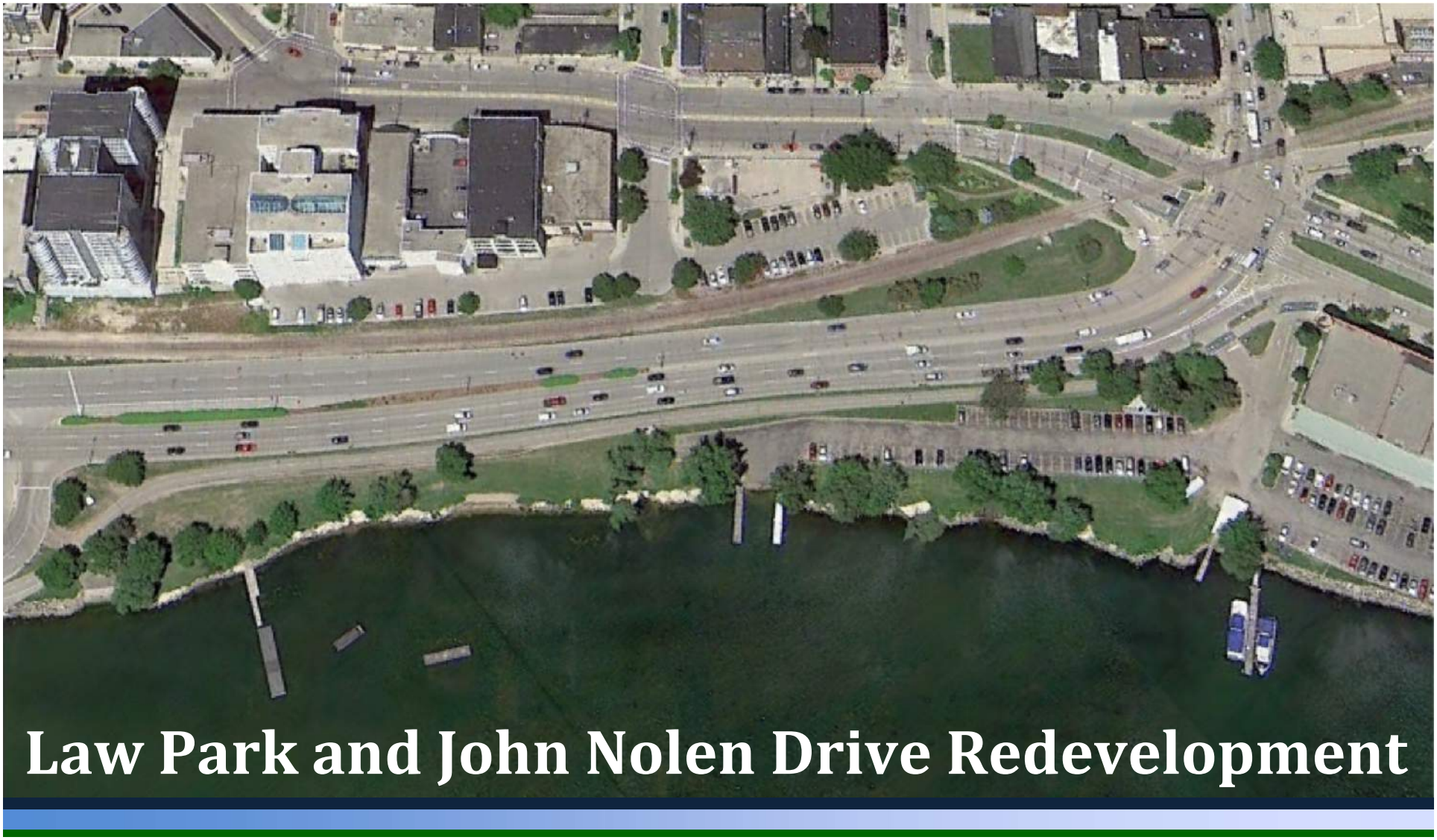

Law Park and John Nolen Drive Redevelopment

Isthmus Engineering and Consulting
Downtown Madison, Inc.

May 1, 2015

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Agenda

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- Project Review
- Technical Attributes
  - Coastal
  - Transportation
  - Structural
  - Foundation
  - Hydrologic
- Schedule
- Project Cost
- Concluding Remarks

Project Area

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Project Goals

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Accessibility

Traffic Flow

Green Space

Reconnection

Alternatives

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Option 1 : At-Grade

Alternatives

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Option 2 : Tunnel

Coastal Design

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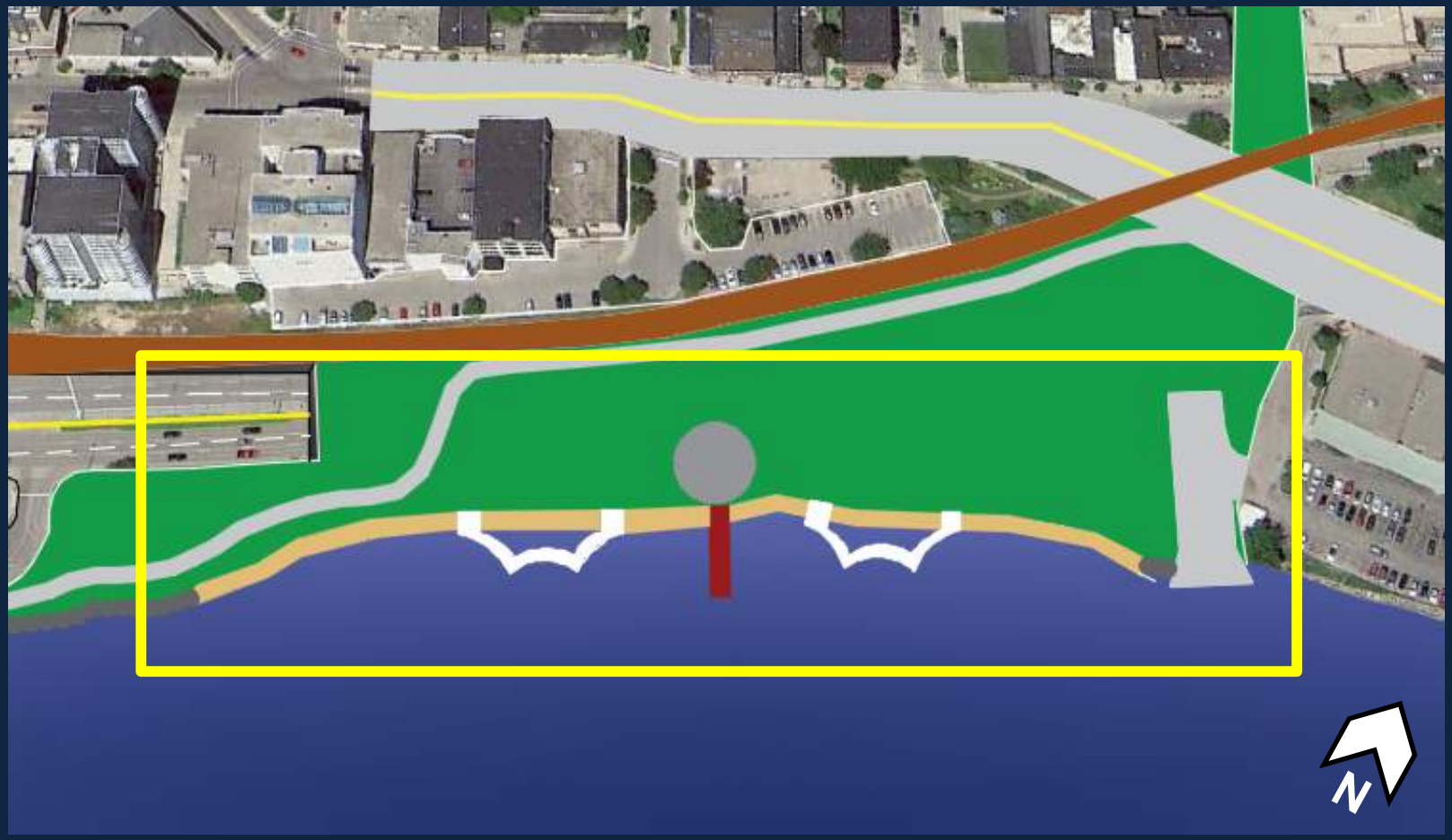

Coastal Design

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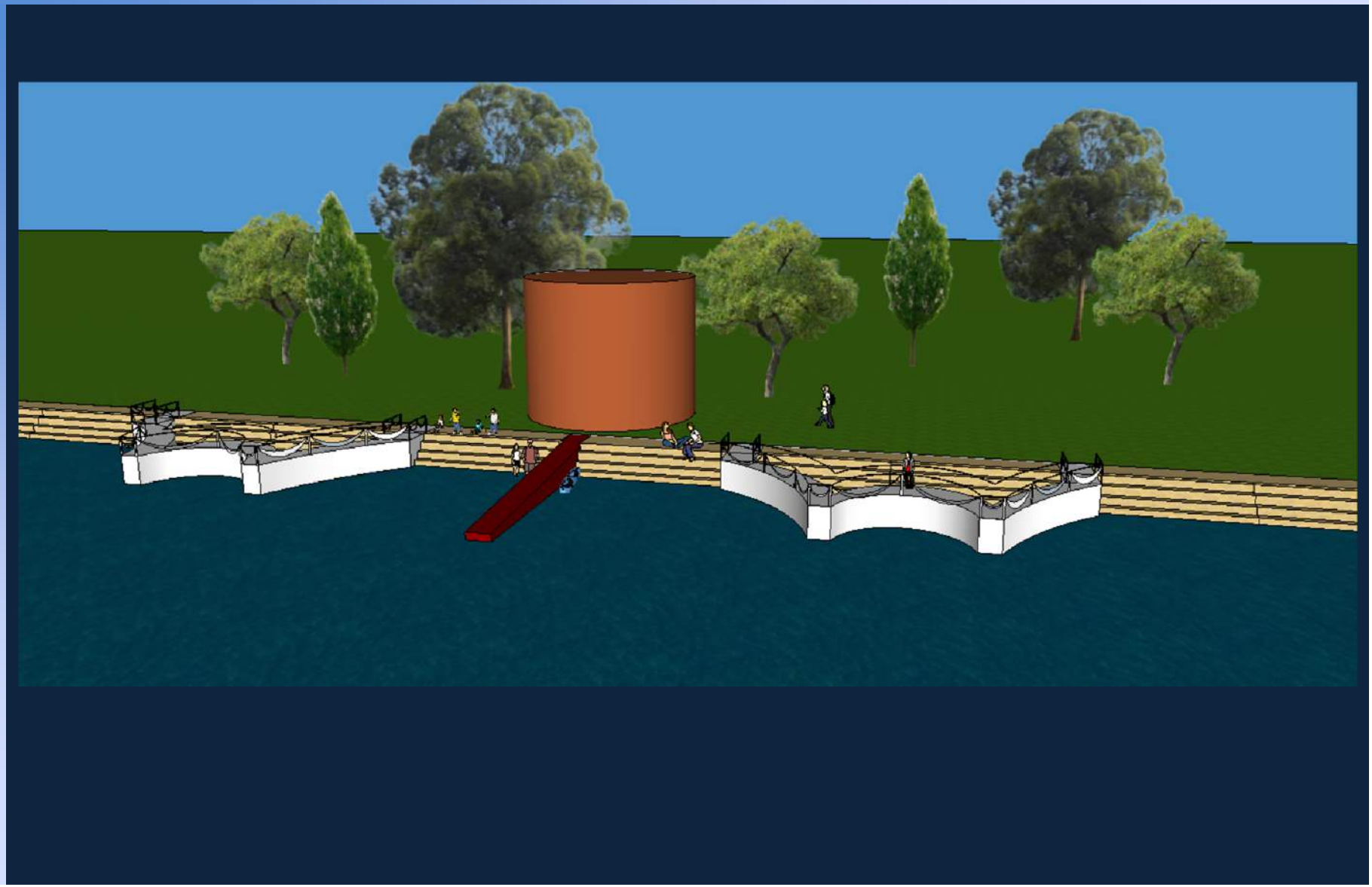

Coastal Design

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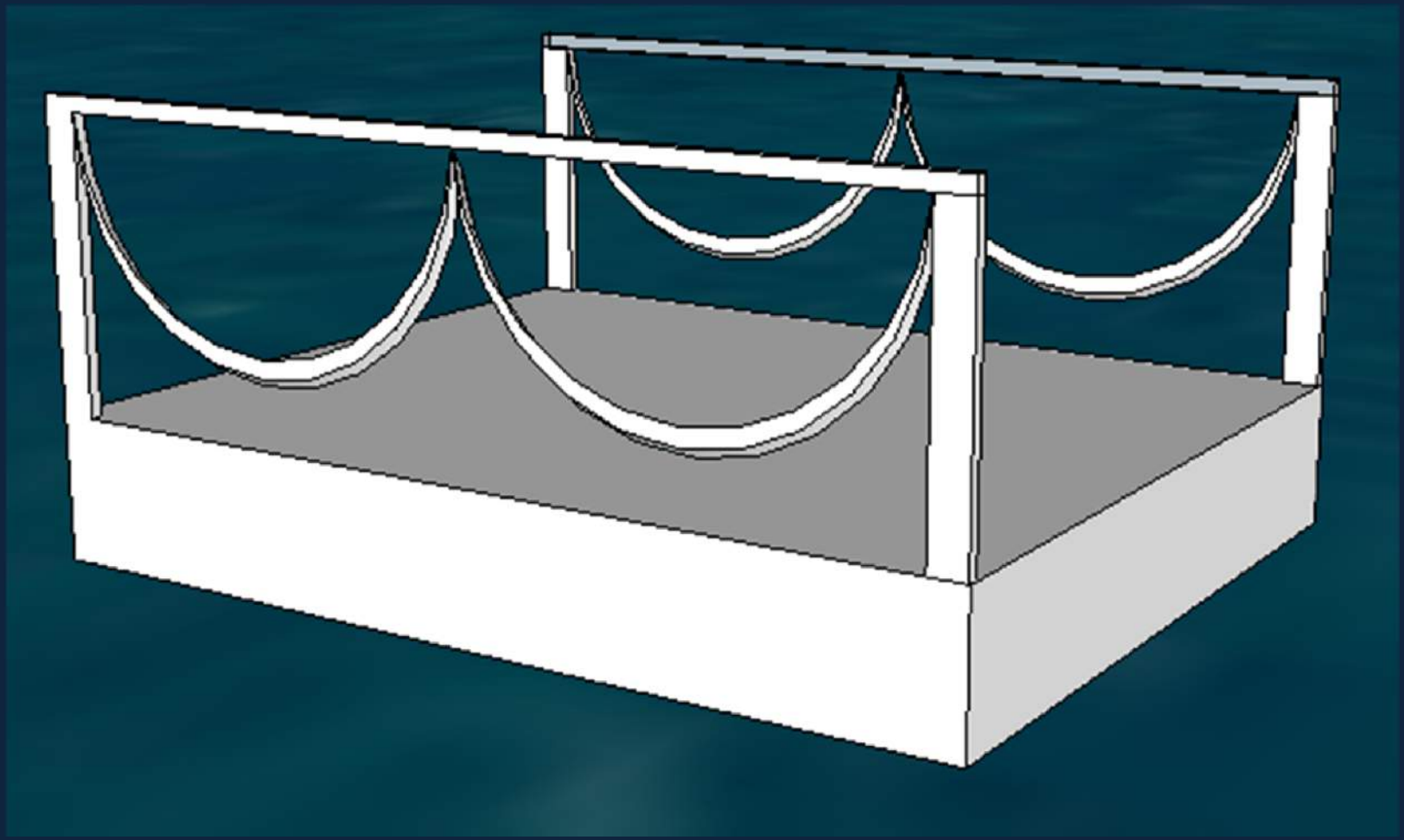
Arched Boardwalk Section



Coastal Design

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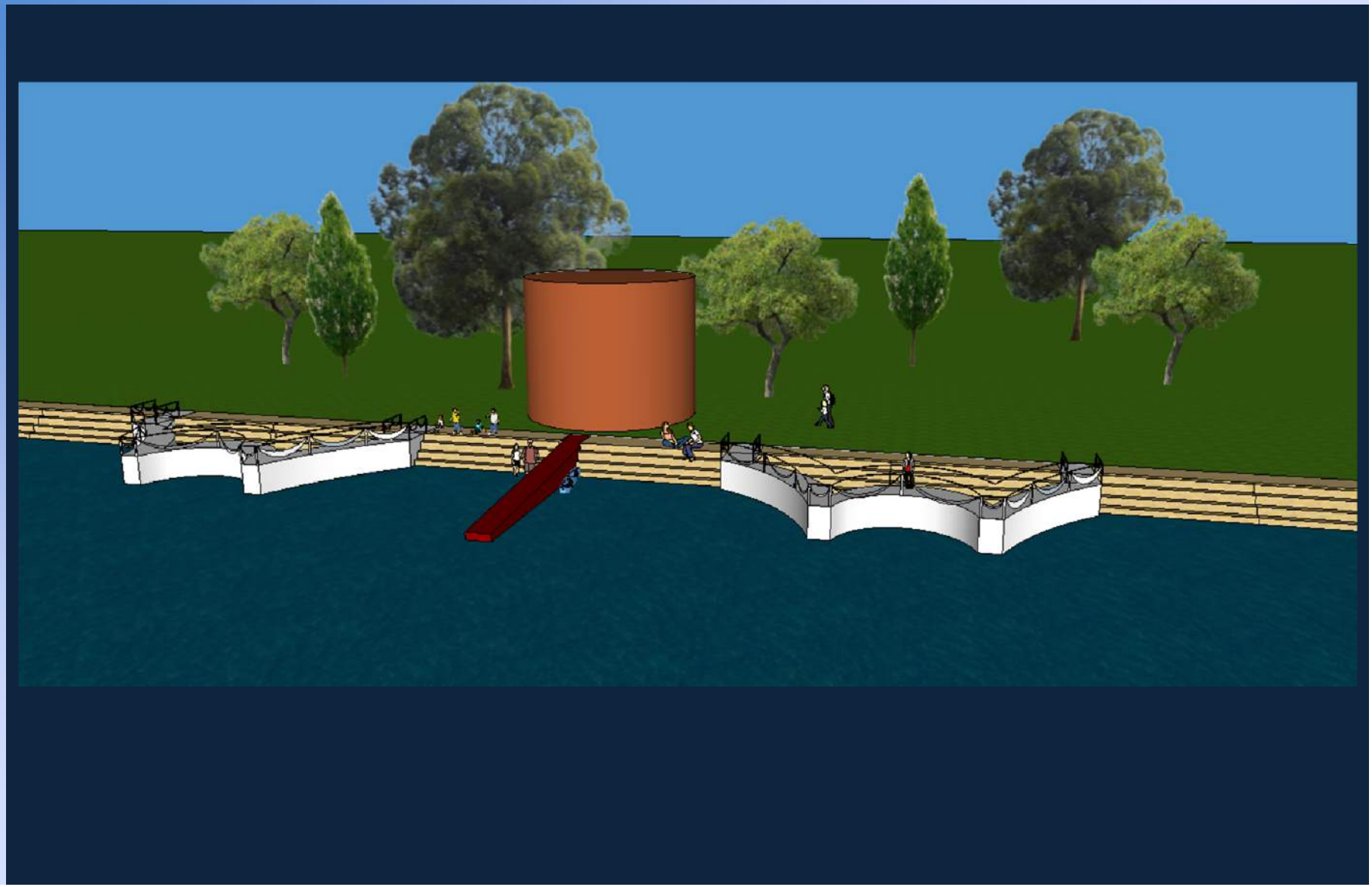

Coastal Design

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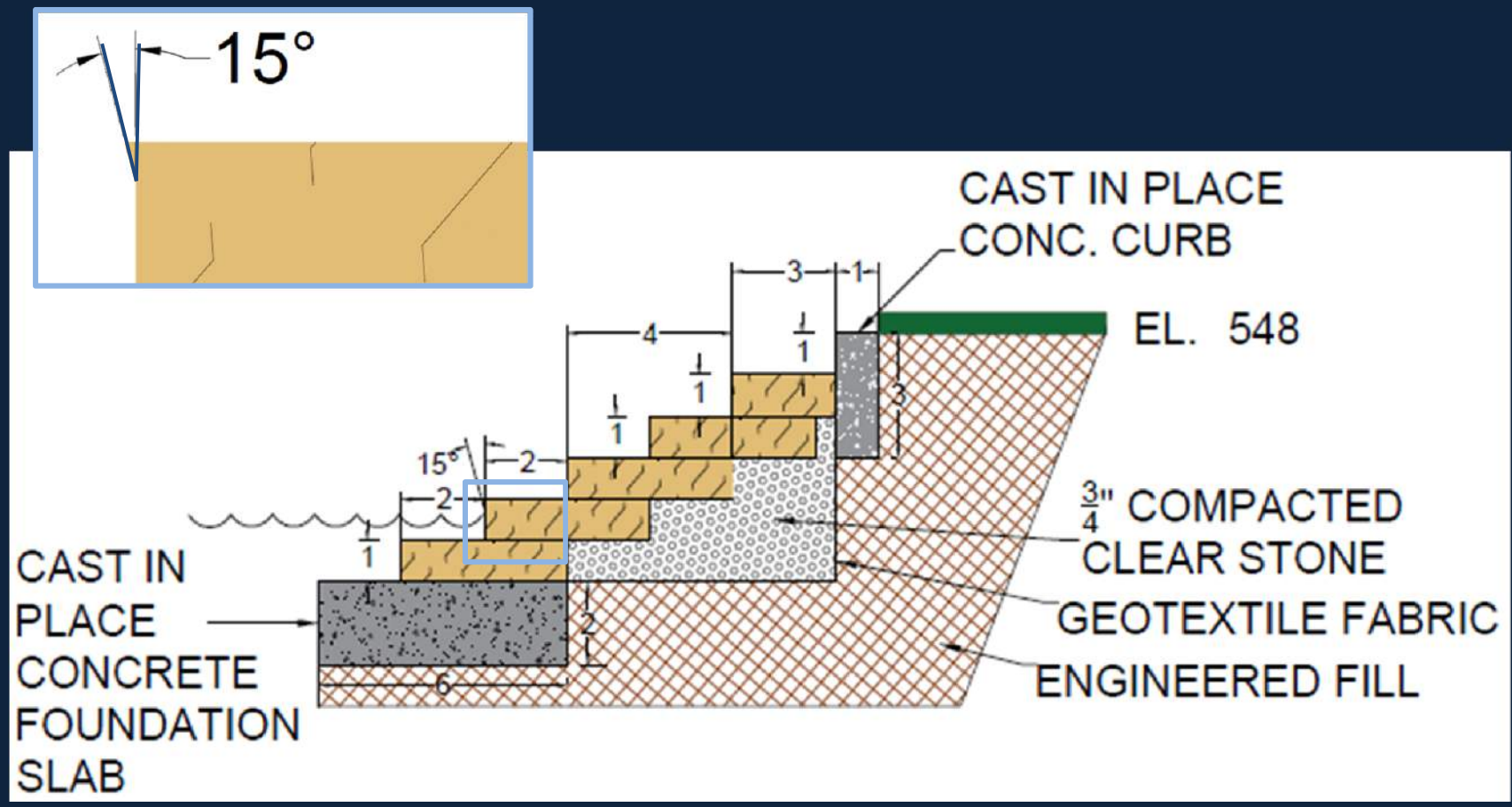

Coastal Design

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Dam-it Dams

Tunnel Specifications

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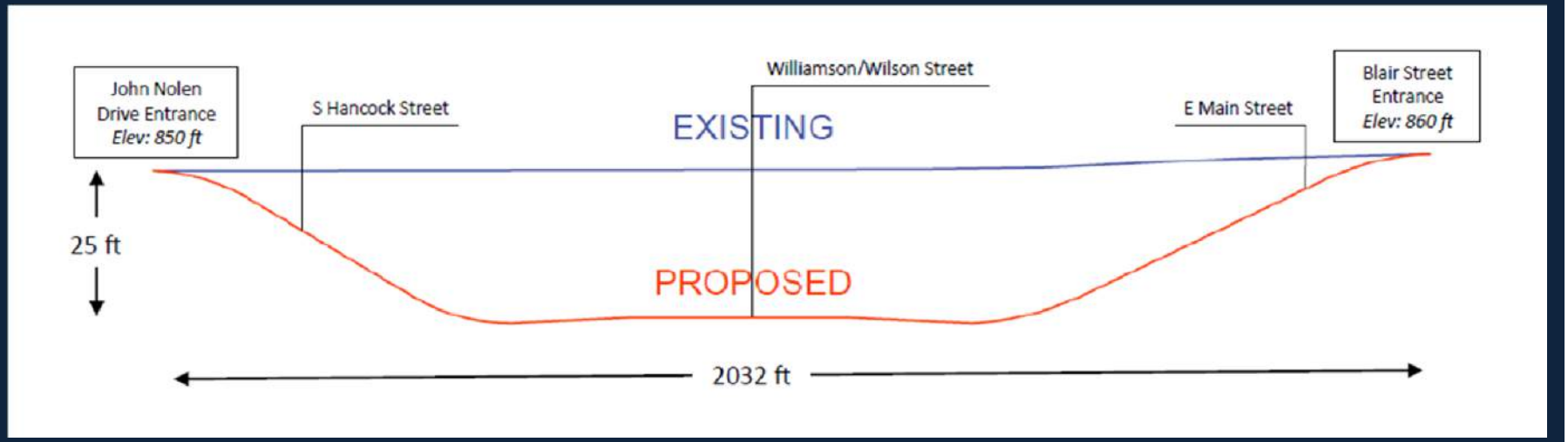
Length = 2032 feet
Depth = 25 feet
Vertical Grade = 6%



Tunnel Specifications

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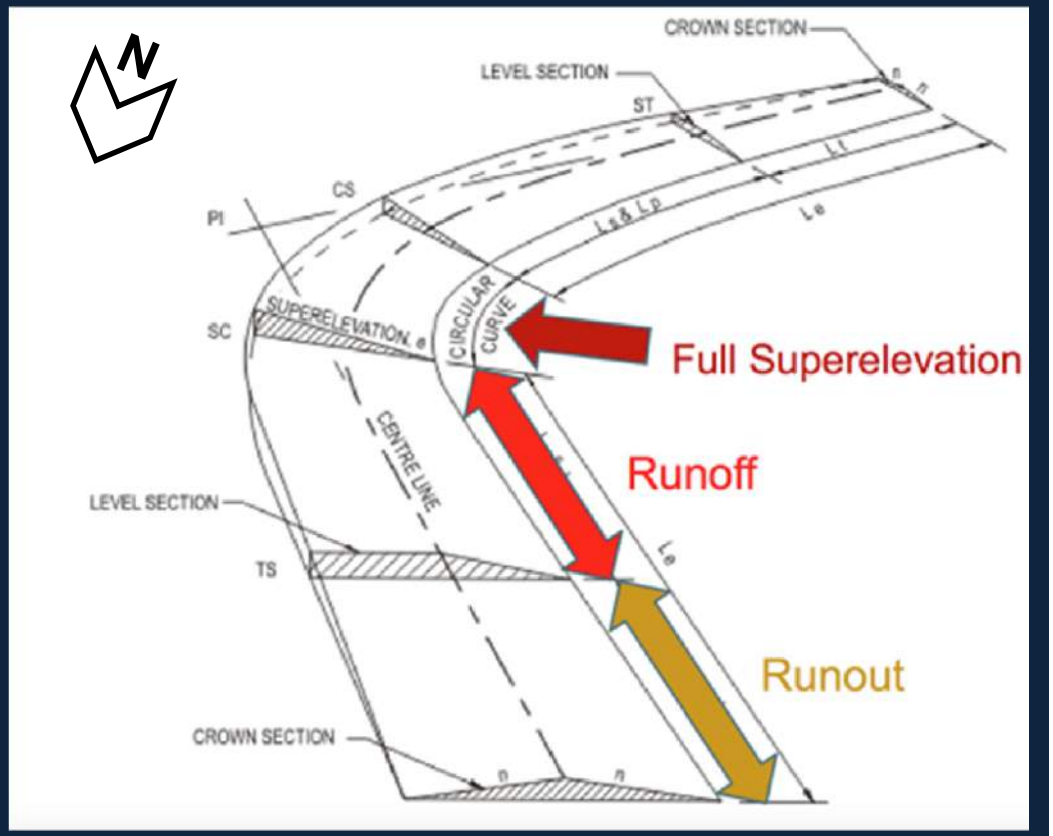
- Superelevation
  - 5.8%
  - Runout
    - 98 feet
  - Runoff
    - 100 feet
  - Full Super
    - 341 feet
- Total Length
  - **737 feet**



Construction Staging

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Stage 1 - Wilson Street

Stage 2 - John Nolen Drive

Stage 3 - “Hairball” Intersection

Stage 4 - Blair Street

Construction Staging

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Stage 1 - Wilson Street

Construction Staging

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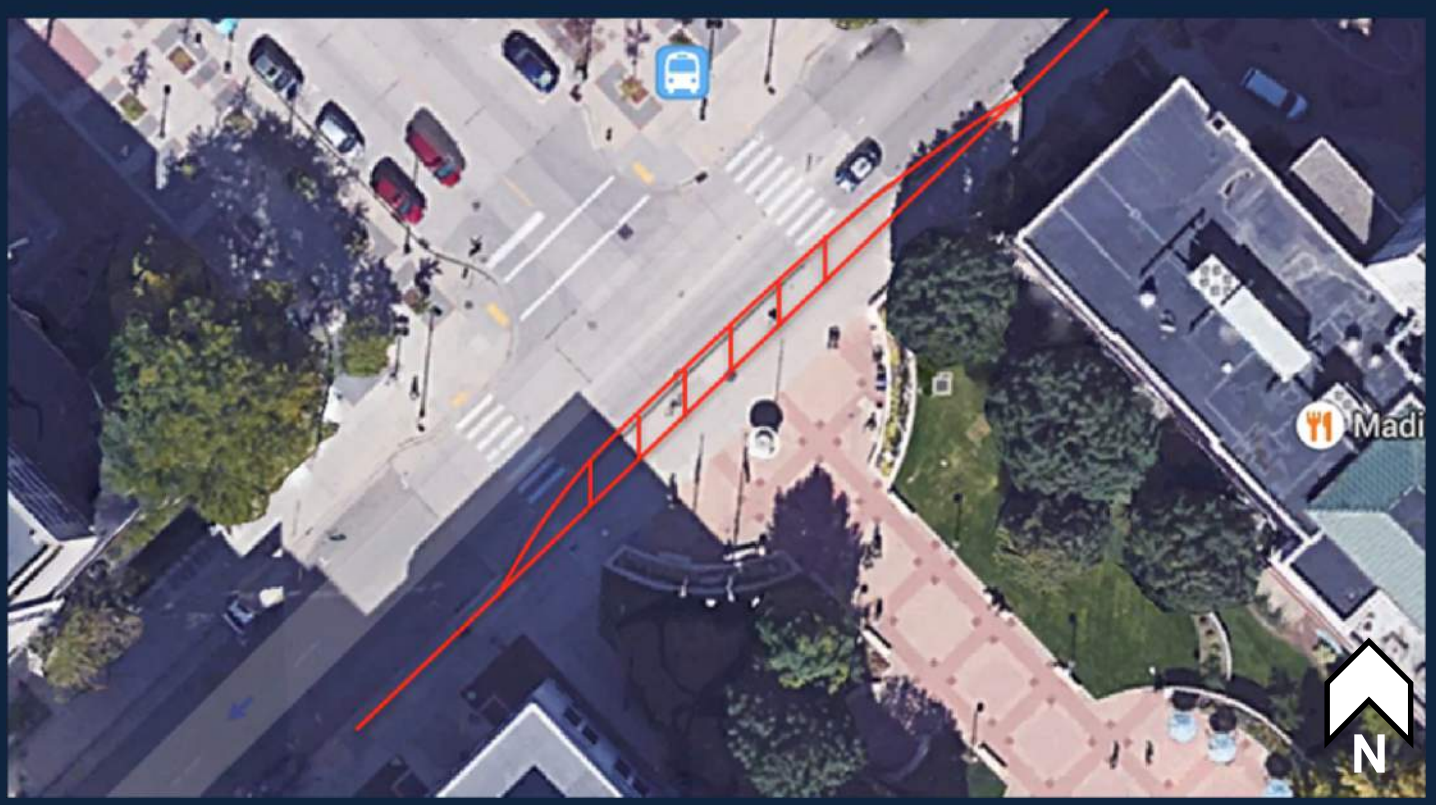
Stage 1 - Wilson Street



Construction Staging

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Stage 2 - John Nolen Drive

Construction Staging

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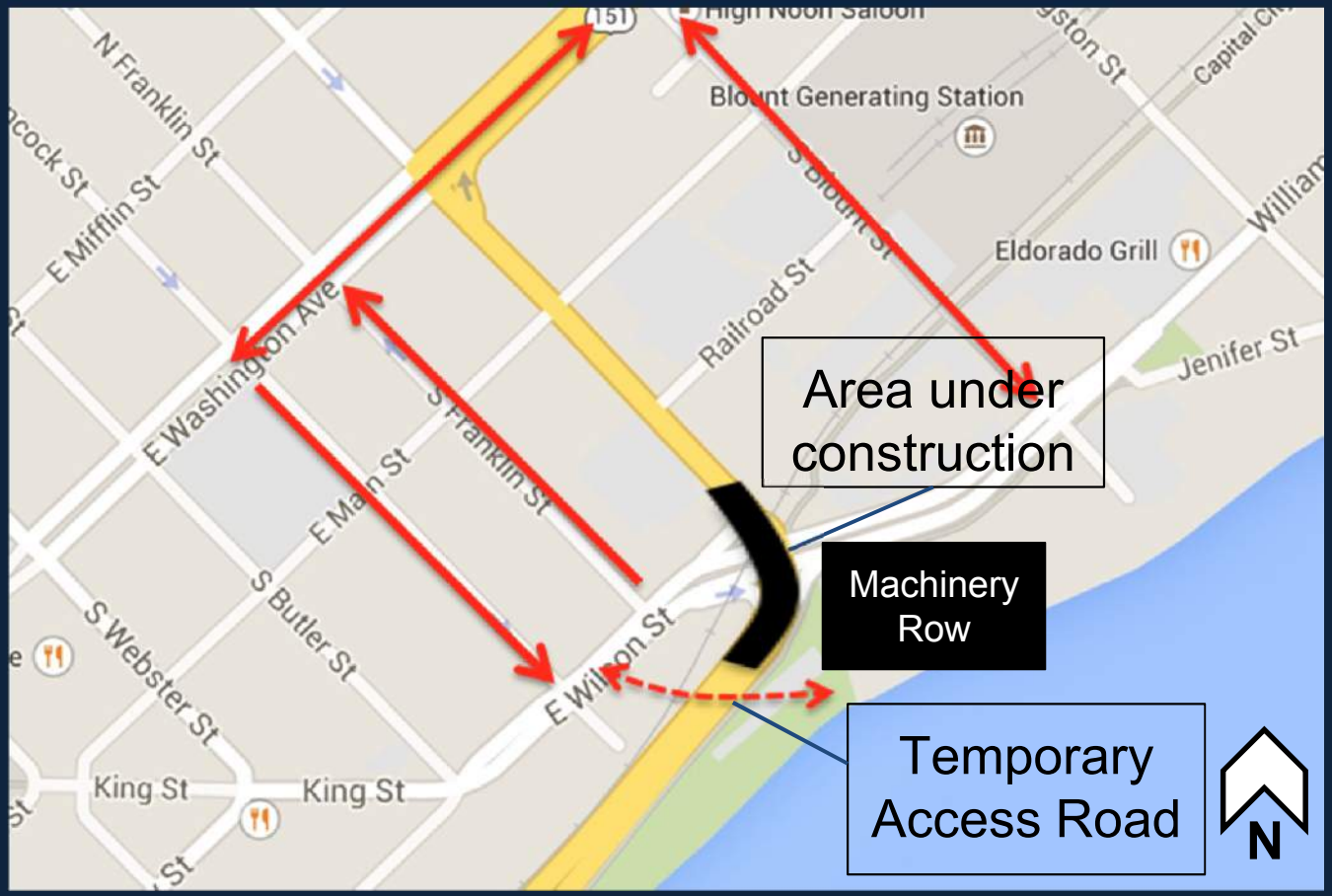
Stage 3 - "Hairball" Intersection



Construction Staging

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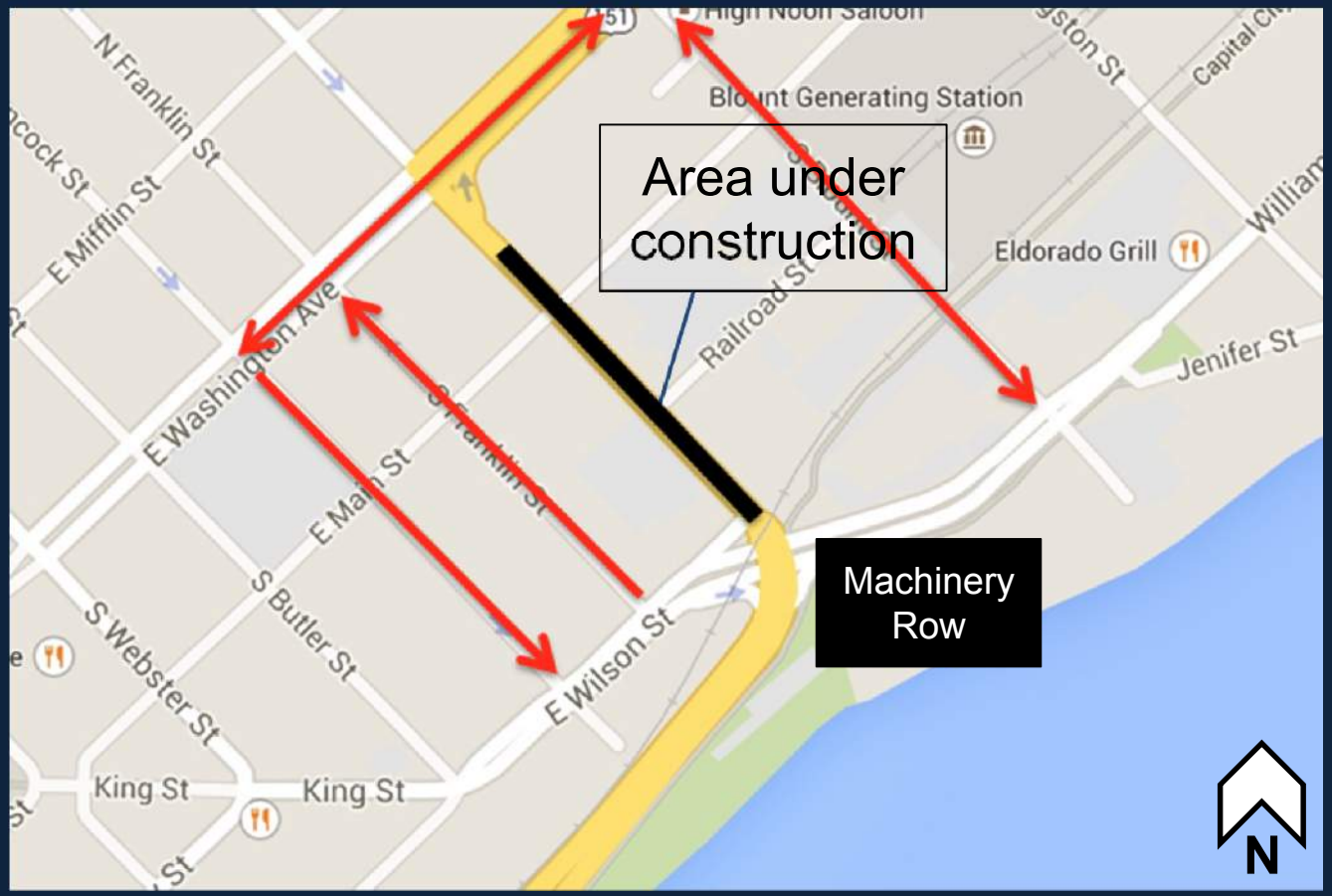
Stage 4 - Blair Street



Construction Staging

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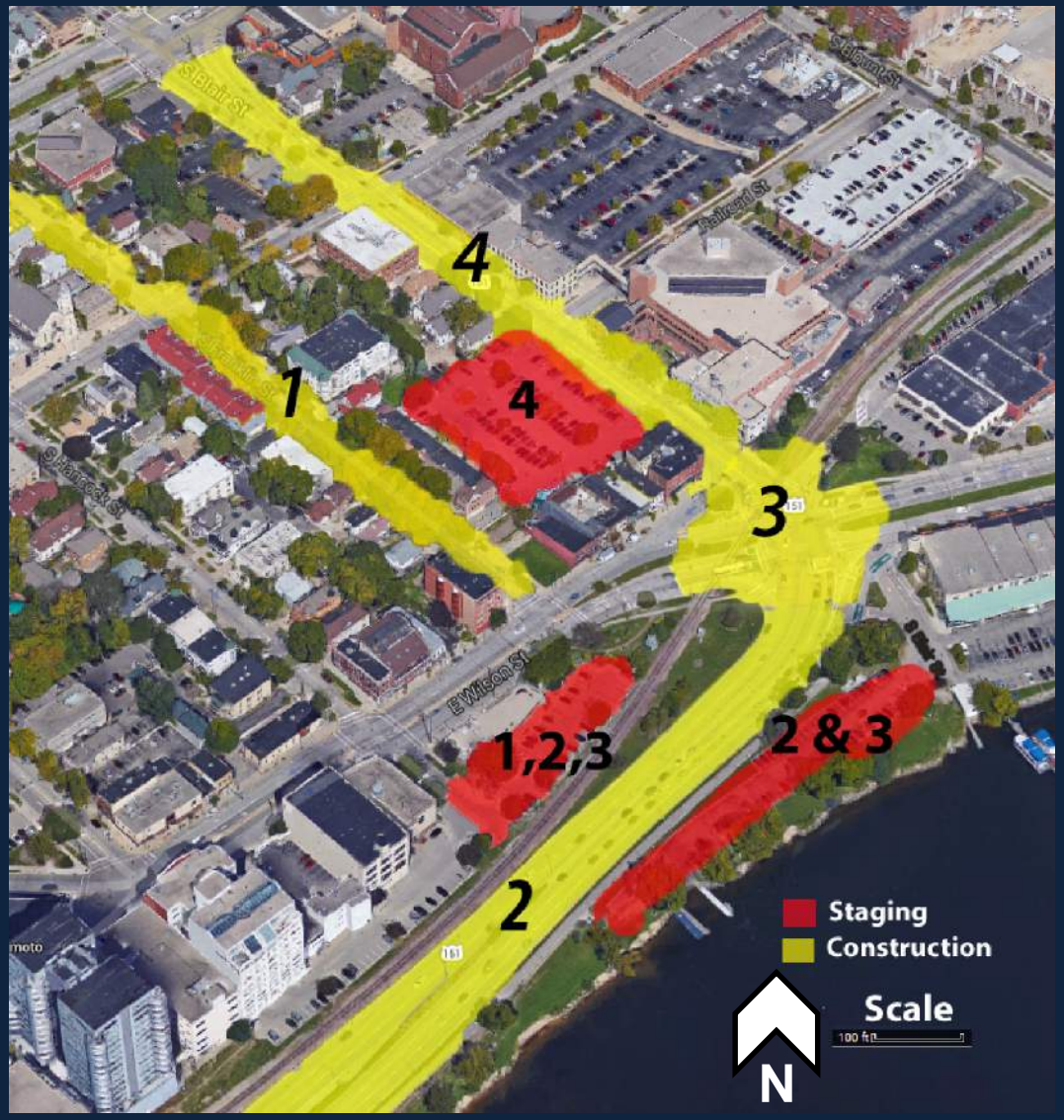

Structural Design

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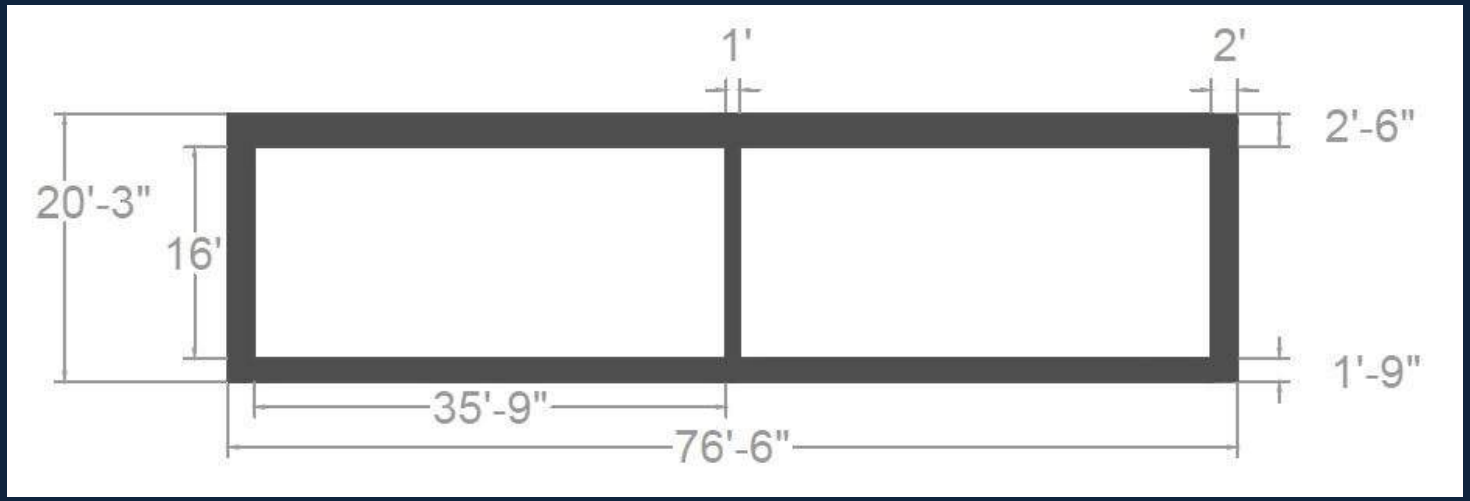

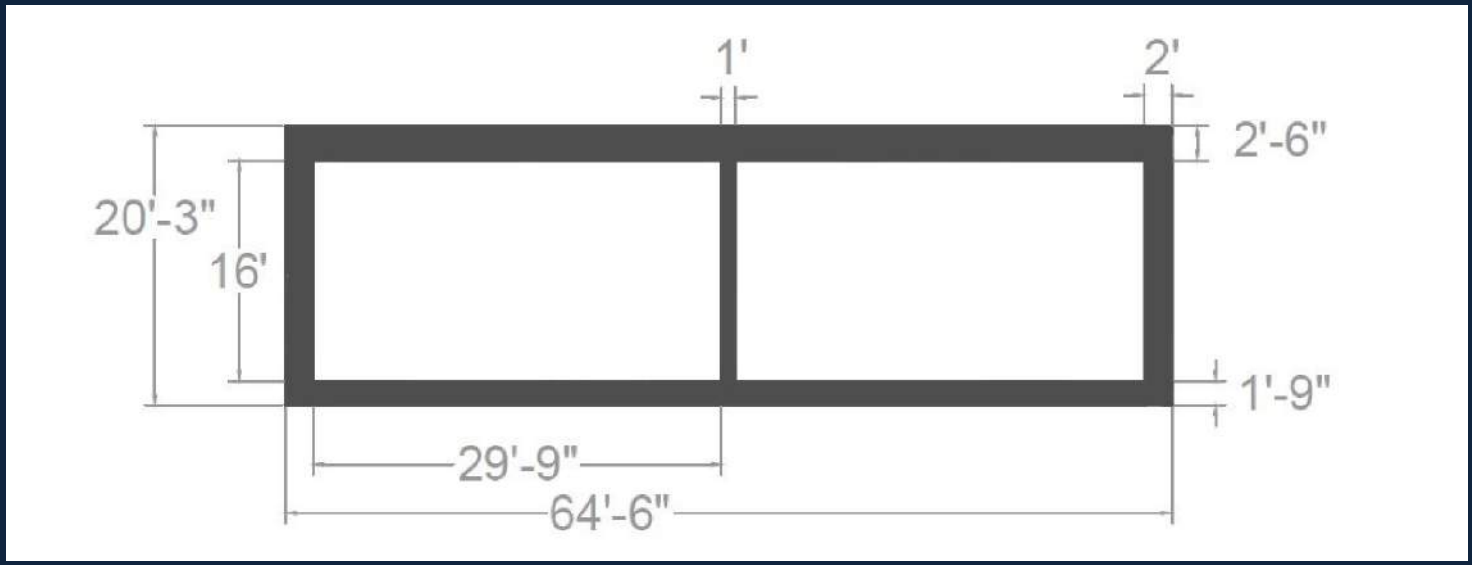

Structural Design

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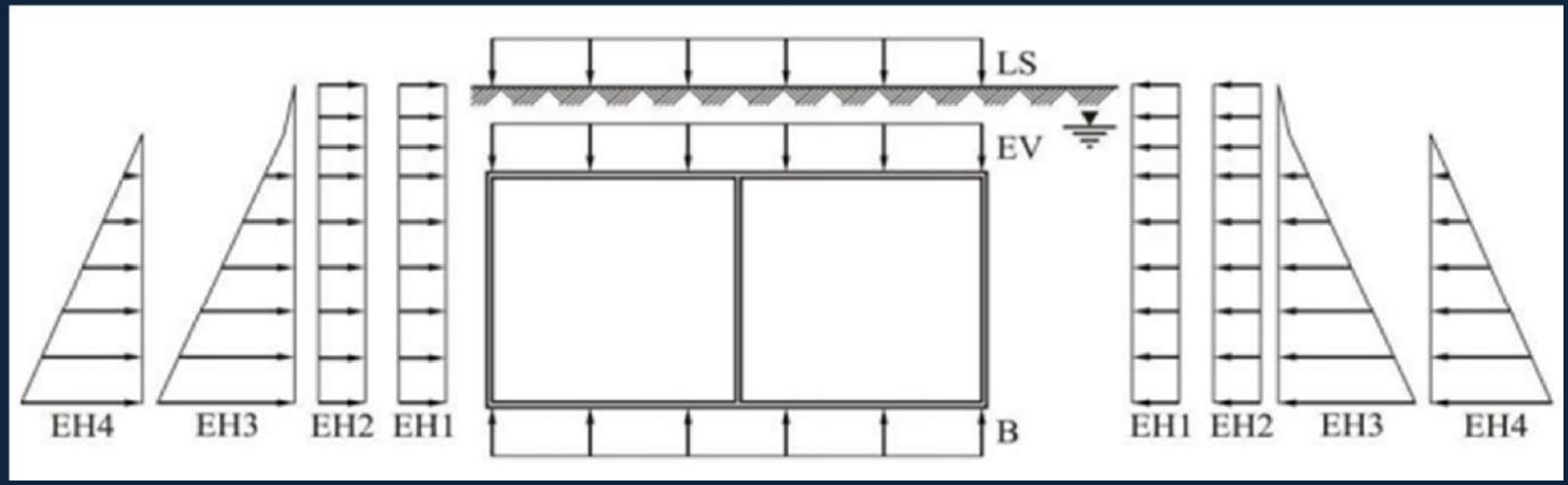

Structural Design

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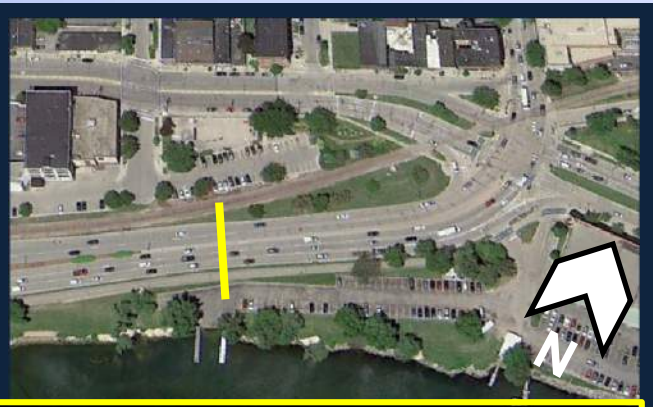

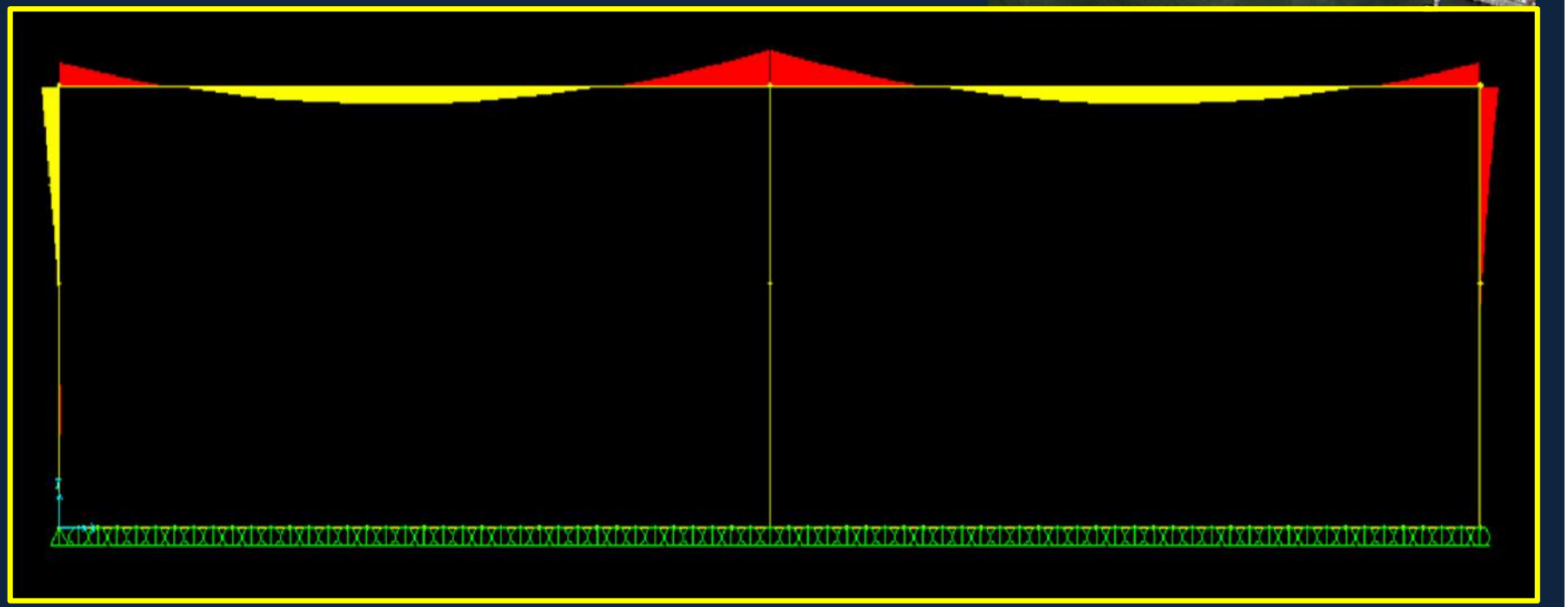

Foundation Design

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- Shallow mat foundation
- Designed to withstand loading, minimize settlement, and counter buoyancy

Foundation Design

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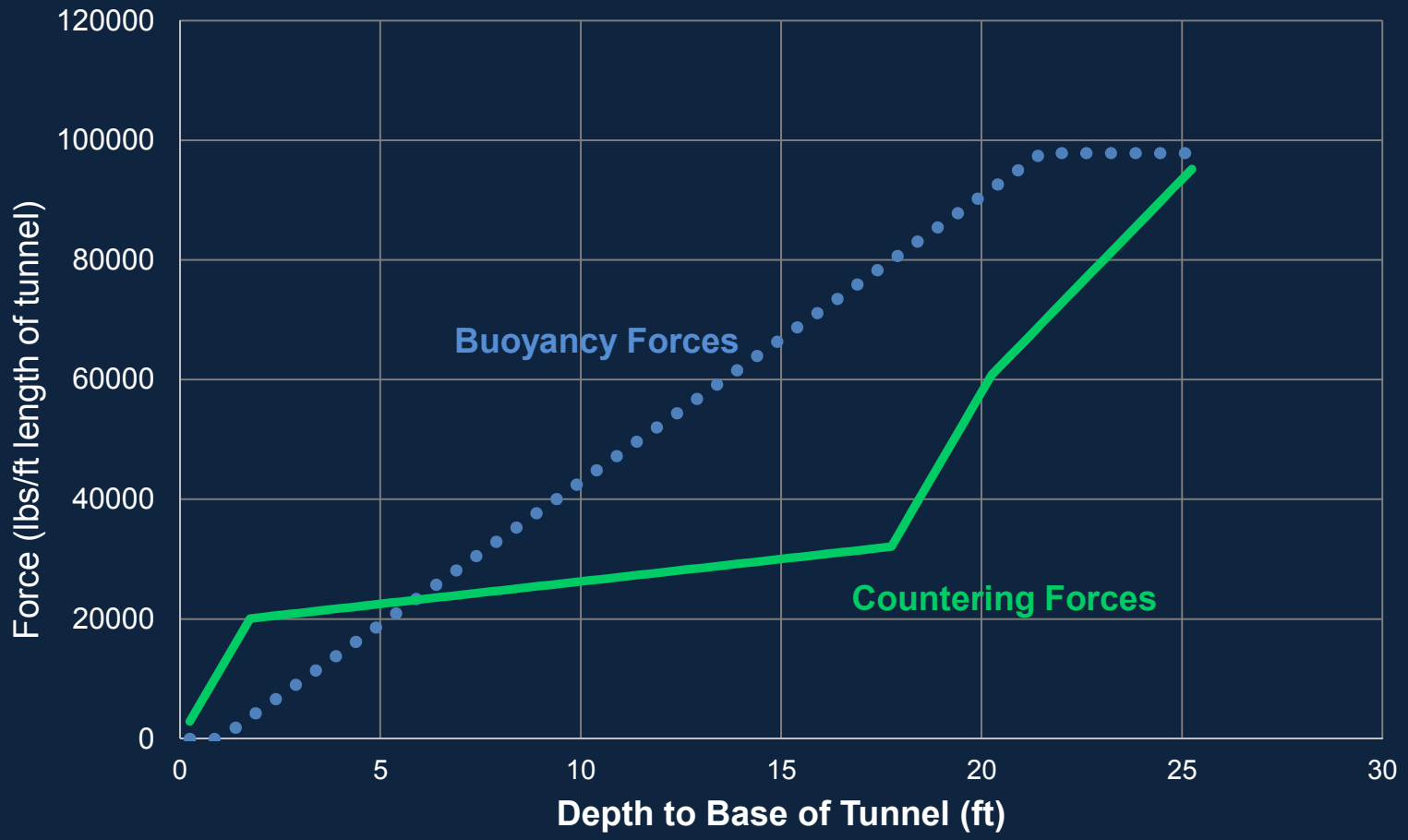
Buoyancy and Countering Forces - Tunnel



Foundation Design

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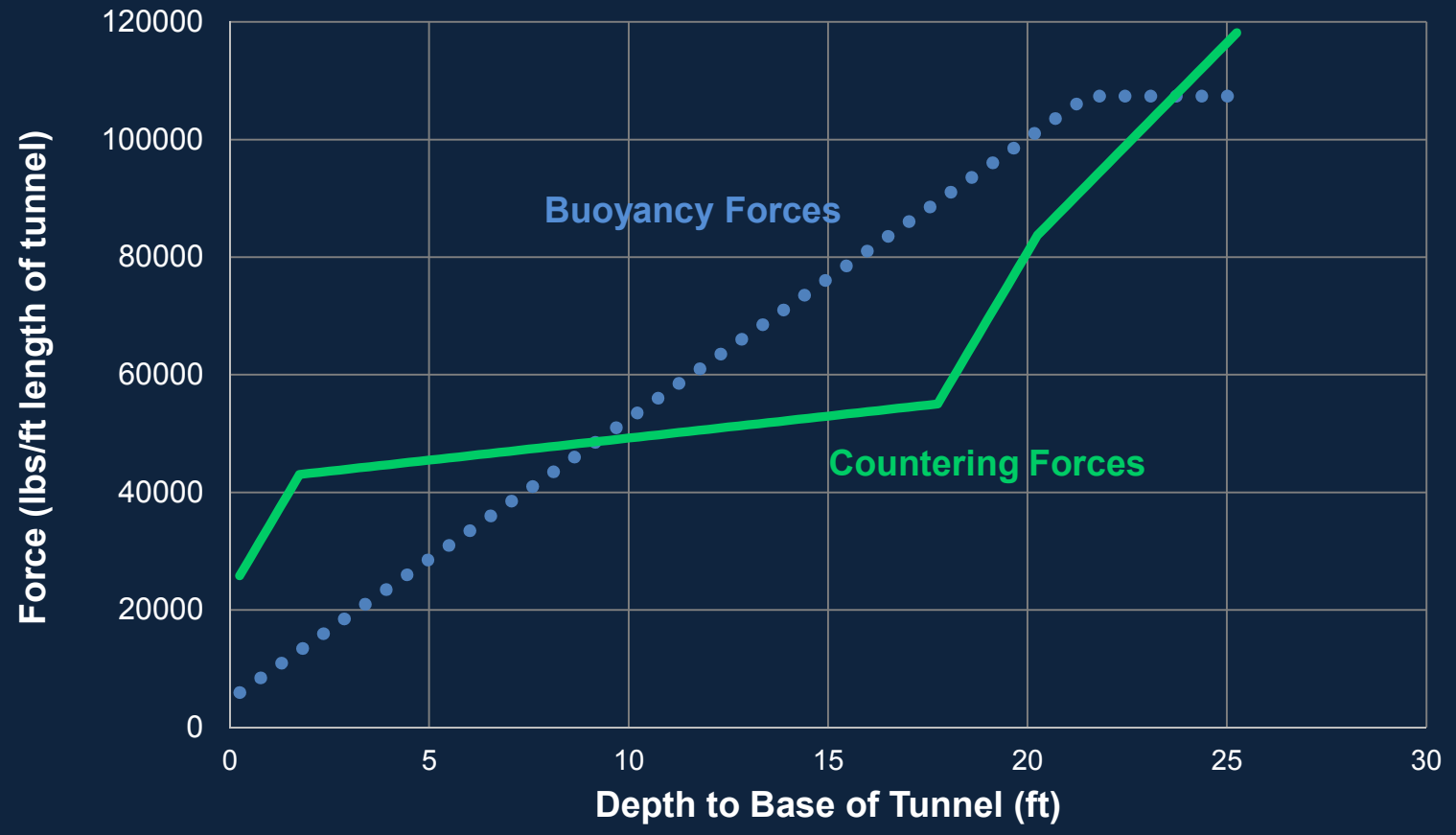
Buoyancy and Countering Forces - With Foundation



Foundation Design

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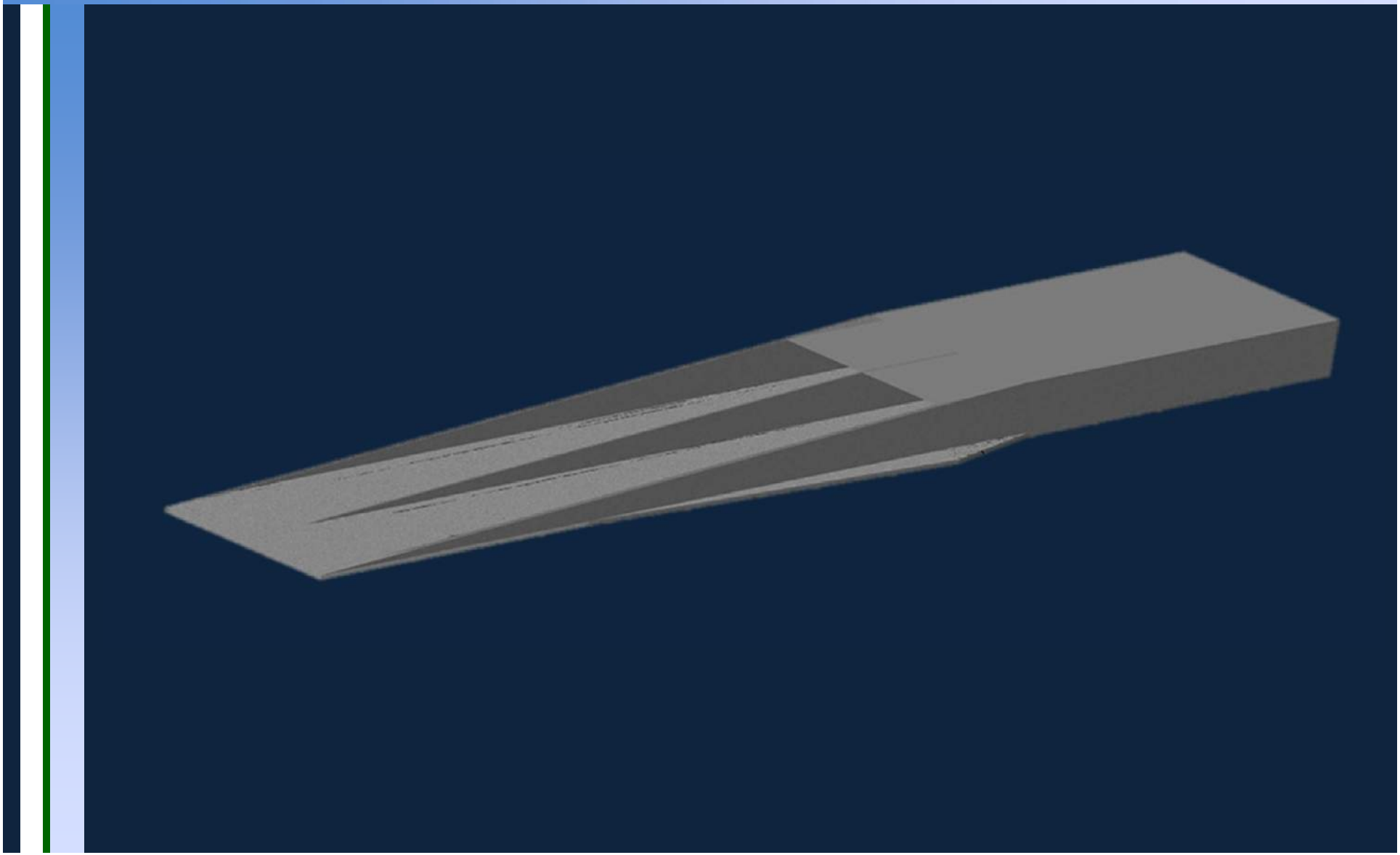

Storm Sewer Design

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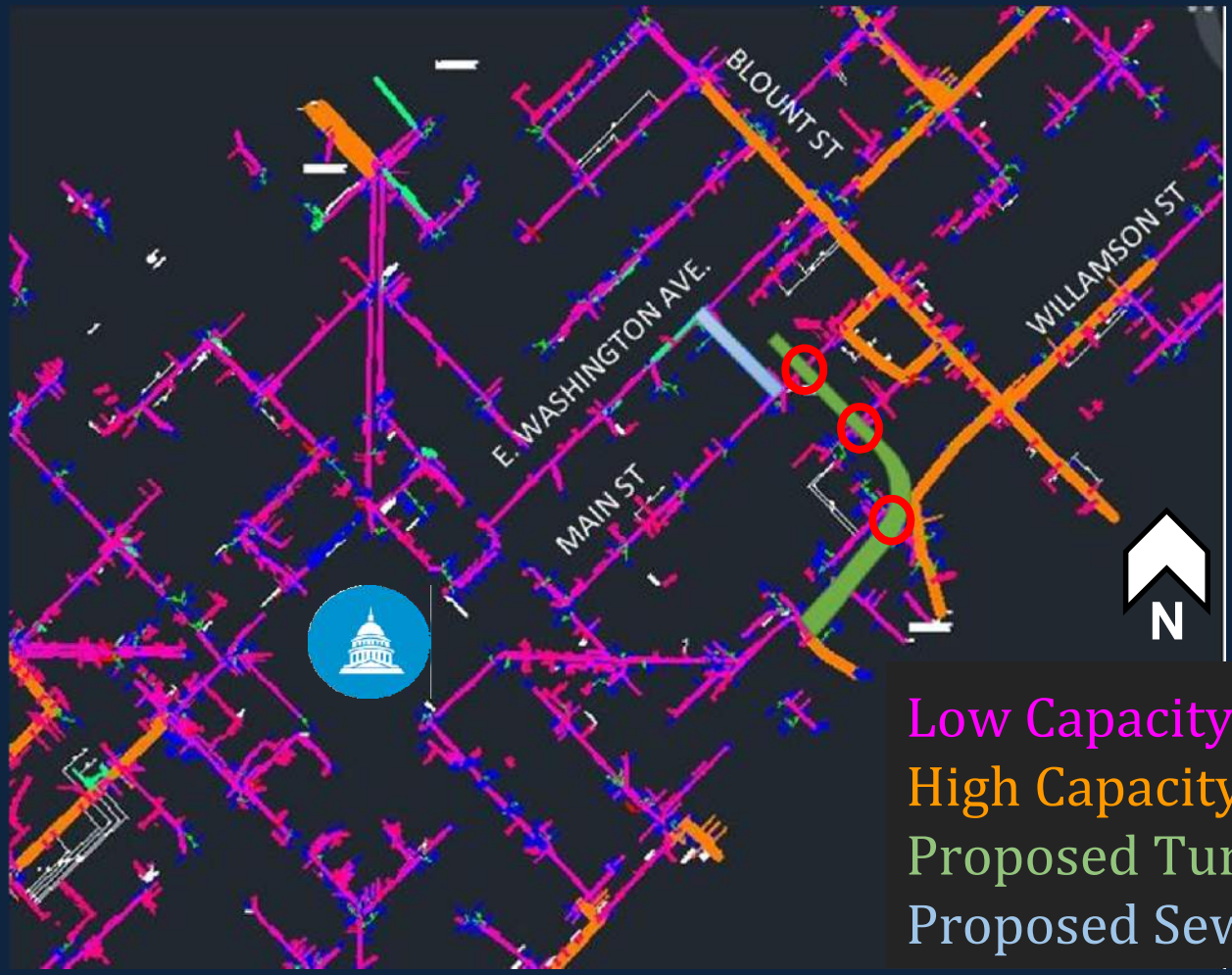

Low Capacity Storm Sewer
High Capacity Storm Sewer
Proposed Tunnel
Proposed Sewer Routing

Storm Sewer Design

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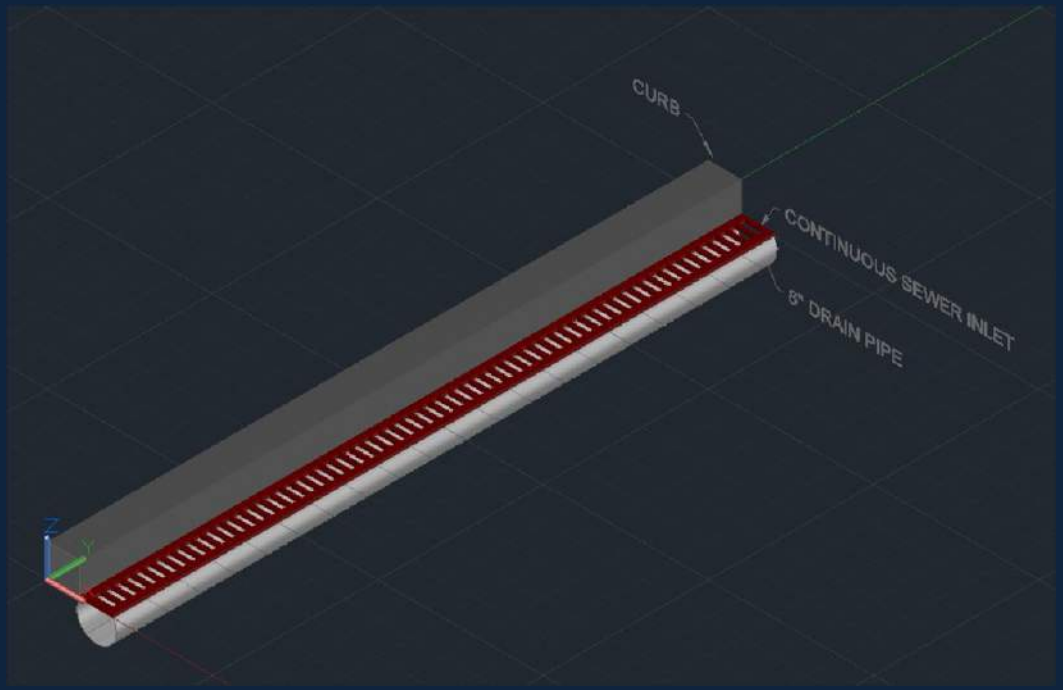
- Peak rainfall: 1.44 in/hr
- Peak runoff: 6,500 gallons per minute
- Continuous Sewer Inlet



Storm Sewer Design

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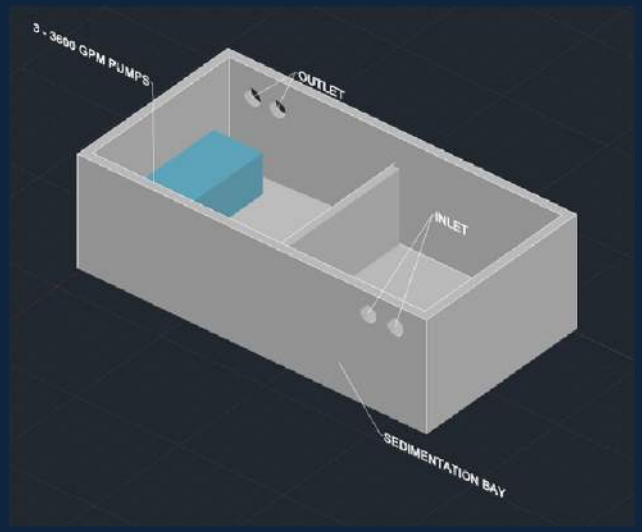
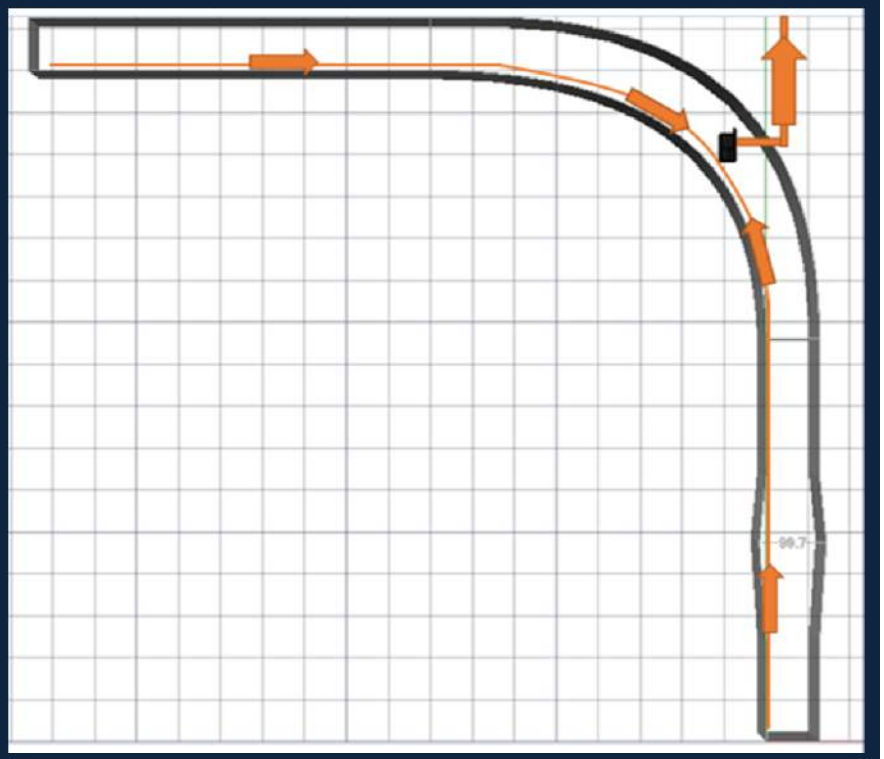
- Continuous Sewer Inlet
- 45,000 gallon sump
- 3 - 3,600 gpm pumps
- Williamson Street high capacity storm sewer





Construction Dewatering

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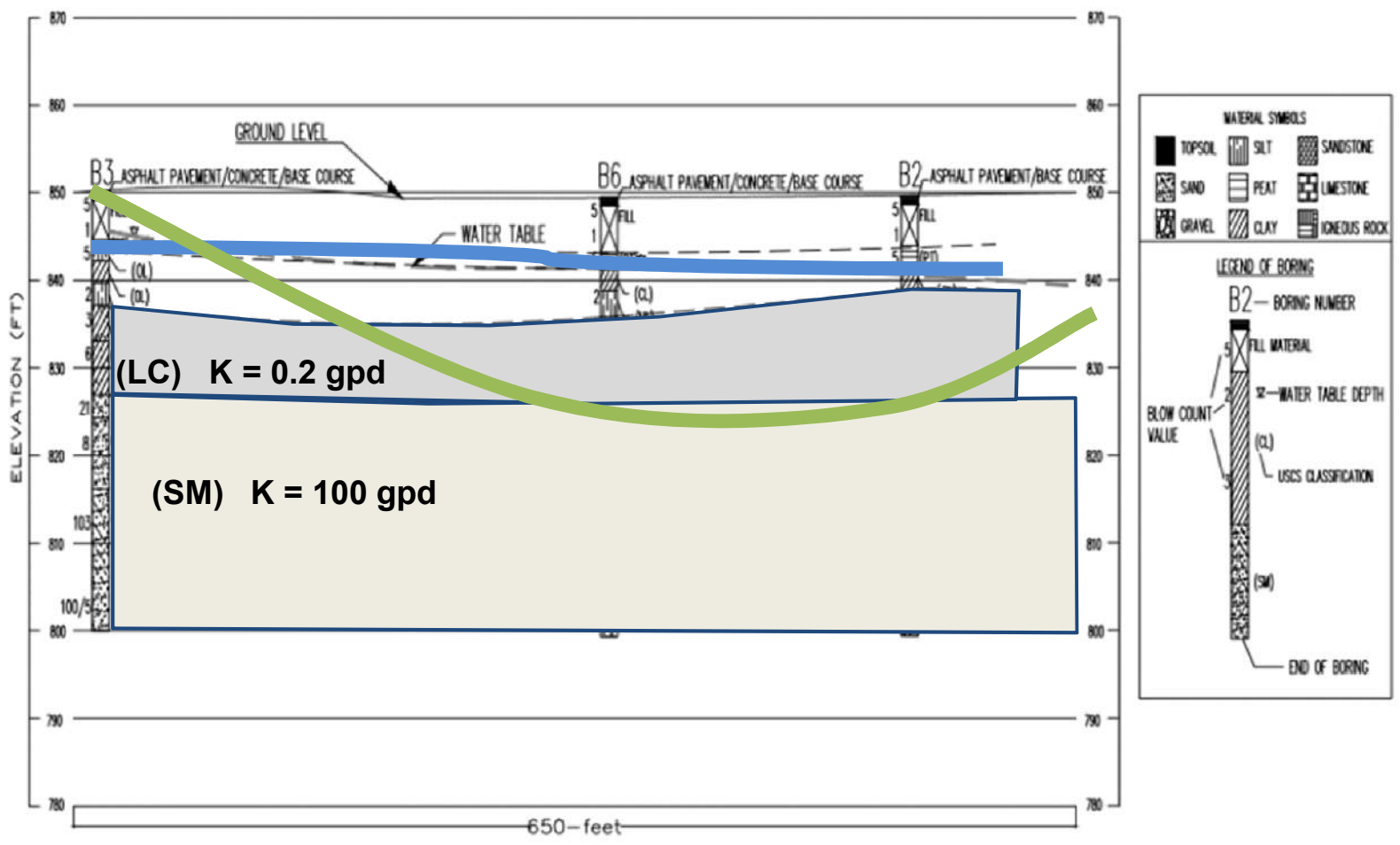

Construction Dewatering

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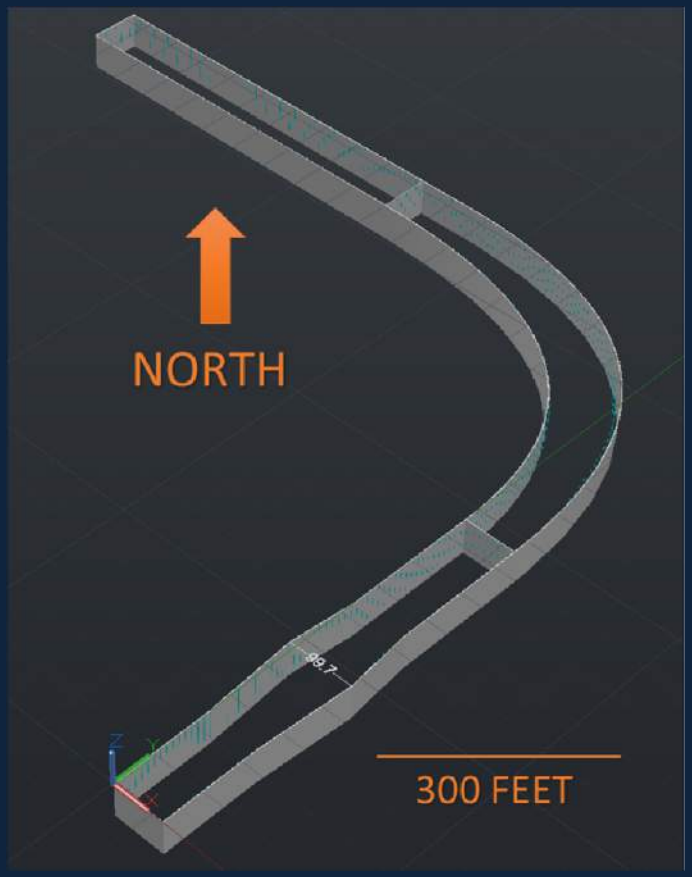
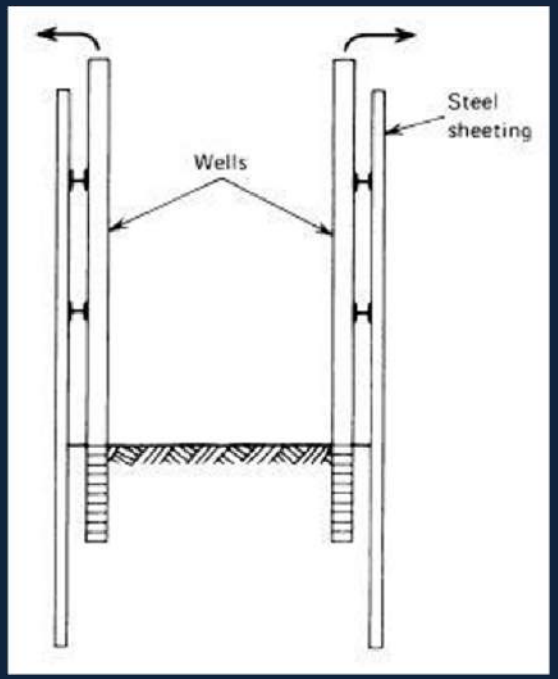
- Estimated 1435 gpm into excavation
- System utilizes sheet piling and wellpoints





Tunnel Waterproofing

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- Spray Membrane
- Geotextile
- Sheet Piling

Schedule

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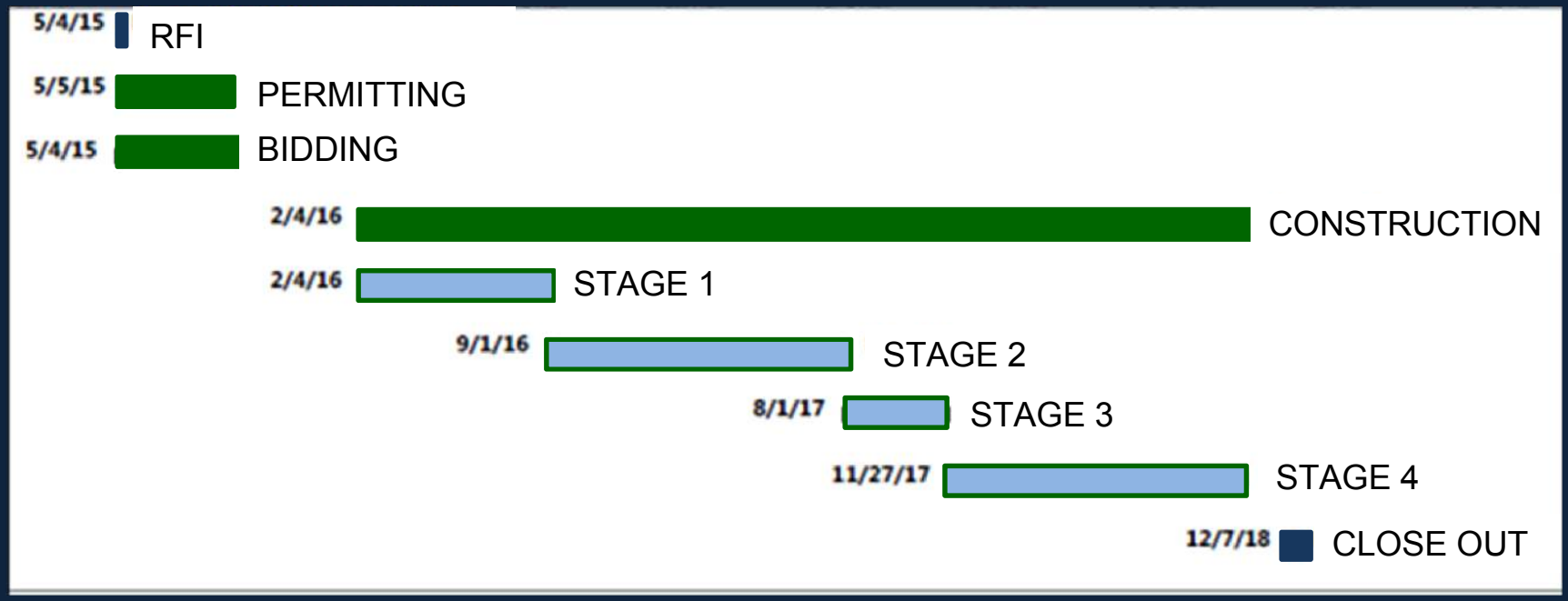

Cost

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Cost Item	Description	Subtotal
Construction	$115,000,000	$115,000,000
Contingency	20%	$23,000,000
IEC Design Fee	10%	$11,000,000
	TOTAL	$149,000,000
Per Linear Foot (2,032ft)		*$69,000*

Cost Breakdown

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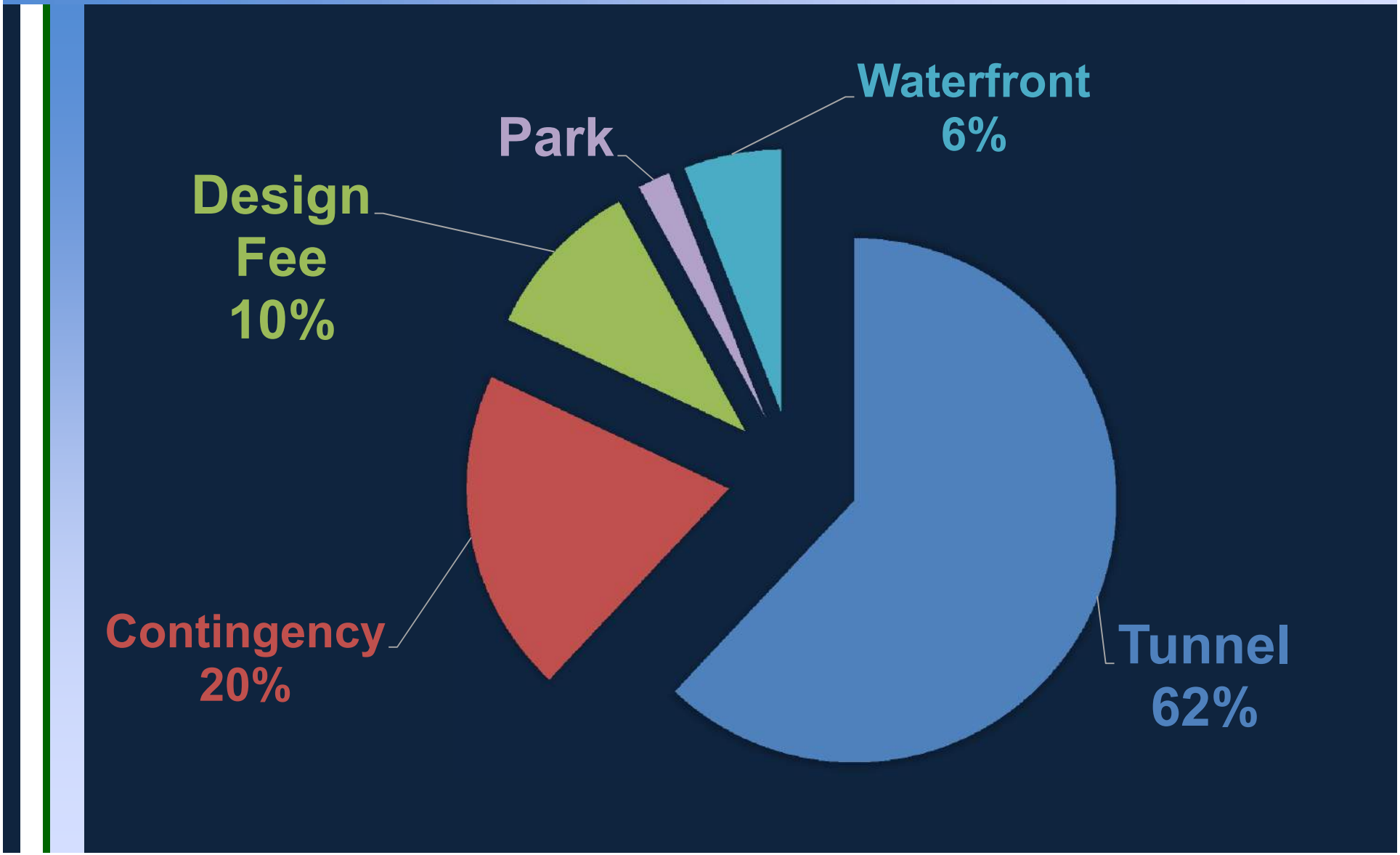

Tunnel Cost Breakdown

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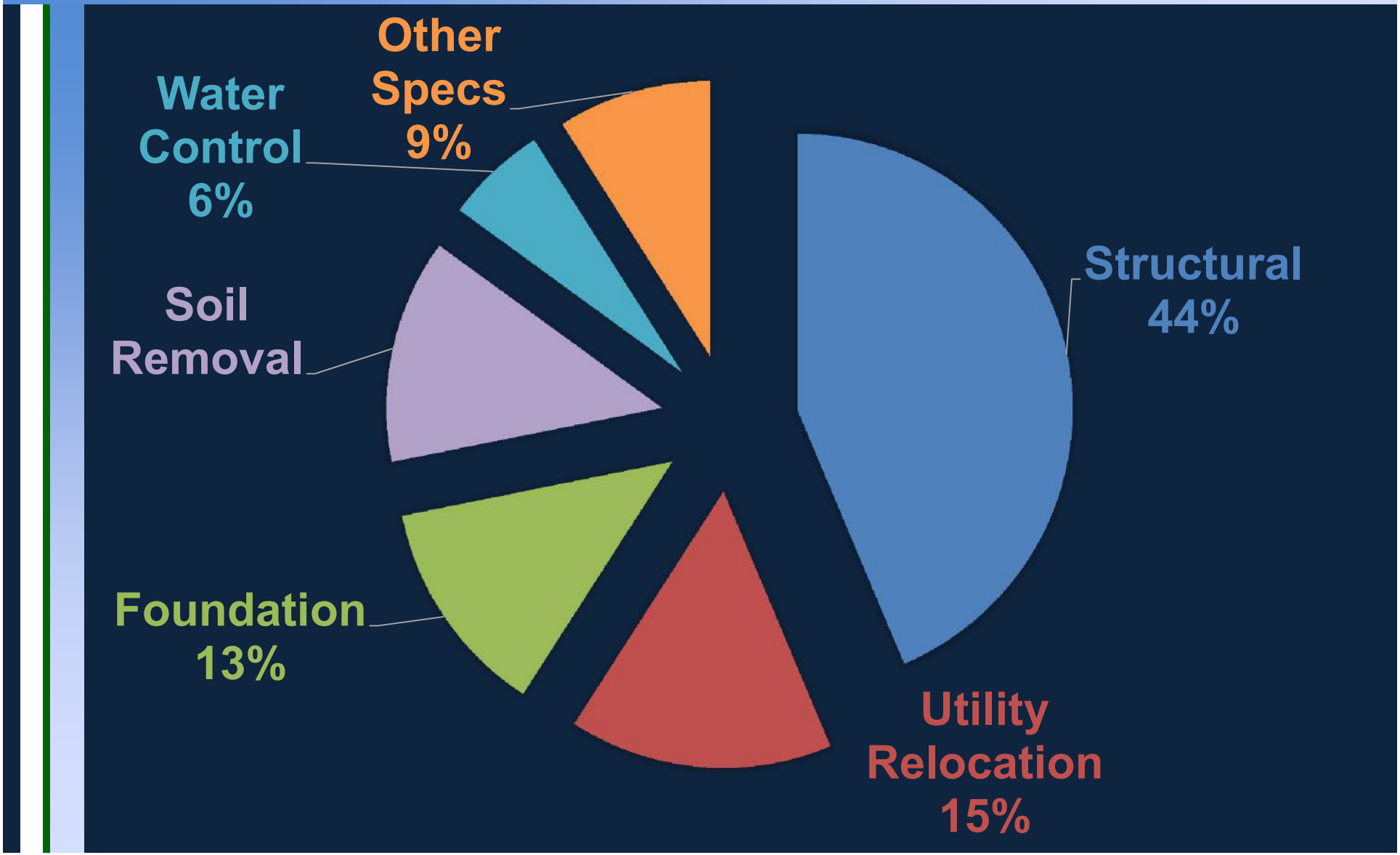

Cross Section

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Concluding Remarks

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Questions

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Supplementary Material

Coastal Design

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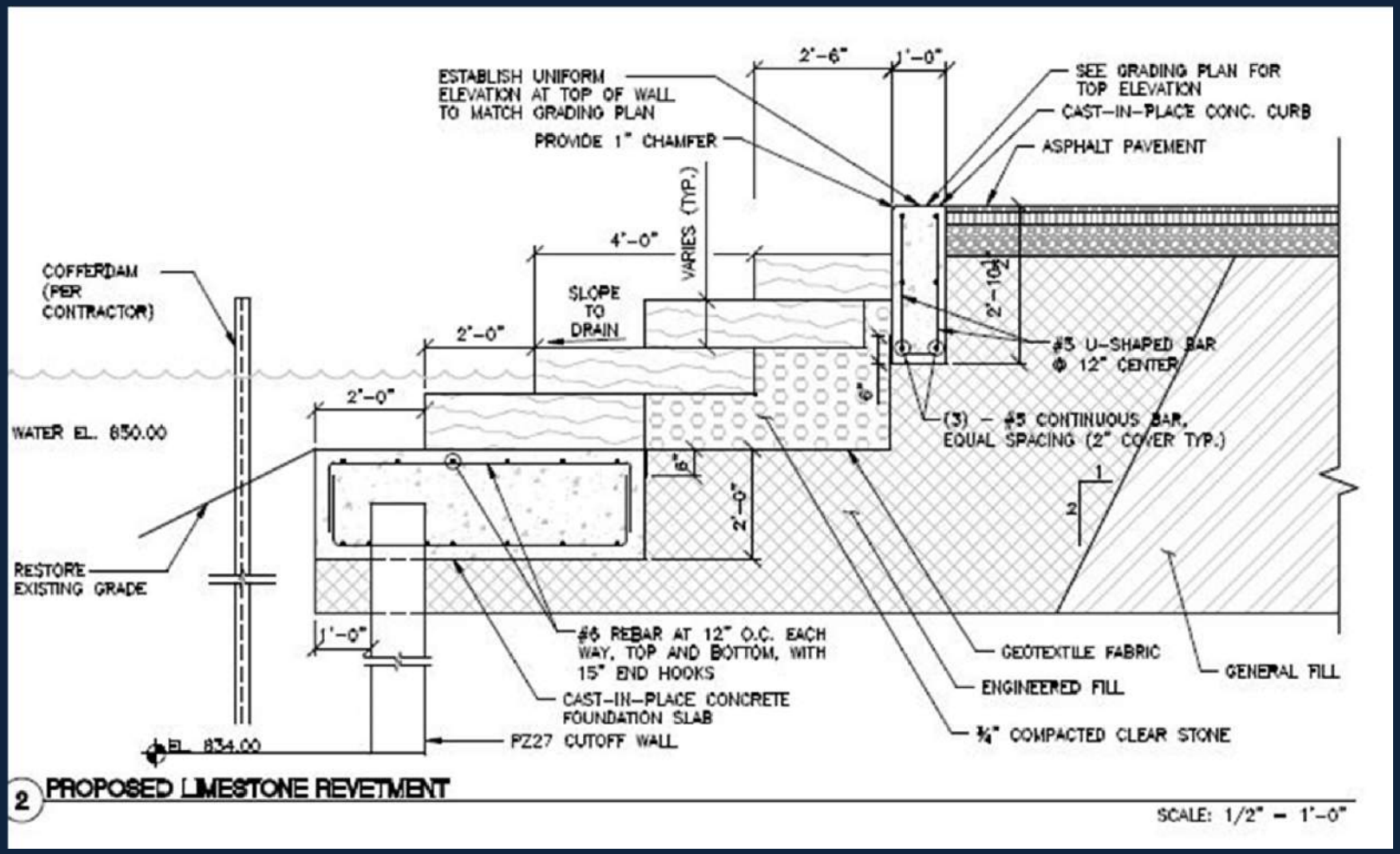
- Mendota Terrace Plan



Coastal Design

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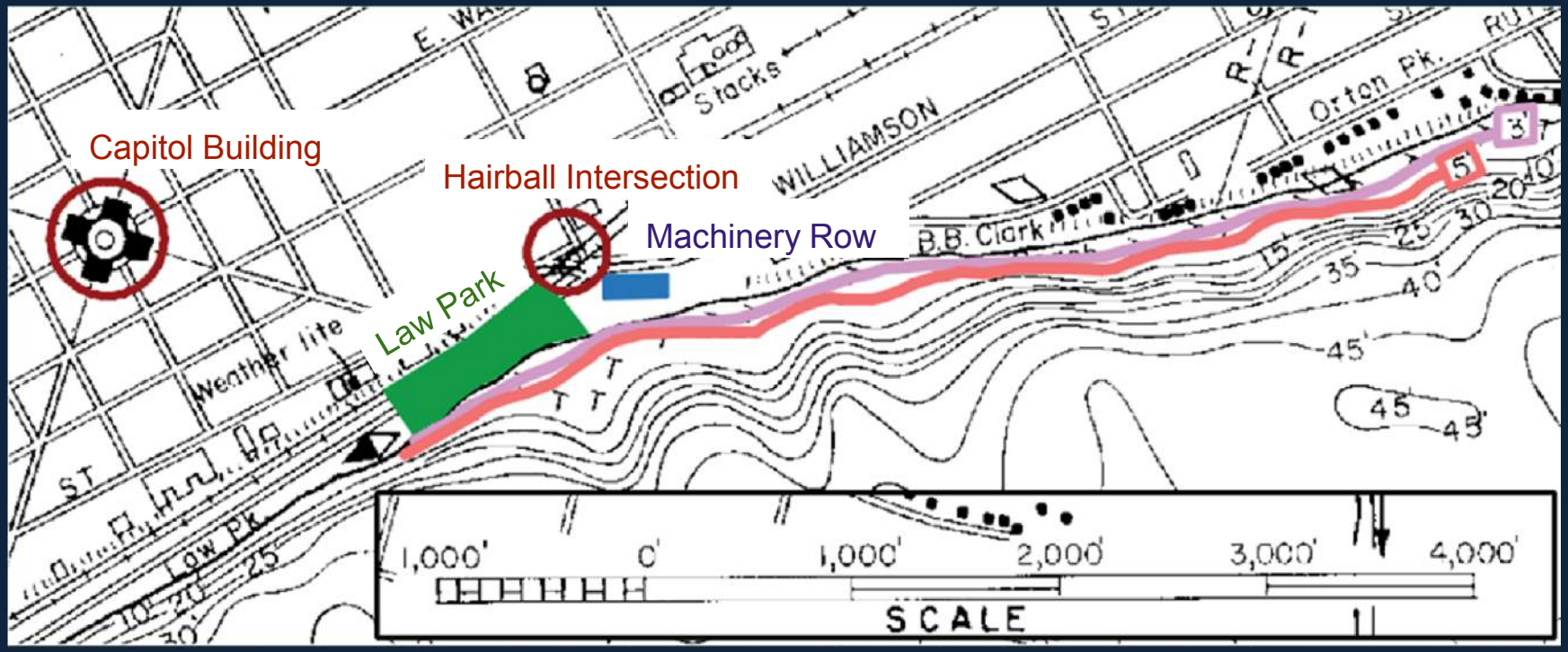
- Bathymetric map



Tunnel Plan View

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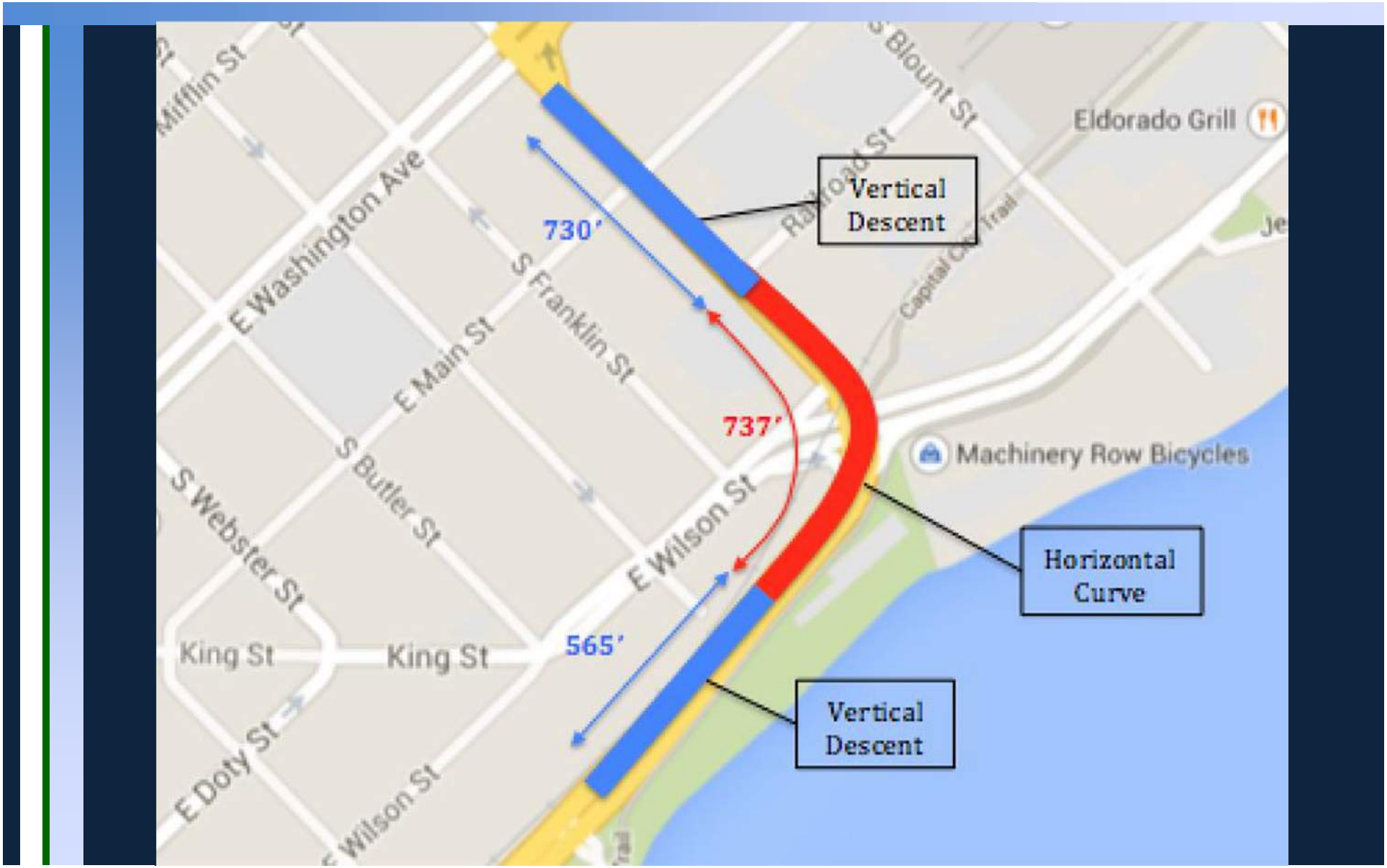

Tunnel Rendering

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Cost Breakdown

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Tunnel	$97,000,000
Contingency	$23,000,000
Design Fee	$11,000,000
Park	$9,000,000
Waterfront	$9,000,000
TOTAL	$149,000,000

Tunnel Cost Breakdown

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Structural	$42,000,000
Utility Relocation	$15,000,000
Foundation	$13,000,000
Soil Removal	$12,000,000
Water Control	$6,000,000
Other Specs	$9,000,000
TOTAL	$97,000,000

Construction Dewatering

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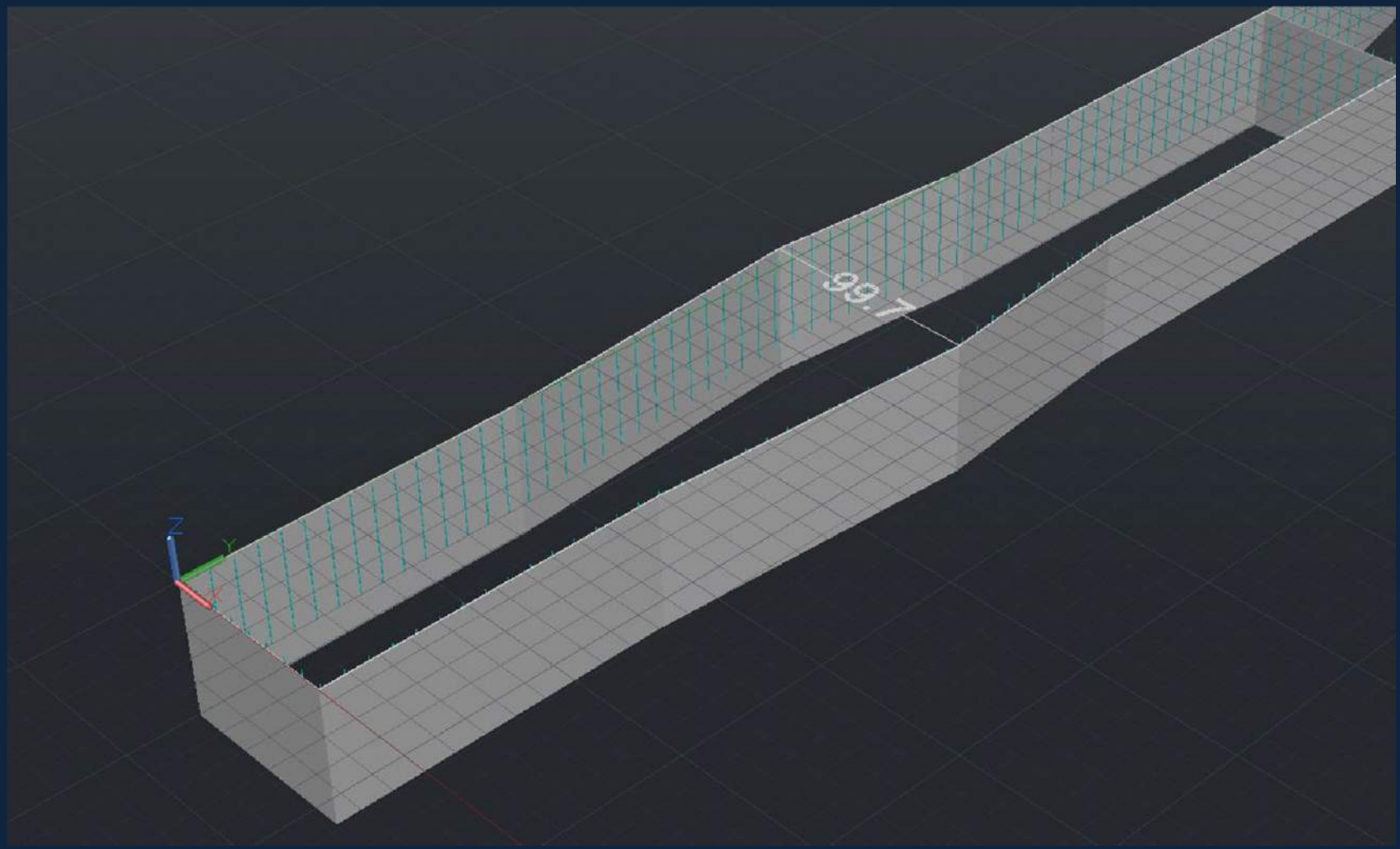

Storm Sewer Design

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