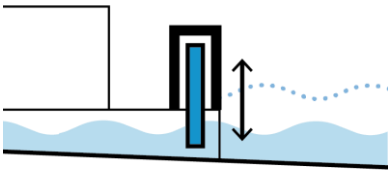
Measure Profile

Gates and Barriers

Flood Adaptation Measure

PHYSICAL INFRASTRUCTURE



SHORELINE LOCATION:

In Water

The Foss Barrier, a 16 tonne gate built in 1989, is lowered into the River Foss to stop the Foss levels from rising flood waters on the River Ouse - York, England ©Michael Jagger/Foss Flood Barrier/CC BY-SA 2.0

DESIGN LIFE	ADAPTABILITY	IMPACT ON THE WATERFRONT	CONSTRUCTION COST
50+ years	Varies	Major Intervention	TBD

COASTAL FLOOD HAZARDS MITIGATED:

Sea Level Rise 

Storm Surge 

Groundwater 

Waves 

Erosion 

MEASURES COMPATIBILITY:

Flood	Seismic
Levee, Seawall, Floodwalls	N/A

ECOSYSTEM SERVICES: Measure may affect these shoreline values

Aquatic Habitat	Terrestrial Habitat	Water Quality	Carbon Storage
↓	—	↓	—

DESCRIPTION:

A flood barrier, surge barrier or storm surge barrier is a specific type of floodgate, designed to prevent a storm surge or king tide from flooding the protected area behind the barrier. The gates most often remain open and allow passage of water between the mouth. Gates and barriers come in many forms and types which are suitable for different opening widths and required vessel drafts.

CONSIDERATIONS:

- Signifcant structure with large impact on waterfront.
- Would need to be paired with adjacent shoreline protection to prevent outflanking.

ADVANTAGES:

- Potential opportunity for urban design improvement with creek crossing.

DISADVANTAGES:

- Limited applicability to coastal storm risk faced within the Bay (assuming closure for daily high tides is not tenable).
- High cost and environmental impact.

Gates and Barriers

Flood Adaptation Measure

		• Potential upland stormwater discharge impacts. • May cause water quality concerns within closed creeks.

CONSTRUCTION IMPACTS TO THE PUBLIC:	SEA LEVEL RISE ADAPTATION OPPORTUNITIES:	CASE STUDIES:
• Dependent on location and siting. • Impacts could be significant if located near shore, or less if in offshore location.	• Limited adaptability. • Could be paired with deployables and shoreline floodwalls as additional protective elements.	• Lake Borgne Storm Surge Barrier, New Orleans • Maeslantkering Storm Surge Barrier, Netherlands • Venice MOSE, Italy.

DESIGN OPPORTUNITIES:

Ecological Enhancements	Urban Design	Form
• TBD	• TBD	• TBD

DESIGN CONSIDERATIONS:

- Requires tie into cut-off wall that will disrupt the water column and allow for full closure in the event of a storm surge or king tide.
- High seismic region will provide a challenge to maintain operability of the gates in the event of moderate to high seismic event.
- Need to ensure circulation of natural channels is not lost, which may require supplemental pumping to move water and sediment.
- Extensive permitting process and high level of environmental study.

SITE-SPECIFIC CONSIDERATIONS:

- Siting requires recognizing federally navigable channels at Mission and Islais Creek.

URBAN DESIGN CONSIDERATIONS:

- Tide gates could provide pedestrian cycling access. While closed, tide gates would prevent navigation from the creek to the Bay.

INSTALLATION AND CONSTRUCTABILITY CONSIDERATIONS:

- Costly installation with long lead time and overall construction duration.

ARCHITECTURAL CONSIDERATIONS:

- Significant visual impact on current shoreline.
- Certain types of gates could be made publicly accessible which could provide opportunity for creek crossing.

HISTORICAL RESOURCE CONSIDERATIONS:

- Abutments for gates would need to recognize adjacent historic resources and account accordingly.

Gates and Barriers

Flood Adaptation Measure

OPERATION AND MAINTENANCE CONSIDERATIONS:

- Extensive maintenance and monitoring costs require active operation to ensure they are utilized when needed to protect infrastructure upland.