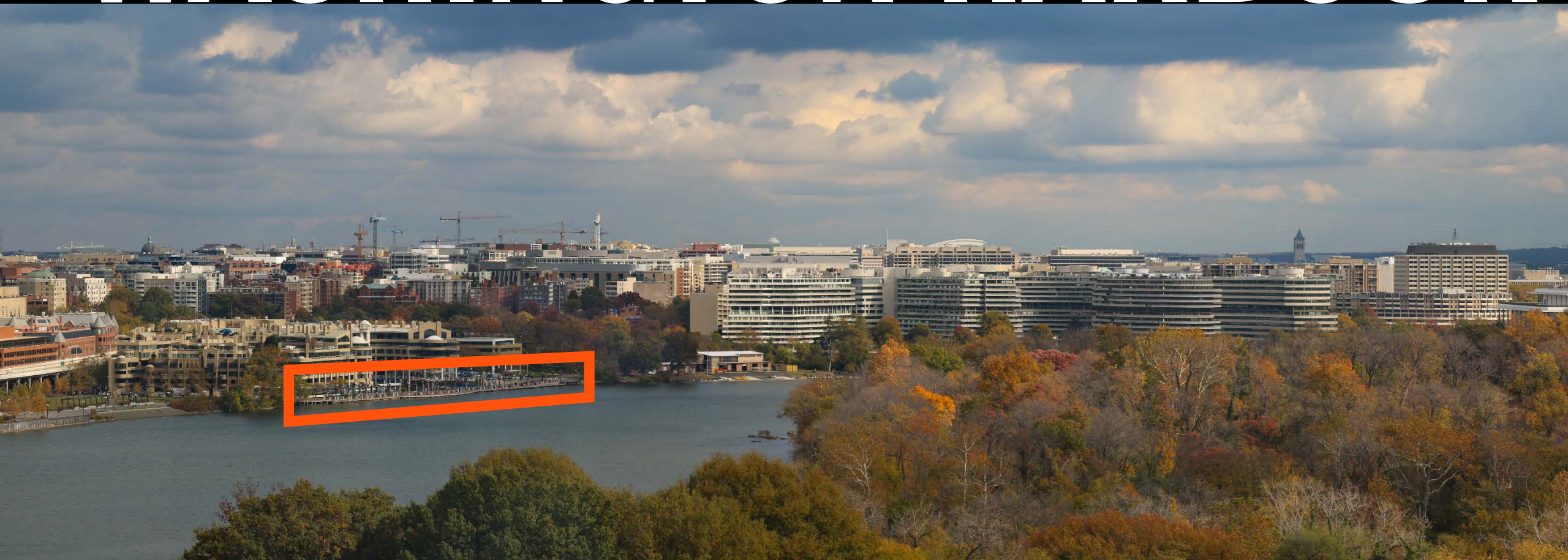
PERKINS EASTMAN

Human by Design

STRATEGIC PLANNING

WASHINGTON HARBOUR

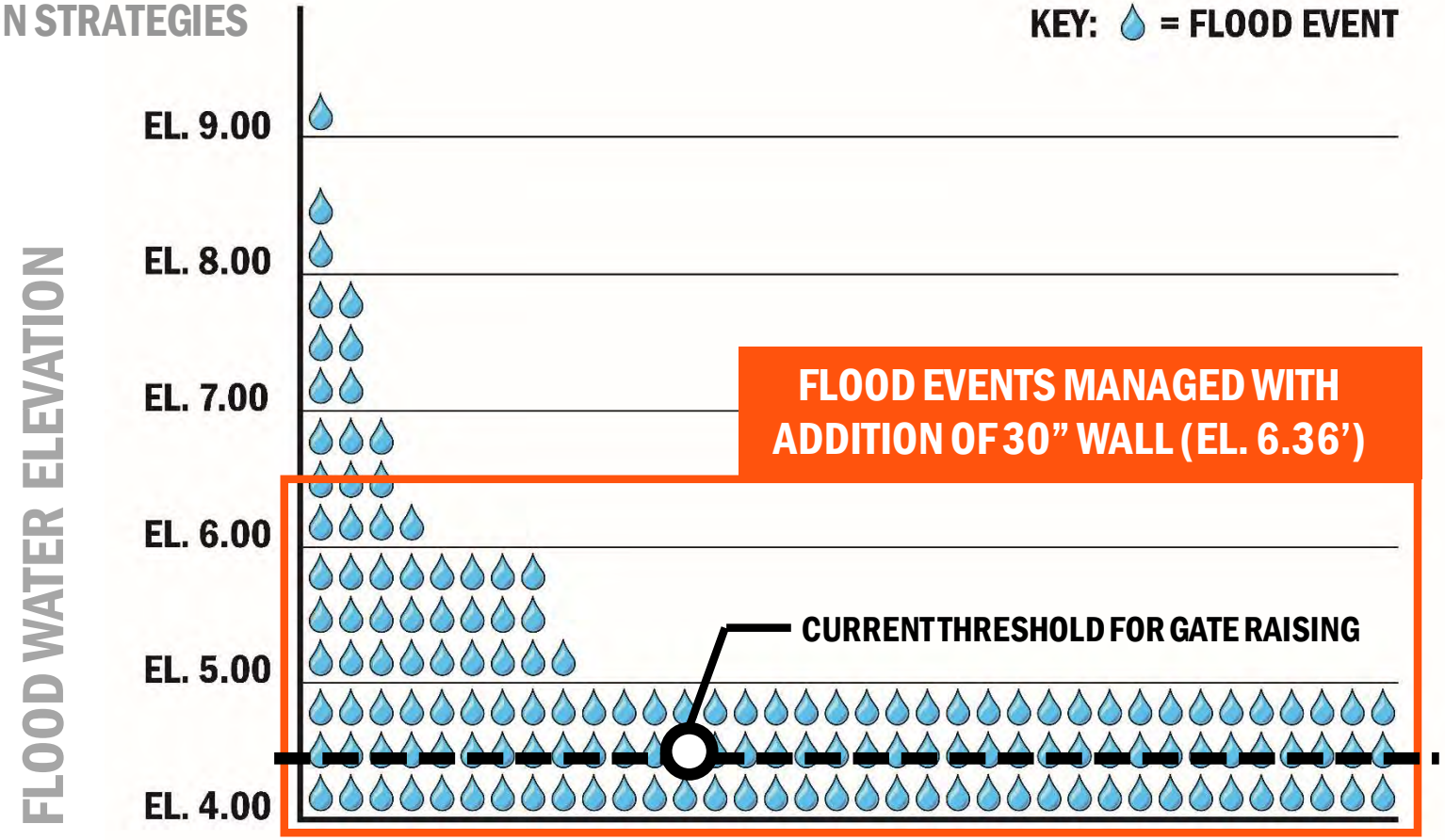


SITE PLAN

WASHINGTON HARBOUR

EXISTING CONDITIONS & CONSTRAINTS

MITIGATION STRATEGIES

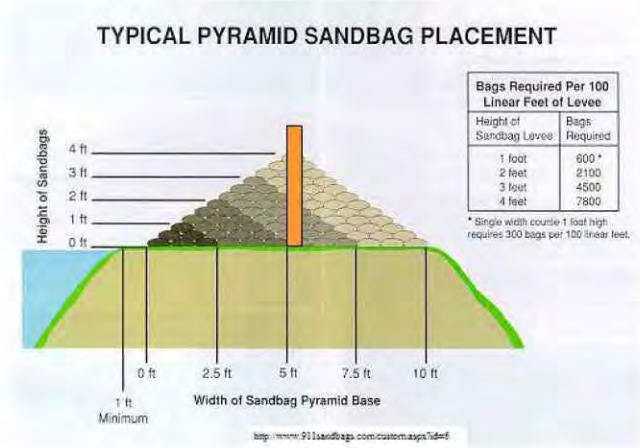


FLOOD EVENTS
(LAST NINE YEARS)

	EXISTING CONDITIONS	WITH 30" WALL
EL. 9.00	1	1
EL. 8.00	2	2
EL. 7.00	6	6
EL. 6.00	10	6.4
EL. 5.00	25	0
EL. 4.00	114	0
TOTAL FLOOD EVENTS	158.00	15.40
AVG. PER YEAR	17.56	
CURRENT AVG. GATE RAISINGS PER YEAR	4.89	
NUMBER OF GATE RAISINGS HAD 30" WALL BEEN IN PLACE		1.71
GATE RAISING PERCENT REDUCTION		65%

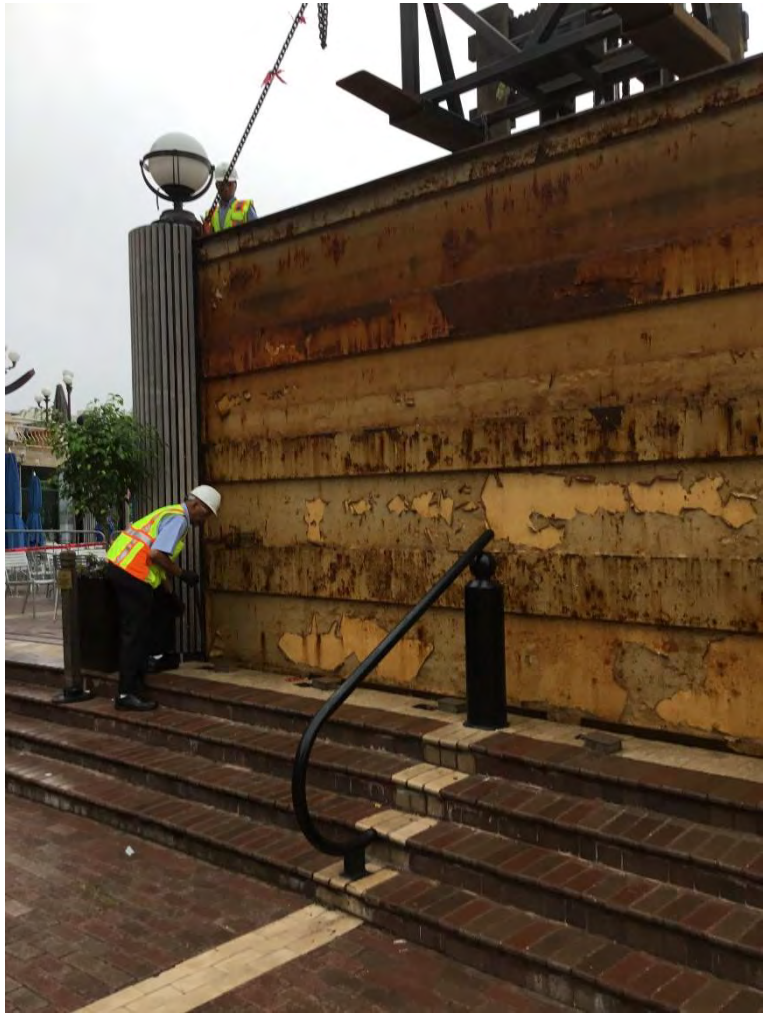
MITIGATION STRATEGIES

- Tiger Dam – single max. height: 42”
  stacked can achieve: 9’
- Sand bags – not enough time to deploy
- Aquafence – max. height: 7’-10”
- Invisible Flood Control Wall – requires storage space



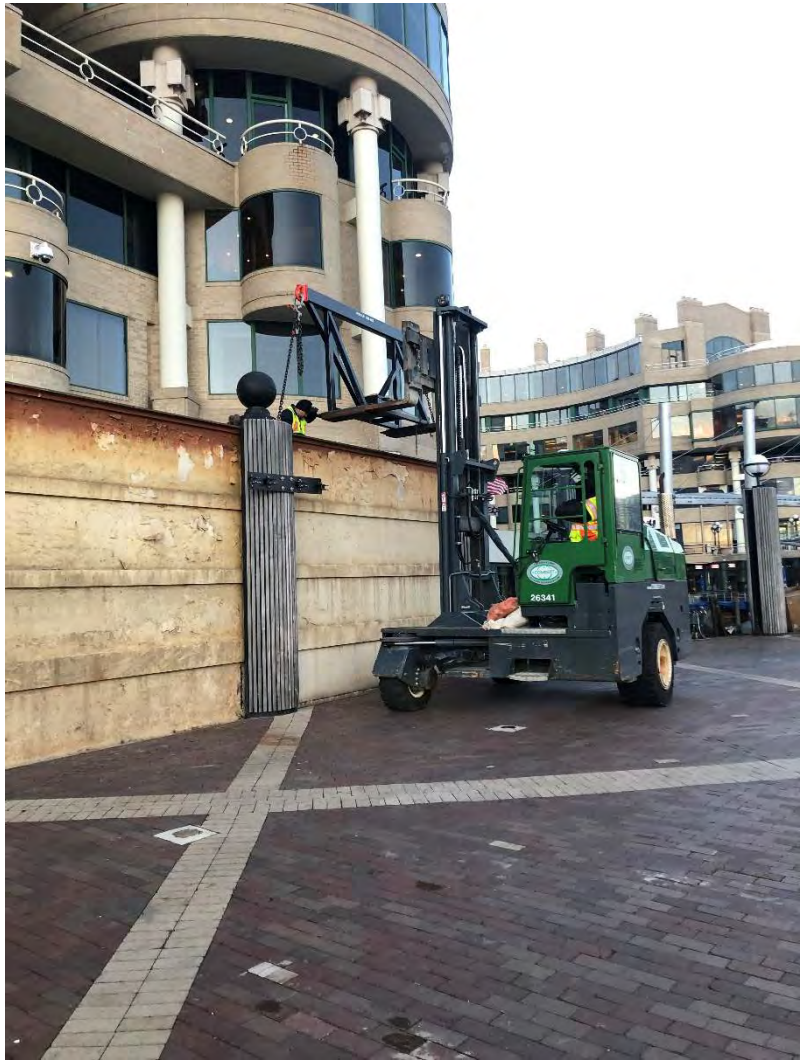
EXISTING CONDITIONS & CONSTRAINTS

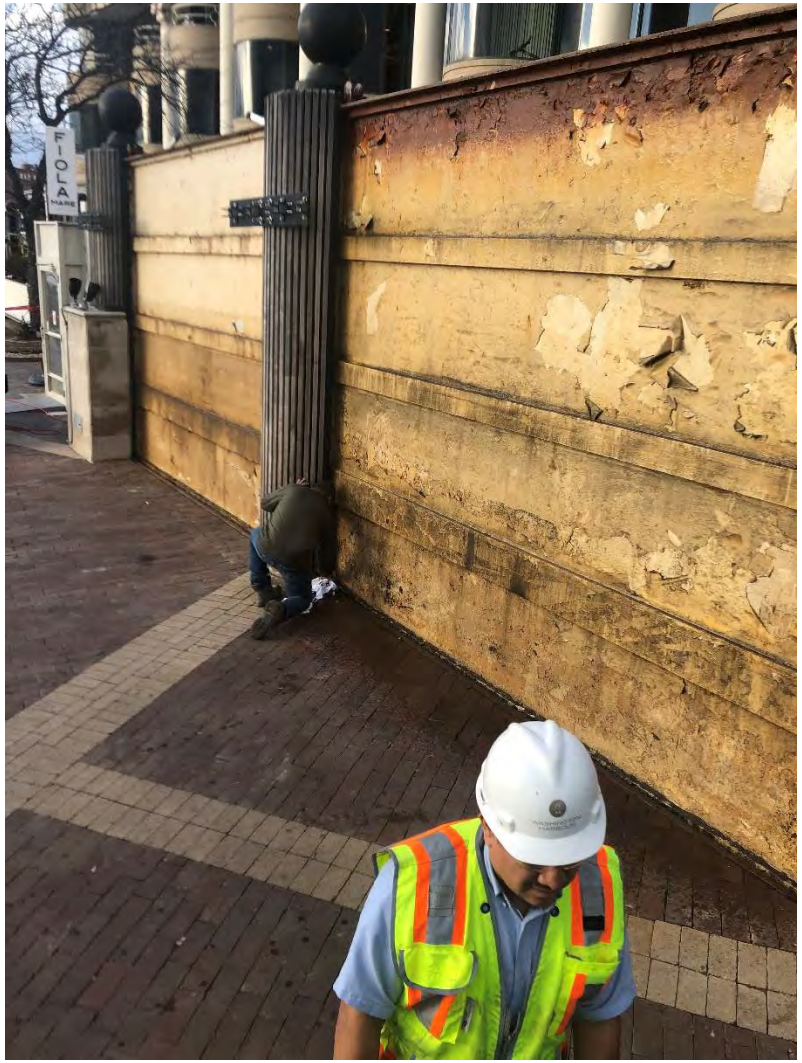
GATE IMAGERY



EXISTING CONDITIONS & CONSTRAINTS

GATE IMAGERY





EXISTING CONDITIONS & CONSTRAINTS

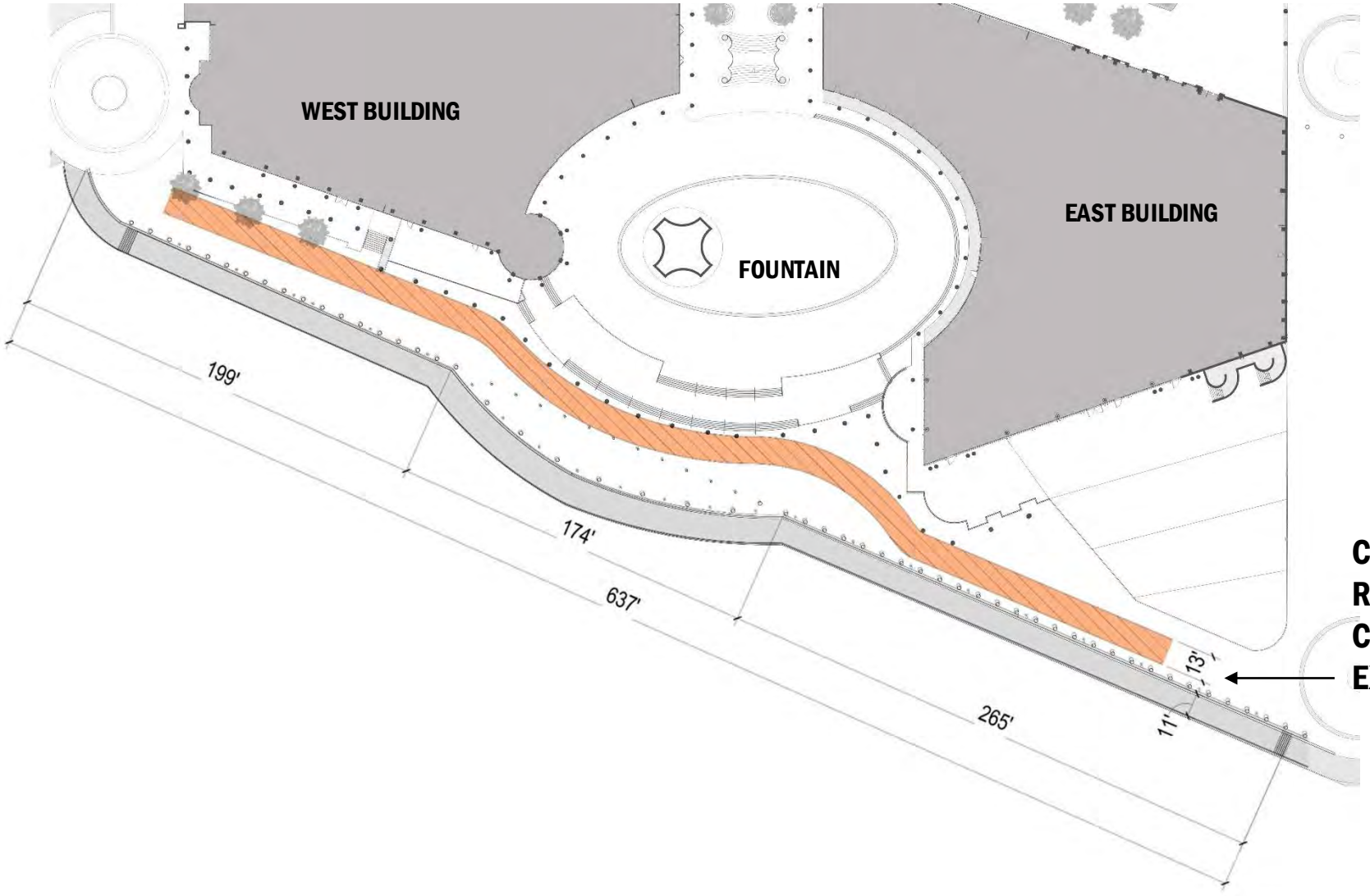
VIEW FROM WATERFRONT

EXISTING CONDITIONS & CONSTRAINTS

FLOOD IMAGERY

EXISTING CONDITIONS & CONSTRAINTS

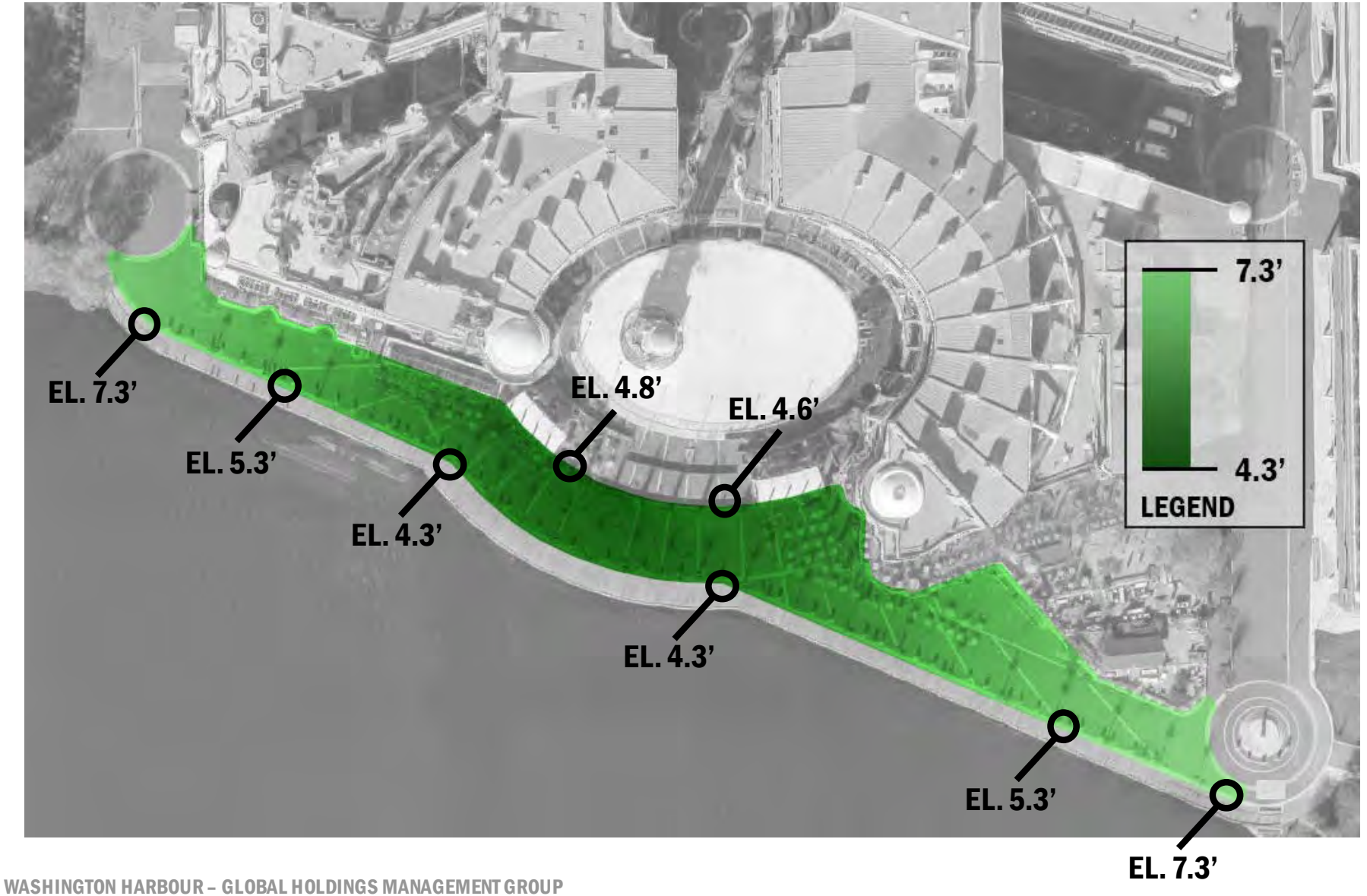
COMBI LIFT PATH



CLEARANCE REQUIRED FOR COMBI LIFT FOR EXISTING GATES

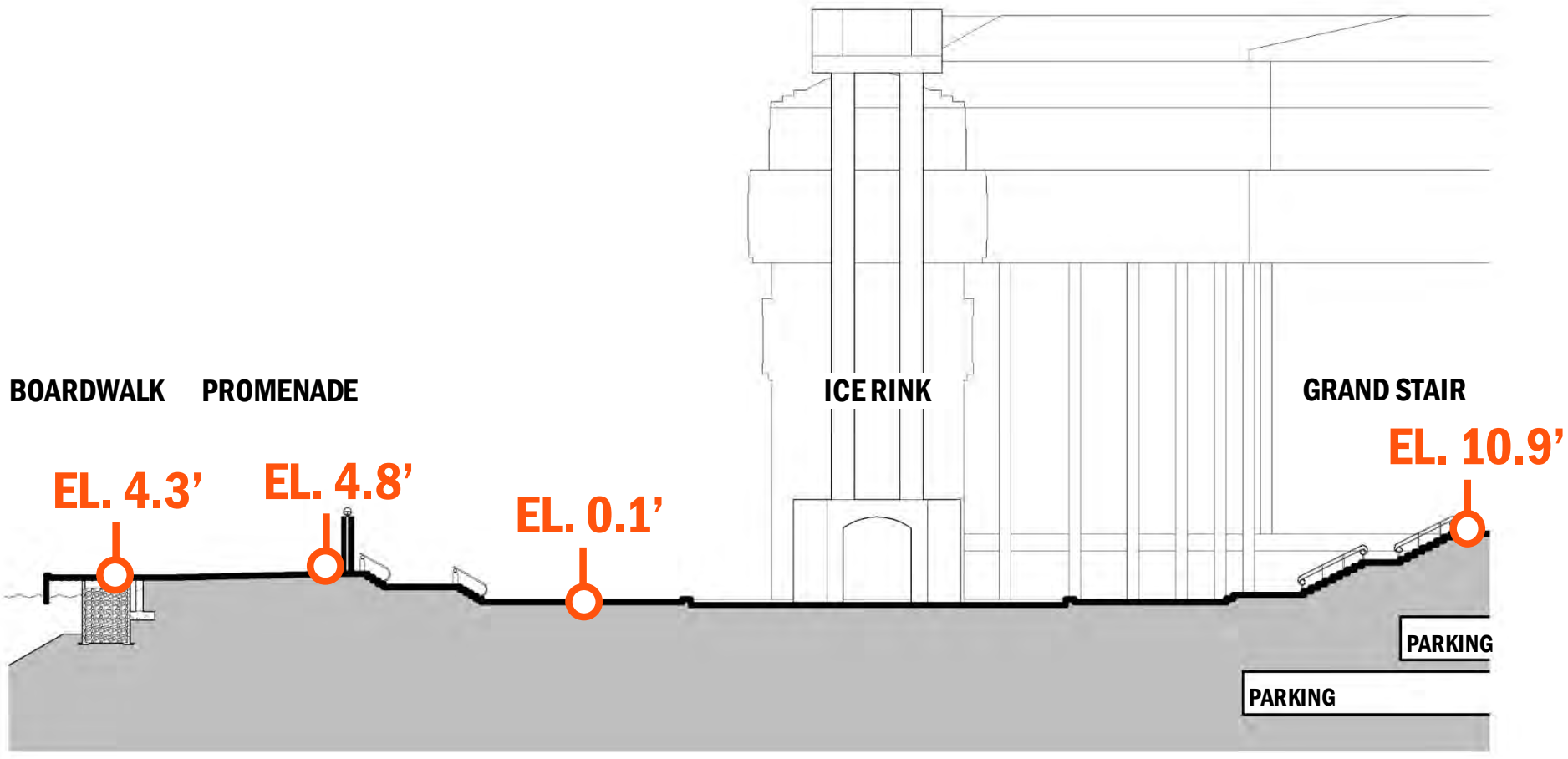
SITE ANALYSIS

TOPOGRAPHIC DIAGRAM



SITE ANALYSIS

SECTION VIEW



CONTEXTUAL MATERIALS

WASHINGTON HARBOUR

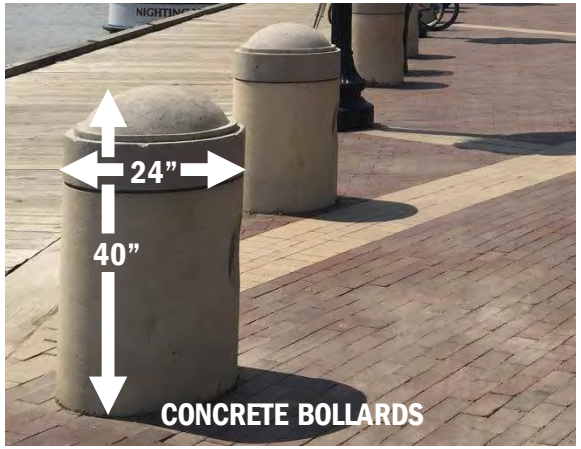

CAST STONE FOUNTAIN EDGE


TREATED WOOD DECKING


MULTI-COLOR BRICK PAVERS

EXISTING STAIR TO BOARDWALK


CAST STONE PLANTER BENCH



CONCRETE BOLLARDS

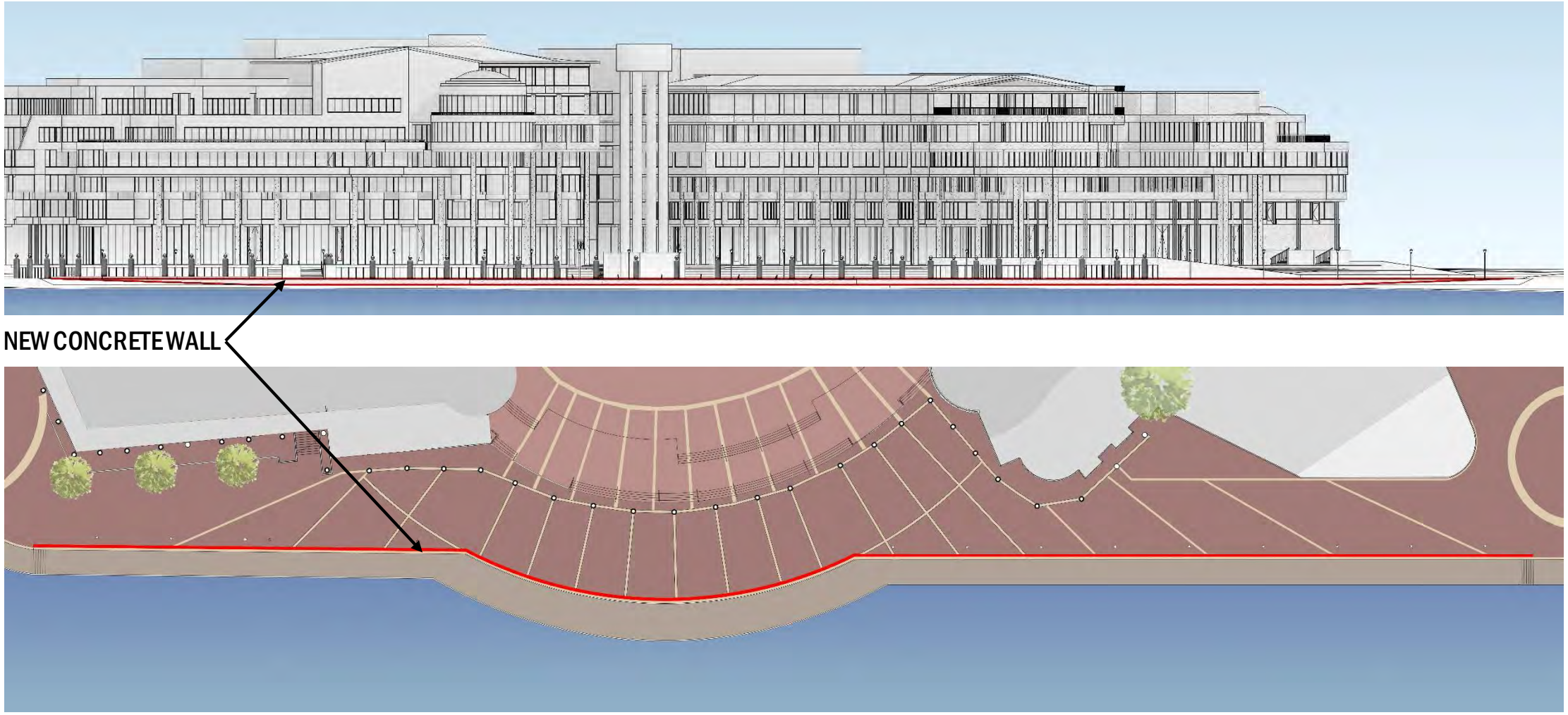

LIMESTONE + PAINTED CONCRETE

KNEE WALL

BASE DESIGN

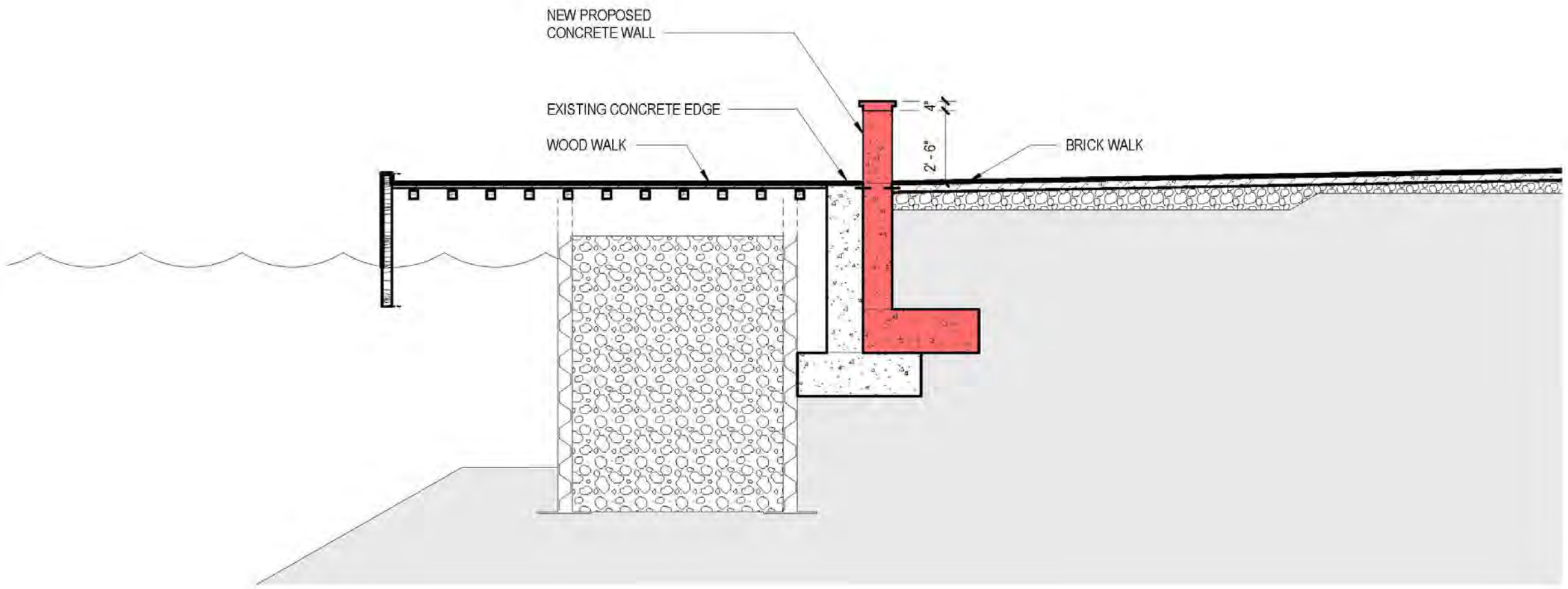
KNEE WALL

BASE DESIGN PLAN & ELEVATION



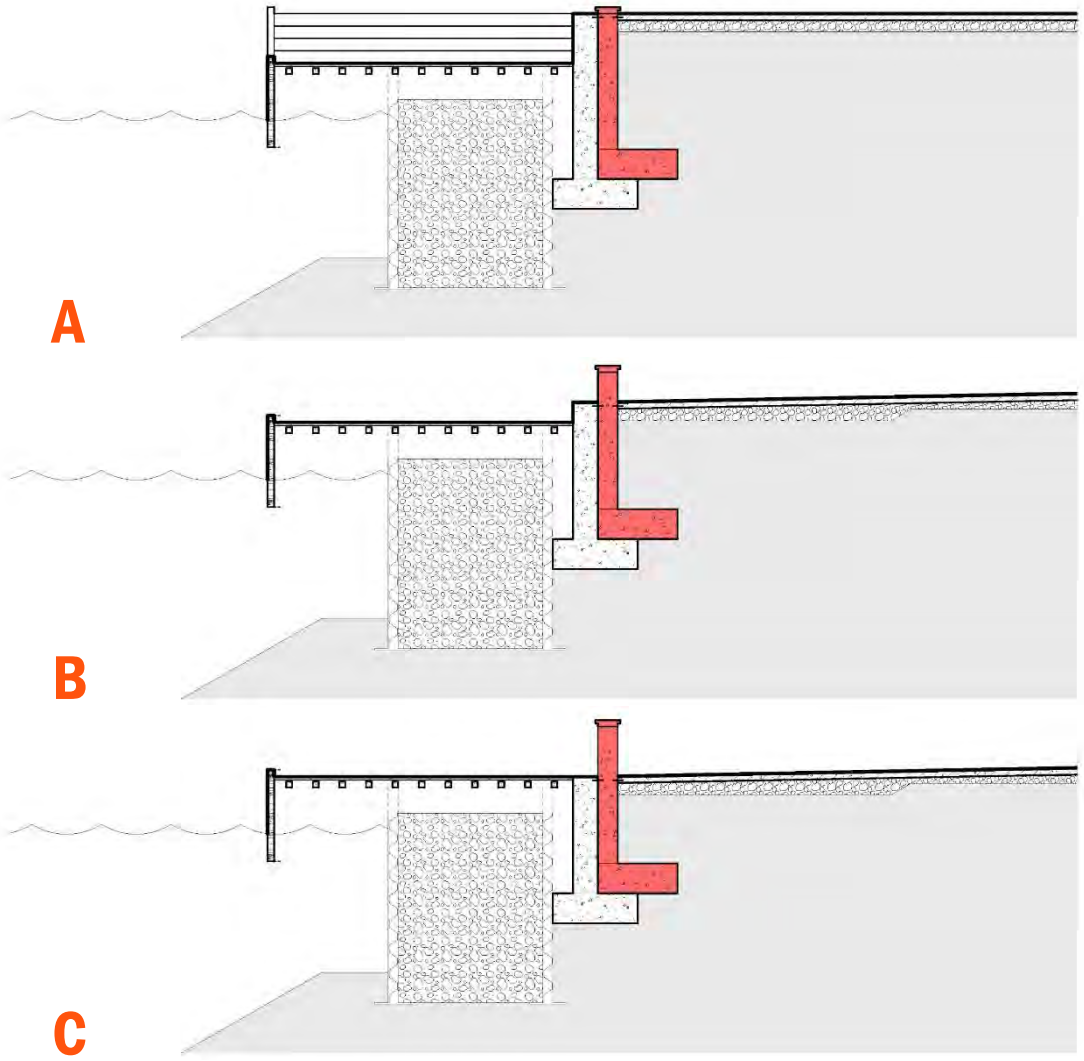
KNEE WALL

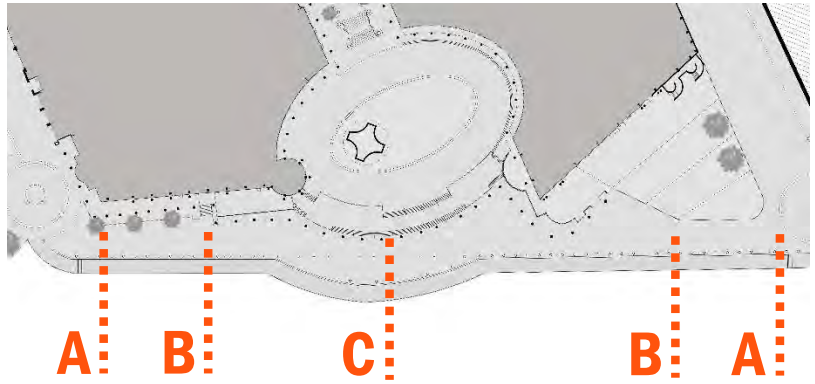
BASE DESIGN SECTION – KNEE WALL



KNEE WALL

SECTIONS ALONG PROPOSED OPTION

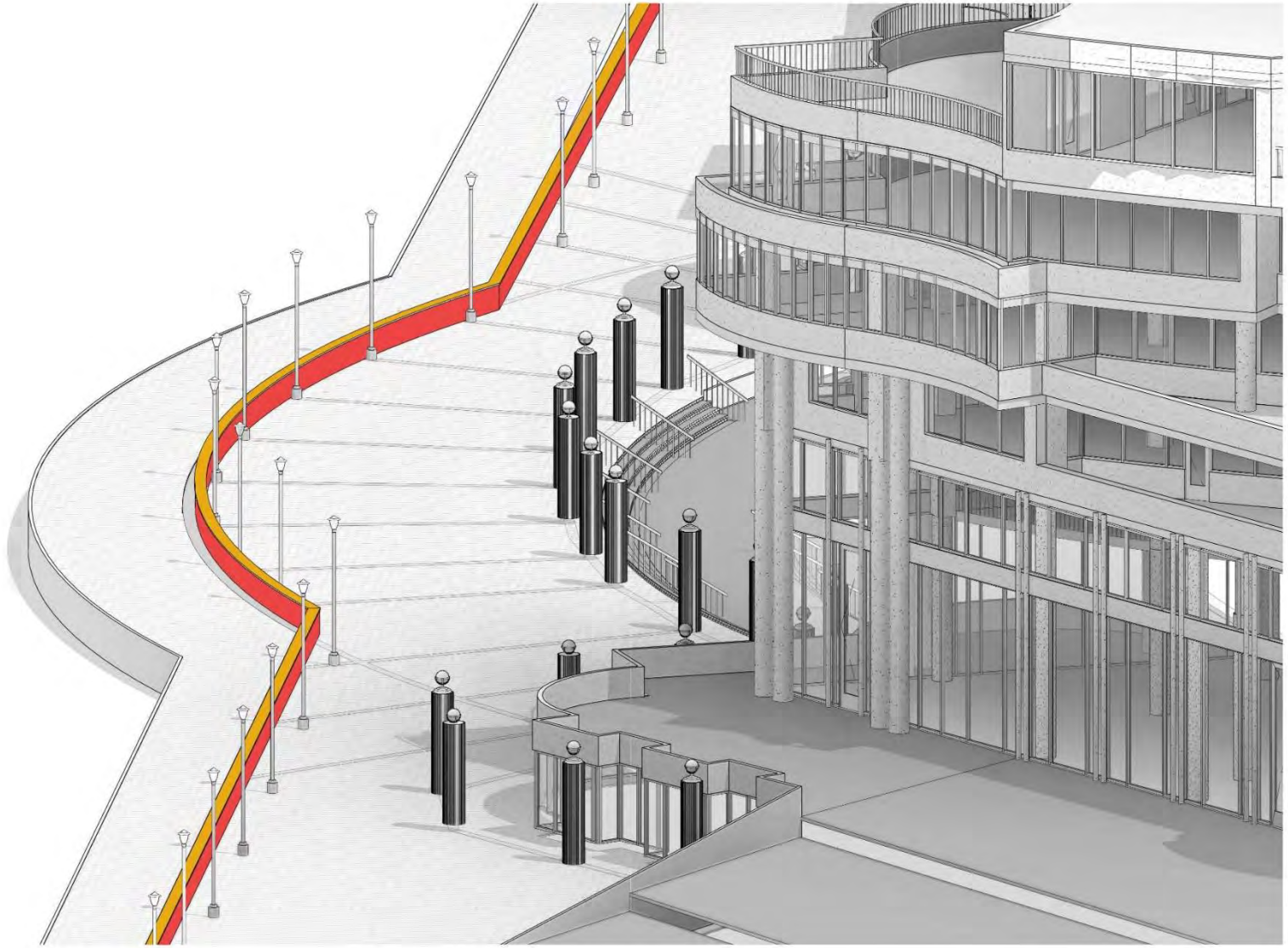




KEY PLAN

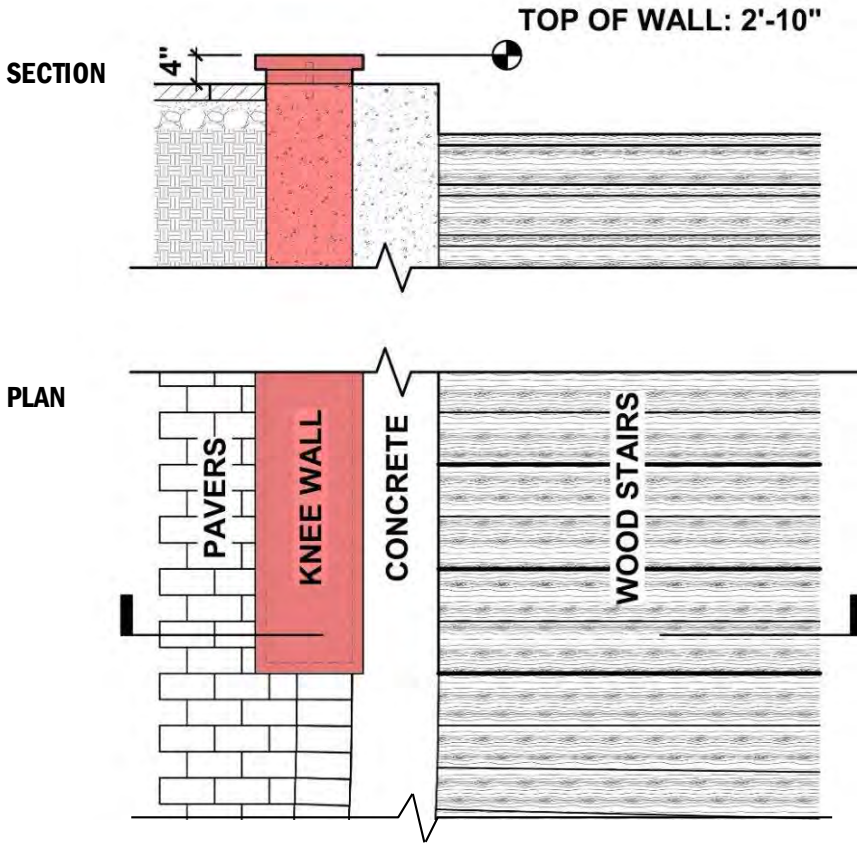
KNEE WALL

BASE DESIGN – AERIAL DIAGRAM

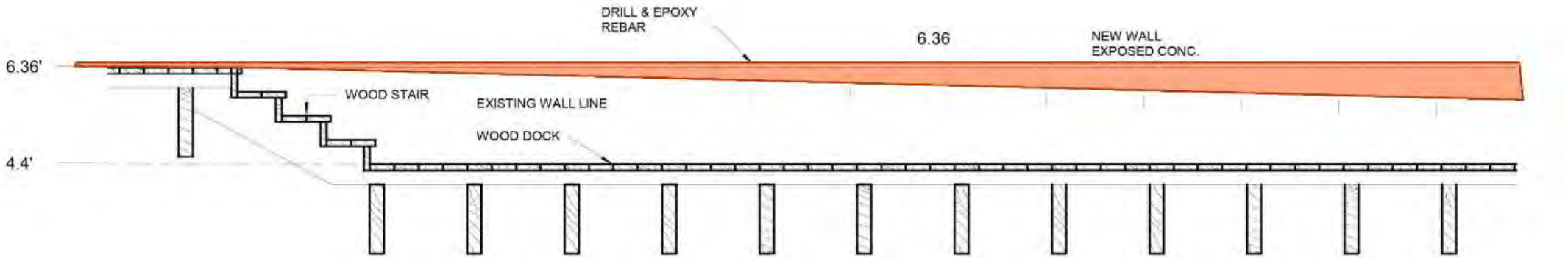


KNEE WALL

END OF WALL – PLAN & SECTION DETAIL



DOCK STAIR SECTION & DETAIL



KNEE WALL

BASE DESIGN– RIVER VIEW LOOKING EAST (EXISTING)

KEY PLAN

KNEE WALL

BASE DESIGN– RIVER VIEW LOOKING EAST (EXISTING)

KEY PLAN

KNEE WALL

BASE DESIGN– RIVER VIEW LOOKING WEST (PROPOSED)

KEY PLAN

GATE DOWN

BASE DESIGN – RIVER VIEW LOOKING SOUTH FROM GRAND STAIR (EXISTING)

KEY PLAN

MAIN GATE UP

BASE DESIGN – RIVER VIEW LOOKING SOUTH FROM GRAND STAIR (EXISTING)

KEY PLAN

KNEE WALL

BASE DESIGN – RIVER VIEW LOOKING SOUTH FROM GRAND STAIR (PROPOSED)

KEY PLAN

KNEE WALL

BASE DESIGN – RIVER VIEW LOOKING SOUTH FROM GRAND STAIR (PROPOSED)

KEY PLAN

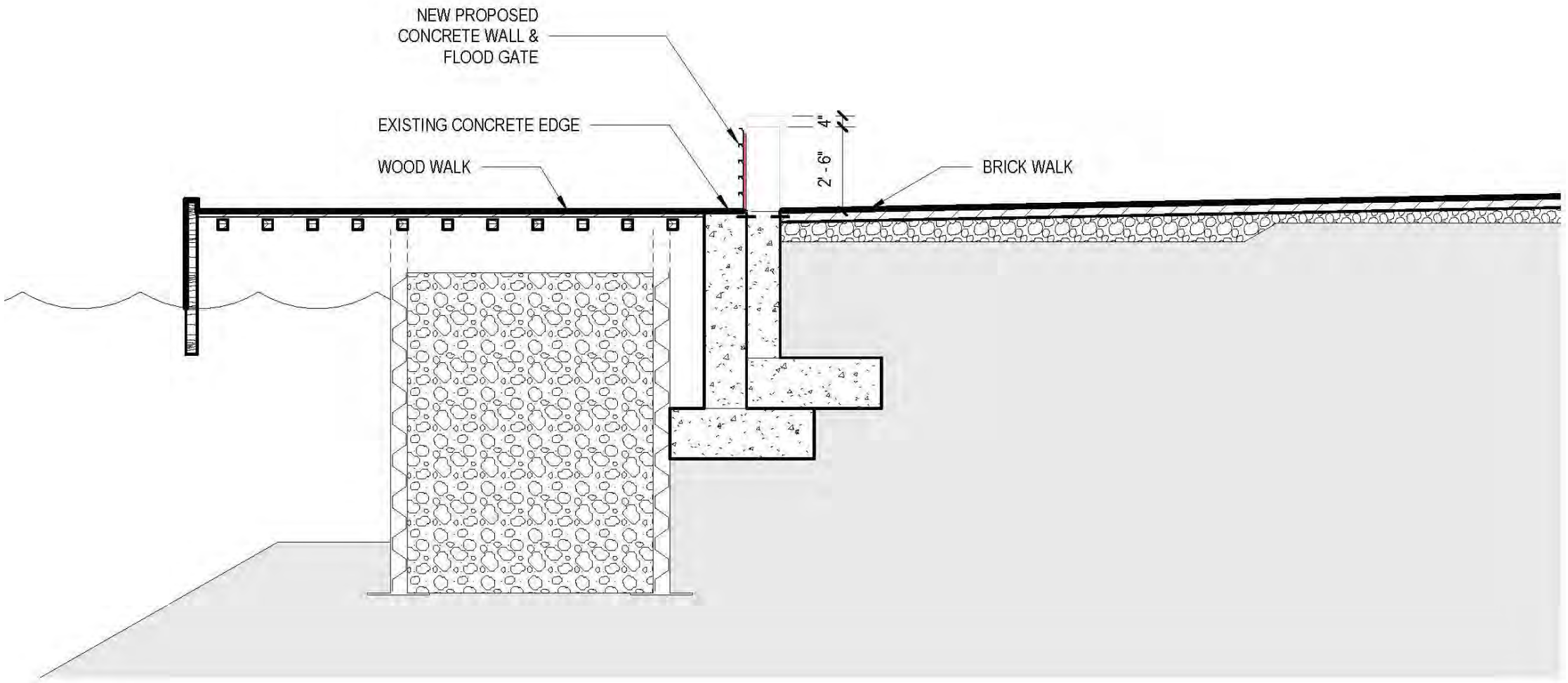
KNEE WALL

WITH FLOOD GATE

BASE DESIGN

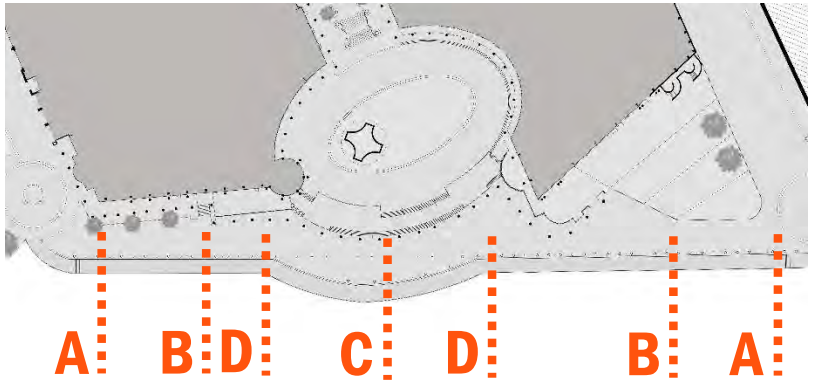
KNEE WALL WITH FLOOD GATE

BASE DESIGN SECTION – KNEE WALL

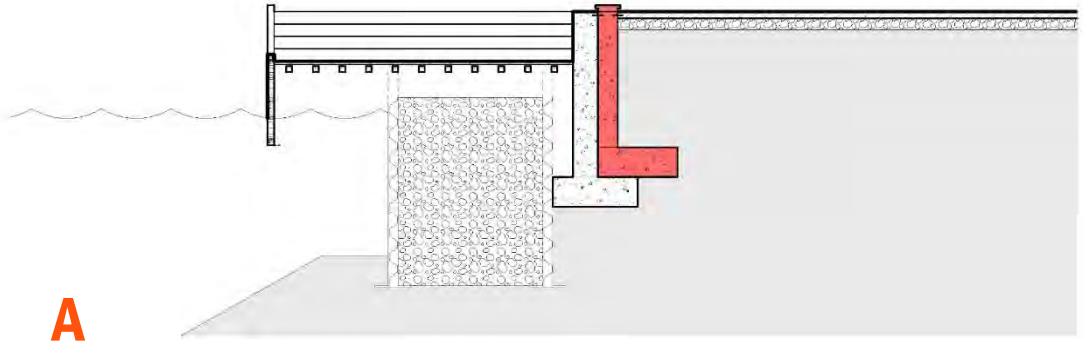


KNEE WALL WITH FLOOD GATE

SECTIONS ALONG PROPOSED OPTION



KEY PLAN



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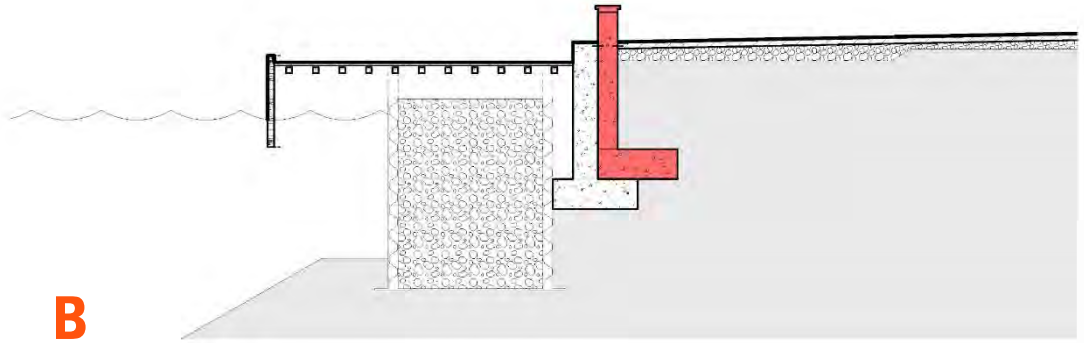

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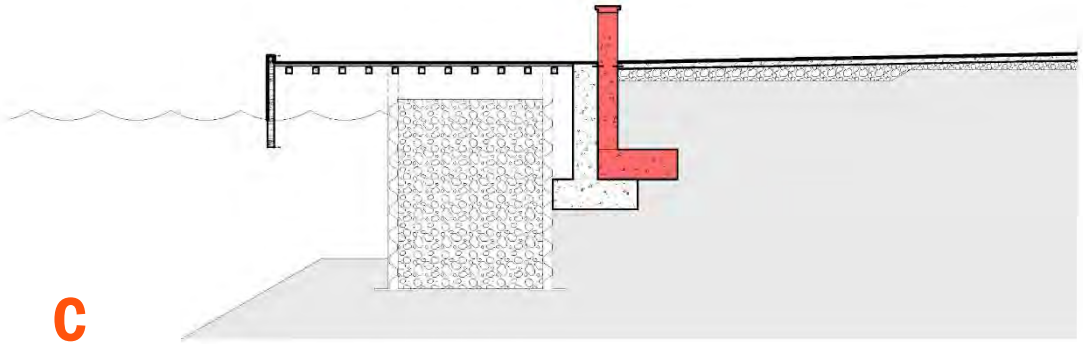

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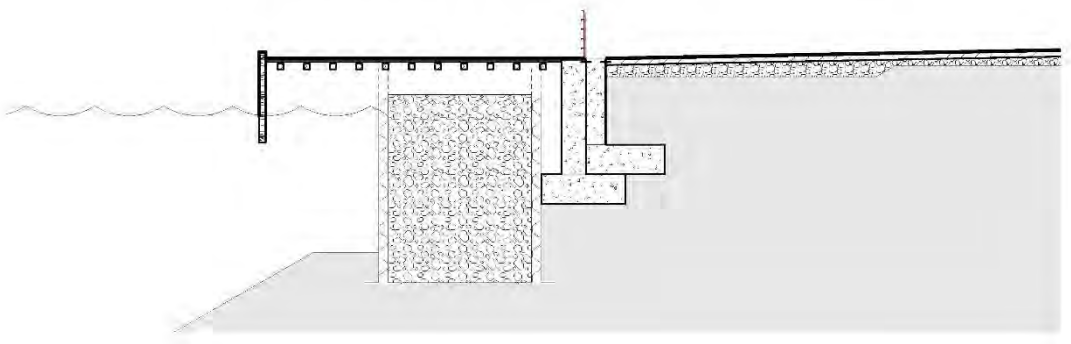
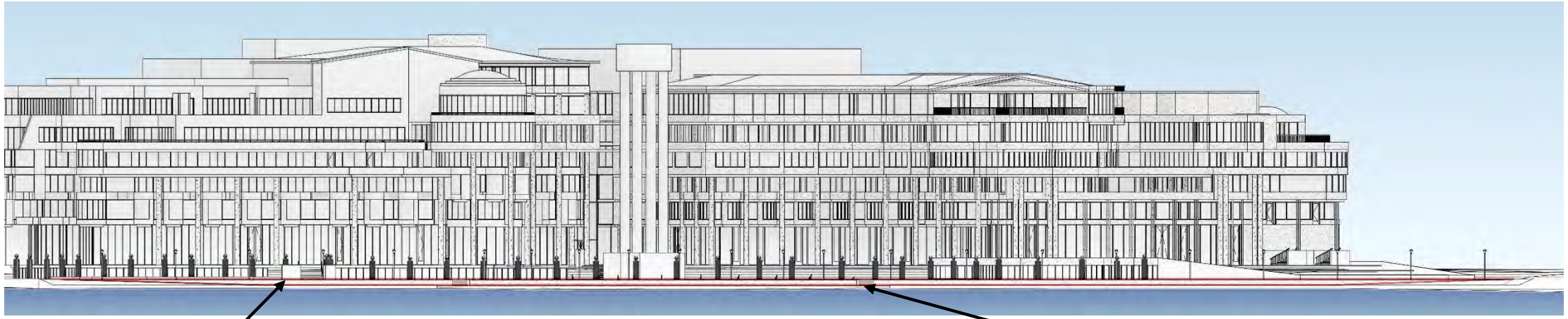


D

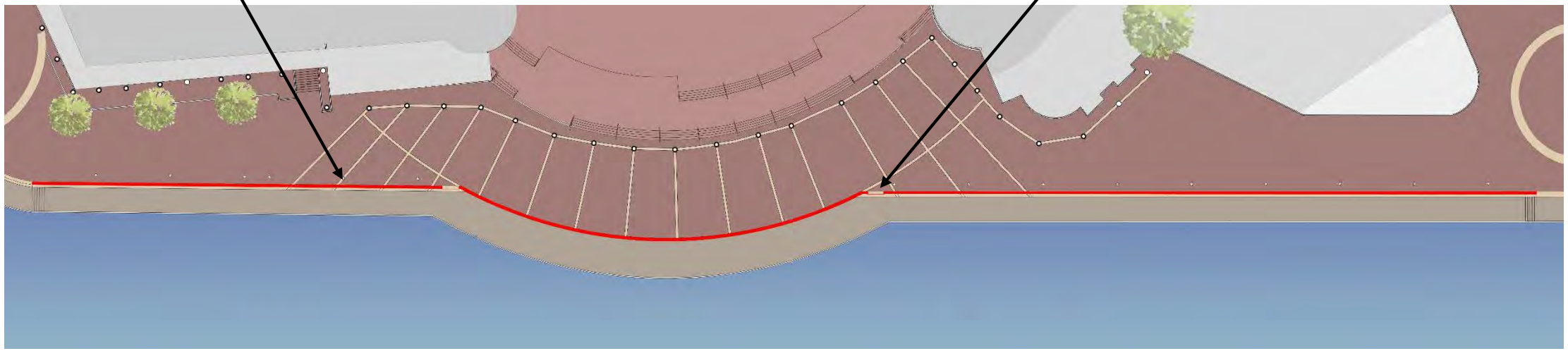
KNEE WALL WITH FLOOD GATE

BASE DESIGN PLAN & ELEVATION



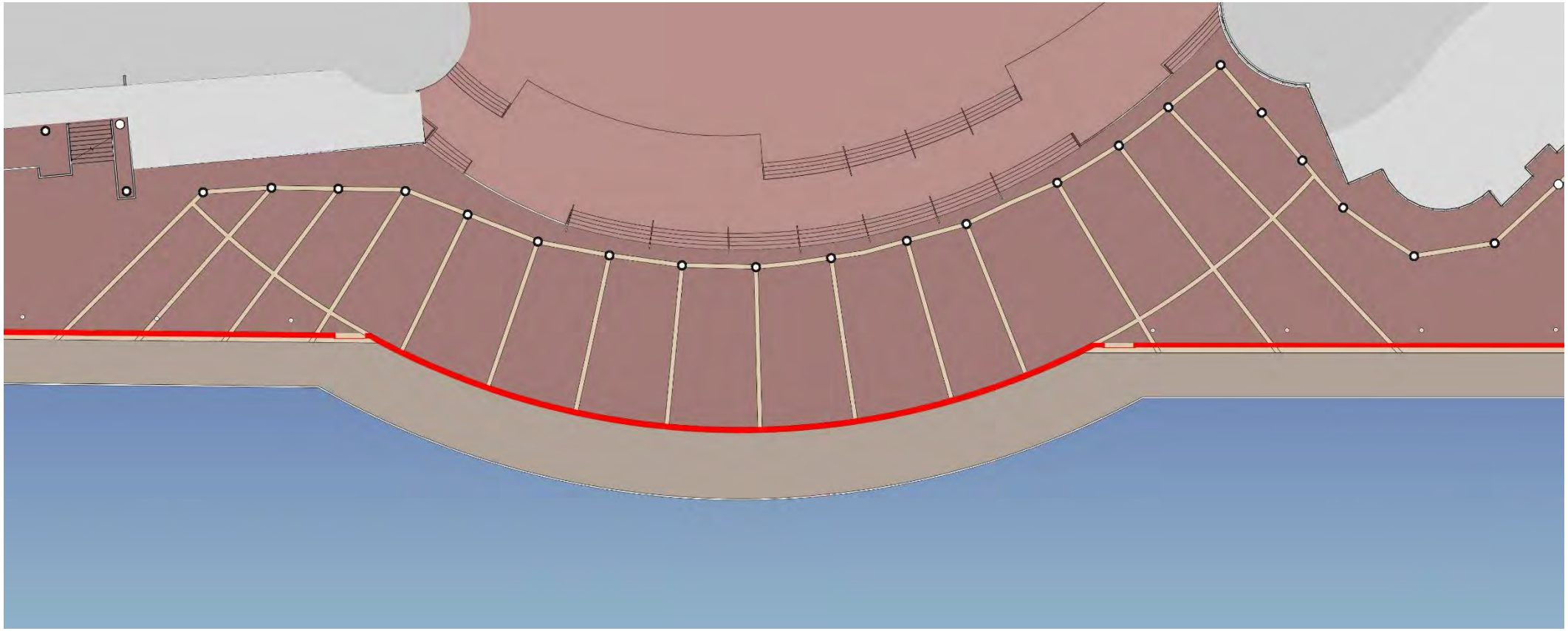
NEW CONCRETE WALL

6’-0” FLOOD GATE



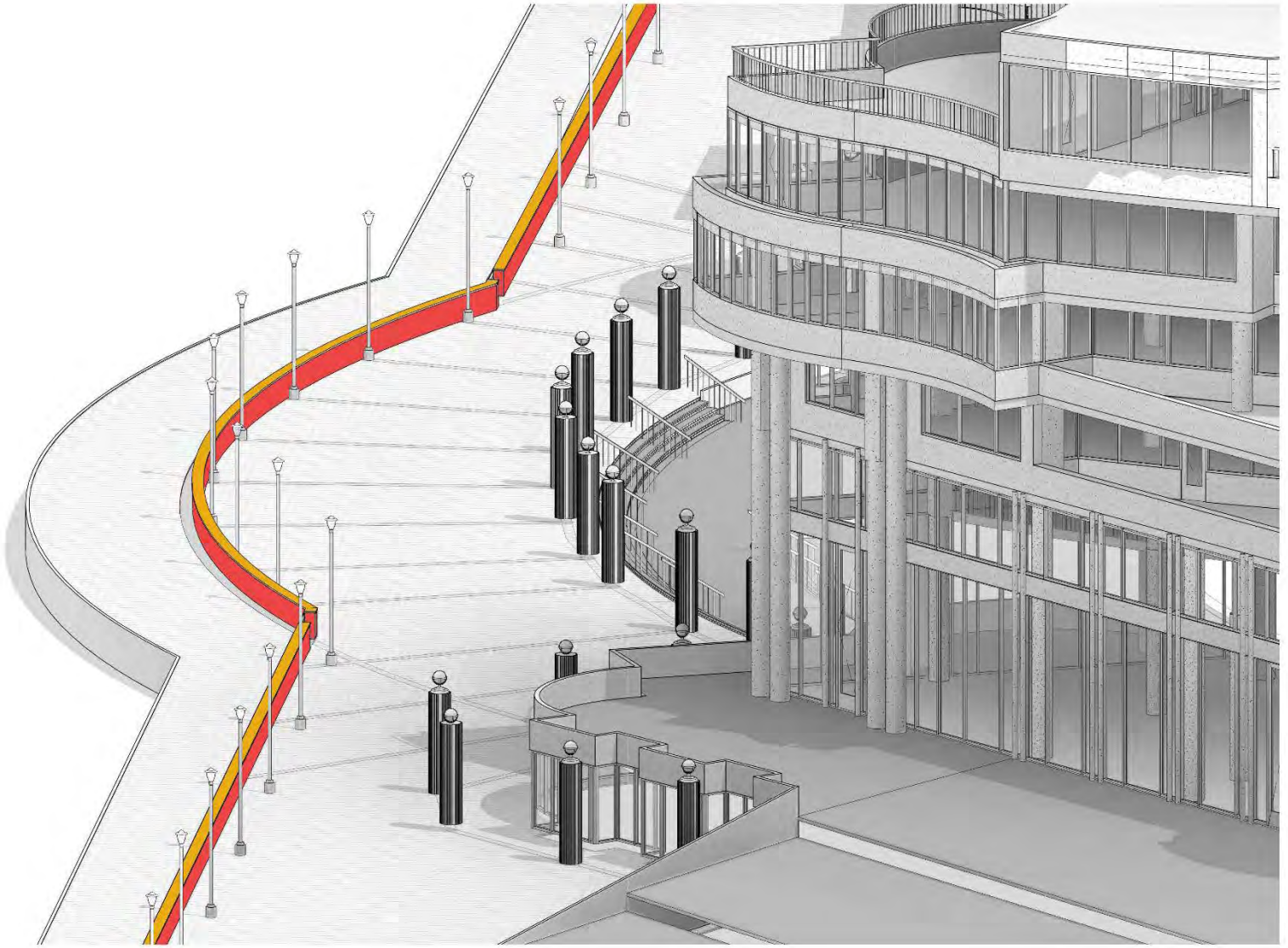
KNEE WALL WITH FLOOD GATE

ENLARGED PLAN



KNEE WALL WITH FLOOD GATE

BASE DESIGN – AERIAL DIAGRAM



KNEE WALL WITH FLOOD GATE

BASE DESIGN– RIVER VIEW LOOKING EAST (EXISTING)

KEY PLAN

KNEE WALL WITH FLOOD GATE

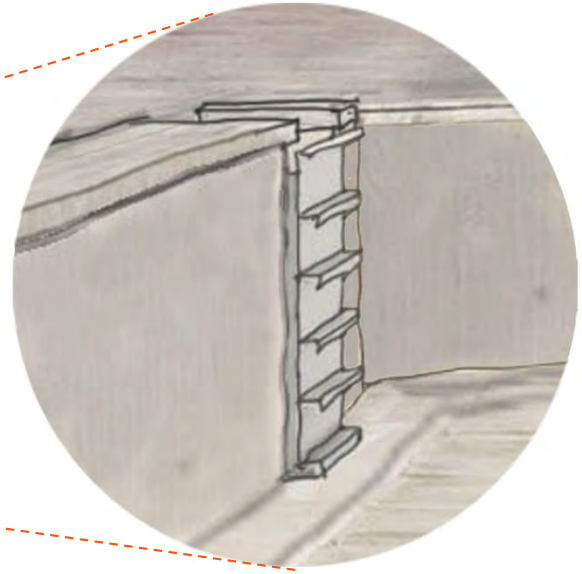
BASE DESIGN– RIVER VIEW LOOKING EAST (EXISTING)

KEY PLAN

KNEE WALL WITH FLOOD GATE

BASE DESIGN– RIVER VIEW LOOKING EAST (PROPOSED)

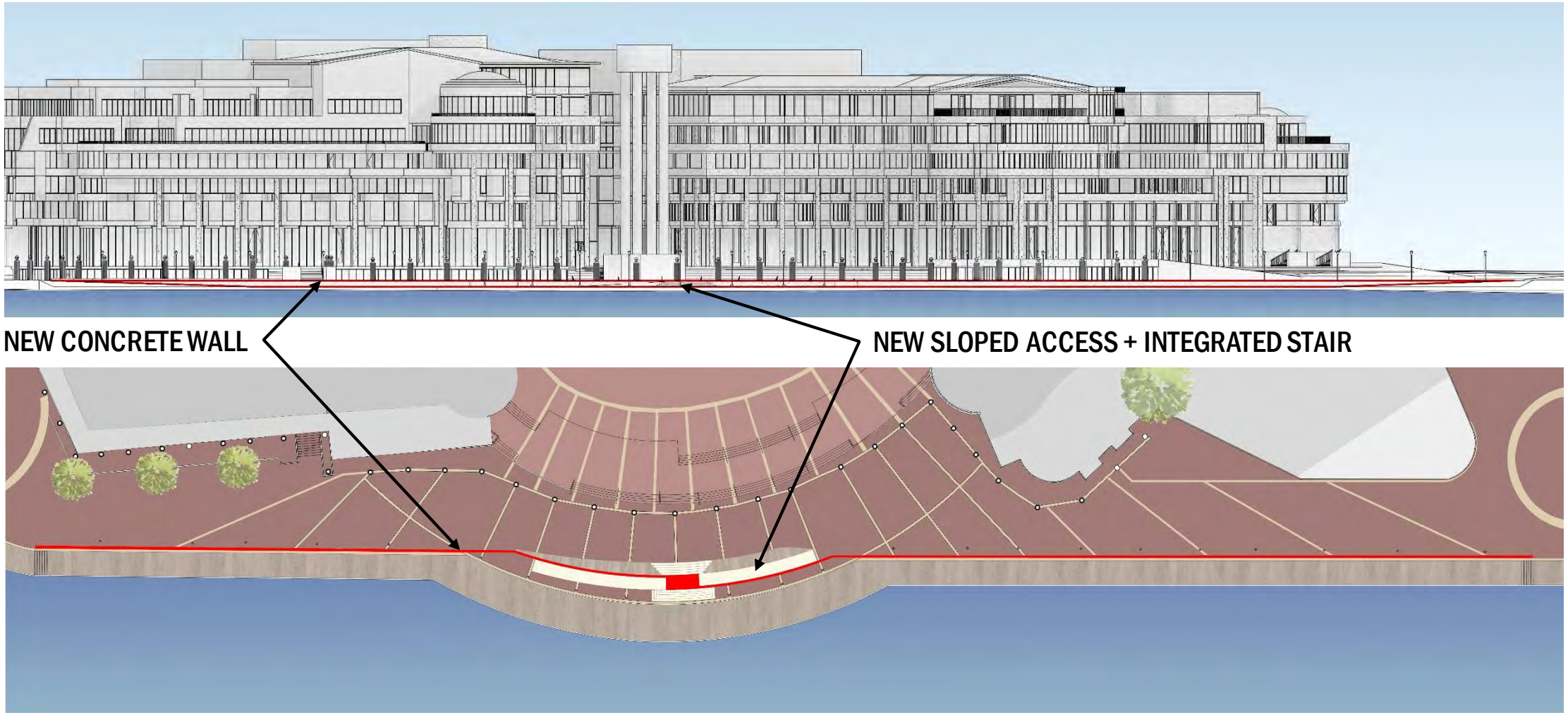
KEY PLAN



STAIR WALL

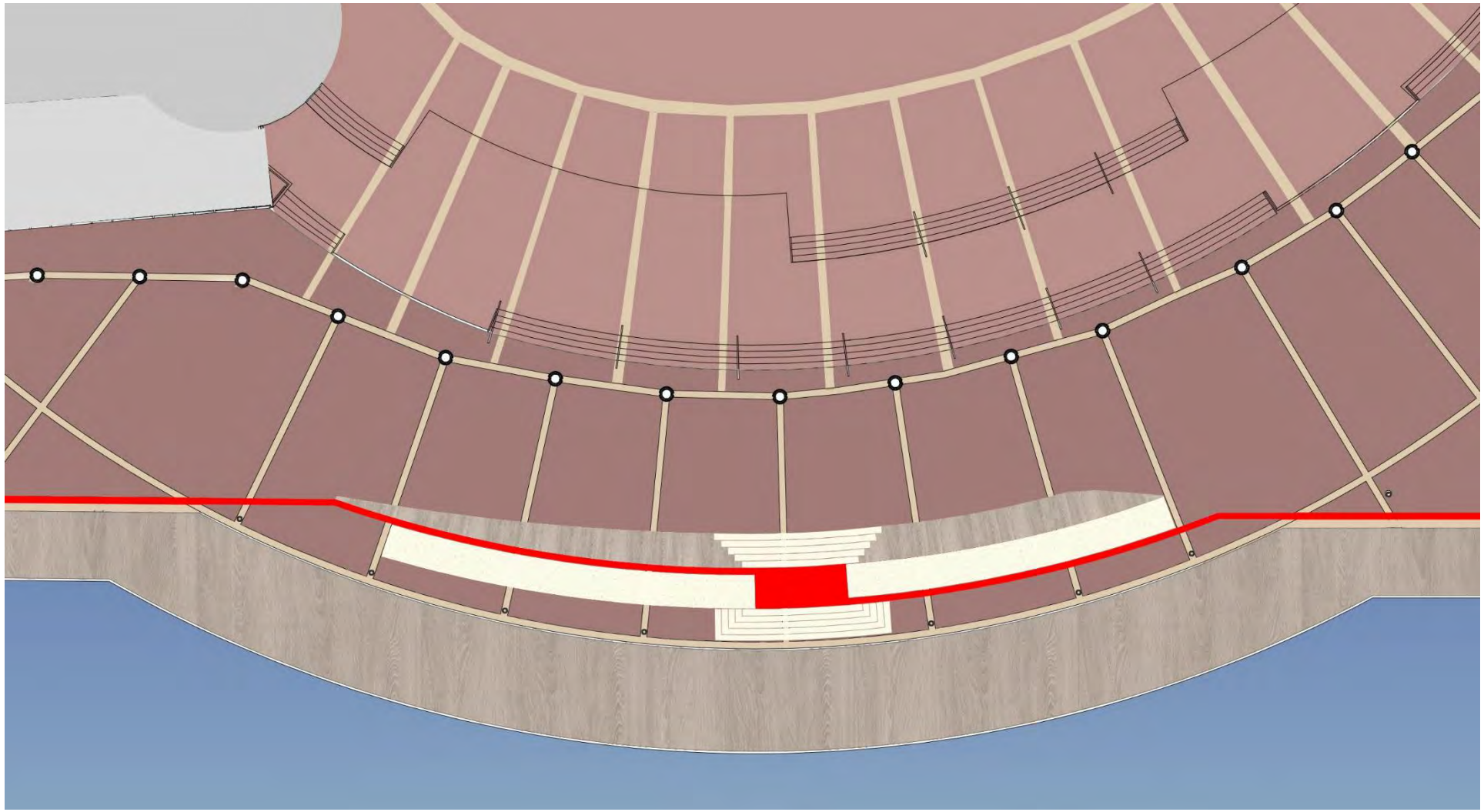
STAIR WALL

PLAN & ELEVATION



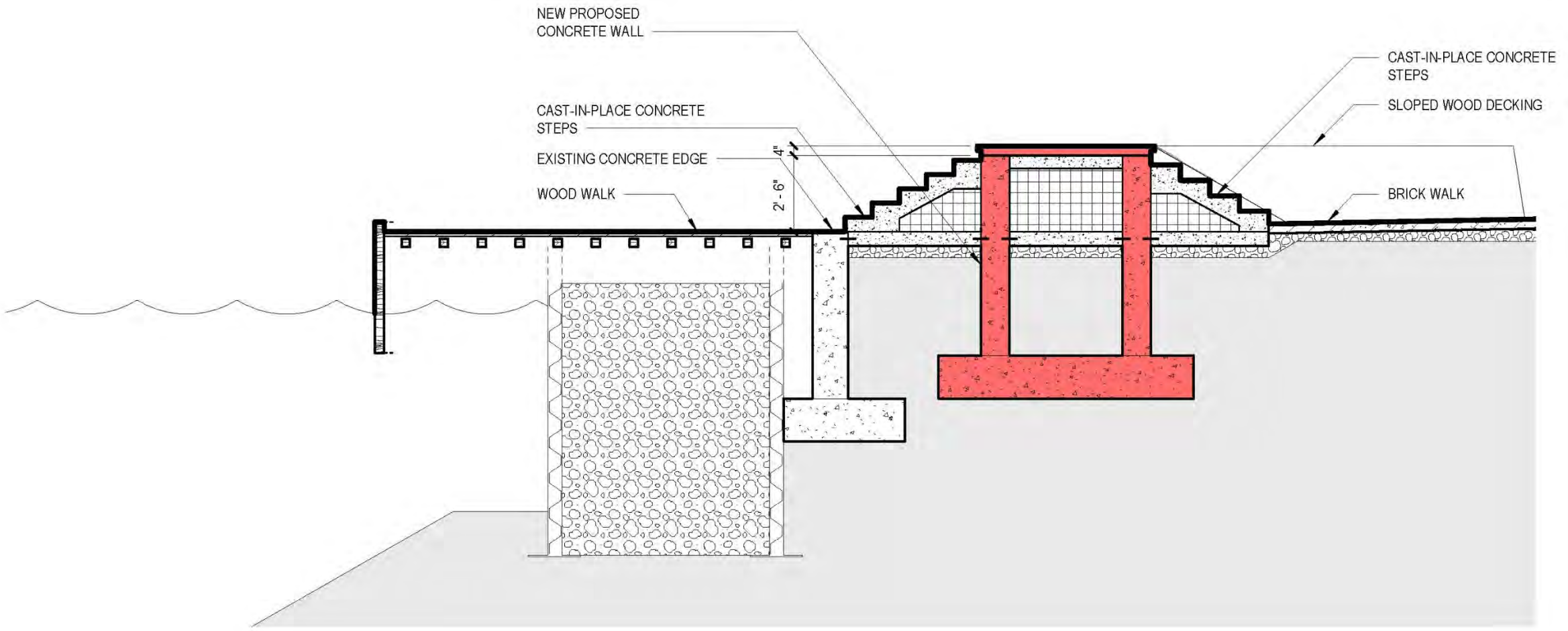
STAIR WALL

ENLARGED PLAN



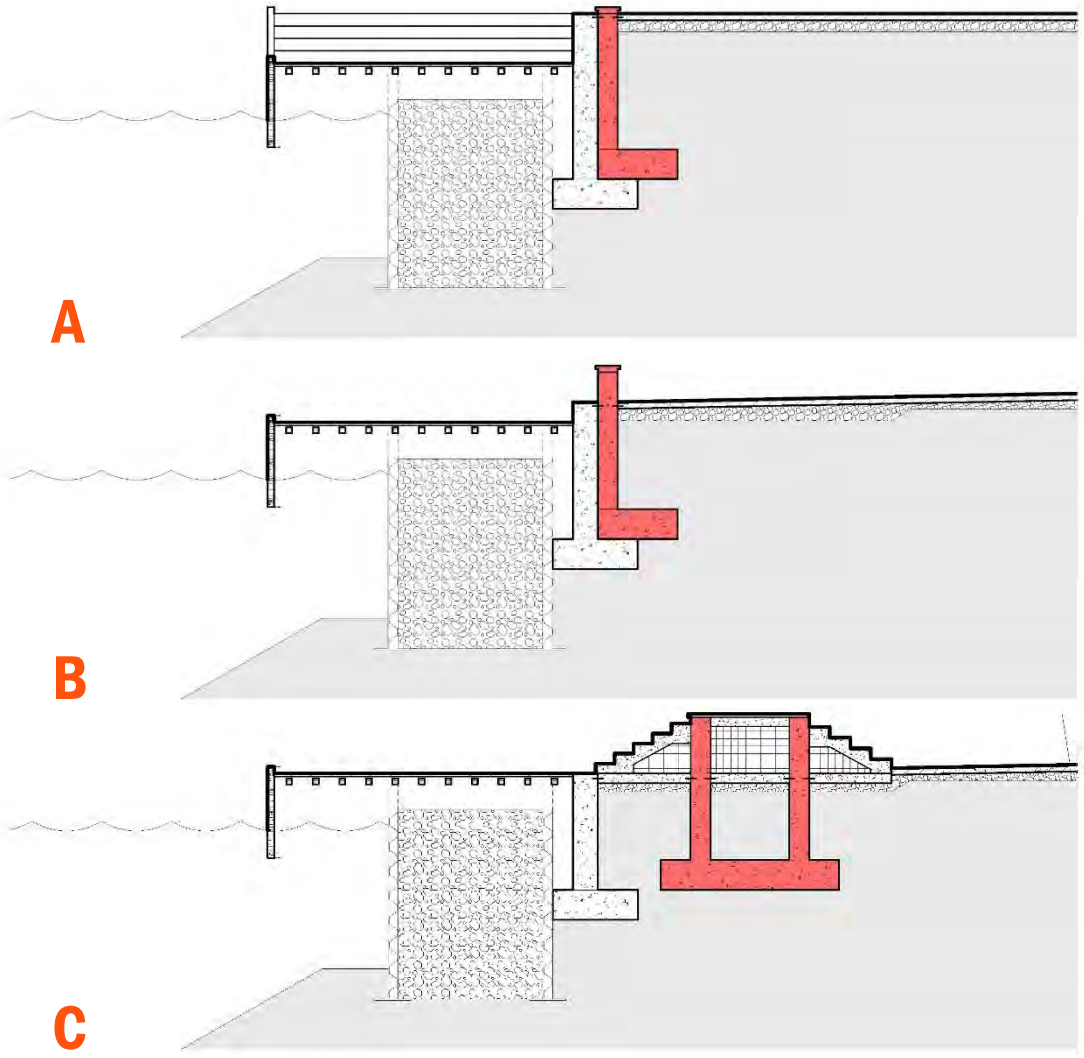
STAIR WALL

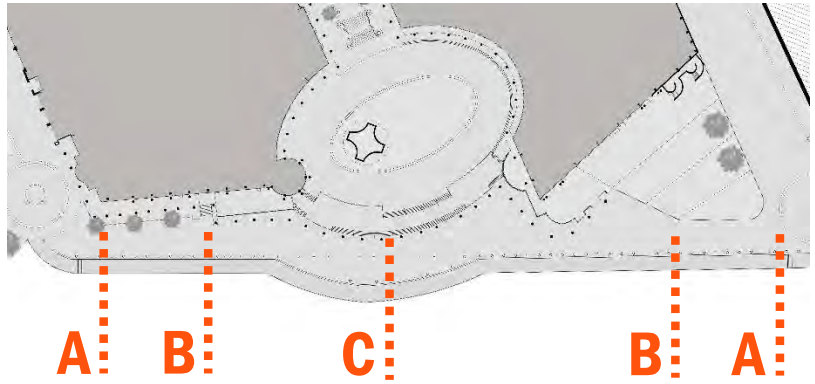
SECTION – STAIR-SLOPE



STAIR WALL

SECTIONS ALONG PROPOSED OPTION

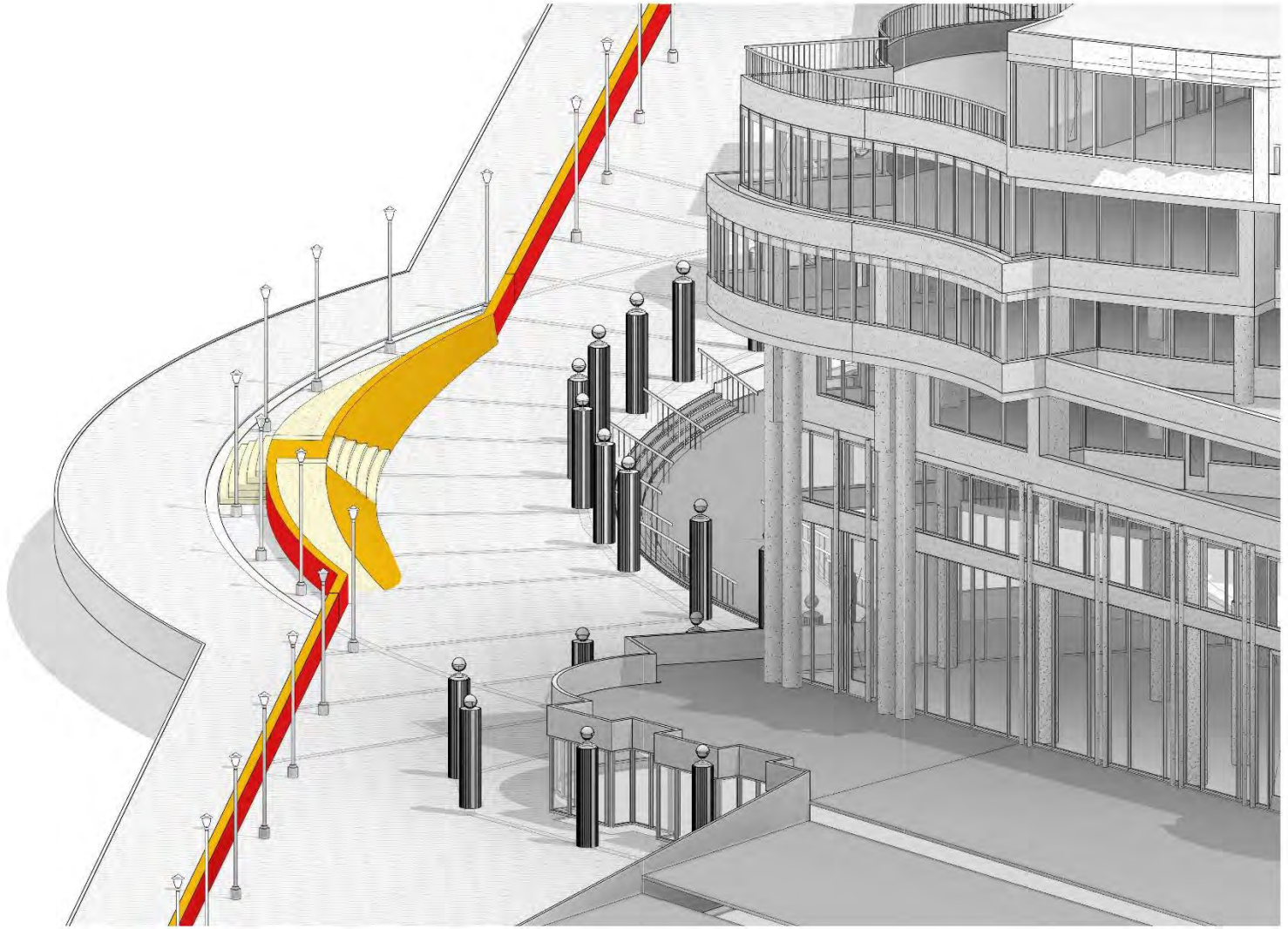




KEY PLAN

STAIR WALL

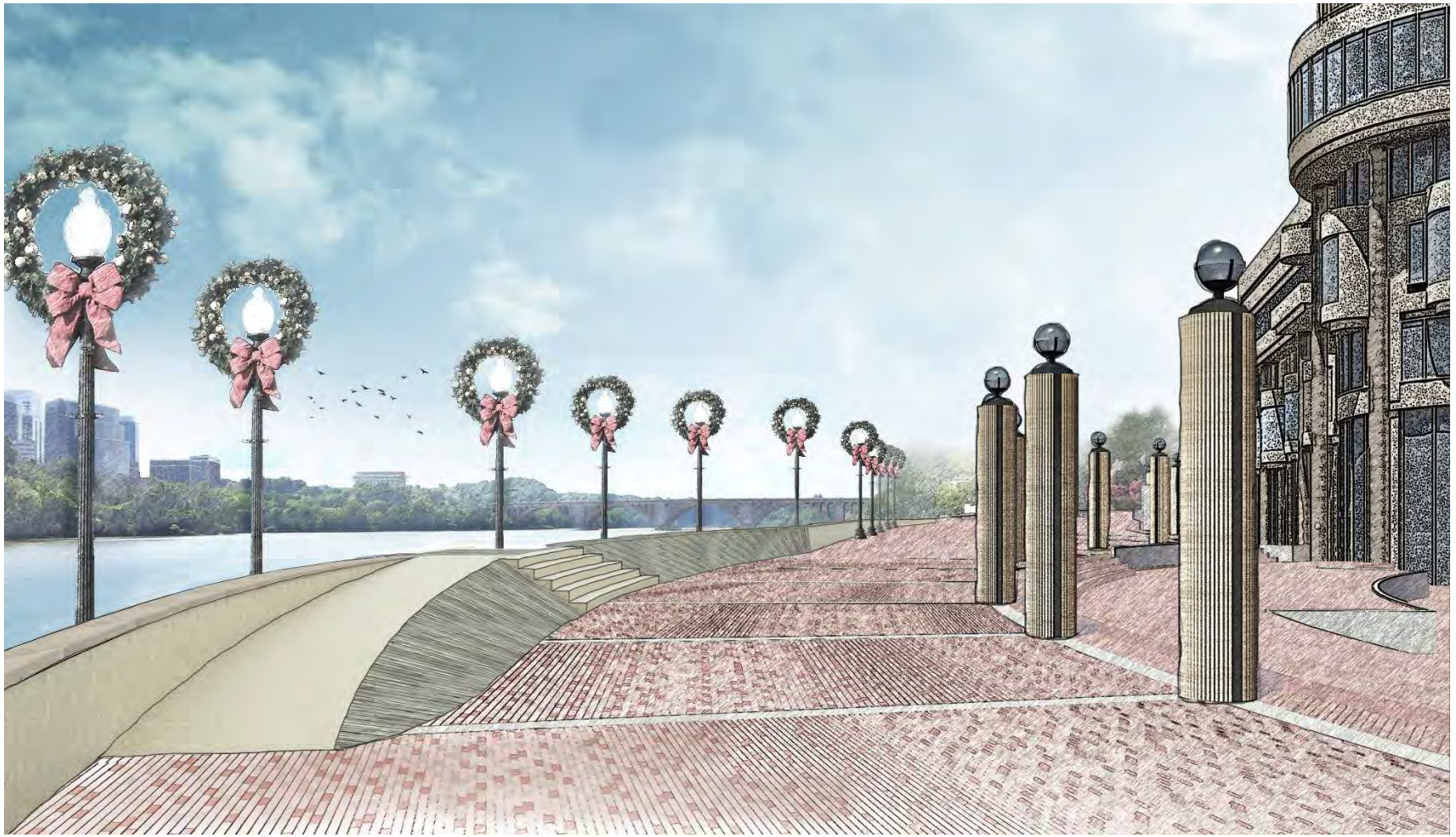
AERIAL DIAGRAM



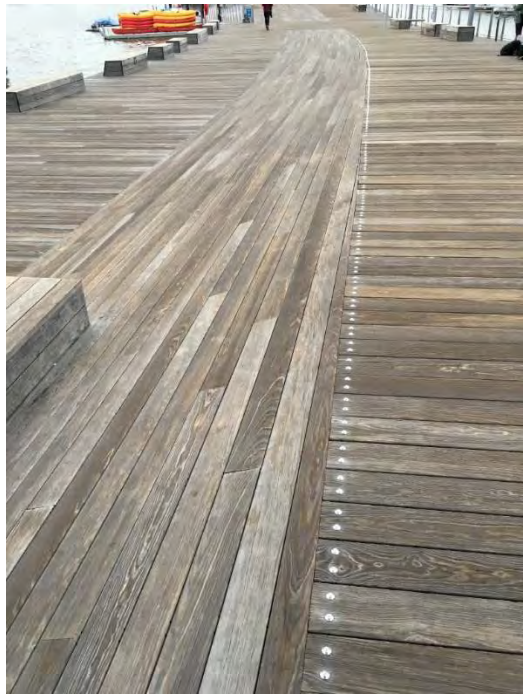
STAIR WALL

RIVER VIEW LOOKING WEST (PROPOSED)

KEY PLAN



SLOPED KEBONY DECKING @ RECREATION PIER. THE WHARF



STAIR WALL

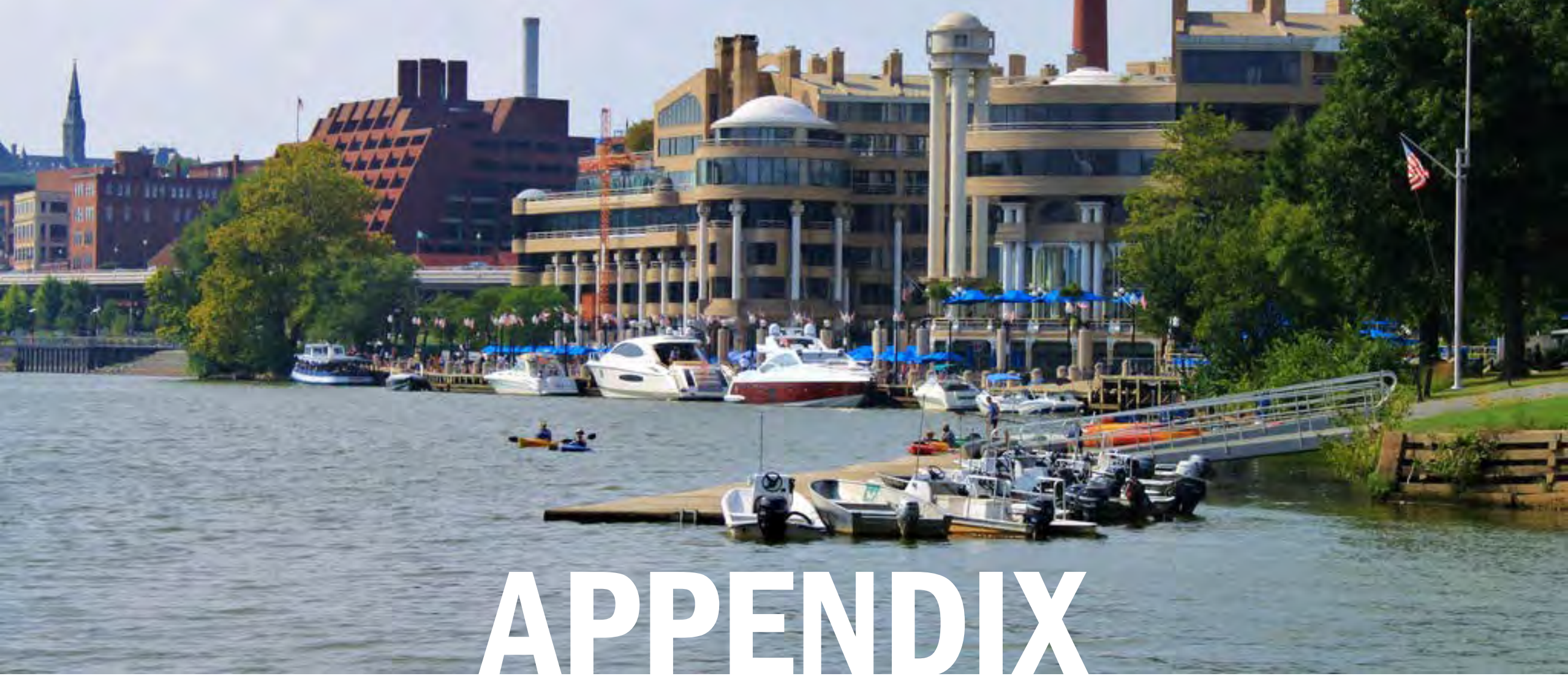
BASE DESIGN– RIVER VIEW LOOKING EAST (EXISTING)

KEY PLAN

STAIR WALL

BASE DESIGN– RIVER VIEW LOOKING EAST (PROPOSED)

KEY PLAN



APPENDIX

SITE PHOTOS

KEY PLAN

SITE PHOTOS

KEY PLAN

SITE PHOTOS

KEY PLAN

SITE PHOTOS

SITE PHOTOS

SITE PHOTOS

KEY PLAN

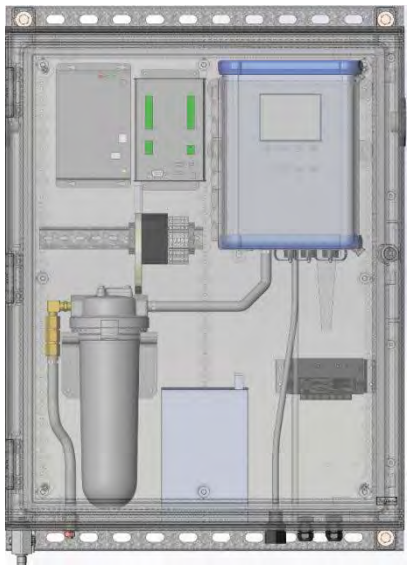
FLOOD STUDY

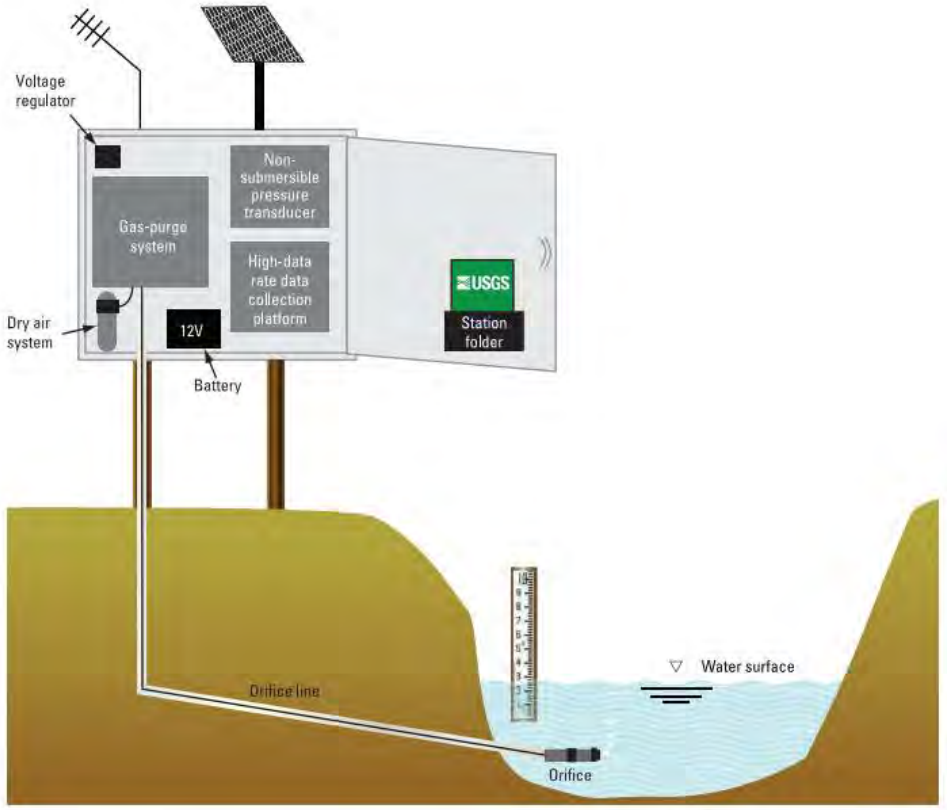
WATER LEVEL STATION

Two water level stations price estimate

- $40k (materials) + $15k (Langan design + permitting) +$5k permit fees + ~$55k installation

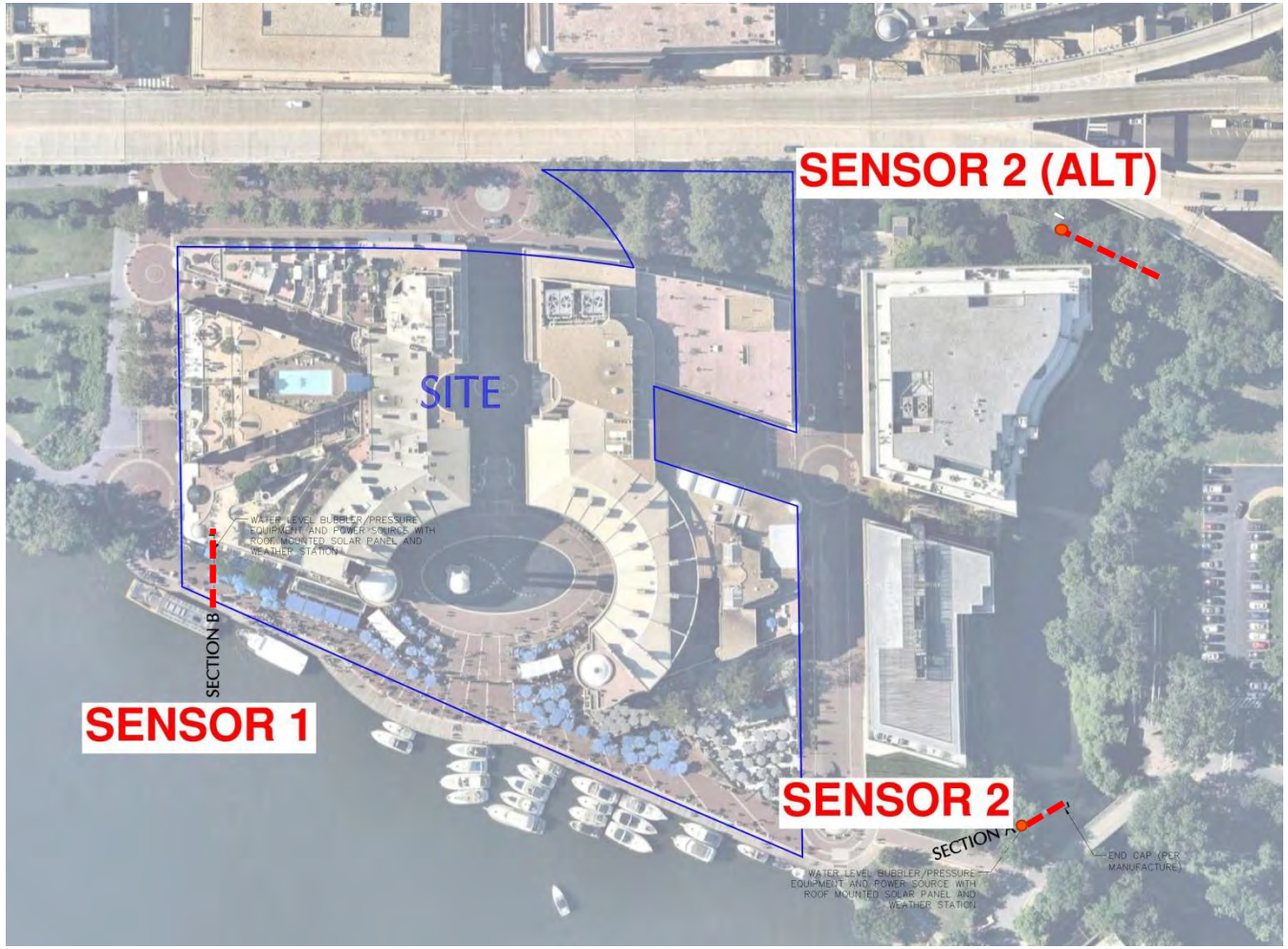
= $115k TOTAL



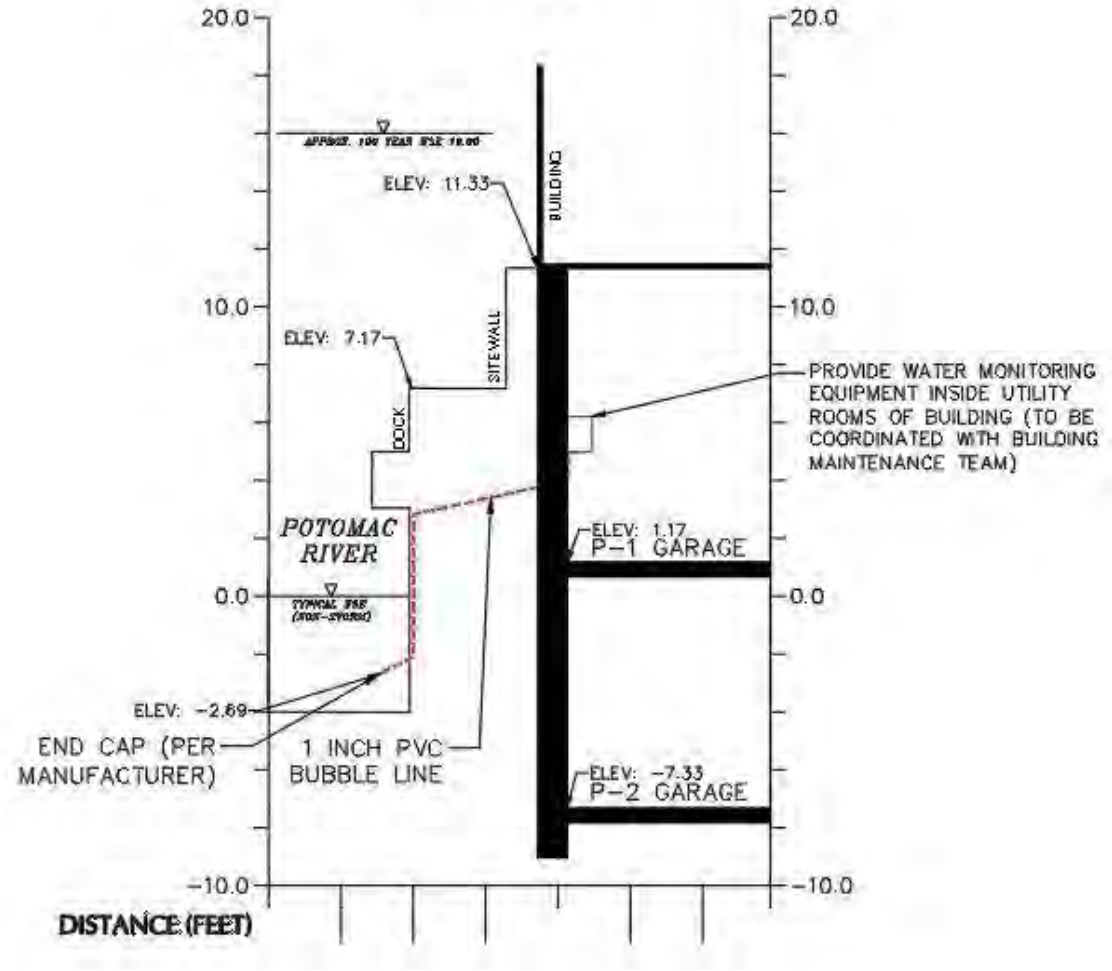


FLOOD STUDY

WATER LEVEL STATION



SENSOR 1

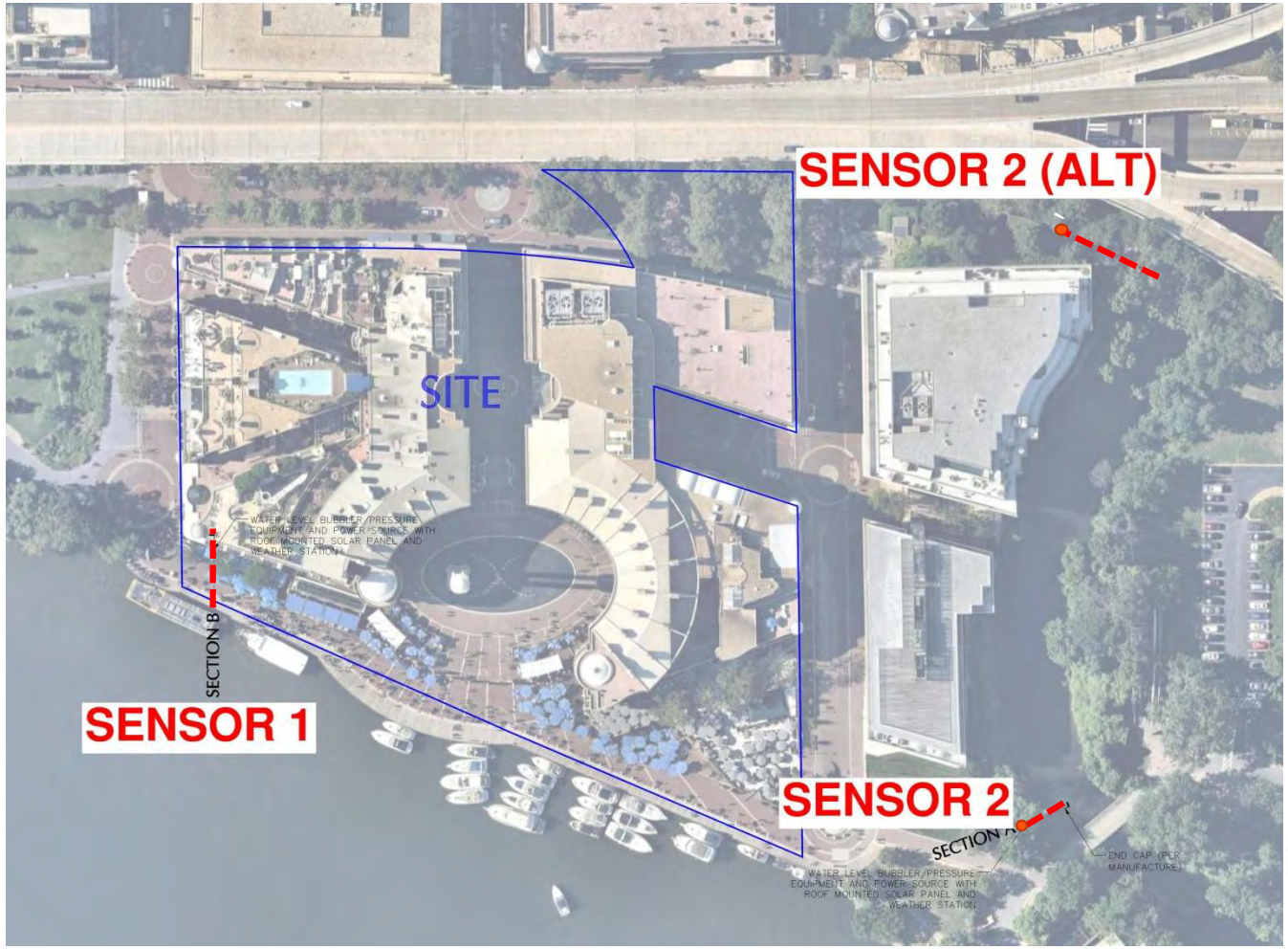


New Rock Creek Flood Mapping

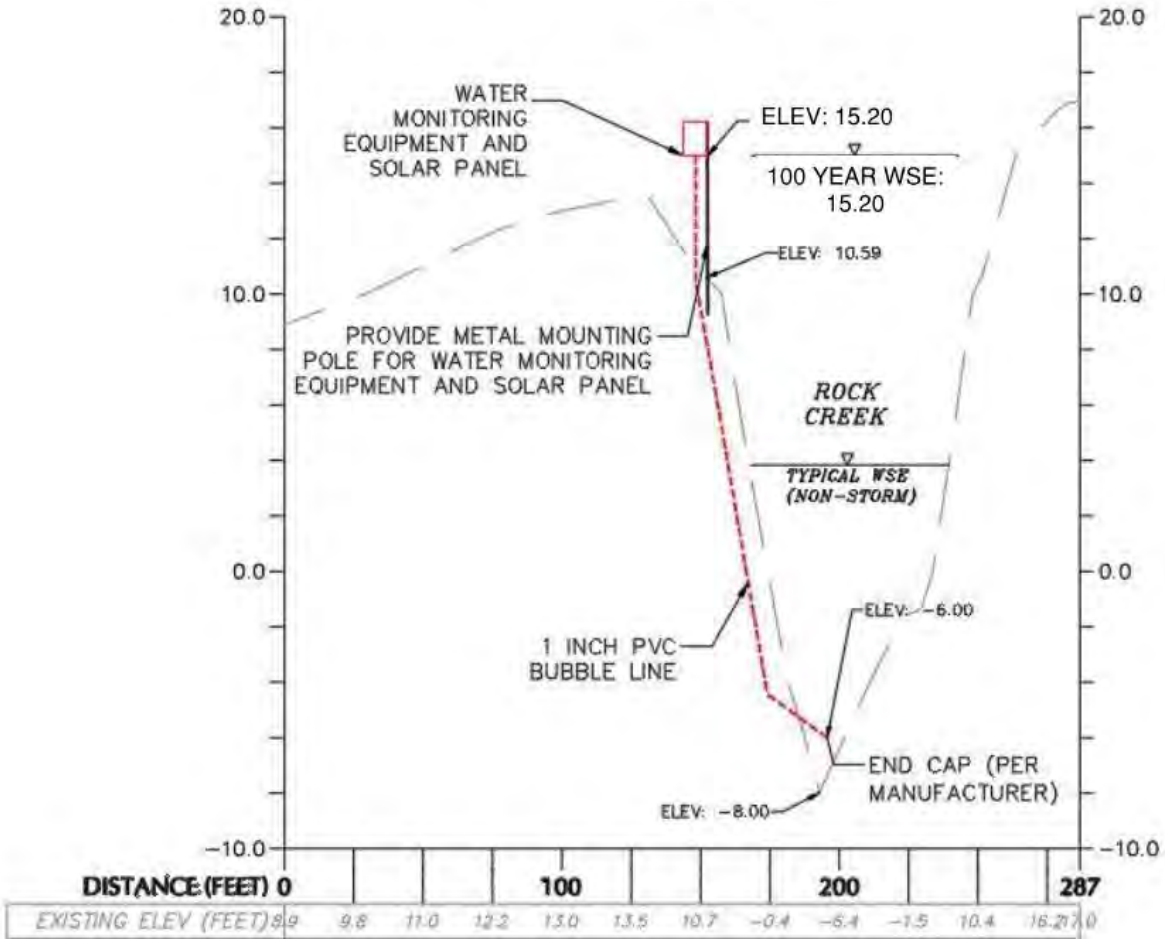
- 2 total water level sensors
  - 1 on Potomac and 1 on Rock Creek

FLOOD STUDY

WATER LEVEL STATION



SENSOR 2



New Rock Creek Flood Mapping

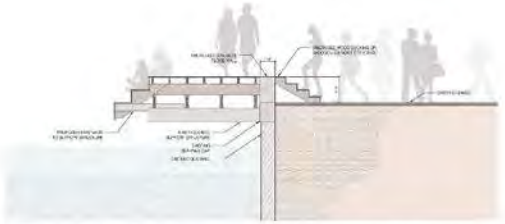
- 2 total water level sensors
  - 1 on Potomac and 1 on Rock Creek

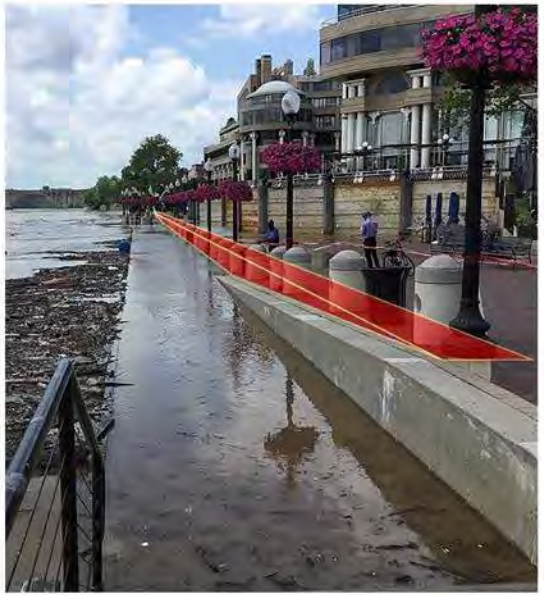
PREVIOUS STUDIES

MITIGATION STRATEGIES

REDUCE NUISANCE FLOODING

- Increase Elevation along Potomac River
- Oculus Schemes for public promenade

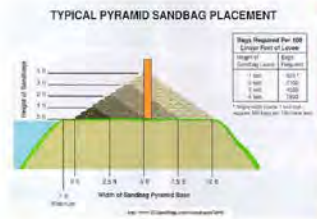




MITIGATION STRATEGIES

MITIGATE ROCK CREEK FLOODING

- Tiger Dam – single max. height: 42" stacked can achieve: 9'
- Sand bags – not enough time to deploy
- Aquafence – max. height: 7'-10"
- Invisible Flood Control Wall – requires storage space



MITIGATION STRATEGIES

TIGER DAM

Summary:

- Water Filled Temporary Barriers
  - 24" to 42" units
  - Stackable to 9'-10"
  - Requires Dedicated On-Site Storage

Tiger Dam Configuration Specs

**Values are approximate and can vary depending on the water/air ratio*

Single Tiger Dam	Height	2' 10.5" (34.5")
	Base Width	4' 8" (56")
2-1 Configuration	Height	5' 4" (64")
	Base Width	8' 8" (104")
3-2-1 Configuration	Height	8' 3/4" (96.25")
	Base Width	12' 7" (151")
4-3-2-1 Configuration	Height	9' 10" (118")
	Base Width	16' 8" (200")

MITIGATION STRATEGIES

INVISIBLE FLOOD CONTROL WALL - FCA

Hand tools for attachment

Lightweight aluminum planks

Install planks from above

Reinforced with rakers

Requires storage space

Requires base mounts

Needs crane for installation

140 West St., NY, NY

MITIGATION STRATEGIES

ROCK CREEK MODIFICATION(S)

Summary:

1. Widen Rock Creek from K Street south to Potomac River
2. Install secondary overflow culverts west of Boat House
3. Re-Align Rock Creek

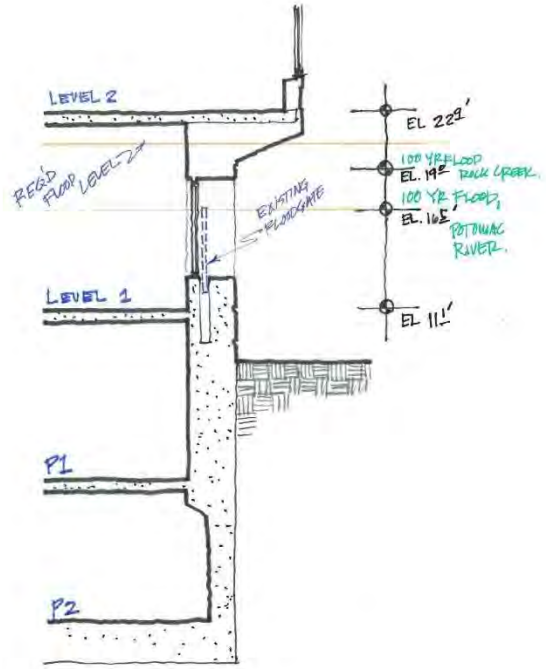
Considerations:

- Solutions provide 2 to 3 foot reduction in 100-yr storm flood elevations
- Benefits Georgetown local community
- Need to preserve and Protect Historic Boat House

MITIGATION STRATEGIES

MITIGATE ROCK CREEK FLOODING

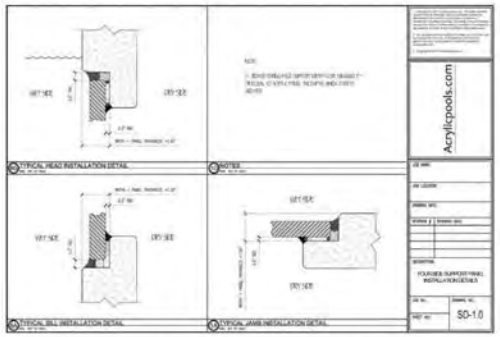
- Increase Height of Flood protection across K Street Facades
- Increase Elevation of Flood Protection along East and West Facades
- Relocate Level 1 Retail higher in building



MITIGATION STRATEGIES

AQUARIUM GLAZING

4 Sided aquarium window



Aquarium glass window details

Windows along north facade

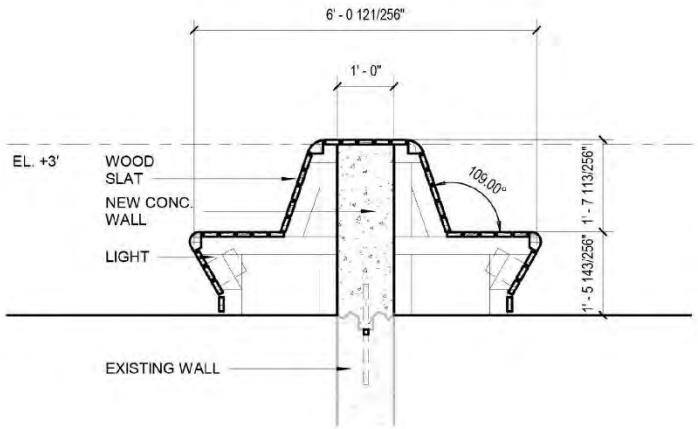
BULKHEAD BENCH

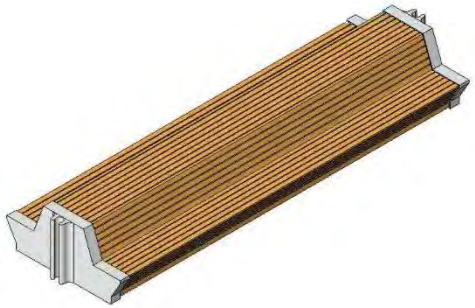
PRESRAY FAST LOG SYSTEM

- Lightweight aluminum channels
- Compression gaskets between logs
- Held in place by turn down knobs
- Up to 20' lengths available
- Concealed jamb when not in use

KNEE WALL

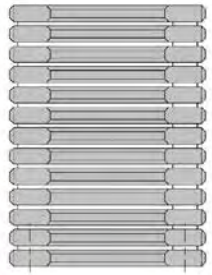
OPTION 1 BENCH SECTION

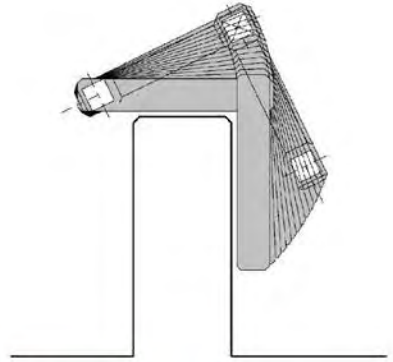




BULKHEAD BENCH

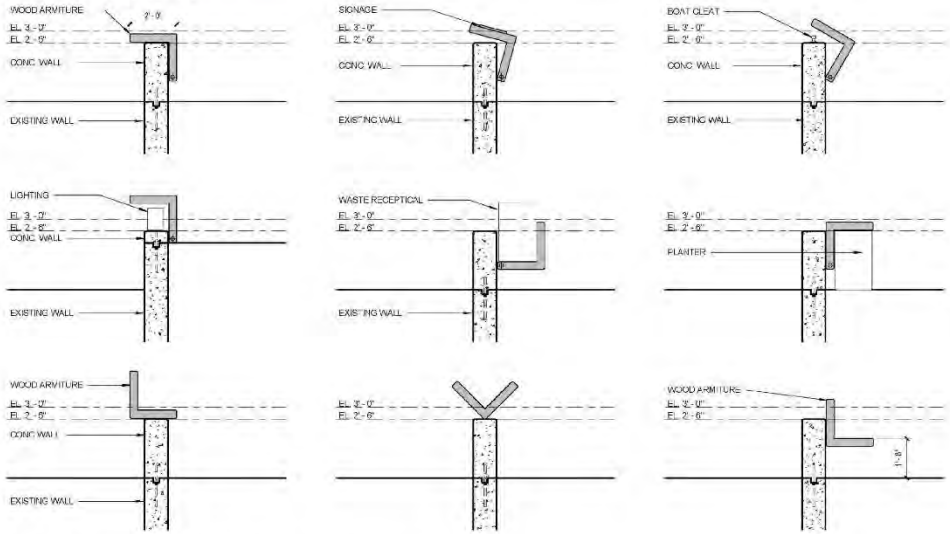
OPTION 3 BENCH SECTION





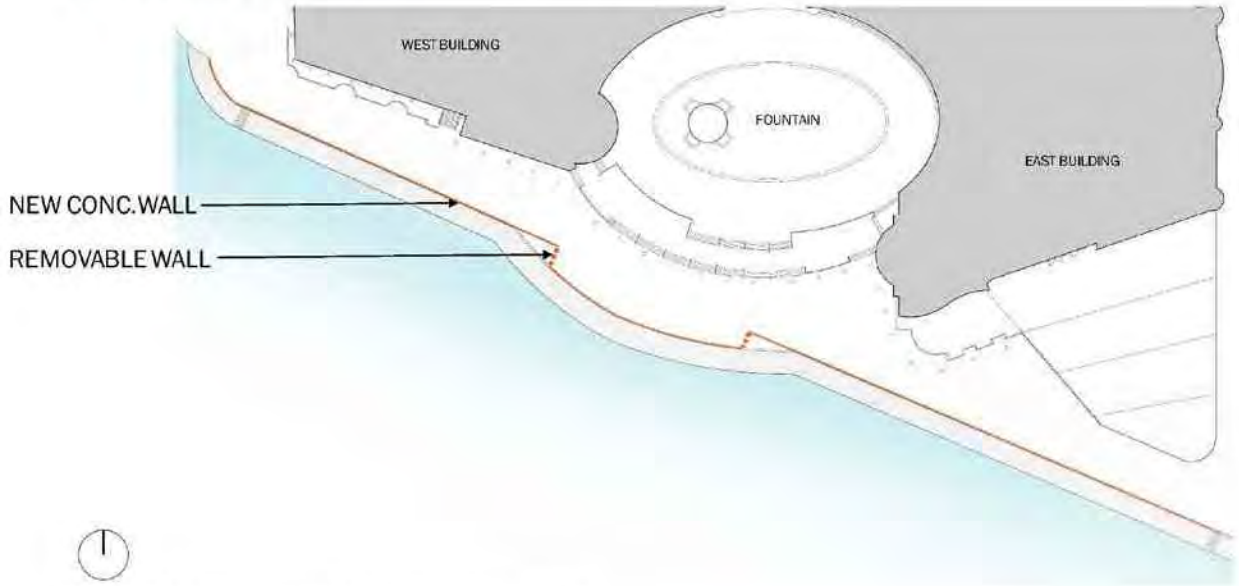
BULKHEAD BENCH

OPTION 3 BENCH SECTION



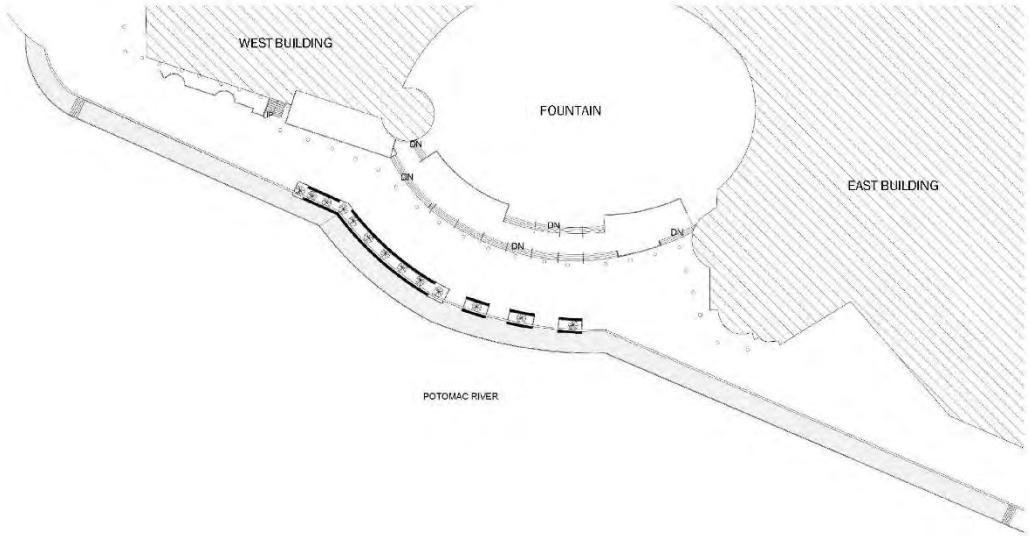
KNEE WALL W/ BREAKS

PRESRAY PLANKS AT OPENINGS



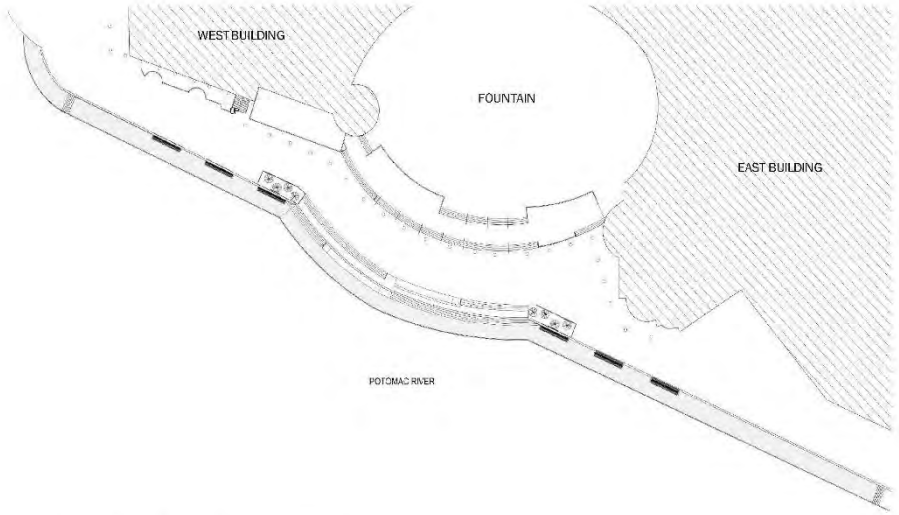
KNEE WALL

OPTION 2 PLAN



KNEE WALL

OPTION 3 PLAN

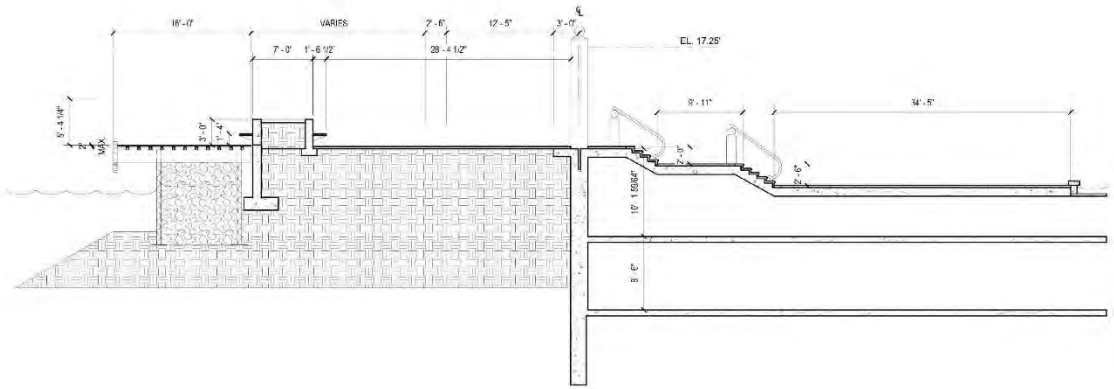


KNEE WALL

3D VIEW OPTION 3

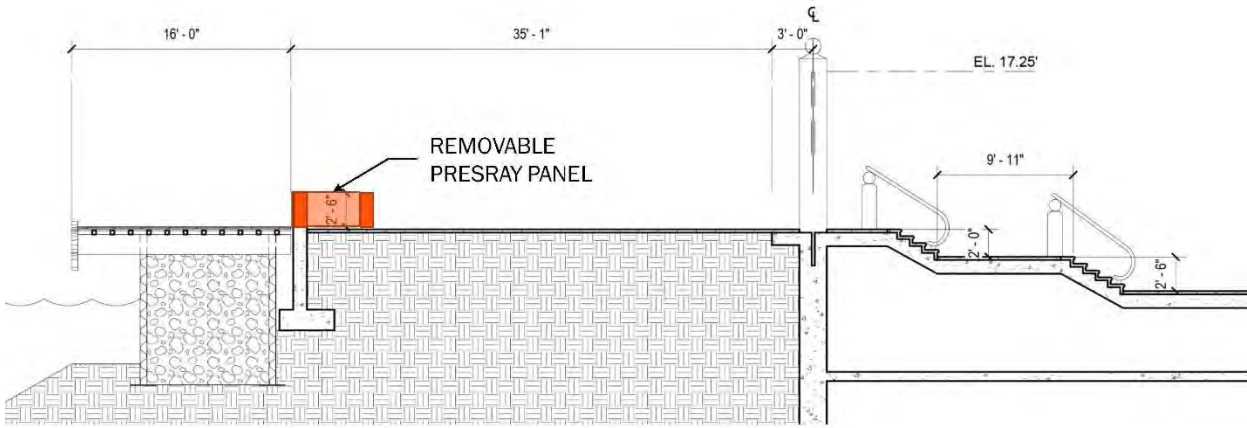
KNEE WALL

OPTION 2 SECTION



BULKHEAD BENCH

OPTION 1 SECTION

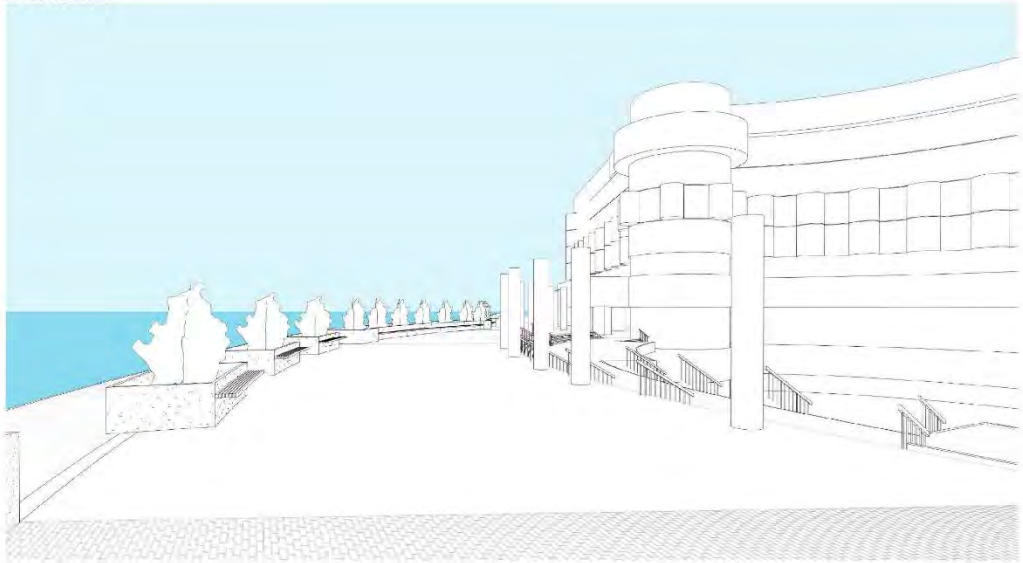


KNEE WALL

3D VIEW OPTION 3

KNEE WALL

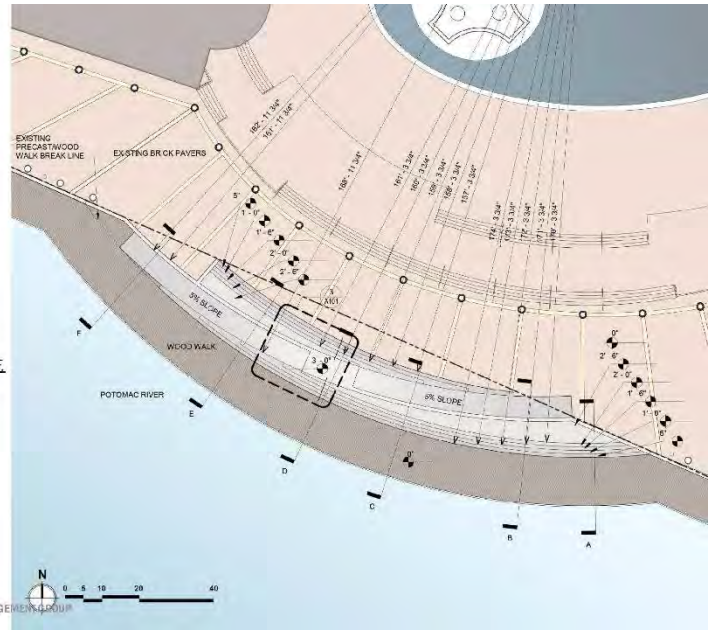
3D VIEW OPTION 2



INITIAL DESIGN

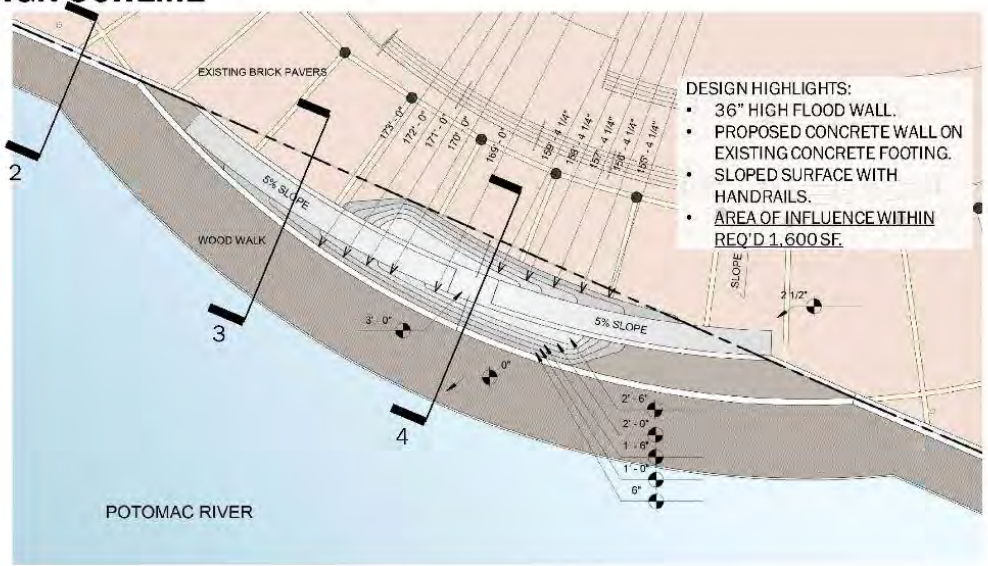
DESIGN HIGHLIGHTS:

- 36" HIGH FLOOD WALL.
- PROPOSED CONCRETE WALL ON EXISTING CONCRETE FOOTING.
- SLOPED SURFACE WITH HANDRAILS.
- AREA OF INFLUENCE EXCEEDS REQ'D 1,600 SF.



DESIGN SCHEME

PLAN



PERSPECTIVE VIEW

PERSPECTIVE VIEW

PERSPECTIVE VIEW