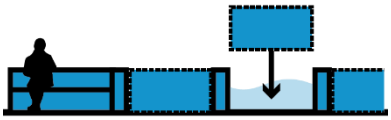
Measure Profile

Mechanical and Buoyant Gates

Flood Adaptation Measure

Physical Infrastructure



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SHORELINE LOCATION:

Shoreline or Asset Specific

DESIGN LIFE	ADAPTABILITY	IMPACT ON THE WATERFRONT	CONSTRUCTION COST
15 - 25+ years	Low	Minor Intervention	TBD

COASTAL FLOOD HAZARDS MITIGATED:

Sea Level Rise 

Storm Surge 

Groundwater 

Waves 

Erosion 

MEASURES COMPATIBILITY:

Flood	Seismic
All	All

ECOSYSTEM SERVICES: Measure may affect these shoreline values

Aquatic Habitat | Terrestrial Habitat | Water Quality | Carbon Storage

DESCRIPTION:

Mechanical and buoyant gates can provide permanent flood protection while still allowing access to the resources they protect. They are typically constructed with a steel gate, and a reinforced concrete foundation. They can also be fabricated in stainless steel and aluminum, making for lighter options than the equivalent steel gates. They are permanent in the sense that their foundation and location is permanent, but they are deployed (closed) only in storm and flood events. Gates are a proven concept and are reliable with adequate inspection and maintenance

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CONSIDERATIONS:	ADVANTAGES:	DISADVANTAGES:
• Siting must consider ADA and other pedestrian needs and requirements. • Operations and maintenance costs must be considered in life cycle analysis.	• No installation or construction required during flood event. • Easy and quick operation. • No off-site storage or transportation required. • Stable and strong, with high resistance to impact.	• Height cannot be increased during surface. • Possibility of failure of mechanical part of electricity supply (if automatic). • Structure could get jammed with debris. • Limited applicability at landscape scale.
CONSTRUCTION IMPACTS TO THE PUBLIC: • During construction, multi-modal transportation will be rerouted and areas surrounding the site will be subject to construction noise and activities	**SEA LEVEL RISE ADAPTATION OPPORTUNITIES:** • Not adaptable	**CASE STUDIES:** • Flood barrier (SCFB) Spakenburg

DESIGN OPPORTUNITIES:

Ecological Enhancements	Urban Design	Form
• TBD	• TBD	• TBD

DESIGN CONSIDERATIONS:

- Depending on the type of gate, the footprint of the permanent structure will vary.
- They can be designed to be fixed to any suitable structure.
- They are normally attached to an adjacent structure or permanent protection, or else laid flat into a recess.
- Heavy duty seals ensure the gates are watertight with no seepage and are typically EPDM rubber which is extremely durable and reforms even after prolonged periods of compression.
- Due to their permanent installation, their deference height cannot be increased during service.
- Automatic operation can be controlled by sensors, actuators, or direct hydraulic link to the watercourse.
- Manual or semi-automated operation usually involves swinging, rolling, or raising into position.

SITE-SPECIFIC CONSIDERATIONS:

- Because installed in a recess, need to be clear or not interfere with underground utilities

URBAN DESIGN CONSIDERATIONS:

- Should not interfere with urban activities when not deployed

INSTALLATION AND CONSTRUCTABILITY CONSIDERATIONS:

- The gates would be manually installed and would remain permanently in place.
- Gates should be mounted directly to a level watertight surface - i.e., banks and soil would require the construction of a concrete sill to ensure watertight seal.

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ARCHITECTURAL CONSIDERATIONS:

- Preferable if not visible when not deployed.

HISTORICAL RESOURCE CONSIDERATIONS:

- Should not impact historical resources.

OPERATION AND MAINTENANCE CONSIDERATIONS:

- The gates would be opened and closed mechanically; depending on design, operation would vary.
- The gate entrance would need to be kept clear of obstructions so that closure is possible.
- The bearings would need to be inspected and lubricated regularly to ensure successful operation.
- Steel and aluminum gates typically have a 50 year design life, and the rubber seals can have a design life of up to 20 years before replacement.