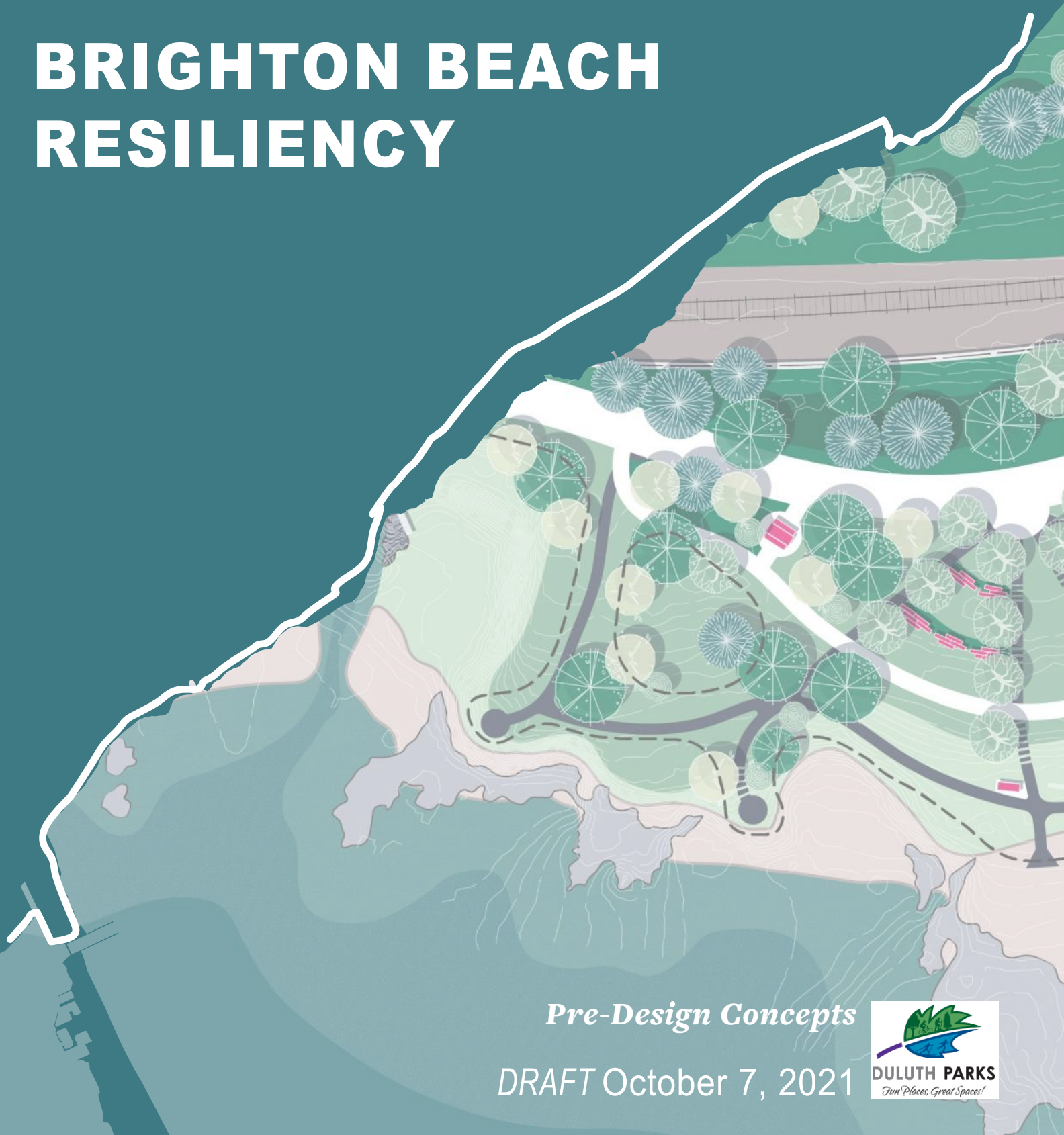


DULUTH LAKEWALK RENEWAL

and

BRIGHTON BEACH RESILIENCY



Pre-Design Concepts

DRAFT October 7, 2021



Contents

- Executive Summaryb
- Chapter 1. Lakewalk Renewal.....1
 - Typical Trail Sections.....4
 - Planting Scheme10
 - Social Trail Strategies.....12
- Chapter 2. Lakewalk Pause Areas: Preliminary Designs15
 - Pause Area 01: Endion Station17
 - Pause Area 02: Veterans Memorial.....19
 - Coastal Design Study: Soldier Pile Wall and Revetment at Lake Superior Outfalls.....20
 - Pause Area 03: Fingers-Malt Shoppe22
 - Coastal Design Study: Malt Shoppe Area24
 - Pause Area 04: Narrows at Brewery Creek.....27
 - Pause Area 05: Grassy Knoll28
 - Pause Area 06: Leif Erikson Bypass30
 - Coastal Design Study: Leif Erikson Soldier Pile Wall.....34
 - Pause Area 07: Picnic Area.....36
 - Pause Area 08: Lower Forest Nook40
 - Pause Area 09: Access Bridge45
 - Coastal Design Study:Coastal Bond Sections 1–4 (near 18th Ave. East Lift Station).....46
 - Pause Area 10: Lift Station.....49
 - Pause Area 11:Water Street Entry51
 - ADA Reroute 1:52
 - ADA Reroute 2:54
 - ADA Reroute 3:56
- Chapter 3. Kitchi-Gammi Park + Brighton Beach Preliminary Design.....59
 - Kitchi Gammi Park + Brighton Beach.....62
 - Coastal Design Study: Brighton Beach Pavilion.....70

City of Duluth Parks & Recreation



LHB, Lead Landscape Architectural Consultant



AMI, Coastal Engineer Consultant



Executive Summary

The Duluth Lakewalk is one of the most beloved and heavily use multi-use trail systems in the City of Duluth, Minnesota, beginning at Bayfront Festival Park and running nearly eight miles along the shores of Lake Superior to Brighton Beach (Kitchi Gammi Park). The original paved pedestrian and bicycle trail was built in 1986 and only spanned a half-mile in Canal Park. Over time however, the Lakewalk has been extended to the east to service the local community and visitors' recreational needs. The most recent segment of the trail is currently being constructed in Brighton Beach park, which will add another 0.80 miles to the overall trail system.

The landscape surrounding the Lakewalk and Brighton Beach are extraordinarily beautiful areas and serve as one of the only places in Duluth where people can be so close to Lake Superior's waterfront. The terrain however, is in poor shape due to heavy use, and the trail's infrastructure and shoreline have been severely damaged from continual wave and storm action. From October 2017 to October 2018, three powerful storms occurred that produced hurricane-force winds and rising wave surges that battered the trail and sent large rocks and pieces of the pavement flying inland. These storms not only overturned a large portion of the Lakewalk, but also devastated the strength of the City's protective shoreline barrier.

Revitalizing the entire Lakewalk is a long-term City goal, as the trail system is an integral part of Duluth's character and should continue to be celebrated as a community asset and tourist destination for decades to come. Due to the recent damage, the timing could

not be better to put additional planning in place for a full revitalization of this beloved trail. The information generated in this document will be used as a framework for decision-making and to help guide the City on what steps to take next. As the need for repair continues to grow, the City is in the process of securing funding to help pay for the ongoing Lakewalk renewal and Brighton Beach shoreline restoration efforts.

The purpose of this report is to begin visualizing what the new Lakewalk and Brighton Beach areas could be, and to gain a better understanding of the associated costs for the desired improvements. LHB Inc, in collaboration with the City's Parks and Recreation department and their coastal partner, AMI Engineers, began working together in the summer of 2021 to establish restoration goals and flush out preliminary designs for the project. General themes focused on implementing sustainability and resiliency by **retreating away** from the lake and by **re-wilding the landscape** to its natural condition, wherever possible. Providing public access infrastructure near the shoreline while also trying to balance the protections of natural resources and preservation of the natural character of the area was also a main priority.

The following pages include proposed design standards for the various trail conditions, suggestions for planting communities to restore the landscape back to a North Shore Coastal Forest, as well as a conceptual layout for the new trail and detailed site designs for the surrounding landscape and shoreline components.





Chapter 1. **Lakewalk Renewal**

PROJECT EXTENTS: LAKEWALK & COASTAL DESIGN

Portions of the Duluth Lakewalk Renewal and Coastal Infrastructure rehabilitation work have already occurred due to certain areas being deemed critical and were completed with the assistance of the Federal Emergency Management Agency (FEMA) through a Federal Bond.

Additional areas of the Lakewalk, Coastal Shoreline, and Brighton Beach, will continue to be rebuilt in stages over the next several years as additional funding becomes available.

Completed Work

- Coastal Bond Phase 1 (2018): The shoreline alongside Fitger's Complex was deemed in urgent need of repair, and therefore was fortified first.
- Coastal Bond Phase 2 (2019): Structural work southwest of Phase I has also been completed, and includes a small portion of a newly paved trail in front of Fitger's Complex.
- Coastal Bond Phase 3 + Lakewalk Trail Phase 1 (2020): The shoreline along Canal Park was armored for protection against heavy wave damage. The Lakewalk trail in this area was also rehabilitated.
- Coastal Design Phase 4 (in process)
-

Please note: The completed Coastal Infrastructure sections are not included in the map below.

Future Work

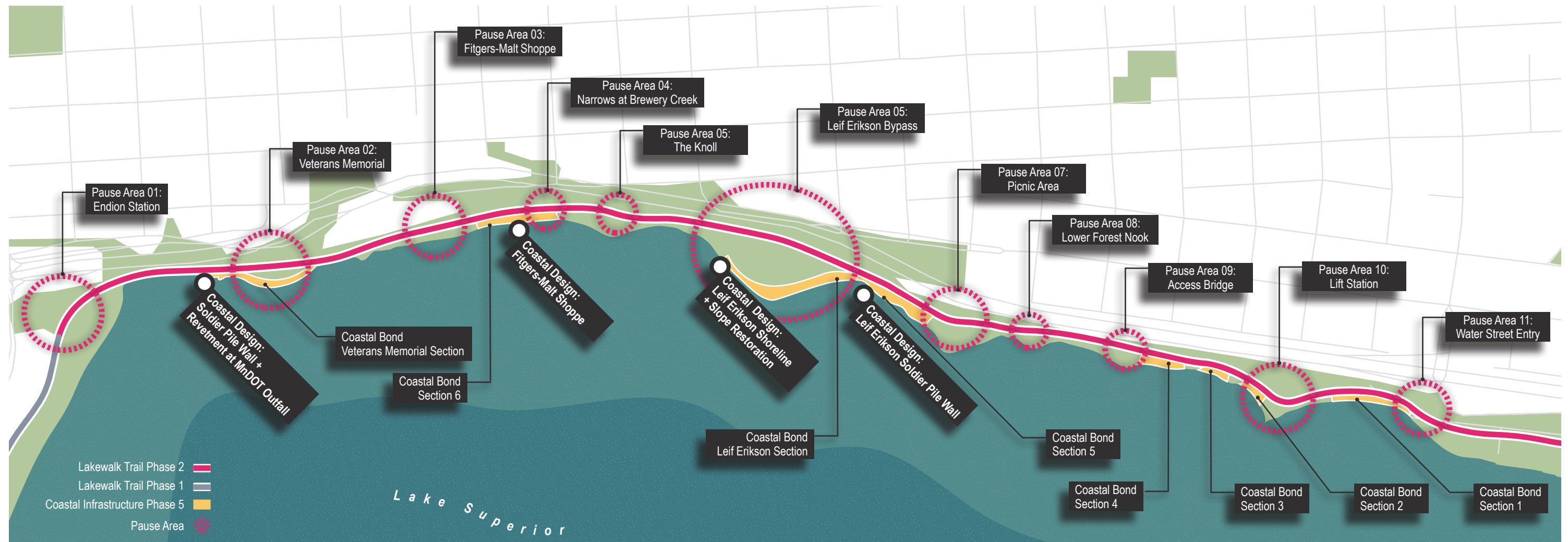
The preliminary designs focus on the final areas that will need to be restored in order to have a fully comprehensive Duluth Lakewalk Renewal and Coastal Infrastructure project. The below map illustrates the two project work categories covered in this document:

- Lakewalk Trail Phase 2
- Coastal Infrastructure Phase 5.

In addition to the overall alignment and coastal infrastructure areas, the project extents also includes eleven Pause Areas along the trail corridor. These are key nodes or areas of interest where there is ample parkland and/or additional open green space. Recreational activities are either already occurring at these locations, or are newly proposed and include picnicking, reflection, and small group gatherings and are considered opportune areas for coastal forest restoration.

As the designs for the future work are refined and progress into the details of each Pause Area, the City and design team will work alongside community partnerships that have existing spaces and desires for future installations along the Lakewalk.

Additionally, an interpretation and signage plan for the Lakewalk is in development - it will be a separate but parallel project which will be closely coordinated with the design development of the Lakewalk and Pause Areas. Thus, signage and historic interpretation elements are not notably present in the following preliminary designs, but space was set aside in each Pause Area to accommodate this developing feature.



Typical Trail Sections



Section Cut at Pause Area 04: The Narrows at Brewery Creek

Constrained Condition

In areas where the trail is constrained by the adjacent railroad corridor and the shoreline bluff, the goal is to increase the width of the trail but shift it inland to be able to safely remove the existing safety railings along the top of the bluff. To achieve this goal, a combination of strategies will be utilized, including:

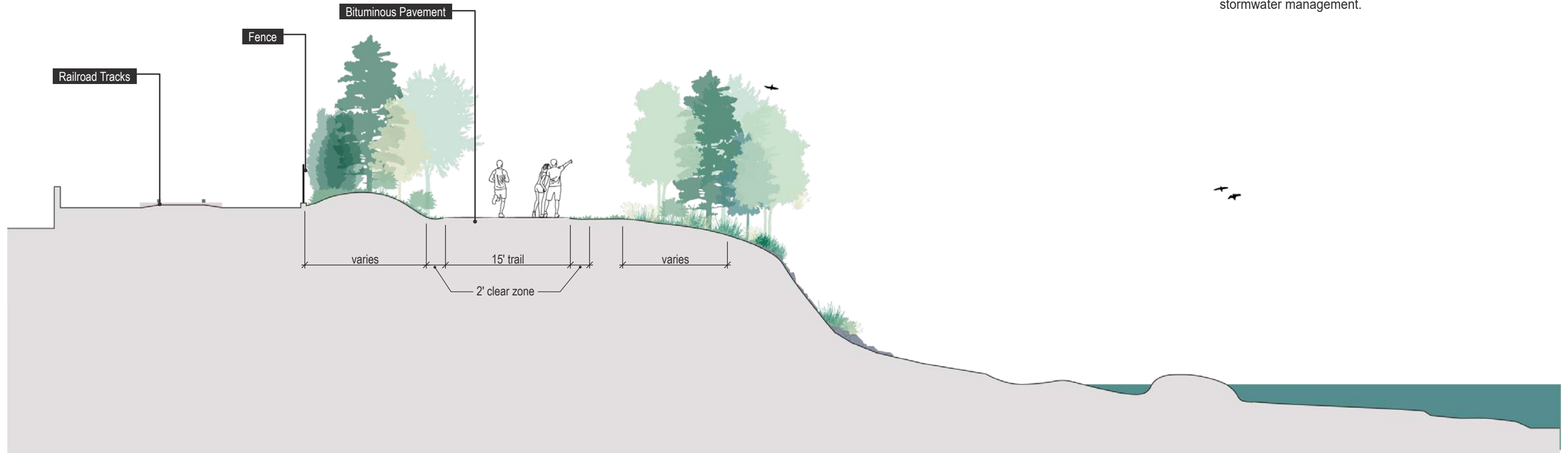
- Relocating the rail corridor fence as close as possible to the railline, using a 9' minimum clearance from the rail centerline.
- Locating trail and required clear zone directly next to rail corridor fence.
- Designing a preferred 15' wide trail, with a minimum width of 12' allowed only in select areas.
- Creating a 5' "flat" zone before the shoreline bluff descent begins; work will be closely tied into the coastal infrastructure design to create 'new land' when needed.
- Installing a bituminous pavement section that can support emergency and maintenance vehicles



Typical Trail Sections

Wide Condition

In areas where the trail has ample room to be located between the rail corridor and the shoreline bluff, a 15' wide bituminous trail will be designed. The trail alignment will generally remain the same in these locations. The wider trail design will take advantage of the space and provide habitat and coastal forest restoration, as well as be used for stormwater management.



Section Cut at Pause Area 09: Access Bridge

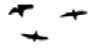


Typical Trail Sections



Split Condition

In areas where the trail splits into multiple pathways, a 15' wide bituminous through-way trail will be designed, with secondary routes spurring off, allowing pedestrians to get closer to the shoreline and/or into more secluded areas for reflection and discovery. The secondary routes will range in width from 4' to 10' and will consist of a concrete, boardwalk, or natural surface material such as crushed aggregate. The green spaces between the split trail condition will be used for habitat and coastal forest restoration, as well as for stormwater management.



Section Cut at Pause Area 07: Picnic Area



Planting Scheme

Throughout the Lakewalk corridor and at Brighton Beach and Kitchi Gammi park, the overall recommended planting scheme will be to restore and re-wild the shoreline to its original condition as a North Shore Coastal Forest. This strategy will help lower the City's maintenance needs while installing a more sustainable and resilient landscape. Although some areas will remain the same and will be reserved for traditional park-like mowed grass, the primary landscape terrain surrounding the Pause Areas will focus on vegetation restoration using native plant community typologies. A maintenance plan will be developed to ensure the success of the restoration areas by controlling



invasive species and managing plant growth throughout the establishment period.

In the following pages illustrating the enlarged Pause Area preliminary designs, the recommended planting zones are color coded by plant community and represent an all native palette. When each Pause Area is ready for final design, a detailed planting plan will be designed and implemented. Below are the descriptions of each of the plant communities along with their dominant species.

Native Plant Community Types for North Shore Coastal Forest

The North Shore of Lake Superior's combination of cool summer temperatures and shallow soil has led to a unique coastal forest community. Below are the native plant communities that can be found within a North Shore Coastal Forest.

Upland White Cedar Forest

White Cedar is the dominant canopy tree, followed by quaking aspen, paper birch, balsam fir, white spruce, and some white pine. Starflower, bluebead lily, and wild sarsaparilla are common plants in the ground layer.

North Shore Spruce-Fir Woodland

This community's open tree canopy is composed of balsam fir, white spruce, paper birch, and black spruce. The forest floor is covered by many species of lichens and mosses. The soil is thin with a lot of exposed bedrock. Low shrubs like blueberry, and bush honeysuckle are common. Additional herbaceous plants include Canada mayflower, bunchberry, and large-leave aster.

Lake Superior Bedrock Shrubland

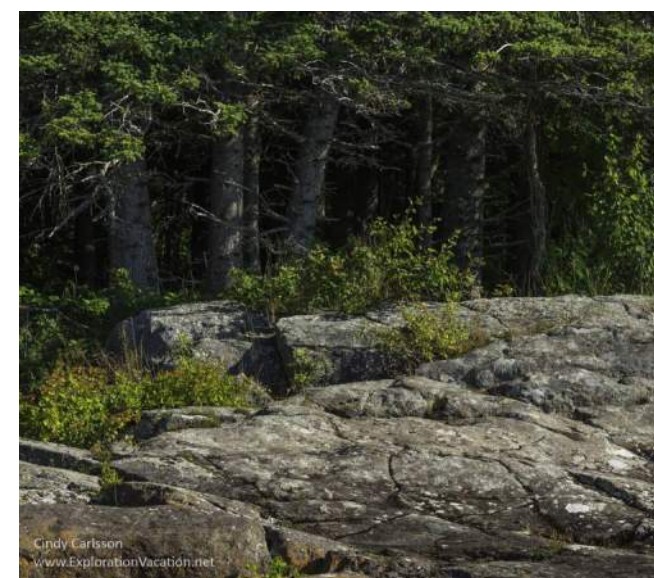
This subcanopy community consists of patchy vegetation of shrubs, wildflowers, grasses, sedges, lichens, mosses that are interspersed among rocky outcrops, cliffs and scattered trees. Many plants are stunted by the thin soil. Common shrubs include junberry and hawthorn species. Trees include balsam fir, white spruce, paper birch and mountain ash.



Additional Plant Communities

Shrubland and Slope Stabilization

This is a mixture of plants with a base matrix of the Lake Superior Bedrock Shrubland species, but includes more shrub and under story species to help stabilize steep slopes. Woody shrubs include, willows, dogwoods, and early wild rose. Where this community is already existing along the shoreline, the new designs will strive to preserve as much of it as possible as the established plants are already stabilizing the slope.



Mowed Turf Grass

In programmed areas and along the 2' clear zone on either side of the trail, a drought tolerant low mow turf grass mix will be used. A low mow grass allows for intermittent mowing but also can withstand more frequent mowing when needed.



Social Trail Strategies

Social trails are the informal trails that are created by repeated foot traffic between two locations, and result in increased erosion. At the time of this report, there are roughly 53 social trails along this section of the Lakewalk corridor. In order to protect the shoreline from further erosion, while also trying to balance the value of providing access to the water's edge, it is recommended that approximately half of the existing social trails be permanently closed, and that the remaining social trails be formalized and restored with a more sustainable approach.

When assessing which social trails should remain open and which ones to close, a variety of characteristics were considered, including; destination, trail configuration, location in relation to pause areas and planned coastal work, existing condition, erosion, use, and slope.

Formalizing Key Trails

In order to successfully formalize a social trail without losing the aspect of discovery or the feeling of "off-the beaten path" that these types of trails offer, a list of strategies and

considerations were developed to be utilized in varying combinations across the corridor.

Formalizing Strategies

Consider key locations

- Maintain beach access points, don't take away a favorite 'secret' spot
- Consider the overlook and viewshed opportunities
- Prioritize trails that tie into restoration pause areas

Surfacing options

- Natural surfacing is desired for most social trails
- Simulate a hiking trail/off the beaten path feeling - to provide the sense of adventure and danger
- Select a few for more social trails for formal access (a mobility friendly access - i.e. include railing, stairs, or a smooth hard surface)
- Control erosion, utilize boulders in revetments for steps

Signage considerations

- Future potential for coded small post sign at social trails, codes for difficulty level and destination type (overlook, beach access, or historical interpretation)
- Signs could work in tandem with closed trail strategies

Closing Social Trails

Closing social trails is a challenge. In order to discourage use of previously used pathways, a list of strategies and considerations were developed to be utilized in varying combinations across the corridor. With the phasing of the Lakewalk and Coastal Design improvements, there is a great opportunity to thoroughly disguise and remove trails from memory with the closure of certain areas during construction, and allowing vegetation to grow back.

Closing Strategies

Educate trail users

- Use signage to help people understand why their old favorite trail is closed
- Install temporary signage to direct users to other routes with same destination (or create new better route)
- Disguise the corridor and/or disguise the airspace of trail (plant dead-fall)

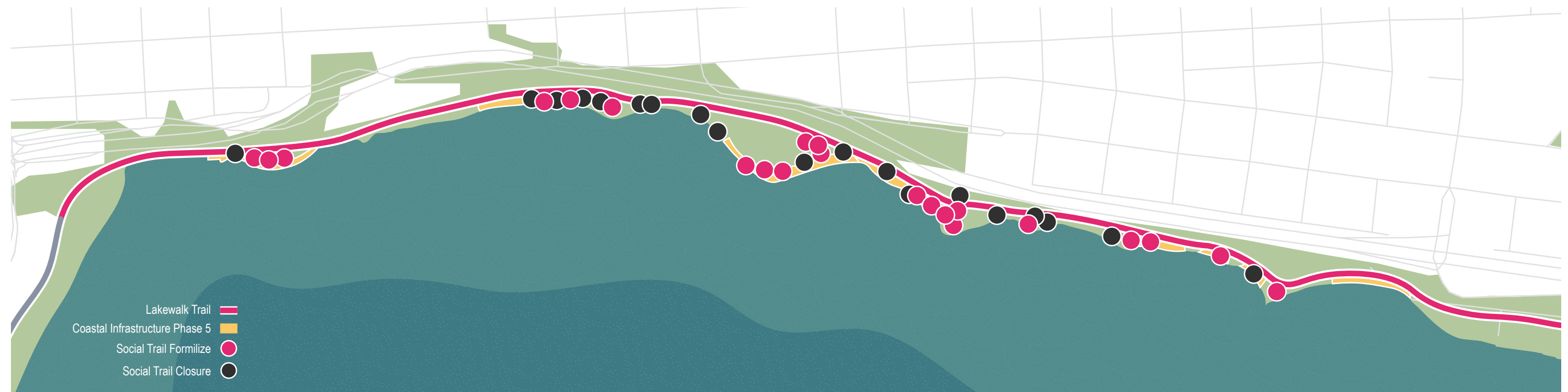
Built strategies

- Break up the hard packed trail and plant with vegetation, consider a quick growing cover crop

- Control erosion, with new vegetation, and regrading methods
- Block the corridor with permanent structures like stone or with temporary fence and signage
- Keep trail restoration disturbance limits as close to the social trail disturbance extents as possible

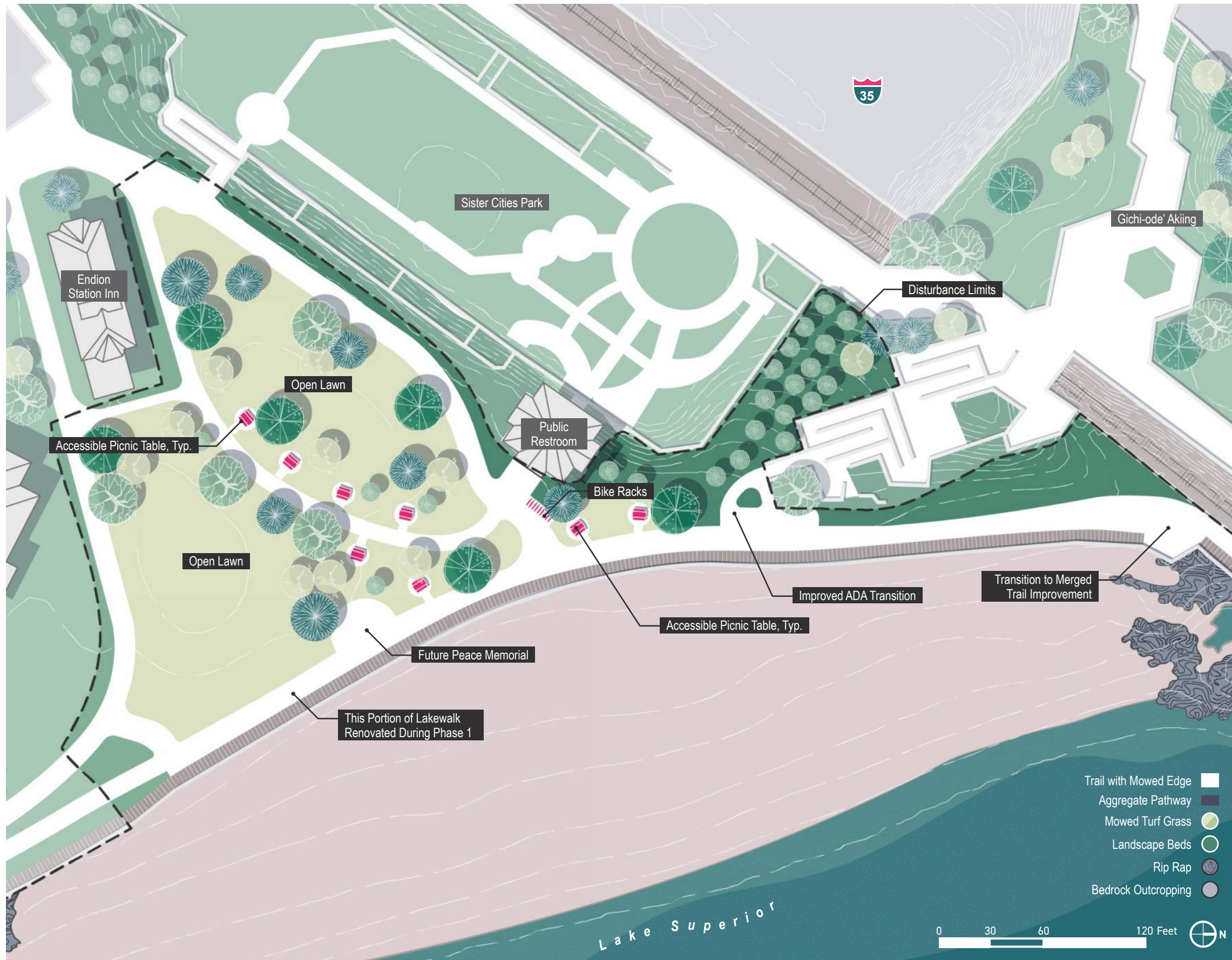


Examples of erosion on an existign social trail





Chapter 2. **Lakewalk
Pause Areas:
Preliminary
Designs**

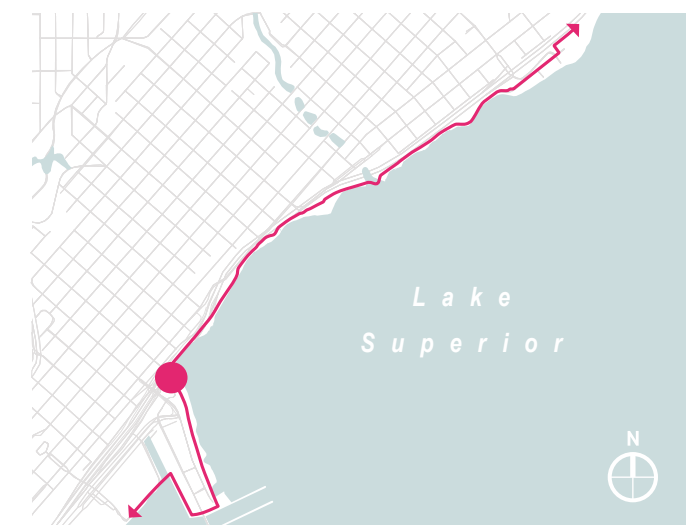


Pause Area 01: Endion Station

Landscape improvements at Endion Station Inn will complement the completed Lakewalk Phase 1 trail and seawall project, while maintaining the current use and primary circulation pattern as a key entry area to the Lakewalk. Additionally, these improvements will provide the space and flexibility to incorporate the City's future plans to place a Peace Memorial along the corridor, public art and/or play installation, as well as future interpretation nodes.

Key Design Features:

- Maintain open programmable lawn
- Refine redundant and intersecting paths
- Improve transitions between multi-use trails
- Improve transitions at connection points to the open lawn areas and Gichi-ode'Akiing
- Provide accessible picnic tables
- Enhance native planting restoration, and remove rock mulch in existing planting beds for easier maintenance
- Include shade trees to define lawn areas





Pause Area 02: Veterans Memorial

Landscape improvements at the Veterans Memorial will focus on maintenance and enhancements of the existing site features. There is an emphasis on protecting the current memorials and remnants of past uses found along the shoreline, while balancing the heavy pedestrian use as well as preserving views to Canal Park and the iconic Aerial Lift Bridge in the background. This section of paved Lakewalk trail was re-paved as part of Phase 1.

Key Design Features:

- Provide maintenance and selected repair to existing boardwalk spur trail.
- Install new lighting at Memorials
- Formalize and stabilize social trails
- Restore vegetation at shore transition, and in areas of washout with native plant communities (shrubland & slope stabilization)
- Maintain mowed grass area
- Provide accessible benches and picnic tables



Coastal Design Study: Soldier Pile Wall and Revetment at Lake Superior Outfalls

This new wall near the MnDOT Outfalls is recommended to be a soldier pile wall with armor stone revetment and colored concrete panels. The wall will blend in with the natural landscape features along the Lakewalk corridor. The new wall will shore up the eroding shoreline which is undermining the trail.

Key Design Features:

- Eliminates shoreline erosion
- Armor stone revetment mitigates wave overtopping
- Immediately provides a safe Lakewalk for public use
- Blends into existing Lakewalk infrastructure
- Maintains access for outfall maintenance
- Protects the 24" forcemain under the Lakewalk and the railroad behind it
- Preserves green space adjacent to Veterans Memorial

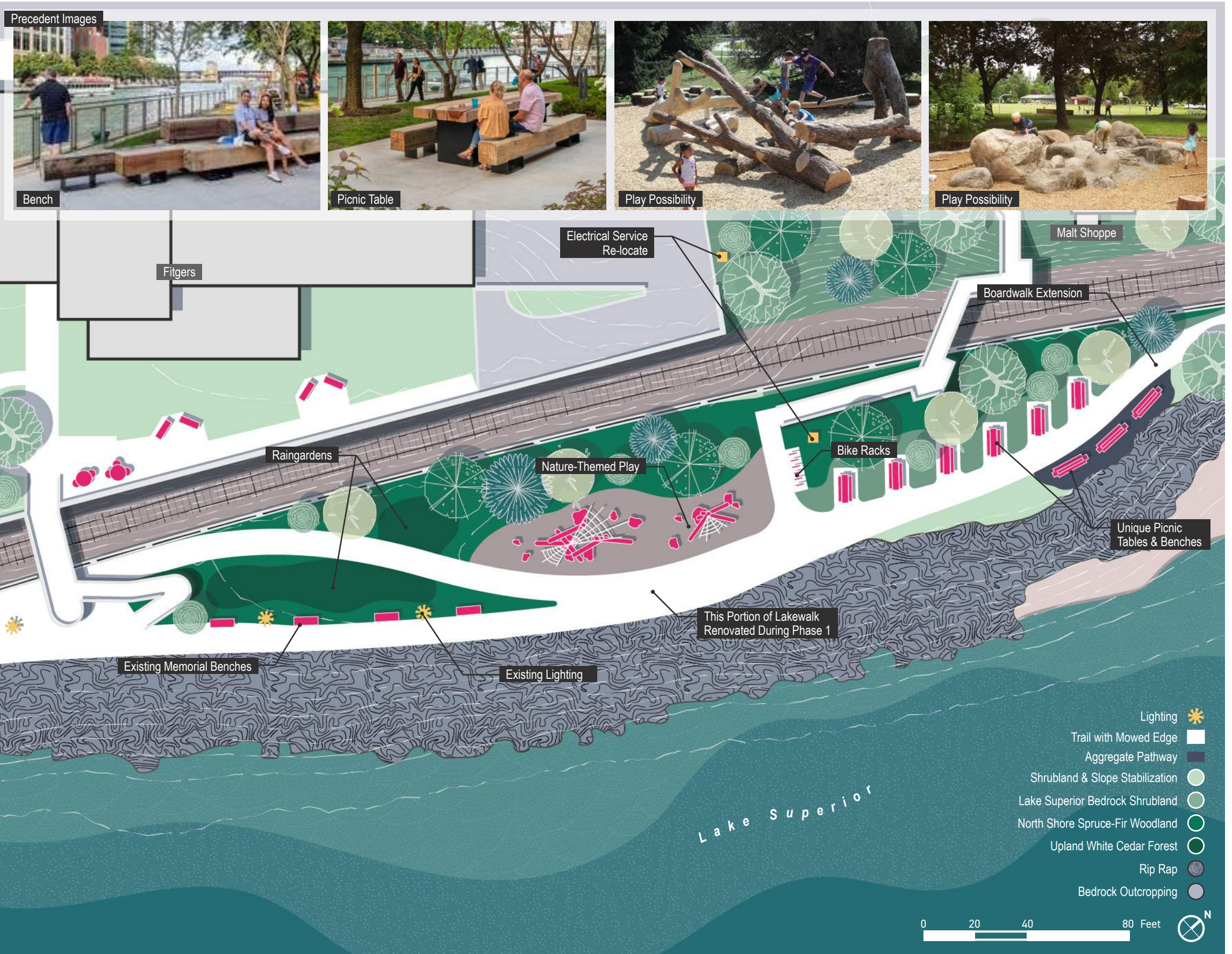


Pause Area 03: Fitgers-Malt Shoppe

Landscape improvements at the Fitgers-Malt Shoppe area will strive to create a destination with flexible areas to rest, eat, and connect with local businesses above the Lakewalk.

Key Design Features:

- Additional unique seating elements will maximize seating and add to the variety of ways to enjoy the Lake
- Incorporate a non-traditional play area with an adventure/nature element simulating Lake Superior's rocky shoreline
- Enhance pre-programmed spaces with native planting restoration to reduce maintenance and provide buffers between uses
- Repair drainage issues occurring across trail; move drainage to under trail and outlet into raingardens
- Increase amount of accessible picnic tables and eating areas
- Better define bike rack area near bottom of Malt Shoppe stairs
- Extend boardwalk to the north to create a purposeful termination and better transition into a single multi-use trail for next segment
- Relocate electrical service to north side of railroad tracks



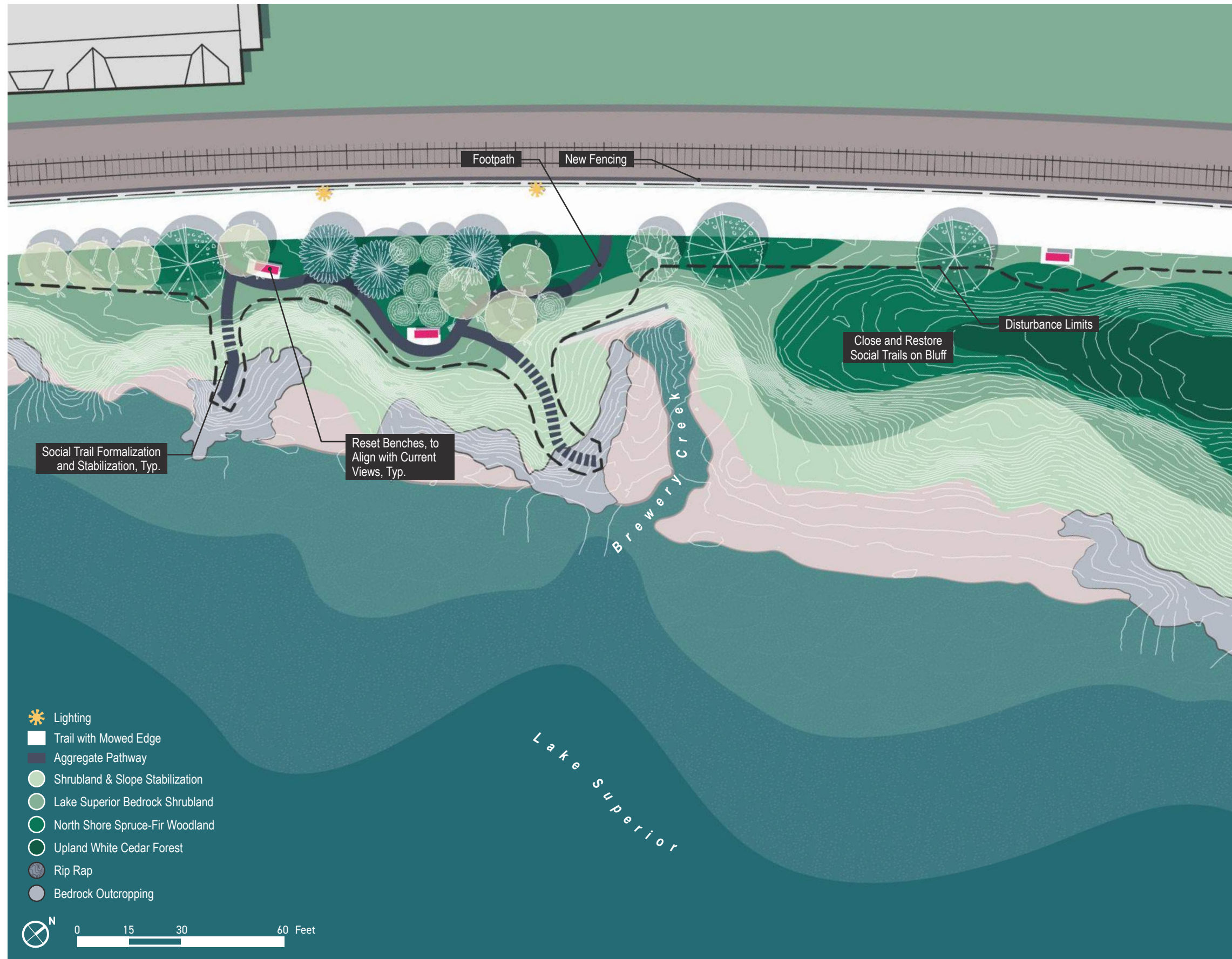
Coastal Design Study: Malt Shoppe Area

The area near the Malt Shoppe will feature a restored gravel beach and new armor stone revetment with stone steps for beach access. A new colored concrete retaining wall with native vegetation along the Lakewalk will help the new design blend in with existing features and provide long-term protection of this prominent trail.

Key Design Features:

- Enhances and preserves the existing gravel beach
- Provides public access down to the beach
- Armor stone revetment and wave return wall mitigates erosion
- Provides a buffer between Lakewalk and top of slope for public safety
- Blends into existing Lakewalk infrastructure
- Protects the 24" forcemain under the Lakewalk
- Protects the railroad behind the Lakewalk



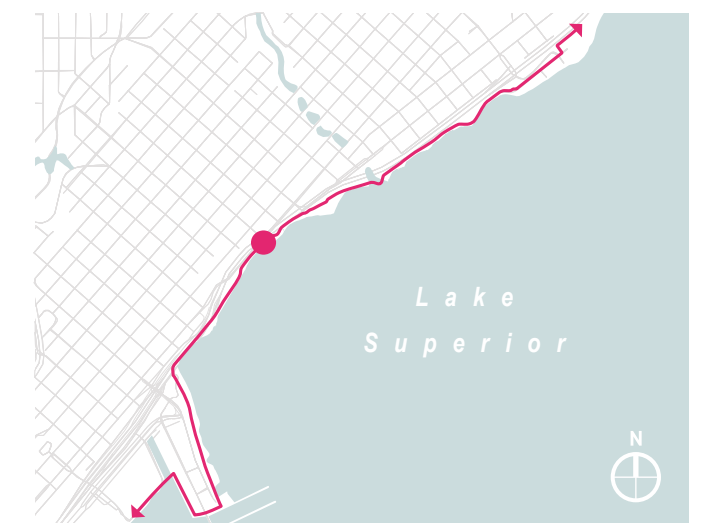


Pause Area 04: Narrows at Brewery Creek

Landscape improvements at the Narrows at Brewery Creek will restore plantings, provide lookouts and a natural surface footpath. The footpath will allow trail users to get off the main trail and have a moment of respite with benches and views of the lake with a landscape buffer from the main trail. This side path will also formalize the social trails down to the waters edge, by directing users to specific locations which will also reduce erosion down the shoreline slope.

Key Design Features:

- Move trail inland toward railroad and widen to desired 15' width
- Relocate lights in line with new fence
- Relocate benches with accessible pads
- Provide spur footpath with natural surface aggregate
- Re-wild pocket between Lakewalk and footpath with native planting restoration
- Stabilize two social trails, and close off social trails on bluff

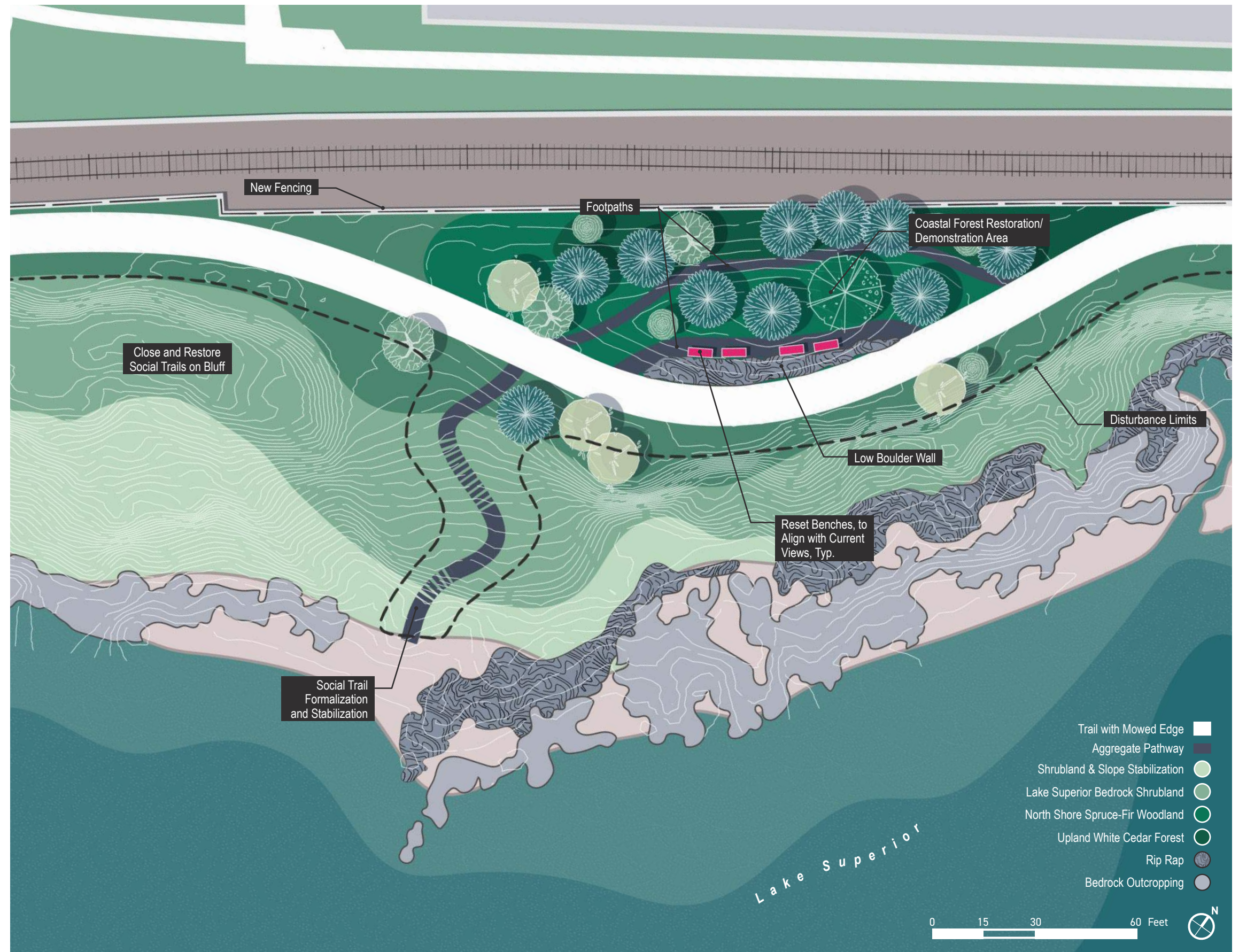


Pause Area 05: Grassy Knoll

Landscape improvements at the Grassy Knoll will showcase a native planting restoration with demonstration area and enhance an existing seating area. Incorporation of a spur footpath through the restoration area will provide opportunities for interpretation and education while also giving trail users an opportunity to explore. Realignment of the Lakewalk trail through this area will create the space needed to eliminate the existing safety railing. Benches in this area will be reset along the footpath for accessibility and will take advantage of the topography and perched view above the main trail.

Key Design Features:

- Eliminate turf and re-wild knoll with coastal forest (white cedar and pine) for interpretation/demonstration area
- Natural surface footpath through coniferous forest floor
- Pull trail inland away from bluff and re-grade for ADA
- Create 5' flat area for shrubland planting and/or bioswale, eliminates need for railing
- Design perched seating area with natural stone boulder wall
- Formalize social trail, provide mobility enhancements for this heavily used access point
- Work with established community partnership to incorporate or relocate existing orchard

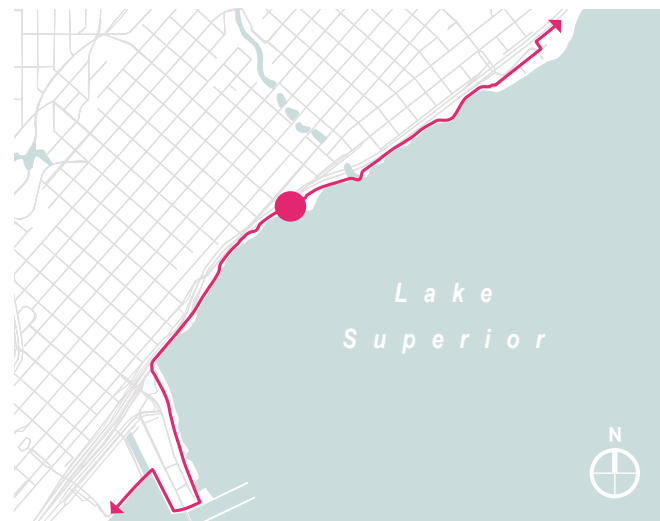


Pause Area 06: Leif Erikson Bypass

There is a desire to create a bypass trail at Leif Erikson Park to improve safety and ADA accessibility throughout this area. The recommendation includes creating a new bypass lane along the railroad track with associated retaining wall to meet grading requirements. This bypass will provide a safer route for bikers and pedestrians who don't necessarily need to enter the larger parkland. This re-route includes a new pedestrian link that is centered on the existing bandshell. Future ADA trail improvements within Leif Erikson Park will occur at a later time.

Key Design Features:

- New bike/bypass trail at 12' width will parallel railroad tracks and will no longer require entry into main park area
- Approximately 400LF of retaining wall needed to support slope and new trail alignment
- Pedestrian links into park align with bandshell
- New pedestrian path along existing Lakewalk trail alignment to include new stairs
- Native planting restoration limited to areas only disturbed during construction
- Work with established community partnership to protect, incorporate, or relocate existing gardens





Coastal Design Study: Leif Erikson Shoreline and Slope Restoration

New armor stone revetment and restored slope with native planting restoration will provide resiliency and protection of this beloved park space. The new shoreline protection will also serve to protect the historical Leif Erikson Park and its historical stone stage structure

Key Design Features:

- Protects the historical Leif Erikson Park and stone stage
- Provides public access down to the beach
- Armor stone revetment provides key shoreline protection
- Blends into existing native shoreline



Coastal Design Study: Leif Erikson Soldier Pile Wall

The area above Leif Erikson will include a soldier pile wall with colored concrete panels to blend in with the existing Lakewalk infrastructure. This section of Lakewalk will be pile supported for durability and safety. Colored concrete curb on top of the ledge rock is also recommended to reduce further slope failures. Native planting restoration along the restored slopes will ensure the area is in keeping with other design elements.

Key Design Features:

- Provides long-term shoreline protection
- Blends into existing Lakewalk infrastructure by using colored concrete
- Protects the 24" forcemain under the Lakewalk
- Protects the railroad behind the Lakewalk
- Preserves the green space near the 12th Ave. East bridge



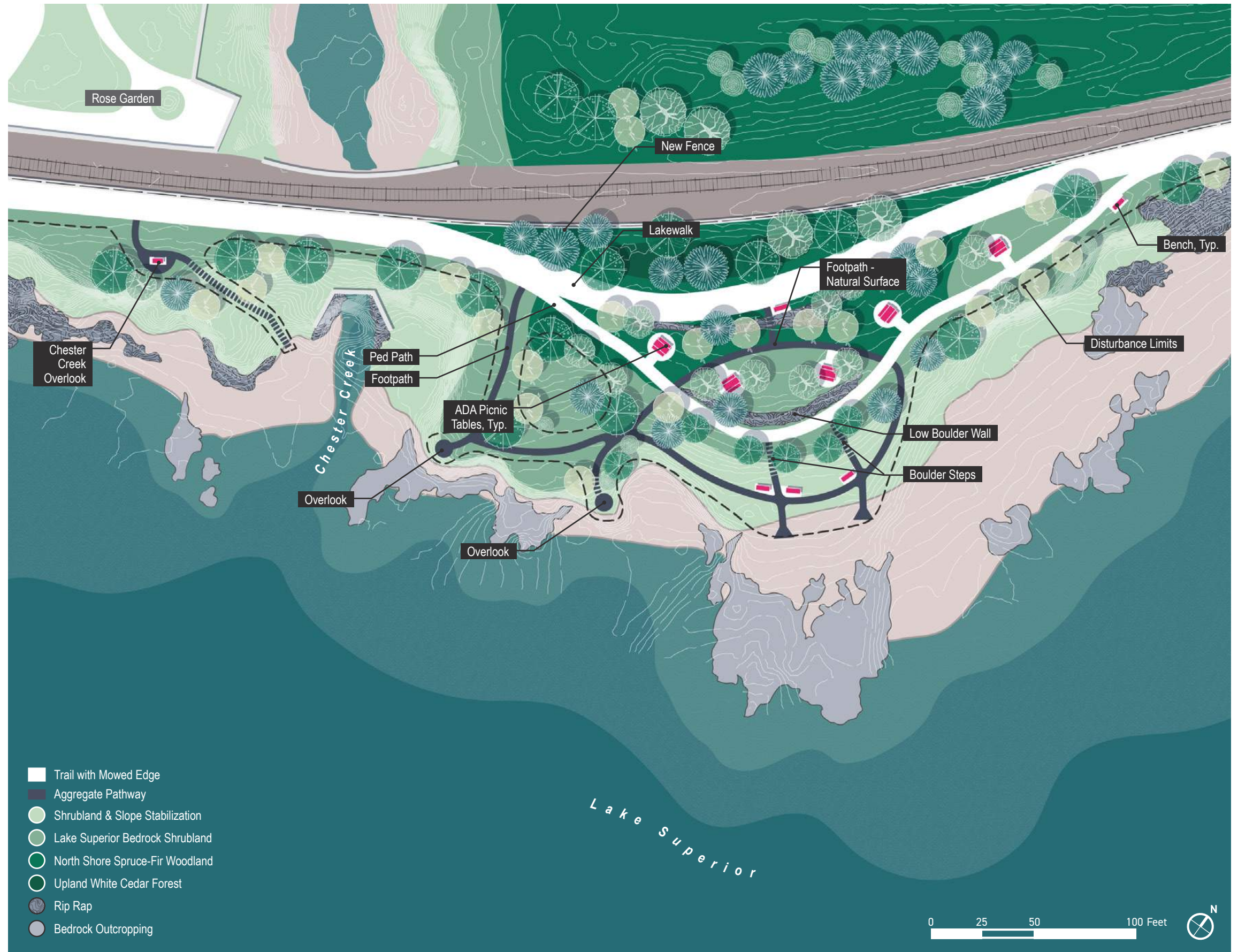
Pause Area 07: Picnic Area

Concept A

This picnic node near Chester Creek outlet is a popular pause area along the Lakewalk Trail and has two design alternatives. Concept A maintains the programmed space but enhances and better defines the existing features at this well-used location. The main Lakewalk trail will be re-routed inland, providing a more consistent grade and an opportunity for commuters to bypass the picnic area. A narrower pedestrian spur trail will follow the route of the existing Lakewalk, and will provide individual picnic nooks, along with natural surface footpaths linking to other key areas such as overlooks and the beach.

Key Design Features:

- Move Lakewalk trail inland for bypass traffic
- Create pedestrian spur path on old trail alignment
- Install accessible benches and picnic tables for flex use
- Formalize and stabilize social trails
- Re-wild pockets between uses with native planting restoration
- Engage community partners for future garden area



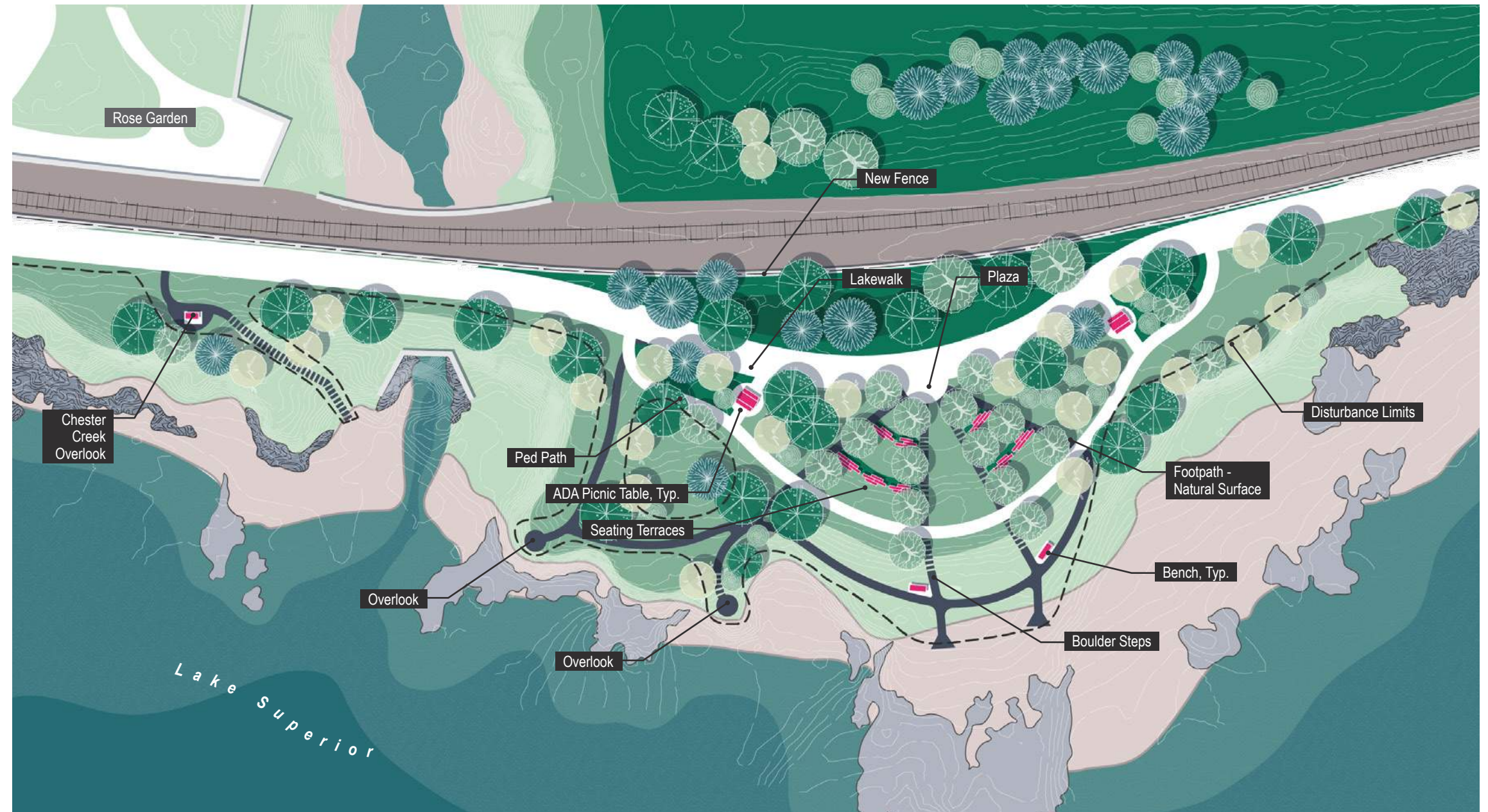
Pause Area 07: Picnic Area

Concept B

Concept B proposes a new organization of space to increase seating and viewing opportunities toward the Lake. Similar to Concept A, the main Lakewalk trail will be re-routed inland, providing a more consistent grade and an opportunity for a bypass for commuters. A pedestrian spur trail will follow the route of the existing Lakewalk, with gravel footpaths formalized to link and access key features. Utilizing a centralized plaza, terraced seating and native plantings will frame and maximize views out to Lake Superior.

Key Design Features:

- Move Lakewalk trail inland for bypass traffic
- Create pedestrian spur path on old alignment with a clear stop/right turn into main trail
- Add lighting for evening use
- Provide natural surface path to frame views and organize connector space
- Formalize and stabilize social trails
- Create central framed view point with addition of plaza
- Terraces picnic areas, with non traditional seating/eating options (drifters or swings)



- Trail with Mowed Edge
- Aggregate Pathway
- Shrubland & Slope Stabilization
- Lake Superior Bedrock Shrubland
- North Shore Spruce-Fir Woodland
- Upland White Cedar Forest
- Rip Rap
- Bedrock Outcropping

Precedent Images



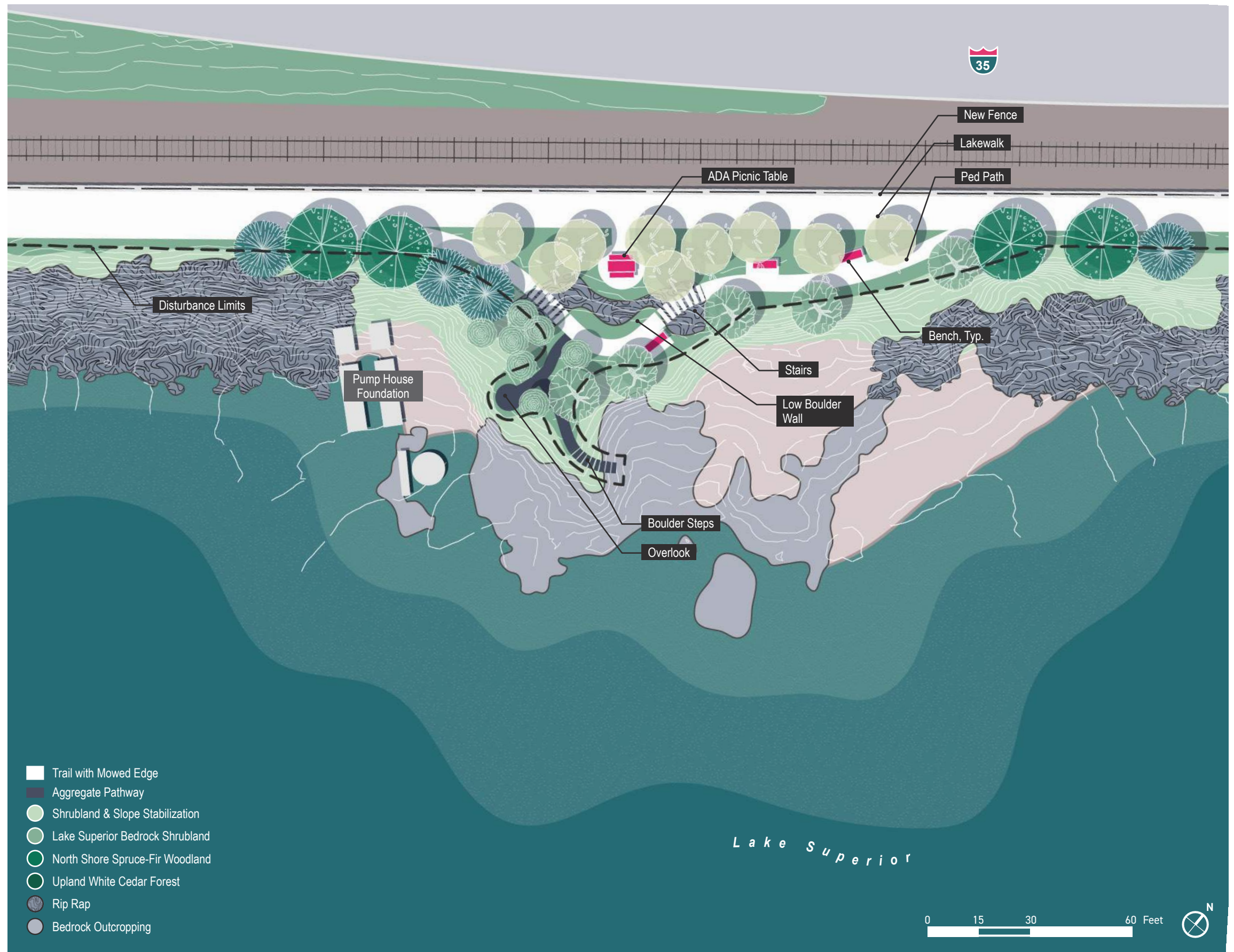
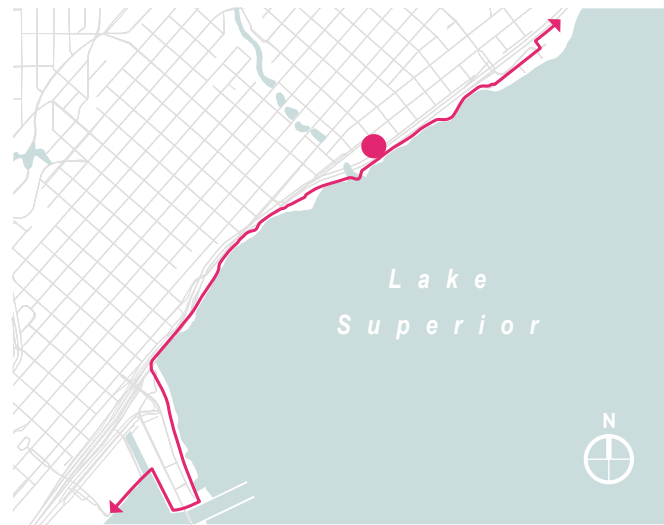
Pause Area 08: Lower Forest Nook

Concept A

This lower forest nook area near the old pump house is secluded, difficult to access, and hasn't been maintained in a while, though it provides a unique setting along the lakeshore. Two design alternatives have been studied that strives to enhance the site. Concept A realigns the main trail and provides more accessible seating. Additionally it will take advantage of the topography and maintain the lower terrace, by providing a pedestrian spur path from the main trail and includes bench with views to the lake.

Key Design Features:

- Move trail inland toward railroad for bypass traffic
- Relocate benches for better viewing
- Re-wild pocket created between Lakewalk trail and spur path with native planting restoration
- Stabilize social trails, close off splits and eastern trail
- Create landing at top of bank for single picnic table
- Avoid/protect old pump house
- Provide areas for interpretation



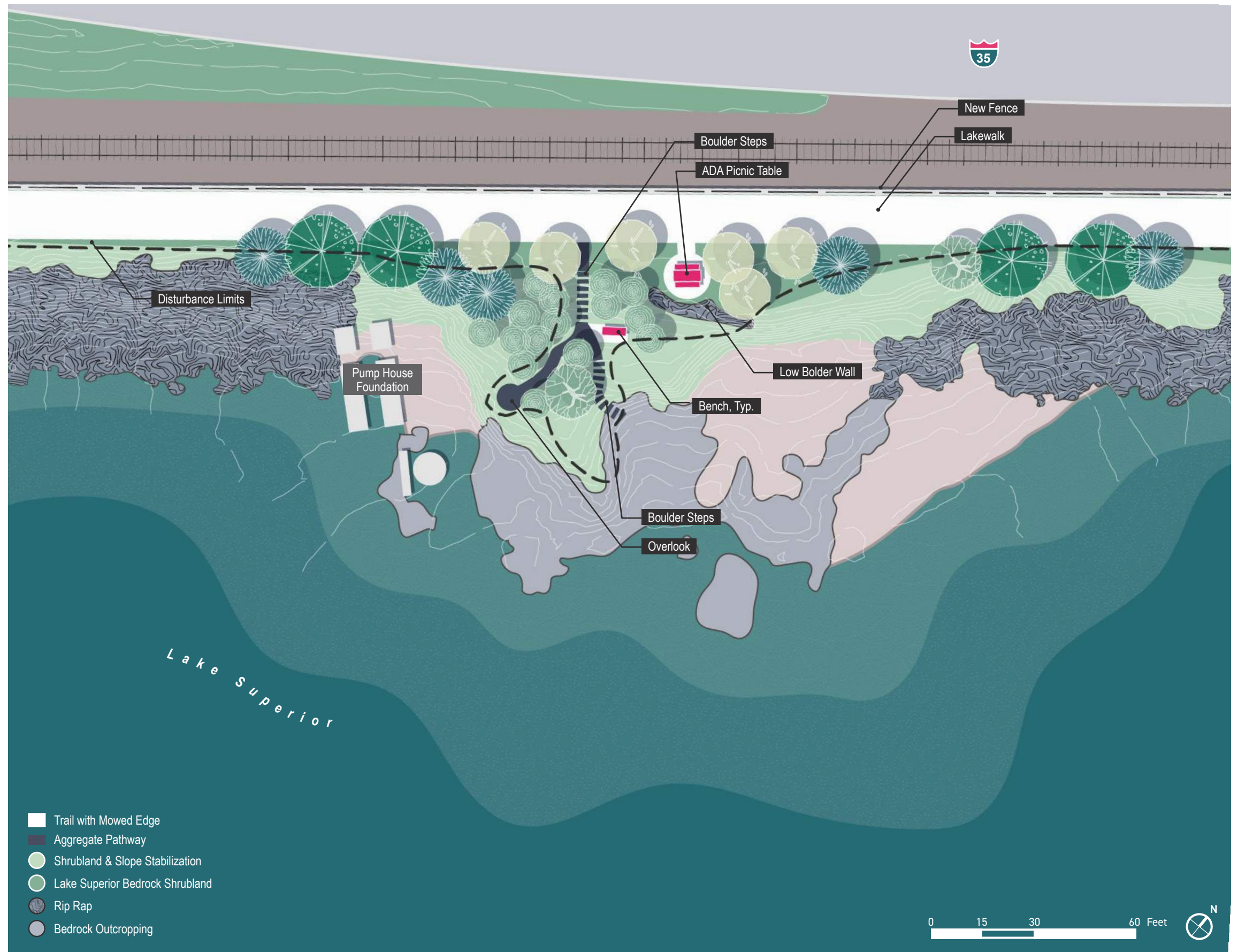
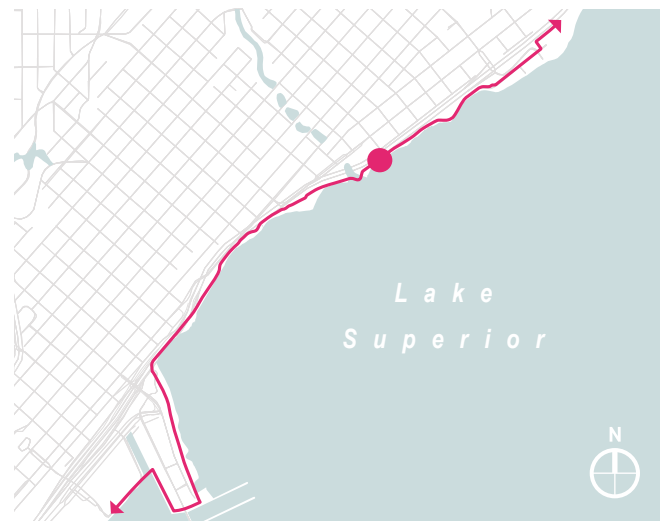
Pause Area 08: Lower Forest Nook

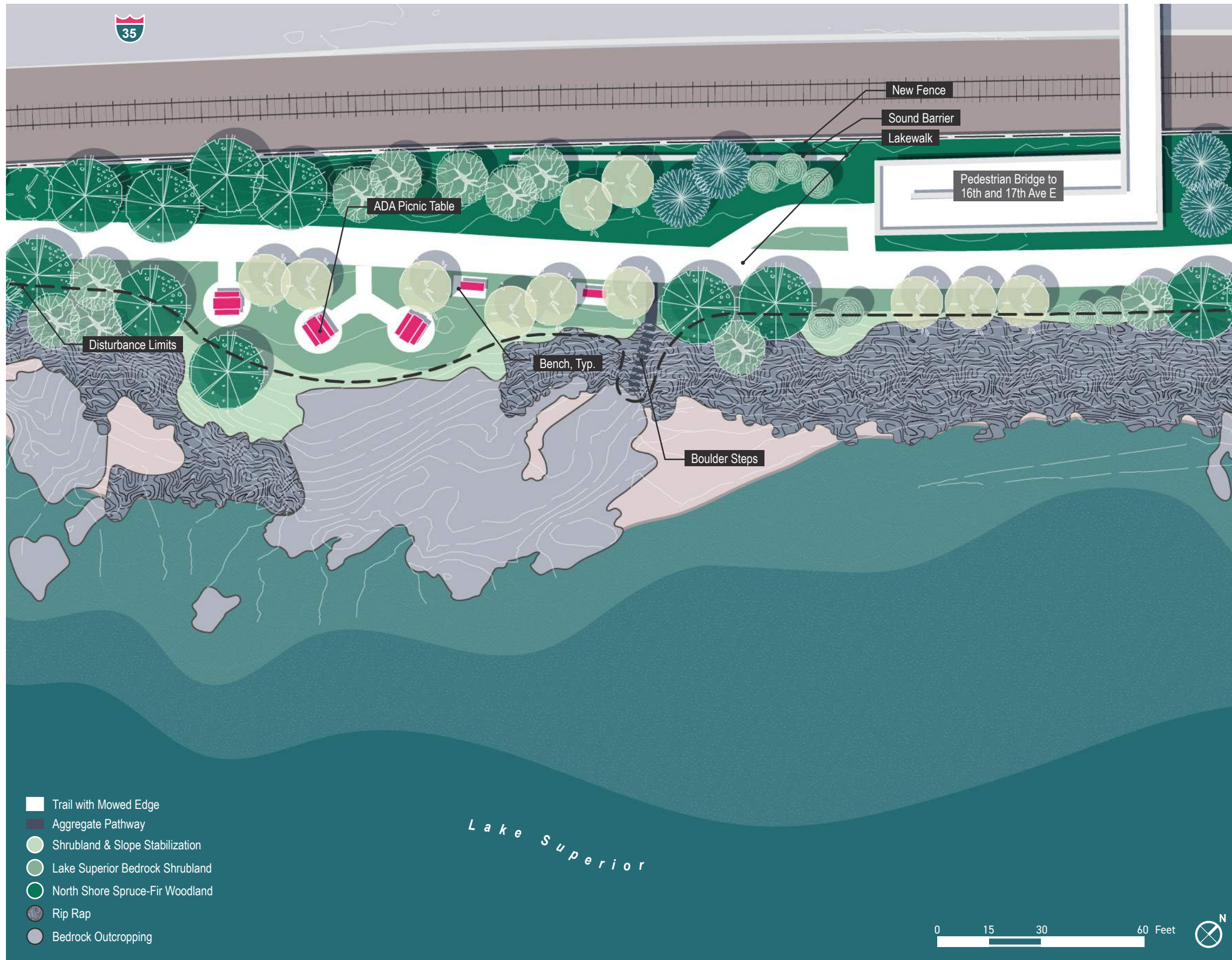
Concept B

Concept B improvements to the Lower Forest nook maintains a similar configuration as it is now. This concept also realigns the main trail closer to the railroad corridor and also creates an upper ADA seating area. The lower terrace would larger remain the same, providing beach access and a singular overlook.

Key Design Features:

- Move trail inland toward railroad
- Relocate benches
- Stabilize social trails, close off splits and eastern trail
- Create landing at top for picnic table
- Avoid/protect old pump house
- Provide areas for interpretation





Pause Area 09: Access Bridge

Landscape improvements at the Interstate Access Bridge enhances the existing use by increasing seating options and preserving the beloved bedrock outcropping at the waters edge.

Key Design Features:

- Relocate benches and picnic tables to make more accessible
- Maintain mowed grass or no-mow mix - minimize disturbance on grass on top of exposed bedrock
- Expose and clean up existing boulder steps for water access
- Add sound barriers along I-35 edge (fencing or vegetation buffer)

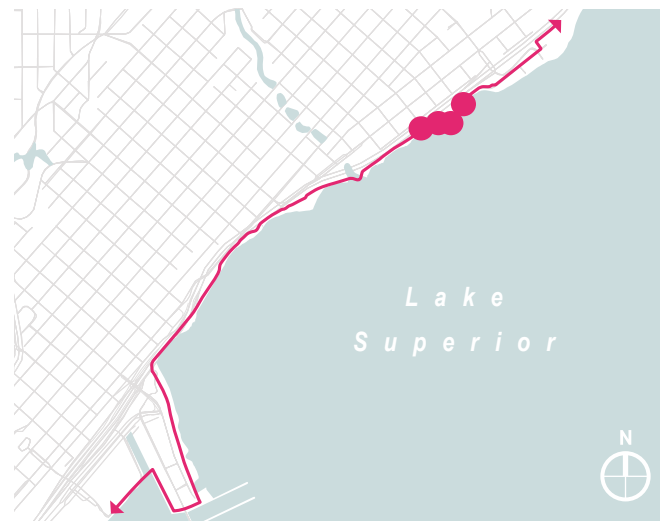


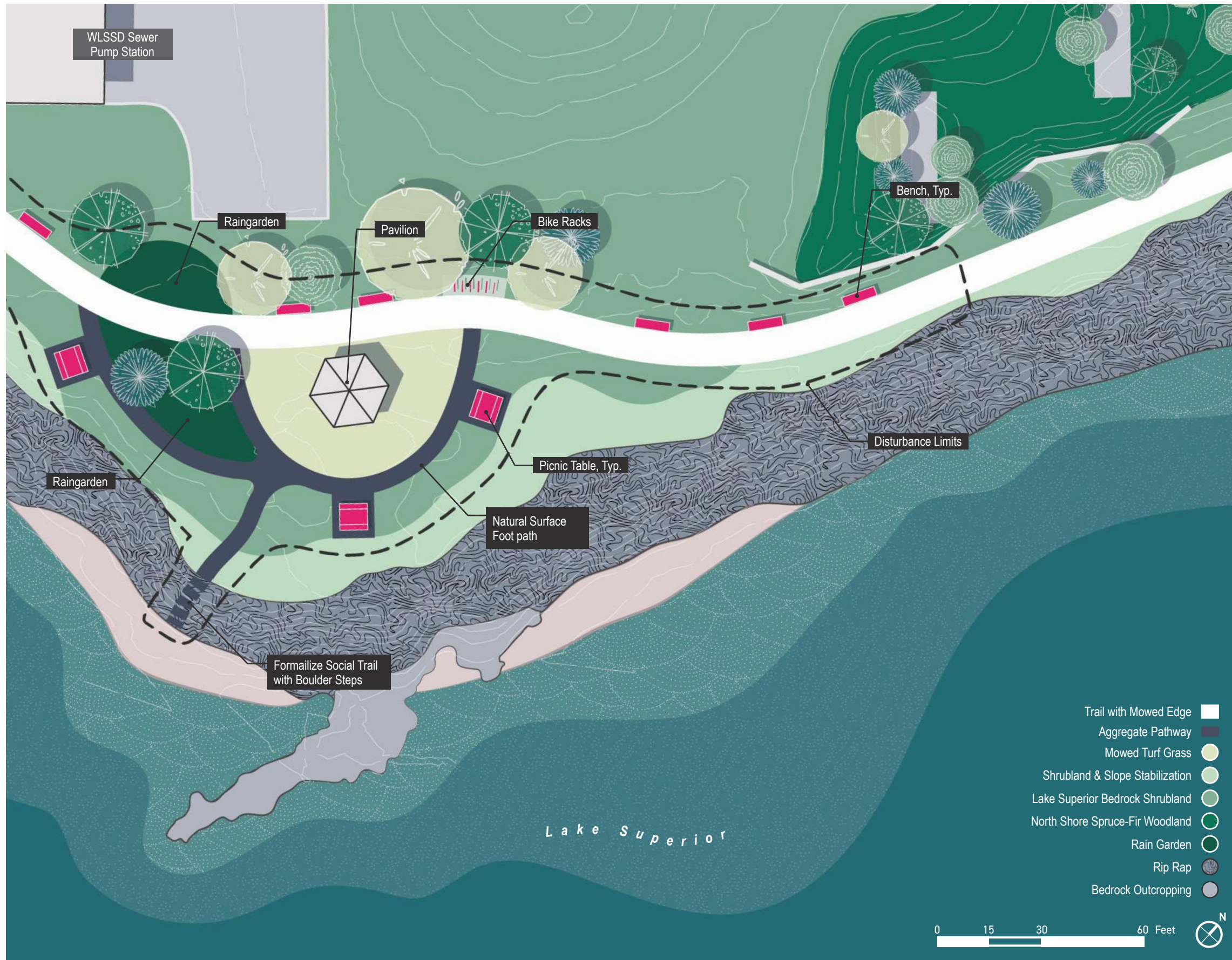
Coastal Design Study: Coastal Bond Sections 1–4 (near 18th Ave. East Lift Station)

Four select shoreline locations between South 16th Avenue East and South 20th Avenue East will feature a new armor stone revetment with native planting restoration along the Lakewalk. The natural based design elements will help the new design to blend in with existing features and provide long-term protection of this prominent trail.

Key Design Features:

- Armor stone revetment to mitigate erosion
- Provides a buffer between Lakewalk and top of slope for public safety
- Blends into existing Lakewalk infrastructure
- Protects the 24" forcemain under the Lakewalk
- Protects the railroad behind the Lakewalk



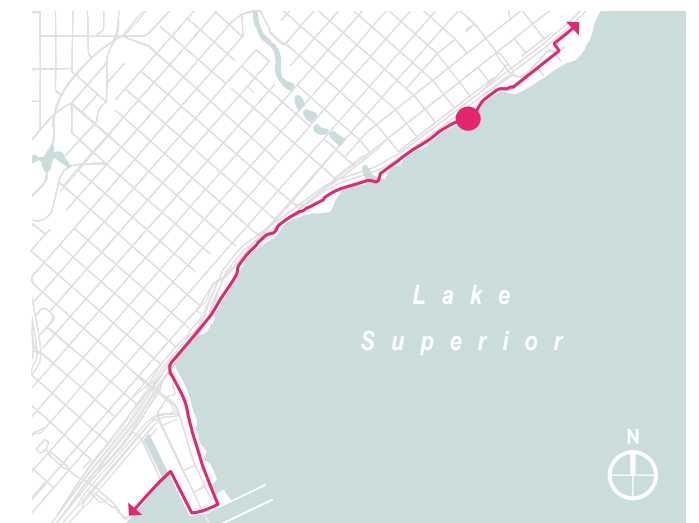


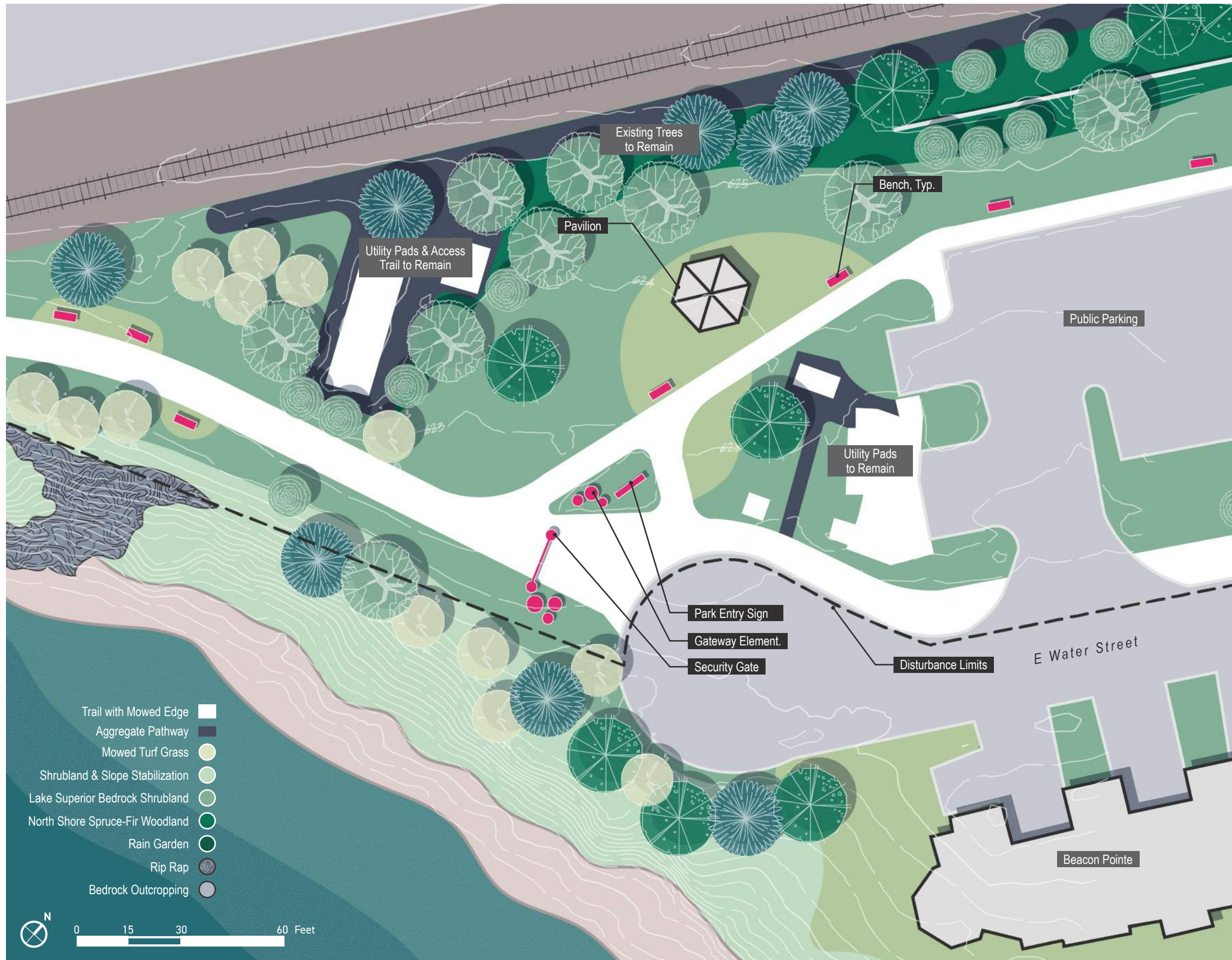
Pause Area 10: Lift Station

Landscape improvements at the Western Lake Superior Sanitary District Lift Station re-imagines the programming of this pause area with a neighborhood focus. This location is near the Water Street trailhead parking lot and with increased tourism and additional neighborhood connections, presents a unique opportunity to add a covered pavilion and create a mini-park like setting for larger groups to enjoy the Lake Superior shoreline.

Key Design Features::

- Removes wooden boardwalk/patio
- Provides raingarden solution for parking lot surface drainage
- Protects and preserves existing trees
- Widens main trail to desired 15' width with pedestrian spur paths for exploration
- Re-wild pocket areas and along trail corridor with native planting restoration
- Formalize and stabilize social trails/access to beach
- Pavilion could have solar component for electrical power





Pause Area 11: Water Street Entry

Landscape improvements to the Water Street Trailhead will enhance the Lakewalk's Eastern entrance. Re-wilding the landscape surrounding the parking lot and green space with a native planting restoration will provide for less mowing maintenance and more trees for shade along Water Street. Relocating the park entry sign to be more centrally located near the turn-around and trail crossroads will create a gateway element to the Lakewalk better marking the start to this segment.

Key Design Features:

- Reduce maintenance and mowing of large unused lawn space, implement native planting restoration
- Create a gateway entry area
- Install new trailhead sign
- Provide shade/boulevards trees along Water Street
- Include accessible seating area and covered pavilion for larger gatherings

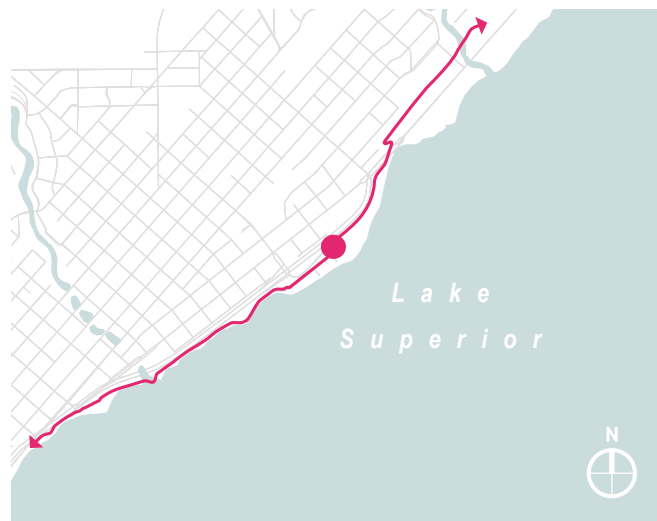


ADA Reroute 1:

The realignment of the Lakewalk near the intersection of E Water Street and S 23rd Ave E reduces the grade of the trail and increases the turn radius to provide a safe path of travel that is ADA compliant.

DESIGNS

DESIGNS



ADA Reroute 2:

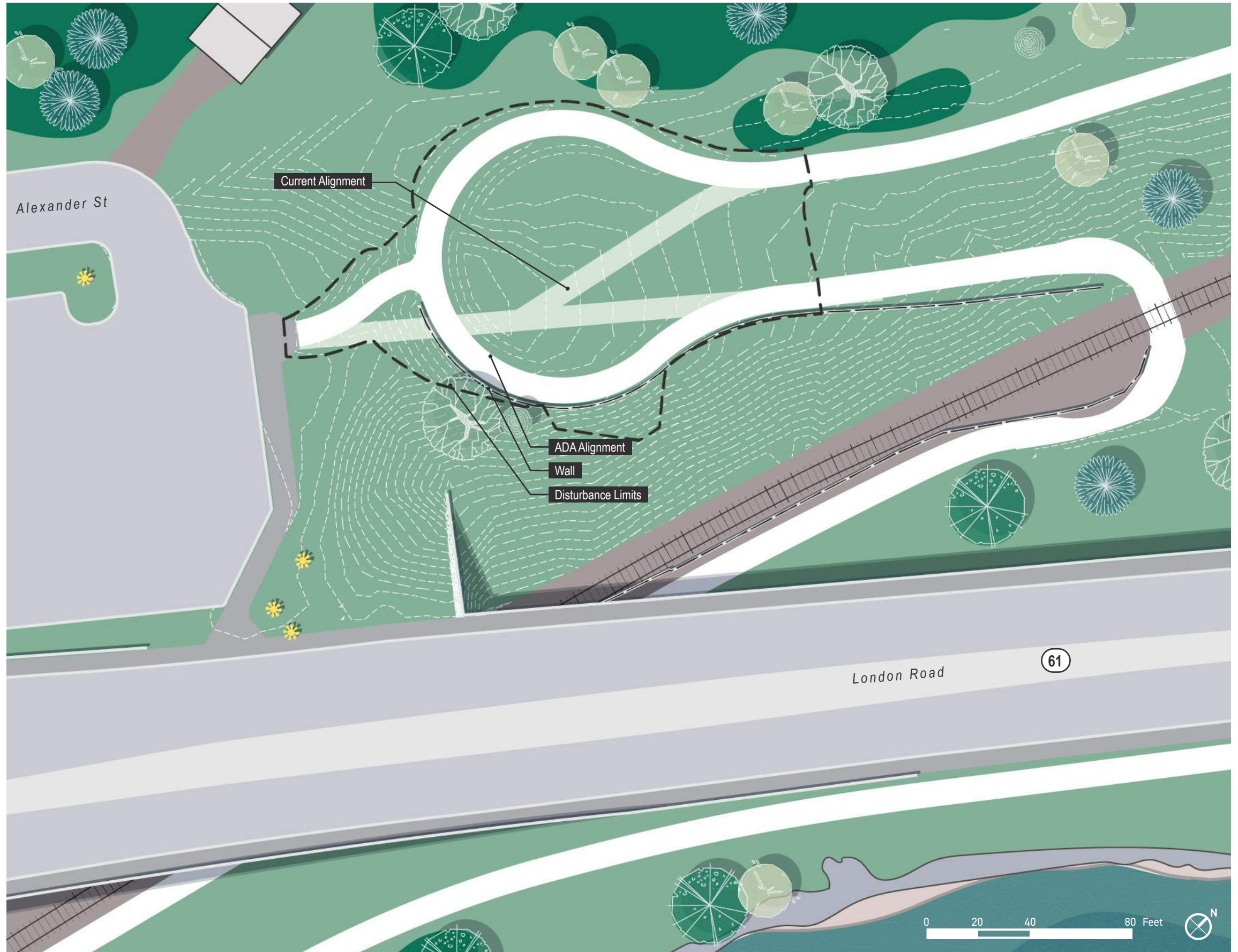
The realignment of the Lakewalk near the intersection of Interstate 35 and Highway 61, and where the Lakewalk splits to cross the railroad tracks, reduces the grade of the trail and increases the turn radius to provide a safe path of travel that is ADA compliant.



ADA Reroute 3:

The realignment of the Lakewalk near the Lakewalk Parking Lot at Holiday Station reduces the grade of the trail and increases the turn radius to provide a safe path of travel that is ADA compliant. Additional study to improve grade and bring the trail up to ADA compliance at the railroad crossing is in progress

DESIGNS

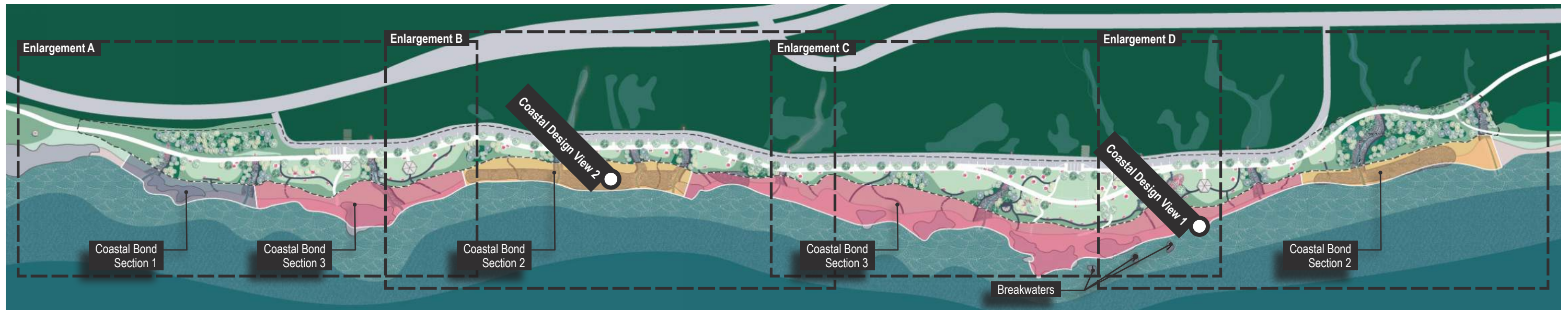


DESIGNS





Chapter 3. **Kitchi-Gammi Park & Brighton Beach Preliminary Design**



PROJECT EXTENTS: KITCHI-GAMMI PARK & BRIGHTON BEACH

The same storms that damaged the Lakewalk in 2017 & 2018, also did significant destruction to the roadway infrastructure in Kitchi Gammi Park and to the Brighton Beach shoreline. Immediately after the storms occurred, the park had to be temporarily closed so that the City could clean-up the damaged pavement and install safety barriers where the shoreline had been undermined and the roadway was in jeopardy of sloughing away.

Current Work

Since then, the City's Engineering department has been designing a more resilient roadway that recedes further away from the Lake, to prevent any further infrastructure storm damage to occur. The new roadway will be constructed during the 2022 season.

In addition to the rehabilitated roadway, the last remaining segment of the Lakewalk Trail alignment is currently being constructed and will be complete this November (2021). The trail will parallel the new road on its south side for the most part, but will spur off to the east when the new road heads north to connect up with Old Scenic Highway 61.

Future Work

The following pages include preliminary designs for the remaining park landscape from the edge of trail all the way down to the shoreline and takes a fresh look at how to restore the parkland with a more sustainable and resilient approach.

General Themes

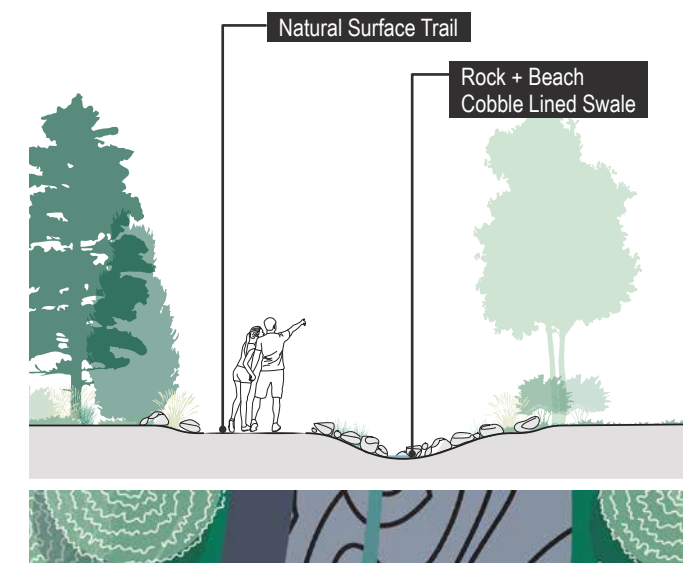
The general themes focus on restoring the park back to a North Shore Coastal Forest, and daylighting the natural drainageways to be key site features, while still providing public access to the water's edge at designated areas. The repeated themes and design moves are used to increase user legibility and align with the broader goals of resiliency, equity, and access. Features include:

- **Daylit Stormwater Outlet Swale** (see cross section on page 61): These swales will not only direct stormwater and return the creeks and tributaries back to their original condition, they will also act as a resilient design feature to allow for various shifts and are meant to change with the conditions of the lake.
- **Beach Access Pockets:** Nestled between the Daylit Stormwater Outlet Swales, there is a repeating pattern of areas to rest and access the beach. Each pocket is surrounded by restored plantings that maintain clear views to the lakes and provides benches and areas to picnic. Utilizing the vegetation pattern and clear access points, there is a minimum of two paths down to the

water provided at each pocket. By using a similar style with each pocket, users will know what to expect as they move through the park. This use pattern will be beneficial with the revised one-way traffic pattern and continuous parallel parking configuration, allowing users to enjoy a similar experience along the length of the shore.

- **Carriage Walks:** A concrete access path from the road through the boulevard will help direct users toward the Lakewalk. With the intention of improving plant health and decreasing erosion by reducing compaction on the tree roots, the Carriage Walks will allow for grass to grow in this heavily used area. Additionally, the repeated pattern of the walks will create a visual cue to the trail users to slow down and be on alert through this area of the Lakewalk with frequent crossings.
- **Re-Wild Planting Scheme:** The overall recommended planting scheme will be to restore and re-wild the shoreline to its original condition as a North Shore Coastal Forest. This strategy will help lower the City's maintenance needs while installing a more sustainable and resilient landscape. See pages 10-11 for plant community descriptions.
- **Dynamic Shoreline Approach:** Working hand in hand with the coastal design, a vegetative buffer nestled into stones with an intentful re-grading scheme will be implemented for the transition area between the shoreline and upland areas. This design feature will protect existing infrastructure and programmed lawn

space, will provide access to the beach, and will allow the shoreline to shift and change with the conditions of the lake.



Cross section of the daylit stormwater outlet swale with natural surface trail. The swale will be rock and beach cobble with vegetation growing in and at the edges to provide a naturalized creek-like outlet into the lake. A natural surface trail will be placed at one edge of each of these channels to allow users to access the beach and interact with the channel without causing additional erosion.

Kitchi Gammi Park + Brighton Beach

Enlargement A

The new park entry, consists of the conversion of the road to one-way traffic and so the western entrance will be the primary gateway to Kitchi Gammi Park and Brighton Beach. The design focus is on native planting restoration of the landscape at the entry to signify to visitors that this is the entrance to a premiere destination park. This treatment will signify to users of the Lakewalk trail that they are moving into or out of a unique section of the trail corridor.

Key Design Features:

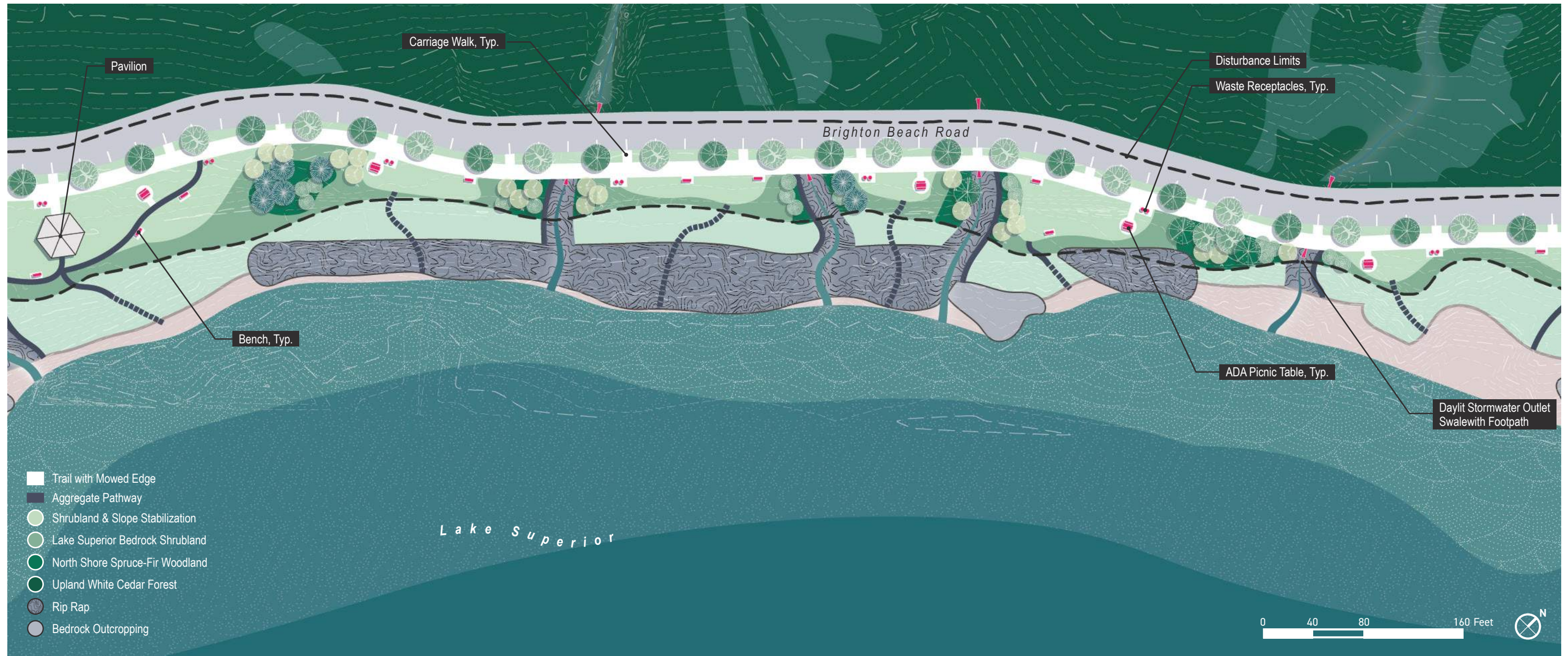
- Kayak Launch staging area, with kayak racks
- Vault Toilets
- New Pavilion/shelter
- Daylit stormwater swales
- Natural surface paths



Kitchi Gammi Park + Brighton Beach

Enlargement B

The constricted section of the park is more of a through space, linking the two main gathering nodes and will contain similar elements as the rest of the park. Between the dayit sotrmwater swales, plant community restoration, and beach access paths, smaller areas for rest and picnicking will be located between the trails and the waters edge.



Kitchi Gammi Park + Brighton Beach

Enlargement C

This is the main gathering node of the park, with the most upland space for flexible programming options. This area will provide ADA access to the beach and maintain many of the existing park features including; Picnic shelter, play area, and a variety of place to view the beach from above.

Key Design Features:

- Vault toilets
- Hammock forest

- Repairs to the WPA fireplace building
- Space an event tent (with anchors)
- Picnic area
- Grills
- Nature play areas with swings
- Refurbished Pavilion
- Daylit stormwater swales
- Natural surface paths



Kitchi Gammi Park + Brighton Beach

Enlargement D

The northern end of the park pulls the Lakewalk trail away from the shore and connects up to existing trails near or on Old Scenic Highway 61. This area was severely damaged by the storms and will focus on vegetation restoration and shoreline re-establishment and revetment protection.



Coastal Design Study: Brighton Beach Pavilion

This portion of the project will feature an updated park space for family gatherings. New native planting restoration will provide a buffer while new rock steps and an ADA accessible path mean the space can be enjoyed by all.

Key Design Features:

- Protects existing infrastructure
- Provides public access down to the beach
- Vegetation and stone provides dynamic shoreline protection
- Creates a buffer between beach and grass areas
- Enhances beach using strategically placed rock outcroppings

