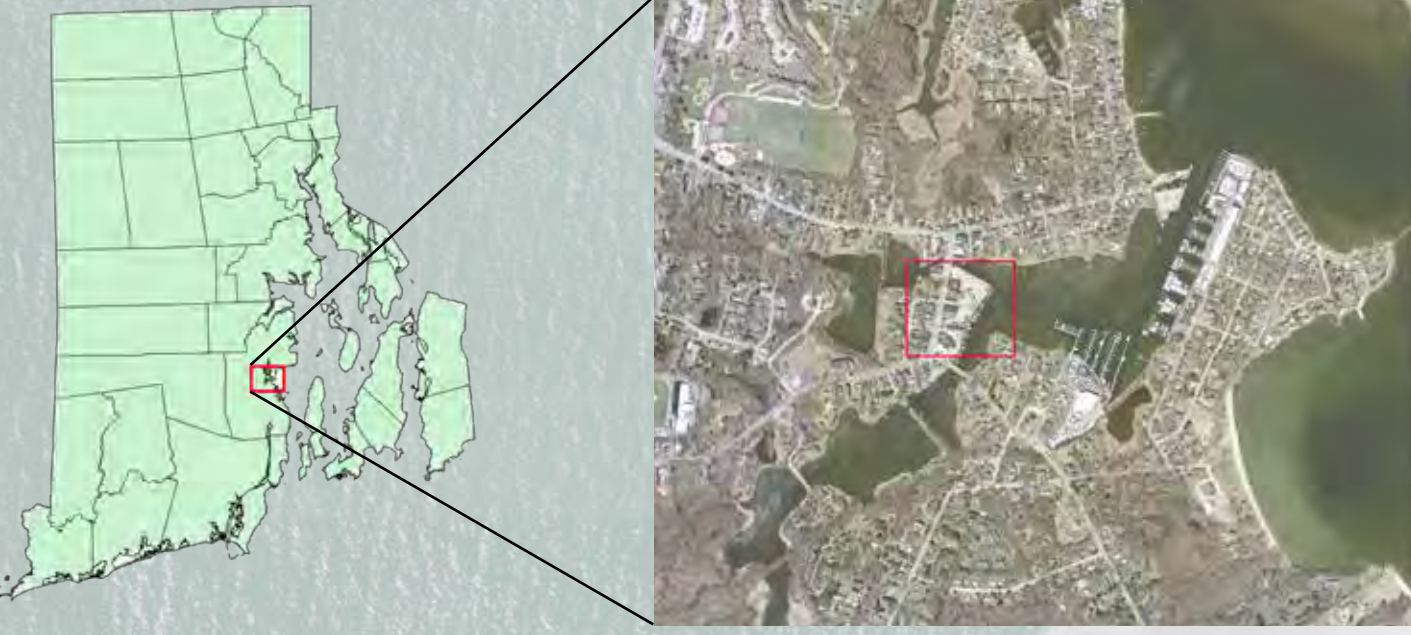


## Multi-Functional Design Concepts for Coastal Stormwater Management

### The Place: Wickford, North Kingstown

The Brown Street waterfront parking lot is in the heart of downtown Wickford Historic Village. It is a key element to support this historical, recreational, and economic hub in North Kingstown, Rhode Island.



### The Problem: Flooding and Water Quality

This low-lying area is vulnerable to flooding from extreme high tides, rain events and coastal storms. Aging subsurface infrastructure drains untreated stormwater from the parking lot to the harbor; the substrate is likely not suitable for infiltration; tides come up through the outfall. The parking lot serves multiple uses for business and waterfront access, and has multiple owners, both public and private. These issues will be more prominent in the future with projected sea level rise and increased storm intensity.

#### Goals and objectives:

- Consider short and medium-term options to enhance resilience while long-term options for Wickford are explored.
- Management practices use a 20-year design life to reduce impacts while long-term solutions are identified.
- Minimize nuisance flooding and reduce pollutants to the harbor. Elevate low areas and install green infrastructure (GI) where feasible.
- Enhance access to the water, civic space and visibility for local businesses and maintain existing number of parking spots.
- Expand walkways, reconfigure parking spaces and flow, and install landscape features.
- Build on relationships with businesses and the public to promote better site design and implement actions.
- Raise awareness of sea level rise (SLR) and water quality issues related to sediments and untreated stormwater.
- Evaluate long-term strategies to sea level rise including options to protect, retreat and accommodate. Incorporate these in the Comprehensive Plan and Hazard Mitigation Plan.

#### Short term and long term options:

- Fill/elevated low areas in the parking area; existing substrate likely not good for infiltration
- Expand and link and expand waterfront walkway and connect to Brown Street at various locations. Utilize permeable pavers, tree wells, and infiltration trench where appropriate.
- Modify existing catch basins and inverts; install flap valves
- Reconfigure parking and travel lanes to add rain garden areas to reduce stormwater impacts
- Utilize green roof on buildings to reduce stormwater runoff
- Utilize kiosk as a way to share information relating to changing seas and green infrastructure.



Elevate outlet pipe with Duckbill Valve (See Sheet 2 Drainage Improvement Section).

Catch basins (typ.), inverts, or outfalls to be modified with flap valves to prevent sea and storm water backing up to the parking lot.

Current Mean Higher High Water  
1 Foot Sea Level Rise

Work with private owners and town owned property to enhance public access along the waterfront edge, by connecting the existing walkway to Brown Street (See Sheet 2 Harborside Walkway Section). Permeable pavers (TBD), and drainage infiltration strips between the parking lot and walkway, combined with tree wells, can reduce stormwater volume and contaminants.

Proposed tree wells along walkways and Brown Street (See Sheet 2 Tree Well Section).

Proposed kiosk with information relating to the changing seas and green infrastructure.  
"Future home to the Brown Street Park"

Low area in the parking lot is in need of fill or regrading due to backup from catch basin. Evaluate long-term potential for a bioretention basin and underground infiltration system to reduce stormwater impacts; existing substrate is likely not good for infiltration.

See Sheet 2 Brown Street Site Photo for view of parking lot

Identify operational practices to inform business and residents of flooding during times of extreme tidal floods and storms.

1 Foot Sea Level Rise + 10 Year Storm

1 Foot Sea Level Rise

Current Mean Higher High Water

# Green and Resilient Infrastructure Planning (GRIP): Get a GRIP on RI's Coastline

Funding for this project is provided by the Department of the Interior through a grant from the National Fish and Wildlife Foundation's Hurricane Sandy Coastal Resiliency Competitive Grant Program

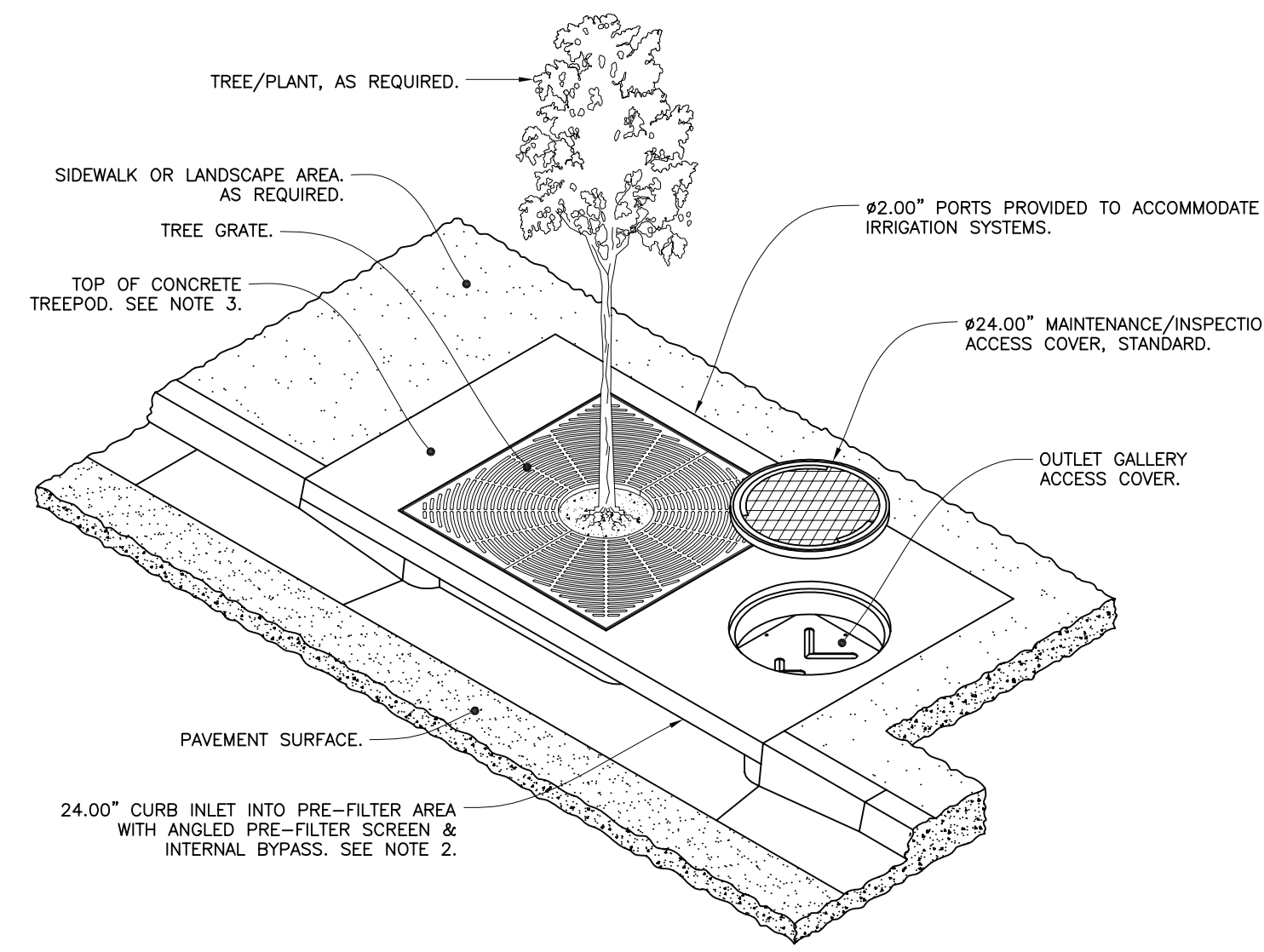


# Multi-Functional Design Concepts for Coastal Storm water Management

## The Place: Wickford, North Kingstown

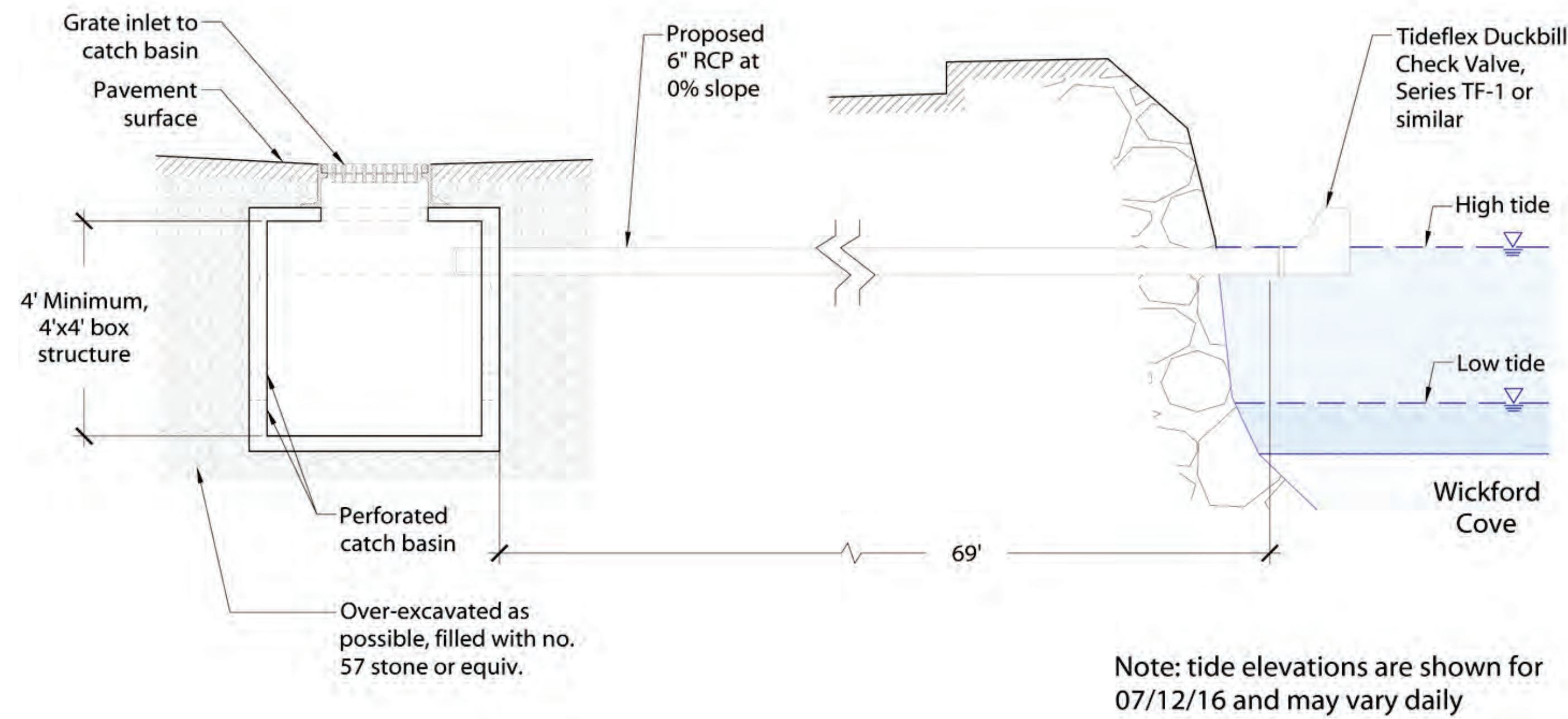
### Planning Considerations:

The parking area is critical to accessing businesses, therefore need to consider how to access local commerce without this parking lot. Start the conversation about utilizing alternative transportation and offsite parking.



### Tree Well Section

Along walkways and Brown Street can reduce stormwater volume and contaminants



### Drainage Improvement Section-

Modify catch basins (typ.), inverts, or outfalls with flap valves to prevent sea and storm water backing up to the parking lot.

### Planting Suggestions and Maintenance Considerations:

Integrate maintenance in design for a successful planting after installation. Utilize a consultant to tag vegetation for maintenance purposes.



Hibiscus moscheutos - Swamp Rose Mallow



Solidago sempervirens - Seaside Goldenrod



Panicum virgatum - Switch Grass

### Alternative Transportation Considerations:

Look at opportunities for alternative transport systems to access this part of Wickford: Additional bike racks, scooters, trolley system, or increased bus routes.

Utilize incentives from local businesses for using alternative transportation methods.



Track the Trolley Live

Trolley services to bring people downtown and utilize off site parking, and mobile applications make planning easy.



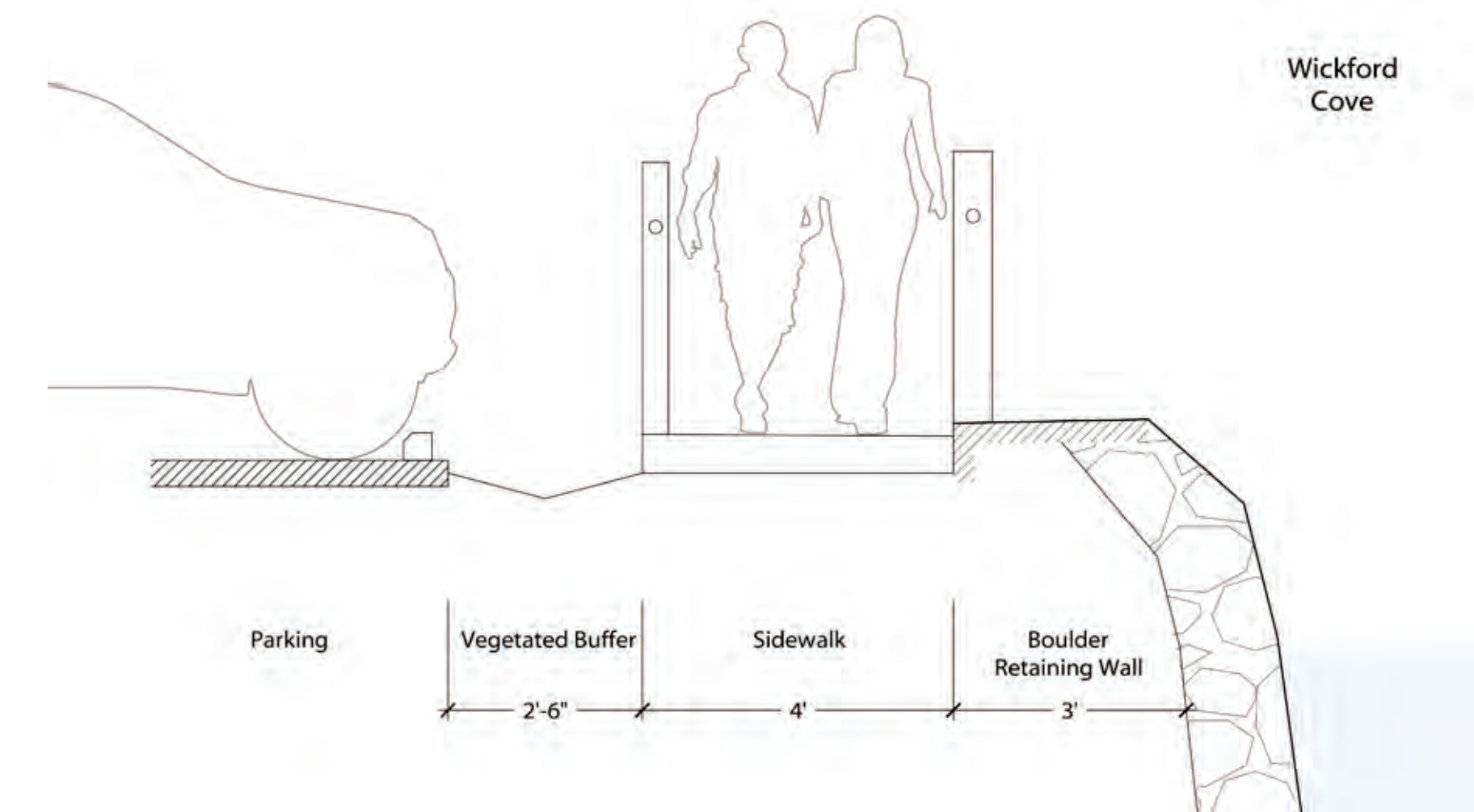
Additional RIPTA routes could be utilized to reduce the need for onsite parking, and bring in more people from around Rhode Island.



Bike Taxis can be a fun way to travel around Wickford- no car needed!



Bike racks provide a place to stop for cyclists when they reach their destination in Wickford and allows them to walk around.



### Harborside Walkway Section- Scale 1/2" = 1'-0"

The additional drainage strip between the parking lot and walkway can reduce stormwater volume and contaminants.



Brown Street parking lot at an extreme high tide (2017).



Green Roof Infrastructure Green roofs are an effective way to capture stormwater runoff and beautify Wickford.

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