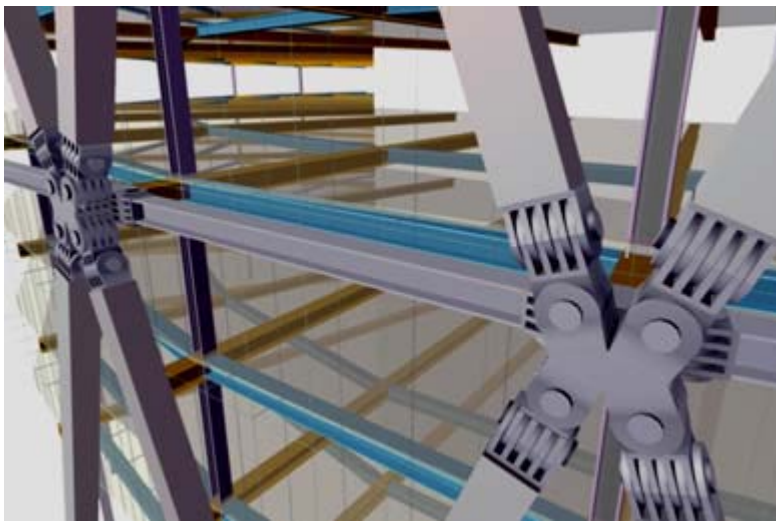
Vertical Lift Tower Alternates

Type Study Examples – University of Pennsylvania



Vertical Lift Tower Alternates

Diagrid Exoskeleton



Vertical Lift Tower Alternates

Vertical Towers



Proposed Meeting Sequence

Proposed Meeting Dates and Durations:

- **Mtg #5 (2 hrs) – Wed 11/18/20 (Movable Bridge)**
 - o Key Topics: Exploring the Movable Bridge Design elements
- **Mtg #6 (2 hrs) – Wed 12/2/20 (Comprehensive Bridge Composition)**
 - o Key Topics: Range of Feasible Alternatives; Preliminary Evaluation Criteria
- **Mtg #7 (2 hrs) – Wed 12/16/20**
 - o Key Topics: Input on the Range of Feasible Alternatives and Visual Design Guidelines; Recommended Type Selection Evaluation Criteria
- **Mtg #8 (2 hrs) – Wed 3/10/21**
- **Mtg #9 (2 hrs) – Wed 6/2/21**





GENERAL COMMENTS

Thank you!

