

Waller Creek Corridor Framework Plan

Block-by-Block Enlargements



Waller Creek Corridor Framework Plan

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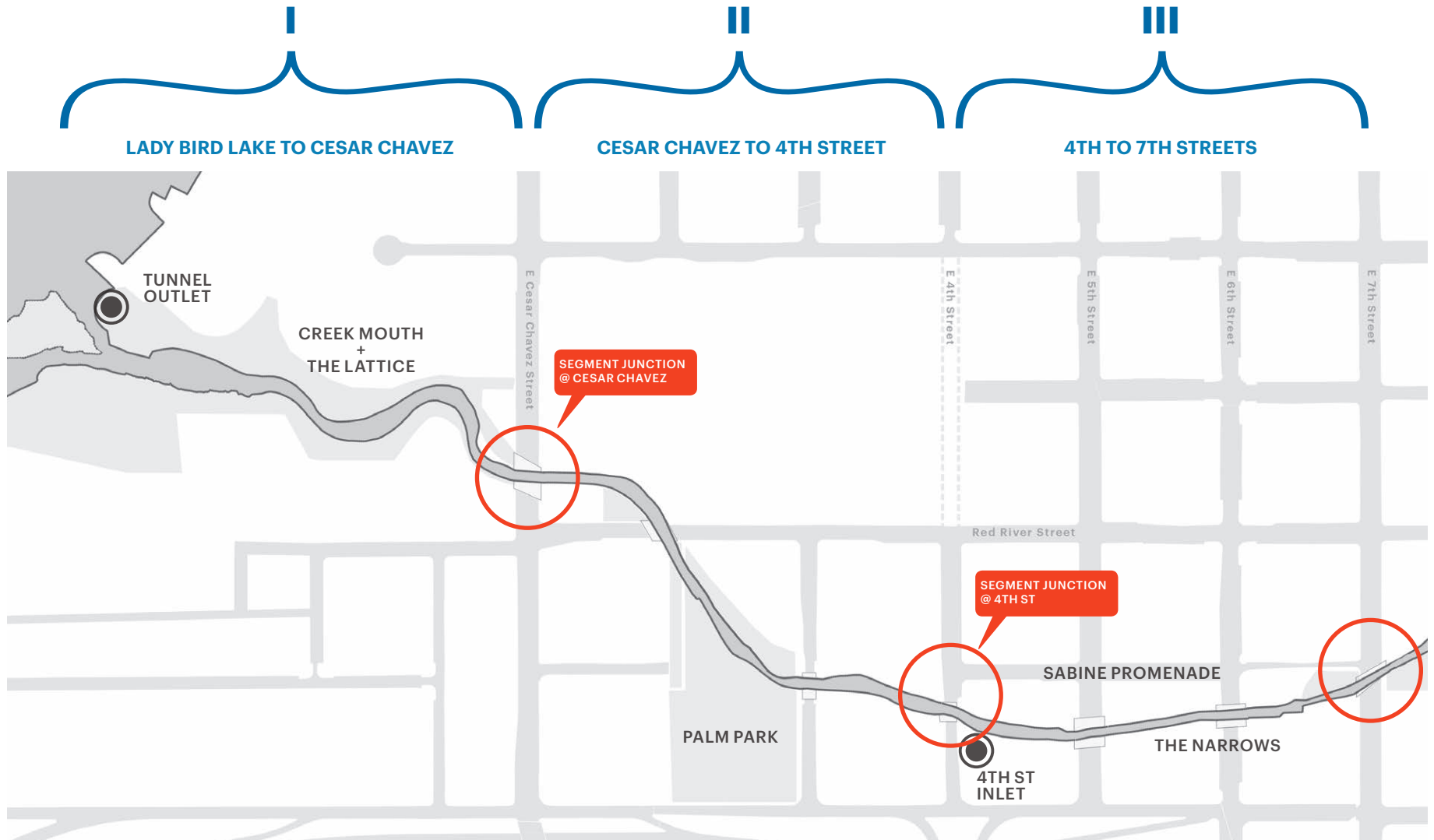
Greenberg Consultants Inc.

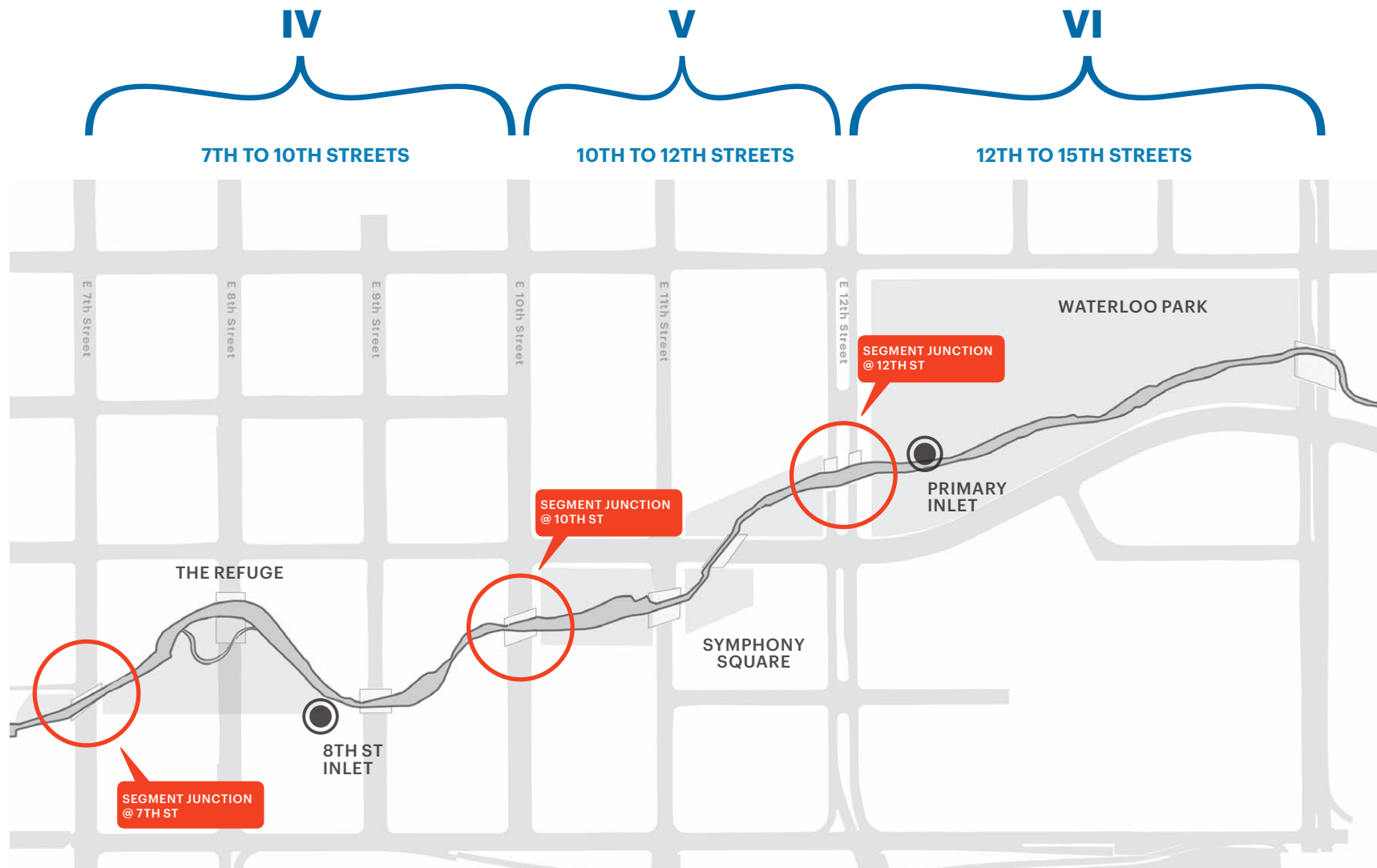
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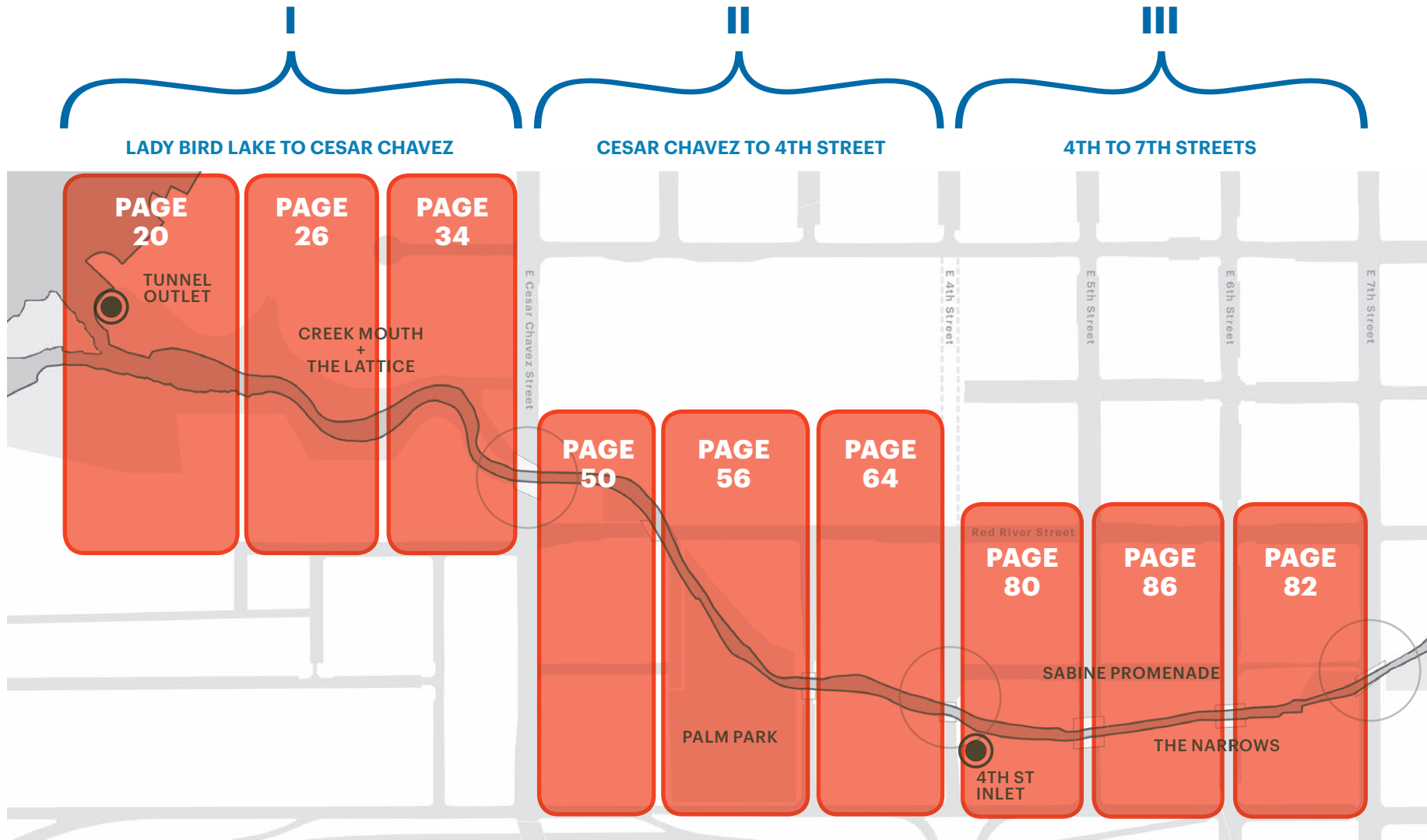
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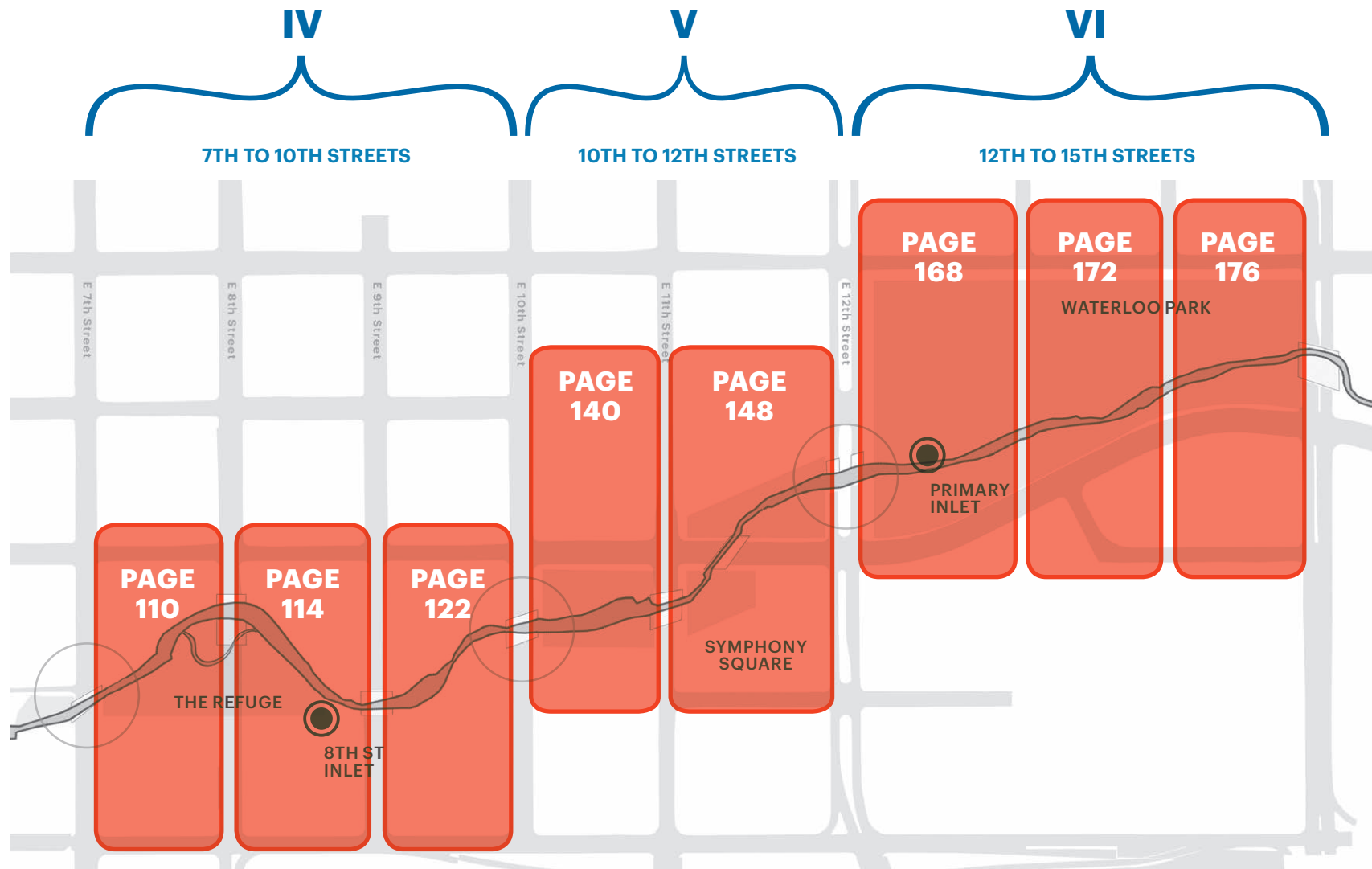
WALLER CREEK CORRIDOR: PROJECT SEGMENTS





WALLER CREEK CORRIDOR: PROJECT SEGMENTS AND BLOCK-BY-BLOCK INDEX





Segment I

Lady Bird Lake to Cesar Chavez

Segment I

Lady Bird Lake to Cesar Chavez



SEGMENT I: LADY BIRD LAKE TO CESAR CHAVEZ



BUILDING A PUBLIC THOROUGHFARE TO THE LAKE

Currently the mouth of the creek can easily be mistaken as a cove at the edge of Lady Bird Lake, offering no cue that the creek channel winds its way up into the intensely urban east side of Austin. Moreover, the existing creek channel presents itself as a significant obstacle to east-west connectivity along the lakefront. The Waller Creek landscape, under the conditions of the post-tunnel hydrology, will become a demonstration of a robust Texas creek ecology, but it will also importantly announce a much-needed public thoroughfare between downtown Austin and the lake.

Longitudinal trails on either bank are joined together by a series of pedestrian trail bridges to form a ladder, or lattice of movements, that will open up an unambiguously public-feeling threshold through the intensity of private development currently being planned or implemented on the lakefront. The new trail system set high above the waterway will foster intuitive way-finding along and across the creek channel while simultaneously highlighting the sensory impacts of the rejuvenated riparian landscape below. This elevated right-of-way to the lakefront will offer a thrilling experience at the junction of the lake and the Waller Creek District.

A LATTICE OF BRIDGES

The proposal to exaggerate pedestrian connectivity in this location with five bridges at the top of the creek banks, seeks to transform the perception of the creek as a barrier into the creek to that of an incubator of urban connectivity, both between the emerging developments on either bank but also between the Lake and the downtown.

A Lattice Bridge will span over an existing 42-inch aerial wastewater line, transforming this eyesore and unattractive nuisance into an invitation to experience one of the most robust and ecologically rich segments of the creek. Bridge abutments will require careful coordination with vertical and horizontal utility easements and careful integration with the construction methodology of the slope restoration.



SEGMENT I: LADY BIRD LAKE TO CESAR CHAVEZ



The mouth of Waller Creek's at Lady Bird Lake is a delta landscape with high ecological value, characterized by a deep channel, an overall functional assessment score of "fair", existing stone "butter-block" walls, as well as the capacity for future private high-rise development. A strong connection to the Butler Hike and Bike Trail is critical to creating an urban, public character at the creek mouth.

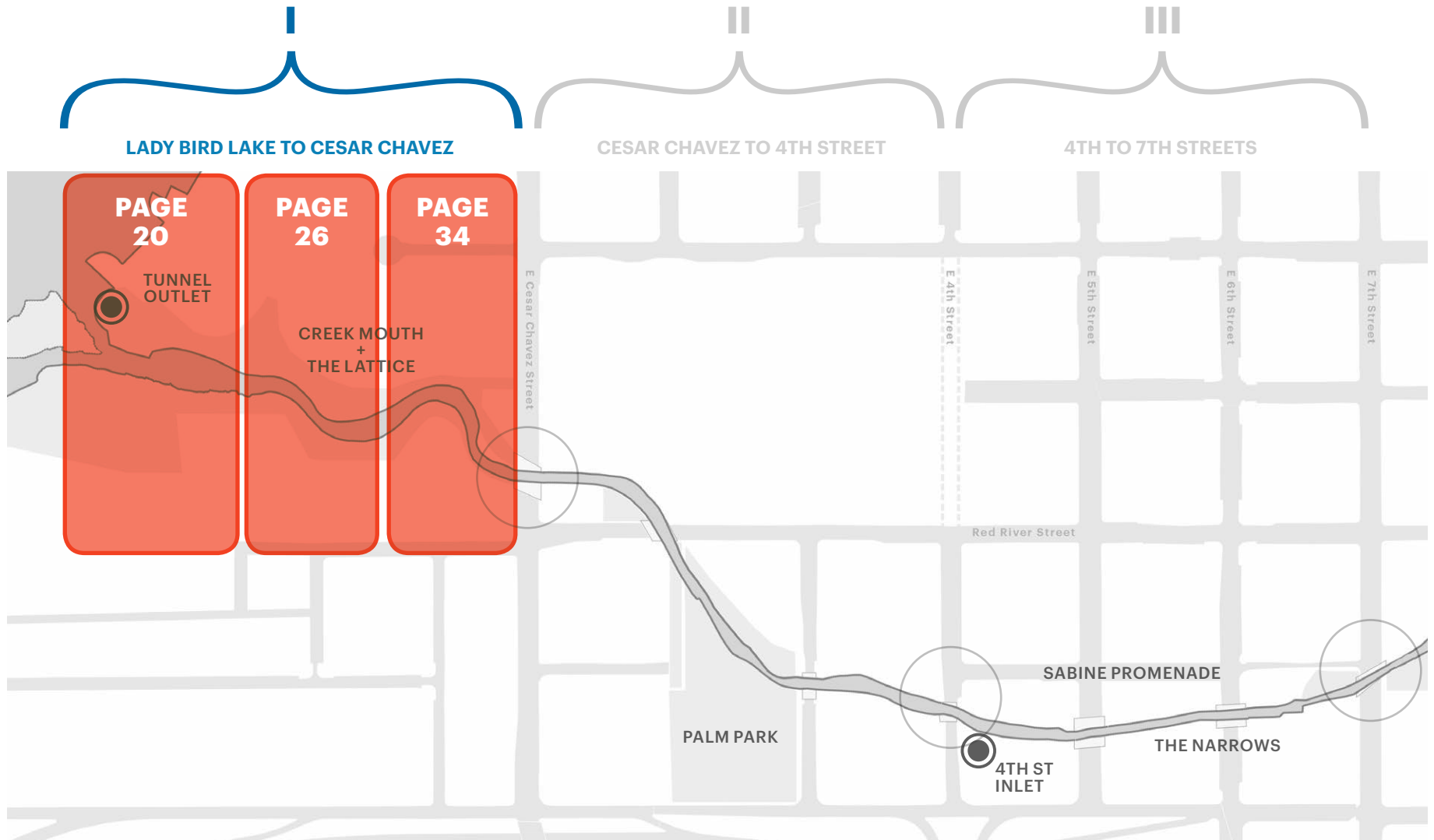
The design of Segment I should be guided by the following objectives:

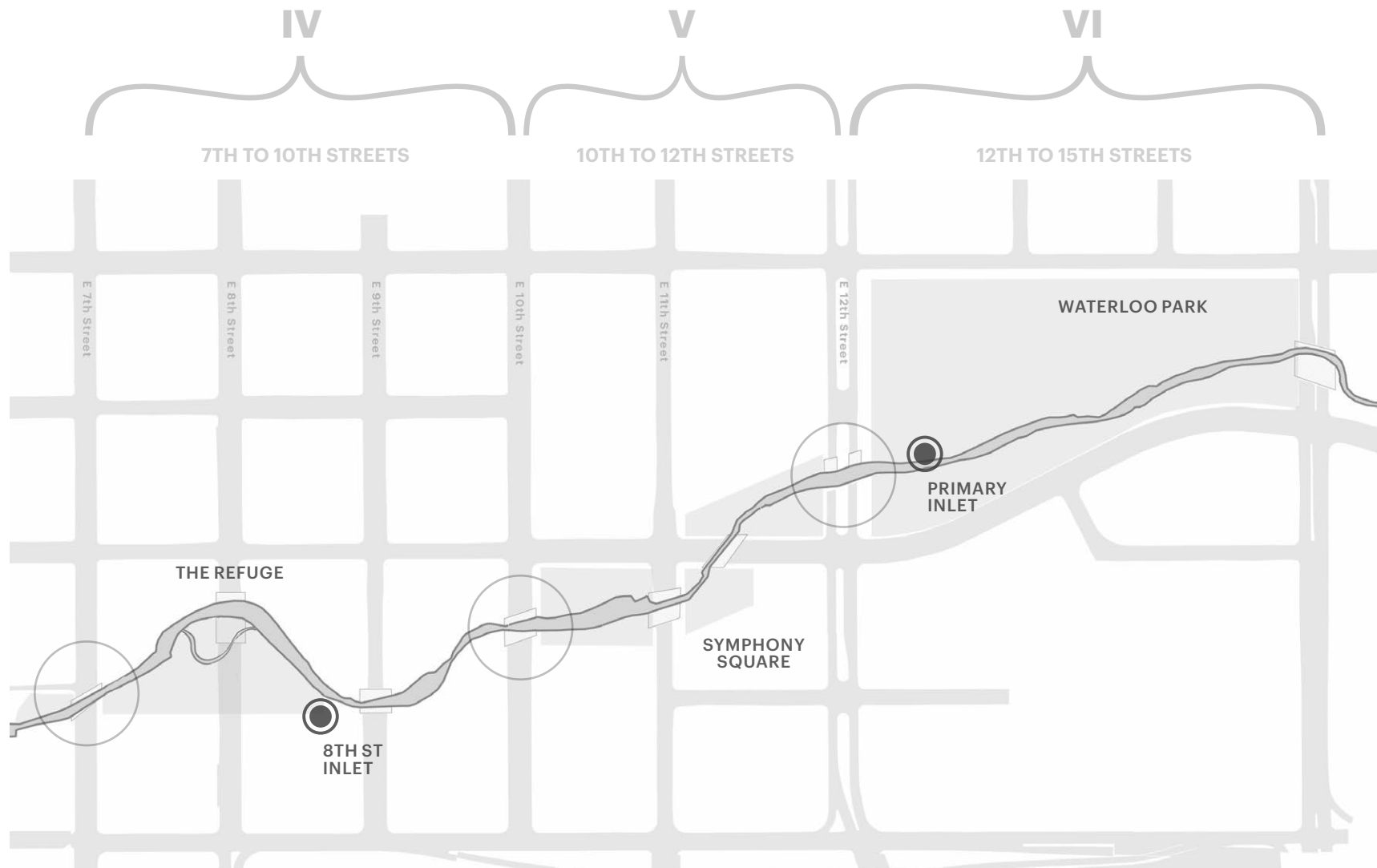
- Minimize site disturbance to the creek bed, especially during construction of adjacent developments.
- Preserve existing slopes and intact retaining walls wherever possible, minimizing disturbance to the riparian slopes.



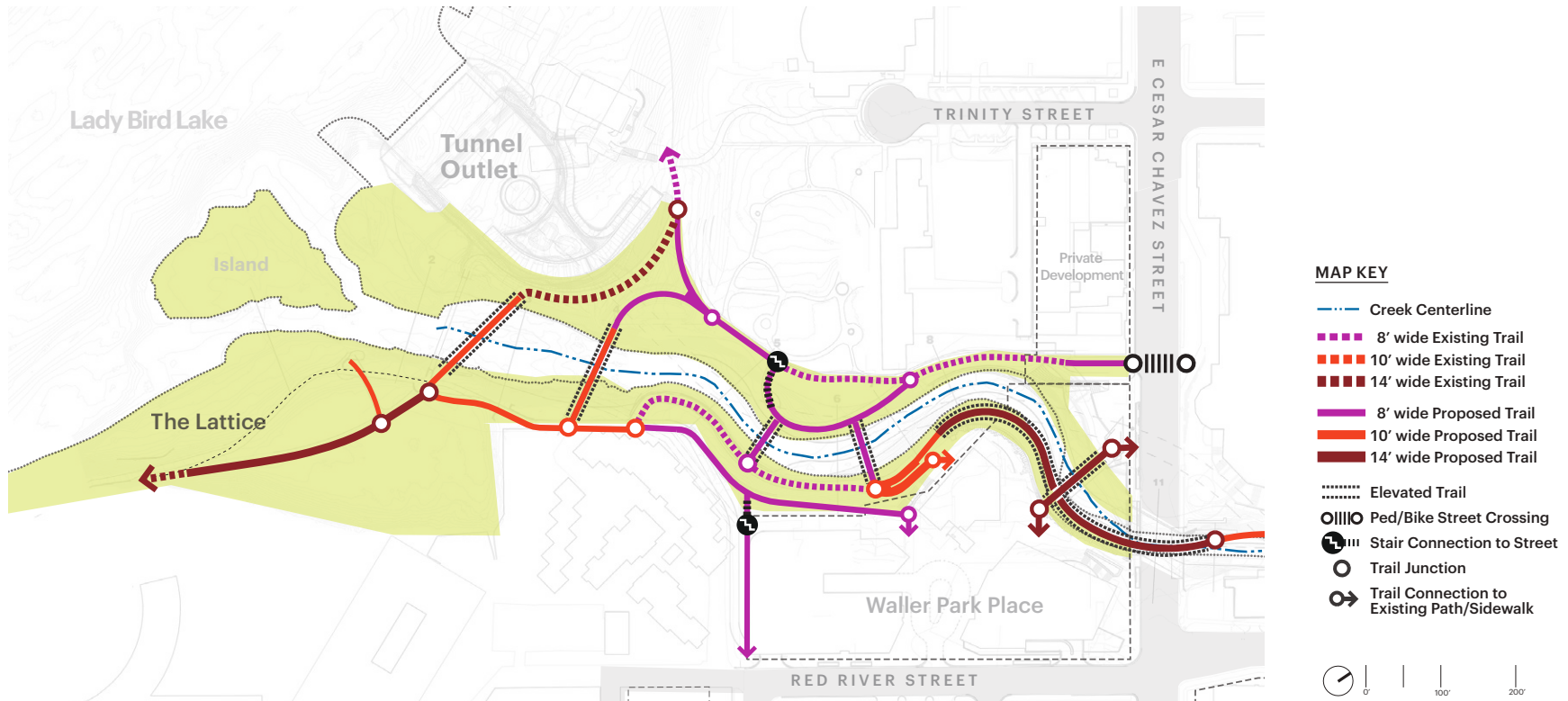
- Prioritize planted slopes (rather than walls) when rebuilding failed banks or reconstructing new banks to protect ecological function and natural character.
- Build ecological and hydrological continuity between upper and lower creek banks.
- Promote visibility of the creek ecology through the trail network that engages it.
- Define the creek mouth as a critical link for pedestrian and bike movement between the lakefront and Waller Creek to the existing downtown bike and pedestrian networks.
- Design elevated trails to the Waller Creek 100-year flood plain, rather than the higher Lady Bird Lake 100-year flood plain.

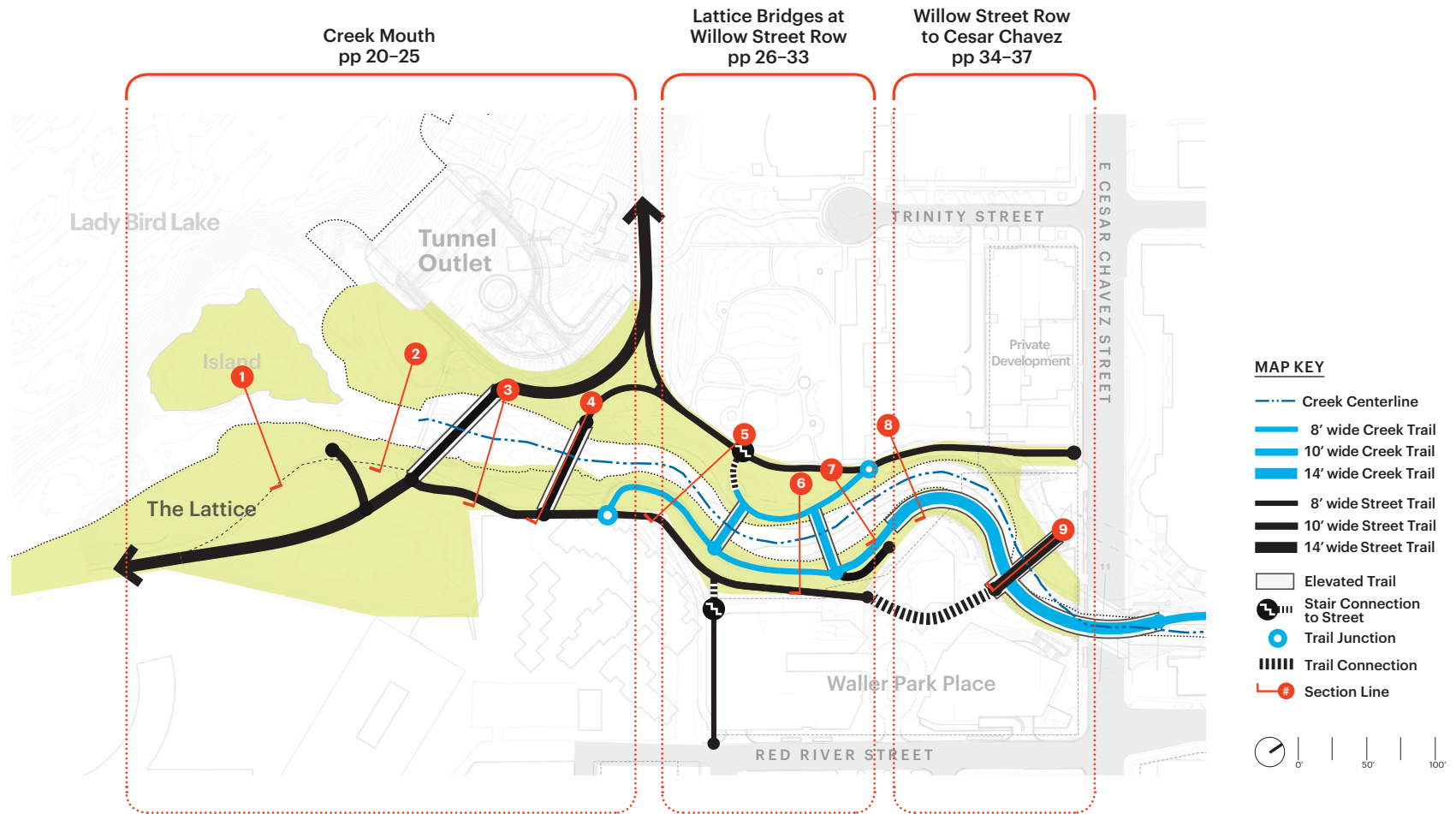
SEGMENT I: LADY BIRD LAKE TO CESAR CHAVEZ



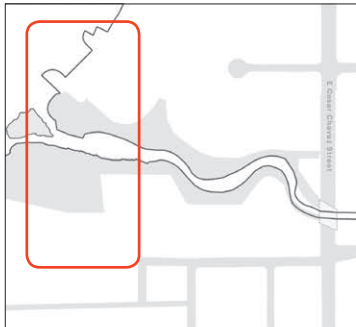


SEGMENT I: LADY BIRD LAKE TO CESAR CHAVEZ



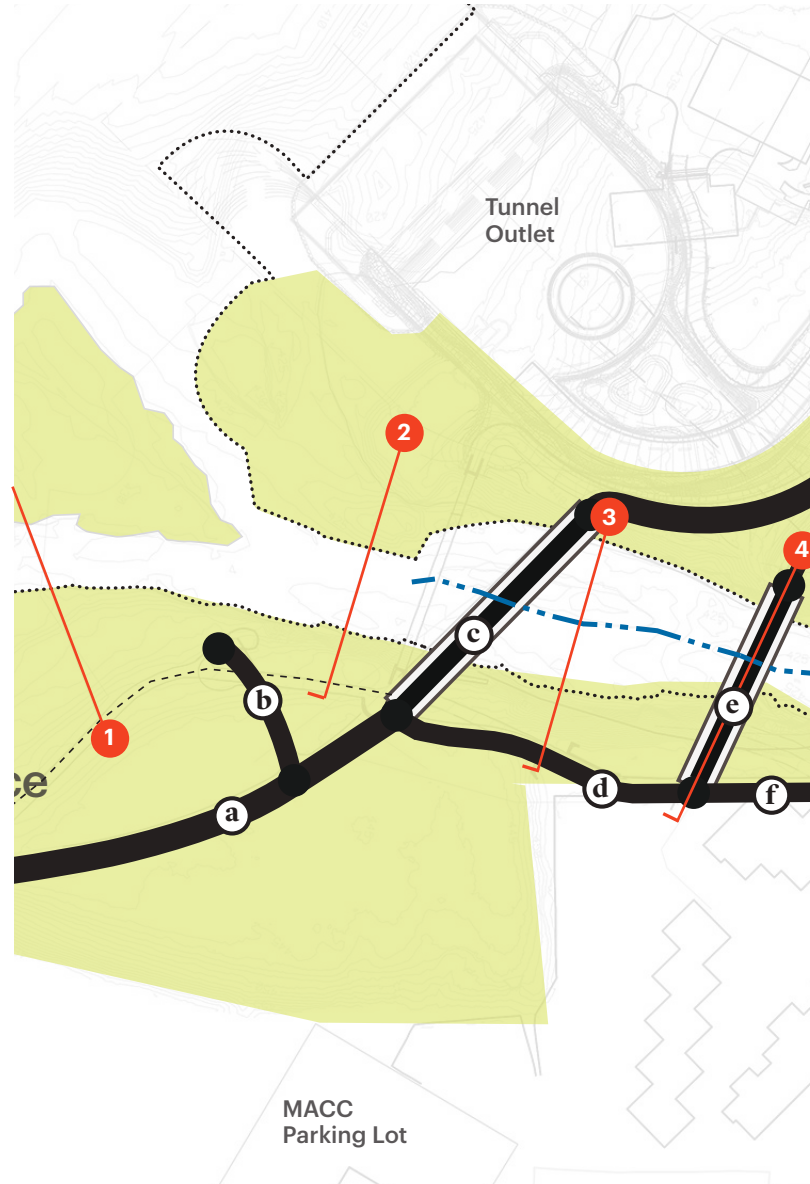


CREEK MOUTH



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. Realignment of existing Butler Hike & Bike Trail to better align with creek crossing and improve sightlines.
- b. Trail spur to access existing memorial benches. Prior to any potential future relocation, dedication terms should be confirmed.
- c. Lattice Bridge replaces existing pre-cast bridge. New alignment eliminates "T" intersection and improves sightlines. Views from bridge to existing islands below offer opportunities for watching wildlife from above without disturbing habitat.
- d. Existing top of bank trail to remain.
- e. Lattice Bridge over existing 42" aerial wastewater line. Bridge abutments require careful coordination with vertical and horizontal utility easements. Review attractive nuisance risks with Austin Water Utility during Bridge design process. (See Appendix)
- f. Trail approach to Lattice Bridge from north will require regrading to achieve grades <5%. Coordination needed with vertical wastewater utility easement.

HYDRAULICS & HYDROLOGY

- The existing islands at the creek mouth have been stable for several years suggesting that they will remain stable under the post-tunnel flow regime. However, flow patterns in this area are highly complex making it difficult to predict how the morphology of the creek mouth will change over time.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on June 5, 2014.
- Overall assessed condition is FAIR. (Riparian Zone = FAIR, Geomorphology = FAIR, Aquatic Habitat = GOOD)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the vegetation coverage within the riparian area and the in-stream canopy cover, using log structures and natural materials such as native vegetation and rock to provide a stable channel form, and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- Existing slopes on both banks are to be preserved or restored.
- Large expanses of existing lawn on both banks can transition to riparian planting at trails.
- Invasive giant reed is to be removed and replaced with planting in character with native riparian habitat.

AQUATIC HABITATS

- Two existing depositional islands in the creek mouth should be preserved and protected as habitat without human access.
- Existing pools in this area should be preserved as habitat.

HERITAGE TREES & EXISTING VEGETATION

- 10 Heritage Trees on this block.
- 3 Heritage Trees near Town Lake Villas in poor condition.
- 3 Heritage-class trees in good condition near memorial benches.
- Dense stand of invasive giant reed on west bank hinders visibility from trail and collects litter.
- Overstory dominated by black willow and hackberry.
- Midstory dominated by hackberry, box elder, poison ivy, and mustang grape.

UTILITIES

- A major power transmission line crosses Waller Creek just before it reaches Lady Bird Lake. There is no intention to relocate this line, however, easements and foundation extents for pylons must be confirmed before designing micropile foundations for the southernmost Lattice Bridge (c).
- 42" wastewater line (approximately 60" diameter casing) crosses the creek at the intermediate Lattice Bridge (5). Vertical and horizontal utility easements must be carefully considered in Bridge abutment design.

STORMWATER RETROFITS

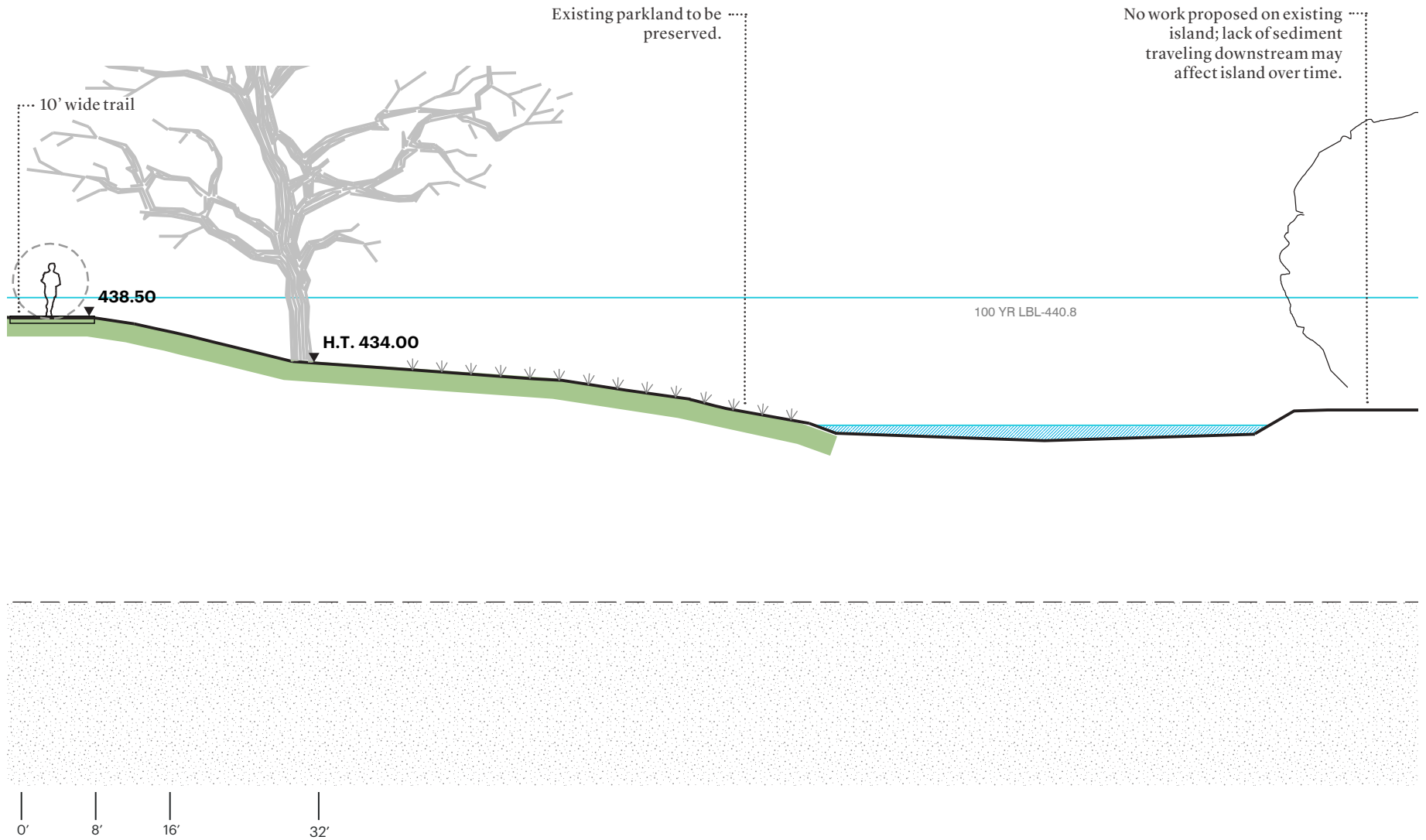
- Outfall, #380780, on the east bank, is best suited to sewershed treatment.
- Outfall # 95258, on the east bank near the existing wastewater line, is a potential candidate for inline treatment, but seems to lack sufficient space for installation and maintenance access.

MAINTENANCE & OPERATIONS

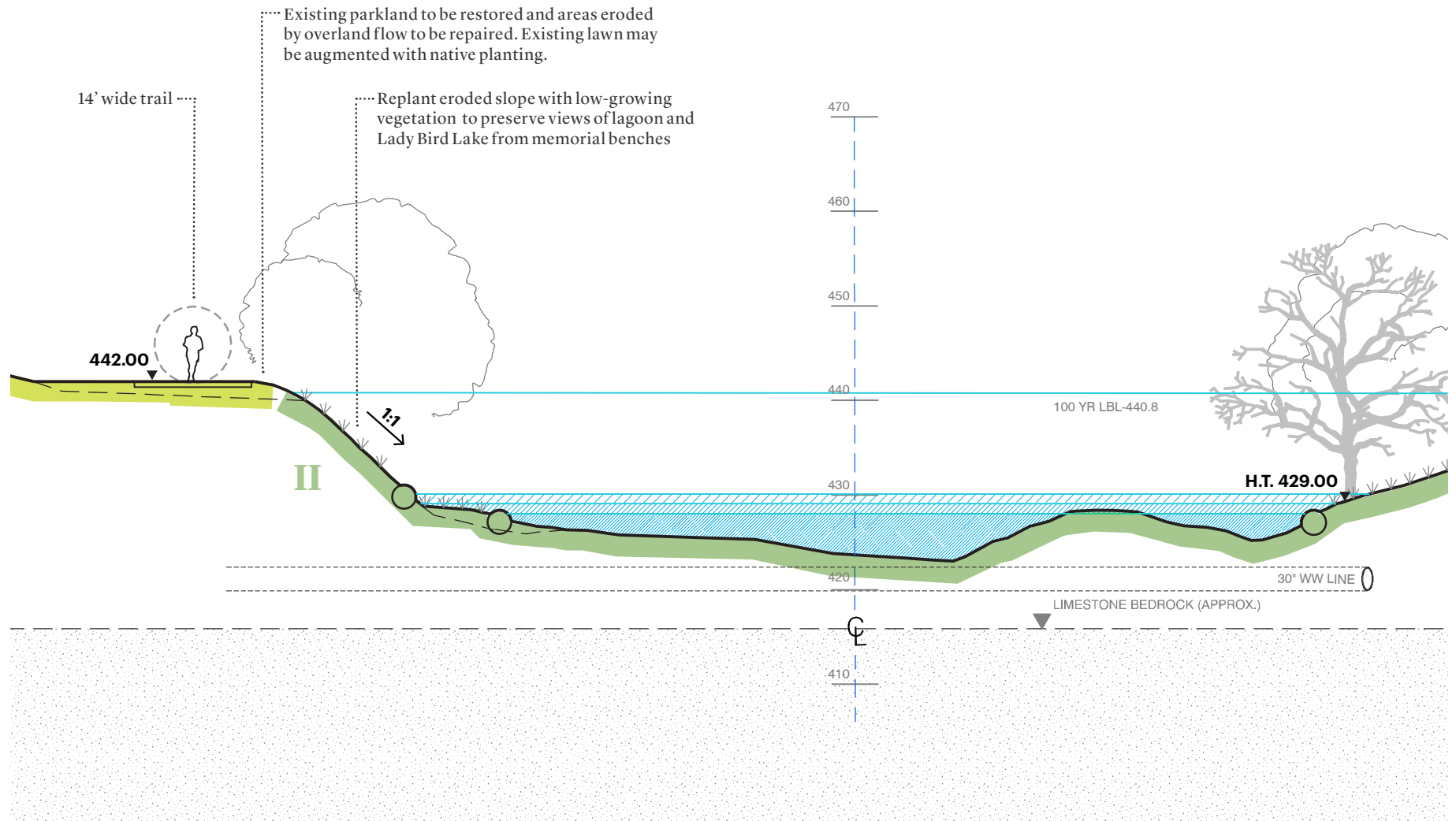
- Butler Hike & Bike Trail is heavily used; a commensurate level of litter removal should be assumed for trails on this block.
- There is no trail access to water-level; maintenance in the channel will be limited to debris removal on a by-occurrence basis.

CREEK MOUTH

SECTION 1



SECTION 2



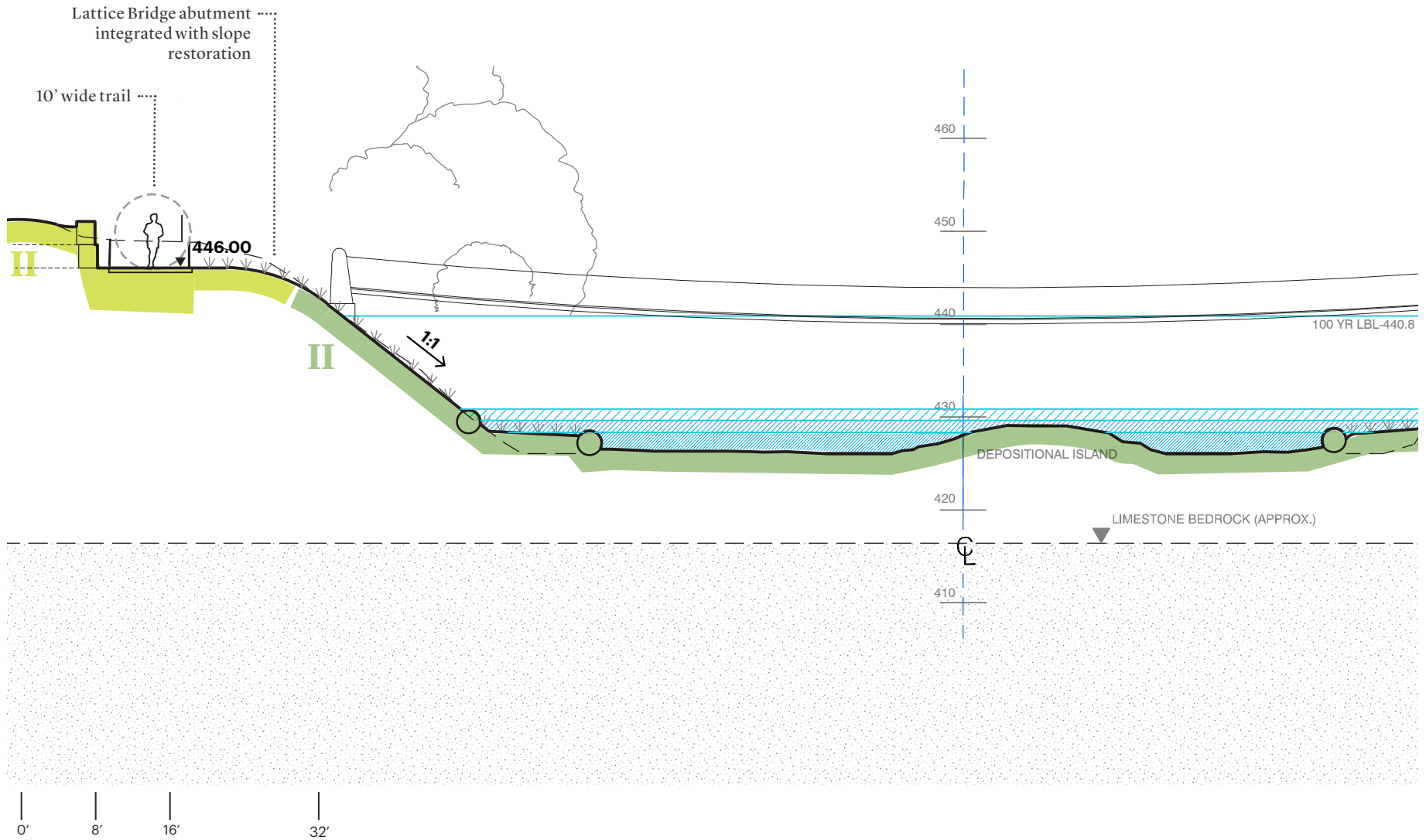
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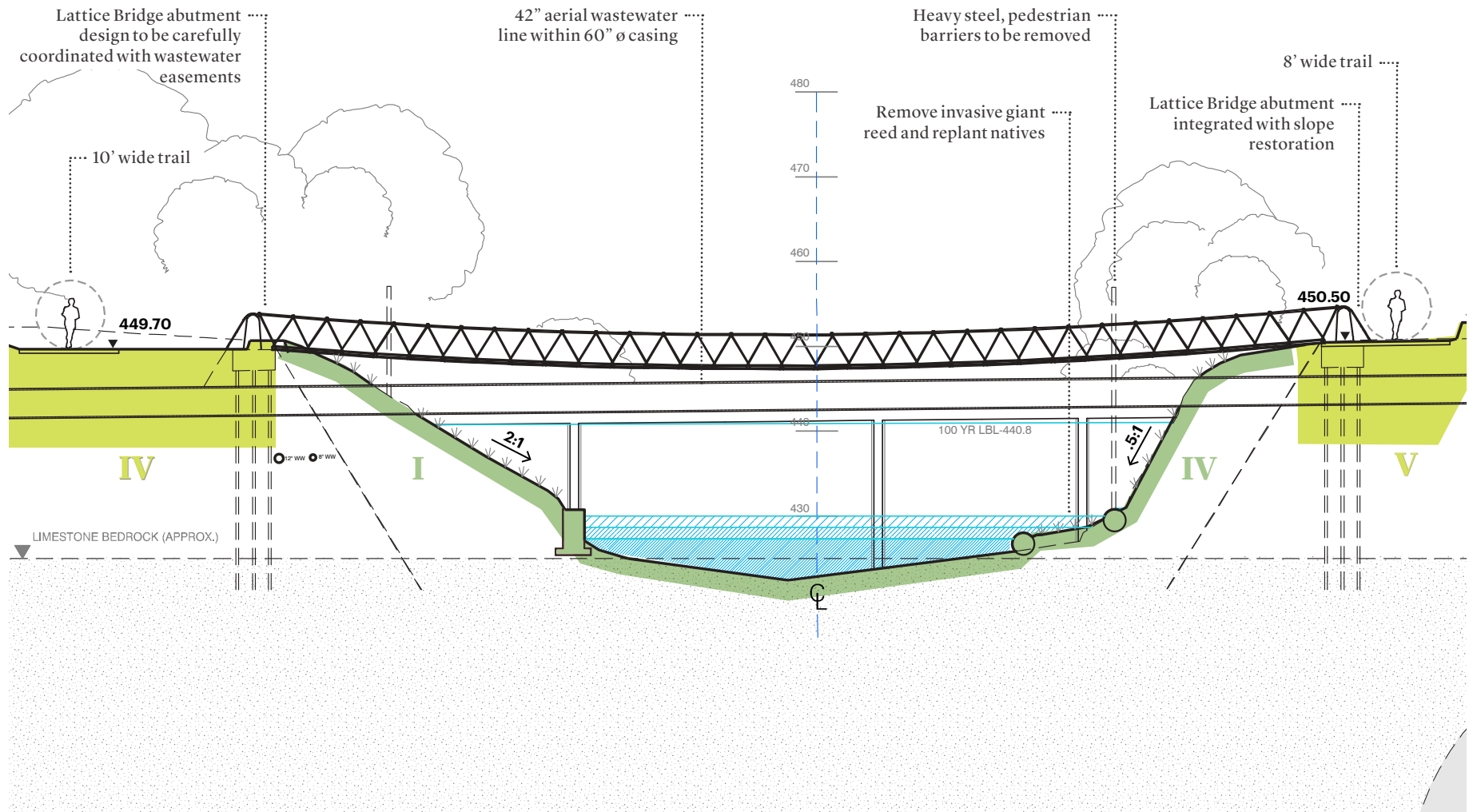
PROJECT TYPE
Do Nothing
Preservation
Restoration
Reconstruction

VEGETATION CLASS
I Problem Species Removal/Reseed
II Removal/Reseed/Replant
III Rescue and Salvage Plant/Seed
IV Significant Removal/Reseed/Replant
V Complete Replacement

GRADING
Grade Transition
Existing Grade
Slope Reinforcement

WATER SURFACE ELEVATION
100-YR WSE
2-YR WSE
5-11 CFS WSE

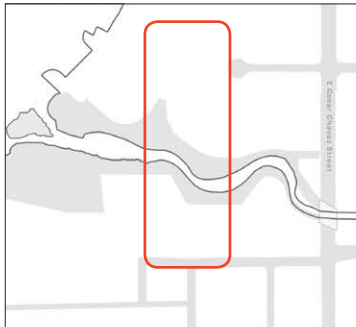




SECTION KEY

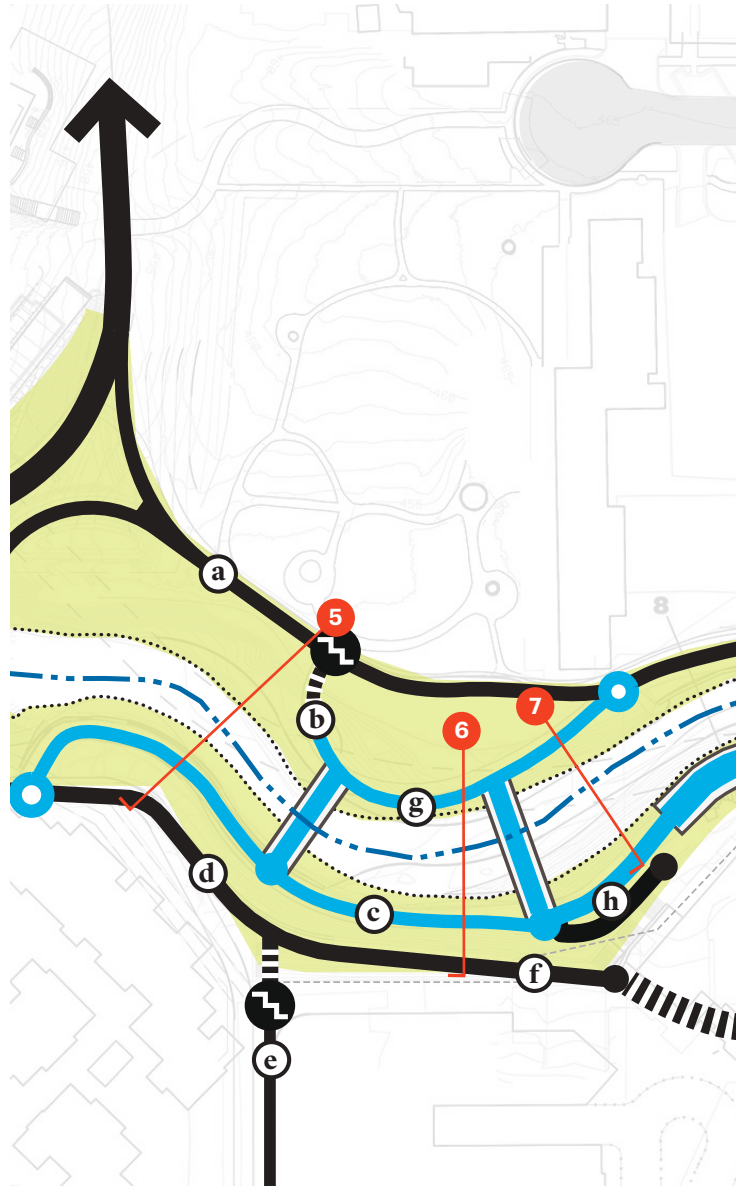
PROJECT TYPE	VEGETATION CLASS	GRADING	WATER SURFACE ELEVATION
 Do Nothing	I Problem Species Removal/Reseed	 Grade Transition	 100-YR WSE
 Preservation	II Removal/Reseed/Replant	 Existing Grade	 2-YR WSE
 Restoration	III Rescue and Salvage Plant/Seed	 Slope Reinforcement	 5-11 CFS WSE
 Reconstruction	IV Significant Removal/Reseed/Replant		
	V Complete Replacement		

LATTICE BRIDGES AT FORMER DAVIS STREET ROW



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. New trail within footprint of existing trail. Grades to be modified to connect at <5% to new trails at Waller Creek Tunnel Outlet facility.
- b. Stairs needed to connect existing top-of-bank trail to grades compatible with existing adjacent Heritage Trees and provide access to mid-slope Lattice Bridges.
- c. Existing trail between large stone block walls. Stones and volunteer vegetation should be preserved and protected except where they compromise wall stability. Selective removal of existing stone blocks to adjust slope of trail to <5%; adjacent stones should be preserved and protected during trail reconstruction. See pg. 30-31.
- d. Top of bank trail within footprint of existing dead-end trail. Grades modified to facilitate access to ROW via connections at (f) and (g).
- e. Preserve existing public connection to former Davis Street ROW. Stair connection needed to connect trail to elevation of future development.
- f. Connection from trail system to Red River ROW via publicly accessible route through new private development.
- g. Mid-slope trail beneath canopies of existing Heritage Trees. Construction of trail is integrated with slope stabilization.
- h. Trail on grade coordinated with adjacent private development.

HYDRAULICS & HYDROLOGY

- There is some risk that the higher post-tunnel baseflow regime will overwhelm the existing riffle/pool sequences. This area would be a strong candidate for ongoing monitoring to ensure the geomorphology is adapting in a safe and appropriate manner.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on June 5, 2014.
- Overall assessed condition is FAIR. (Riparian Zone = FAIR, Geomorphology = FAIR, Aquatic Habitat = GOOD)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the vegetation coverage within the riparian area and the in-stream canopy cover, using log structures and natural materials such as native vegetation and rock to provide a stable channel form, and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- On the west bank, riparian slopes will be preserved and restored. Overbank flow from the adjacent lawn south of the Austin Housing Authority building may be contributing to erosion.

- On the east bank, the top of bank will be reconstructed by private development. The aggregation of parcels is expected to significantly alter top-of-bank grades.
- The middle to lower slope of the east bank is formed by large, stone block retaining walls constructed in the late 1980s and stabilized by tension mat grids. Adjacent excavation and development should take care to protect these tie-backs. These walls and associated trails are distinctive elements of lower Waller Creek and should be protected.

AQUATIC HABITATS

- Deep, shaded channel offers a unique example of a natural creek environment in the midst of a city.
- Existing riffle/pool sequence to be preserved; they are of a quality that can inform the design and construction of riffle/pool sequences further upstream.
- Particular care should be taken to protect existing aquatic features during construction of adjacent private developments.

HERITAGE TREES & EXISTING VEGETATION

- 7 Heritage Trees on this block. 2 on the west bank are in poor condition.
- Mid-slope trail on east bank (e) runs alongside grove of Heritage Trees; critical root zones to be verified before or during trail design.

- Overstory and midstory is dominated by hackberry. Groundcover is dominated by poison ivy.

UTILITIES

- On the east bank, a buried wastewater line runs south from the former Davis Street ROW before daylighting and crossing the creek. Because this line is close to the surface, changes in grade to existing sidewalks (d) must be closely coordinated with Austin Water Utility.

STORMWATER RETROFITS

- No outfalls discharge into Waller Creek on this block.

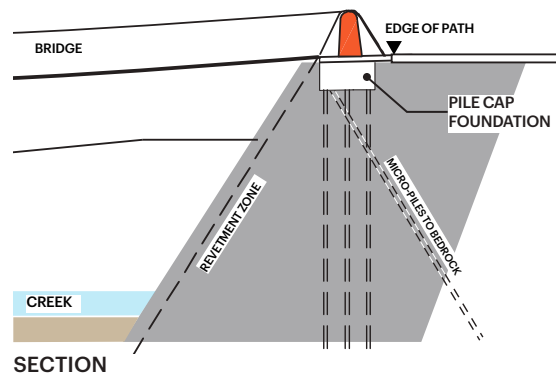
MAINTENANCE & OPERATIONS

- The intent for this area is to promote a thriving community of native riparian vegetation and have no regular maintenance of vegetation. Monitoring for invasives post-restoration will be important.
- The creek channel is very deep and there is limited trail access to water-level for maintenance activities.
- Volunteer vegetation growing out of the existing stone walls should be left in place and protected. Woody vegetation should only be removed when it threatens to undermine the structural stability of the wall or create trail conflicts.

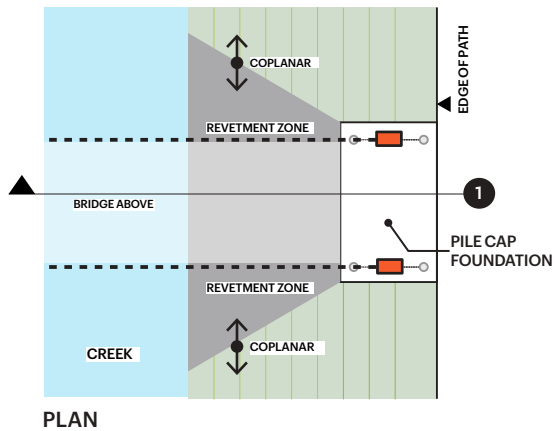
LATTICE BRIDGES AT WILLOW STREET ROW

The importance of access, seeing, and being seen cannot be underestimated in urban spaces like Waller Creek. Seeing others on nearby bridges reinforces a sense of safety, and fosters new east-west connectivity that will become increasingly important as the Rainey Street district evolves from a neighborhood of low-rise, single family homes into a district currently anticipated to house a 35% increase in the downtown population. These bridges will connect this enclave of high density to the rest of the downtown waterfront.



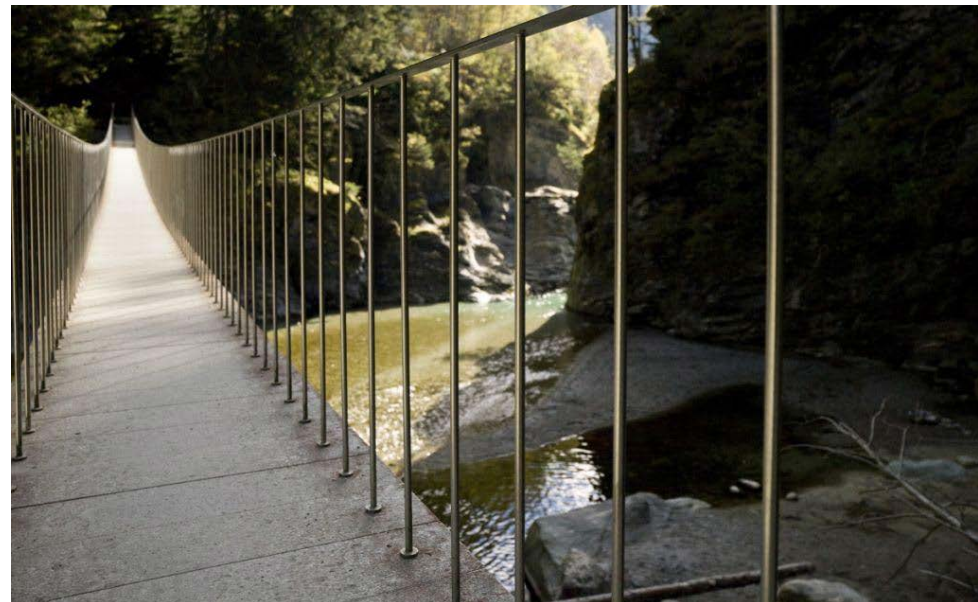


Capilano Suspension Bridge, Canada



THE LATTICE BRIDGE ABUTMENT

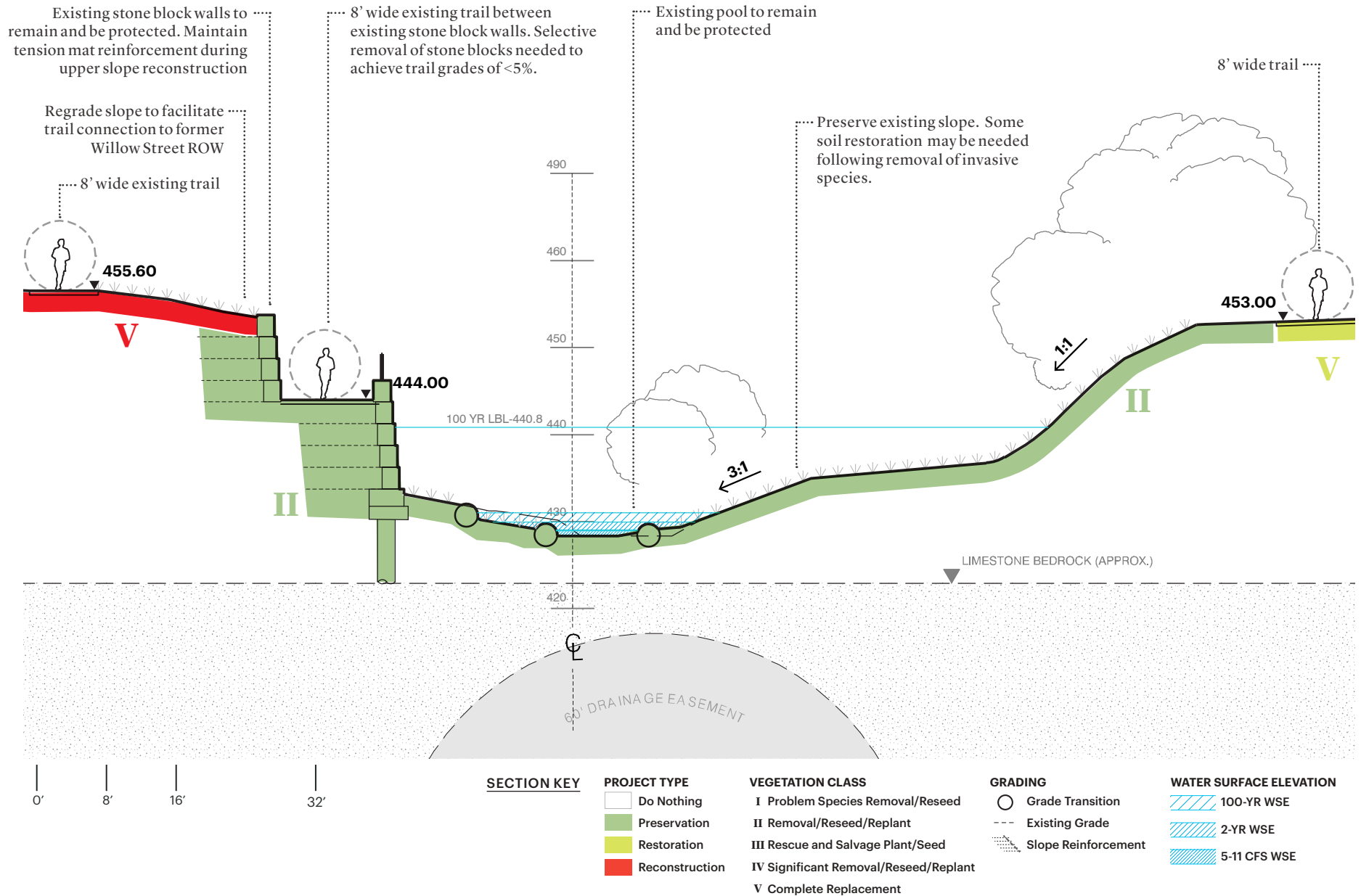
With a relatively small footprint, each abutment and its visible revetment will be carefully integrated into the engineered earthen slopes. This bridge type is advantageous for this site as the abutments help slope stability.

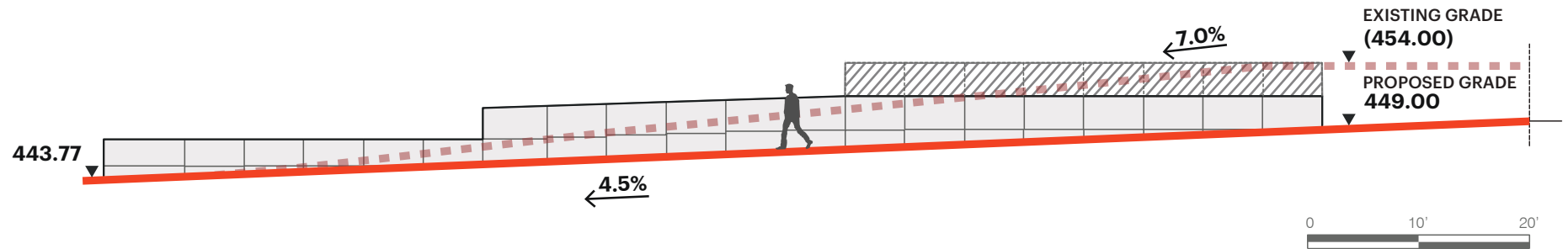


The Suransuns Footbridge, Switzerland

LATTICE BRIDGES AT WILLOW STREET ROW

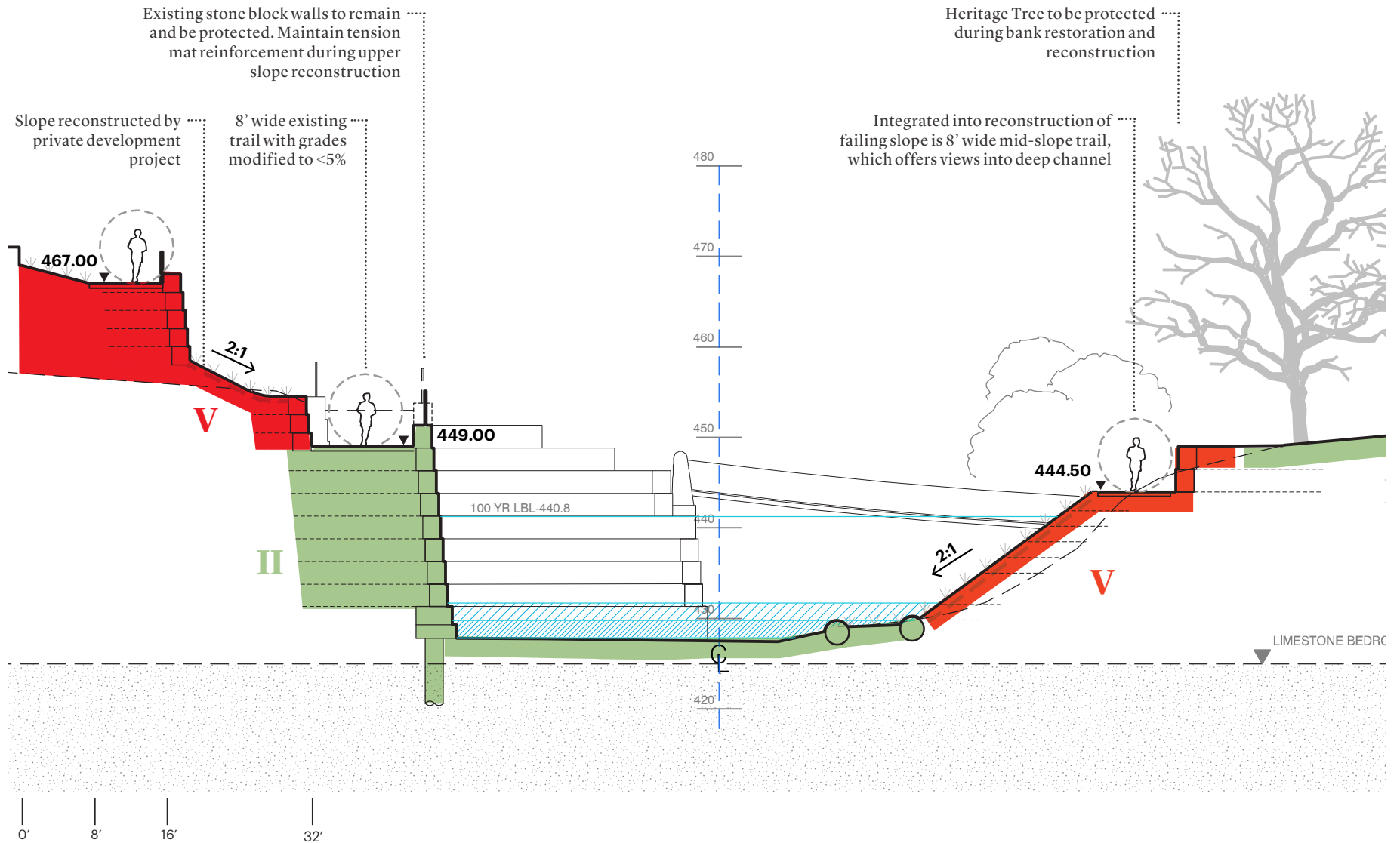
SECTION 5

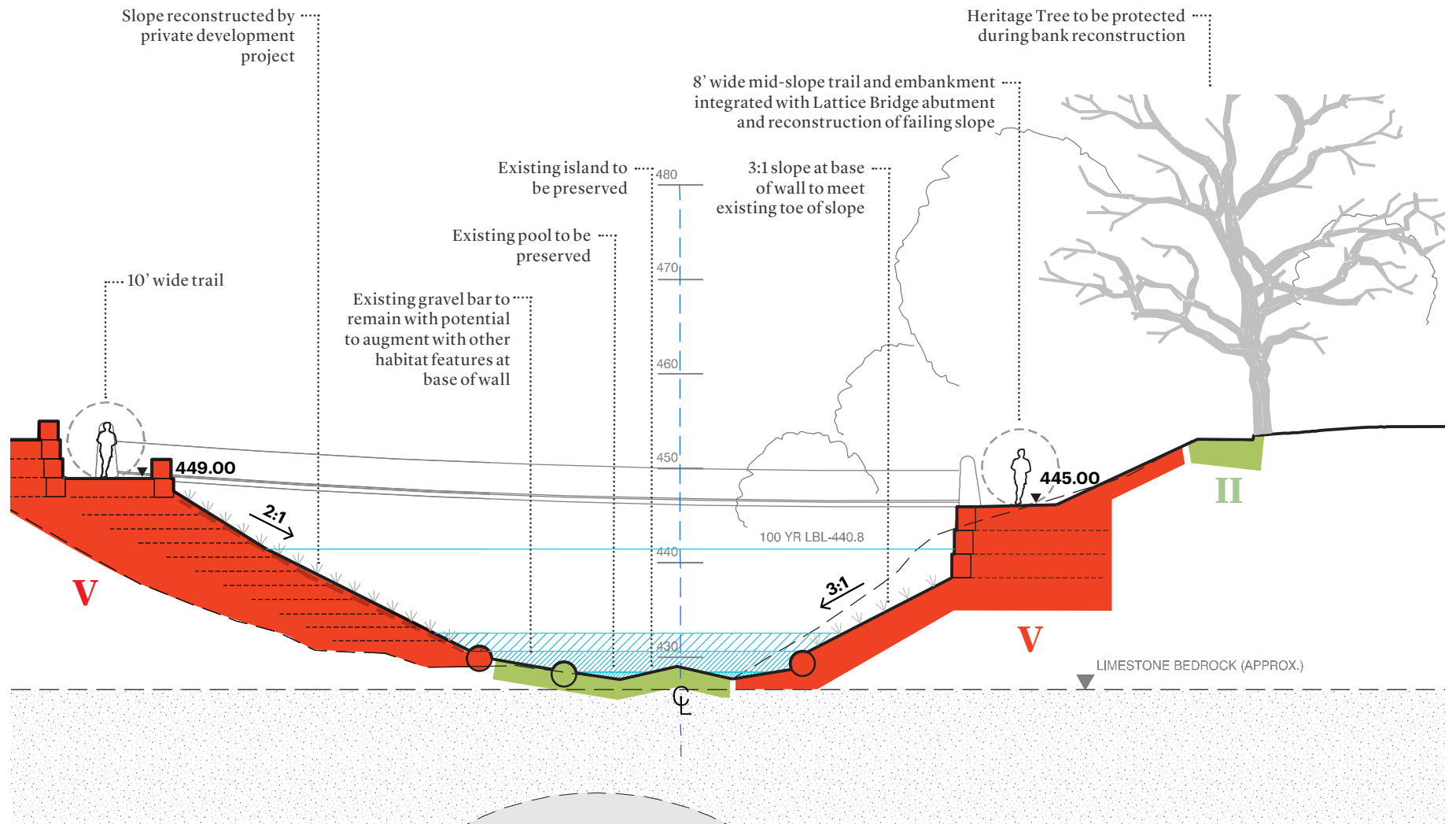




MODIFICATION TO EXISTING BLOCK WALLS

Existing “butter block” stone walls frame trails that exceed universal design standards in several locations. The selective removal of blocks enables re-grading these trails. The above example is located at the north end of the existing wall that meets the Waller Park Place property. This adjustment opens up accessible routes to both Red River and the creek trail below Cesar Chavez from the existing trail.

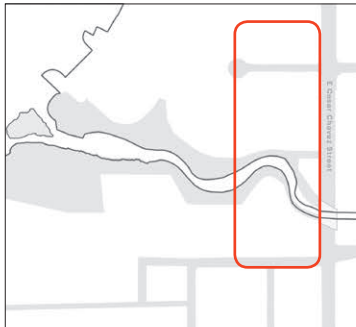




SECTION KEY

PROJECT TYPE	VEGETATION CLASS	GRADING	WATER SURFACE ELEVATION
 Do Nothing	I Problem Species Removal/Reseed	 Grade Transition	 100-YR WSE
 Preservation	II Removal/Reseed/Replant	 Existing Grade	 2-YR WSE
 Restoration	III Rescue and Salvage Plant/Seed	 Slope Reinforcement	 5-11 CFS WSE
 Reconstruction	IV Significant Removal/Reseed/Replant		
	V Complete Replacement		

WILLOW STREET ROW TO CESAR CHAVEZ



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. Mid-slope trail is integrated with reconstruction of failed concrete/gabion slope. This trail also offers opportunities for ecological/educational programming.
- b. Lattice Bridge
- c. Trail on private property, to be coordinated with sub-grade program of adjacent development.
- d. Public access through adjacent development connects trail system to bicycle network at Red River Street.
- e. Existing top of bank sidewalk to remain or be improved within current alignment. Existing mid-slope trail between large stone block walls to be modified to be <5%; selective removal of stones may be needed.
- f. Trail currently terminates in gravel parking lot. New trail to connect to south Cesar Chavez sidewalk and potential mid-block crossing aligned with Convention Center entrances.
- g. Steep slopes on private property require an elevated trail on the east bank. Extensive retaining walls would be needed to support a trail on grade.
- h. Recommended alignment for privately developed bridge.
- i. Proposed elevated trail on east bank to pass under Cesar Chavez Bridge and cross to west bank.

HYDRAULICS & HYDROLOGY

- The existing channel will be relocated within this reach.
- The removal of the existing trail crossing under Cesar Chavez will need to be coordinated with the temporary channel construction related to private redevelopment activities.
- Channel relocation and construction within this block will increase the water surface elevations during large storm events; however, the 100-year water surface elevation should still be below the existing banks.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on June 5, 2014.
- Overall assessed condition is FAIR. (Riparian Zone = FAIR, Geomorphology = FAIR, Aquatic Habitat = GOOD)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the vegetation coverage within the riparian area and the in-stream canopy cover, using log structures and natural materials such as native vegetation and rock to provide a stable channel form, and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- On the west bank, the slope closest to Cesar

Chavez is anticipated to be reconstructed as a result of new private development. This slope is currently stabilized by a large stone retaining wall; the character of these stones is desirable and they should be protected or re-used where possible.

- Mid-block on the west bank, overbank run-off from an existing surface parking lot may be contributing to slope erosion.
- The east bank is anticipated to be completely reconstructed as a result of new private development with sub-surface building program.

AQUATIC HABITATS

- Much of the existing creek channel in this reach is expected to be reconstructed as a result of new private development on the east and west banks.
- Existing pool-riffle sequence and gravel bar in the creek channel should be protected during the reconstruction of adjacent banks.
- Just downstream of the Cesar Chavez Bridge, a cross-vane and wetland bench are proposed at the west bank.

HERITAGE TREES & EXISTING VEGETATION

- 2 Heritage Trees on this block at the top of the west bank. These are adjacent to an existing sidewalk to remain.
- 1 Heritage Tree has been assessed to be in "Poor Condition."
- The west bank contains areas of invasive species that

are on slopes to be preserved and restored. Detailed design will determine appropriate areas for thinning, removal and replacement.

UTILITIES

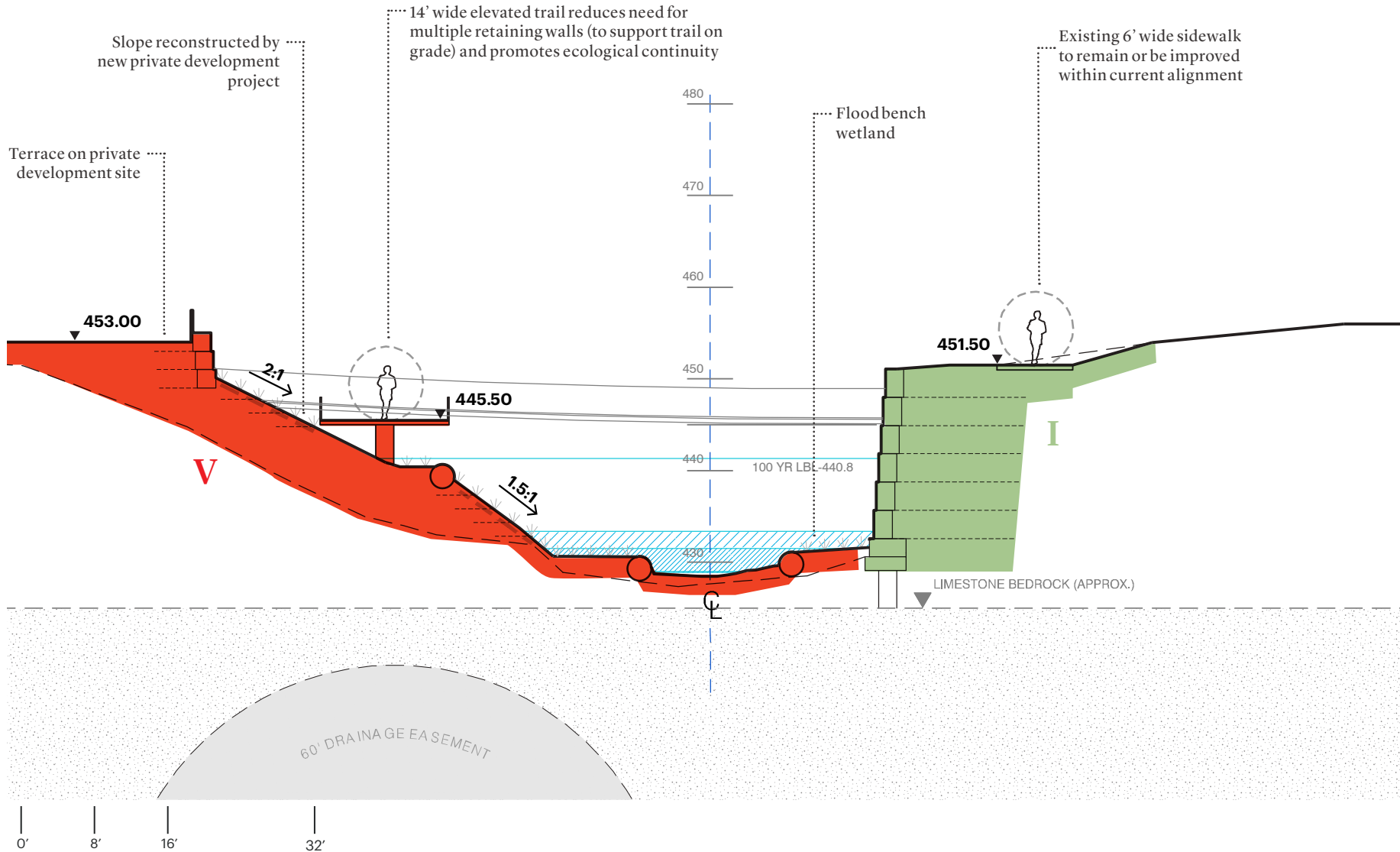
- An overhead utility line, running east-west, crosses Waller Creek near section #8. This line serves a private development and is anticipated to be carried under the Lattice Bridge.
- On the west bank, near Cesar Chavez Street, two historic fuel tanks should be considered for removal and the surrounding area remediated.

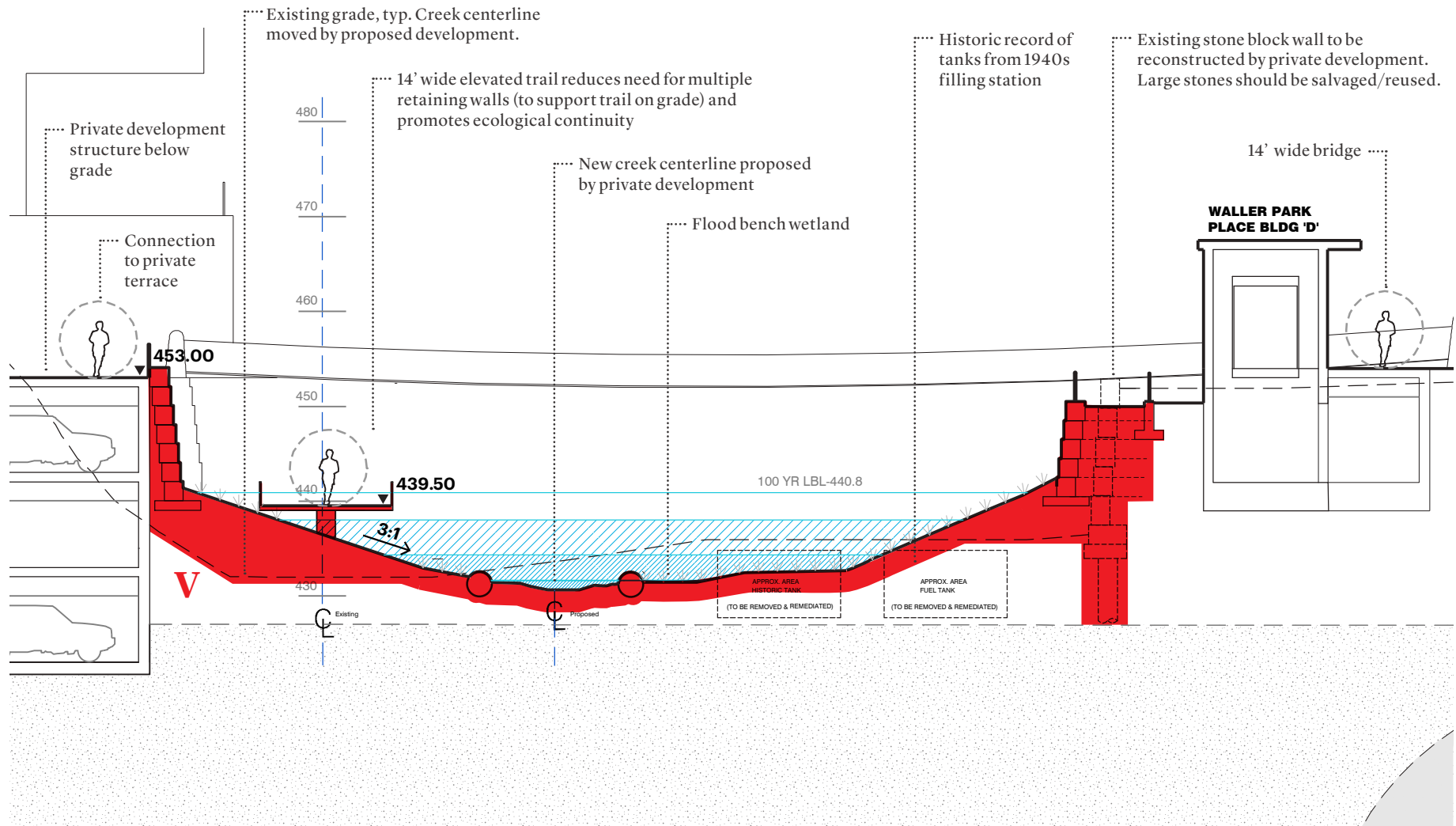
STORMWATER RETROFITS

- Outfall #602378 discharges from the east bank at Cesar Chavez Street. It may be reconfigured upon private redevelopment of the site, but in its current condition, it is a candidate for landscape treatment.
- Outfalls #631157 and #602539 discharge from an existing stone embankment on the west bank. These are moderately suitable for inline treatment, but require coordination with an adjacent development sites.

MAINTENANCE & OPERATIONS

- Volunteer vegetation growing out of the existing stone walls should be left in place and protected. Woody vegetation should only be removed when it threatens to undermine the structural stability of the wall or create trail conflicts.





SECTION KEY

PROJECT TYPE
Do Nothing
Preservation
Restoration
Reconstruction

VEGETATION CLASS
I Problem Species Removal/Reseed
II Removal/Reseed/Replant
III Rescue and Salvage Plant/Seed
IV Significant Removal/Reseed/Replant
V Complete Replacement

GRADING
Grade Transition
Existing Grade
Slope Reinforcement

WATER SURFACE ELEVATION
100-YR WSE
2-YR WSE
5-11 CFS WSE

Segment II

Cesar Chavez to 4th Street

Segment II

Cesar Chavez to 4th Street



SEGMENT II: CESAR CHAVEZ TO 4TH STREET



ACTIVATING THE CONNECTION TO THE LAKE

Since the construction of I-35 over 50 years ago, Palm Park has been cut off from any meaningful street-level connections and, with the increased frequency of creek flooding, has been severed from the channel by a block-long retaining wall and other slope stability solutions. This isolated park space is re-envisioned as an annex to the creek landscape by laying back the park-side bank in order to create a visual connection between the park and the new trail system. As such, the park will serve as a hub of new street-to-creek connections between the historic downtown core and the lake.

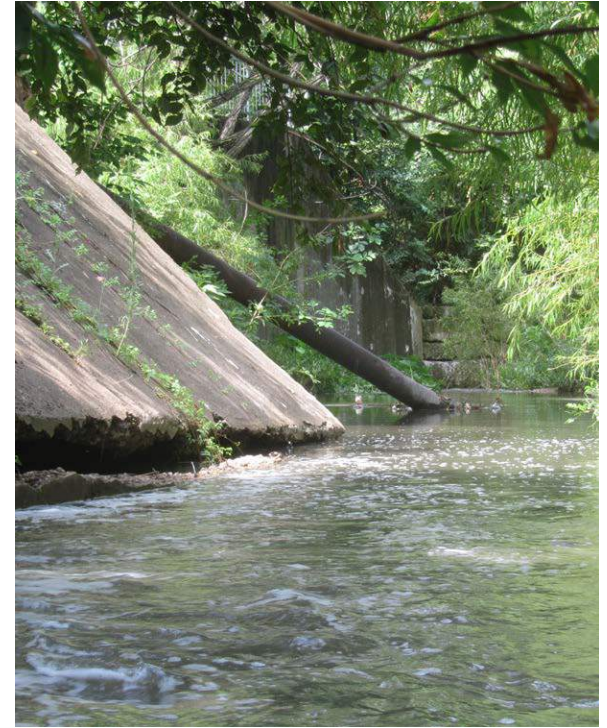
These interchanges will be increasingly important as the intense wave of redevelopment occurs along the creek, as they will reserve an inclusive-feeling public space, a mix of residents and visitors of Austin, and imbue the creek with a new role as the passage to the lake. Beyond its importance as a hub of connectivity, the park is planned as a multi-use and family-friendly open space that serves residents of East Austin, downtown and creek trail-goers.

THE INTERCHANGE BETWEEN STREET + CREEK

Palm Park is the most critical component of the chain of parks concept along Waller Creek because of its role in mediating the many street/creek transitions. A particularly important sectional interchange occurs just north of Palm Park between 3rd & 4th Streets where the forthcoming street-level promenade on Sabine Street merges with the creek-level trail system and also gives access to the Narrows. Particular attention to developing visual and tactile cues will be required to help avoid pedestrian and bike conflicts at this junction.



SEGMENT II: CESAR CHAVEZ TO 4TH STREET



This segment of the creek suffers from failing bank revetments and poor visual and physical connectivity between creek and street/park. The future reinvention of Palm Park as a place for families – from East Austin, downtown, and beyond - will be a primary driver for the design of Segment II.

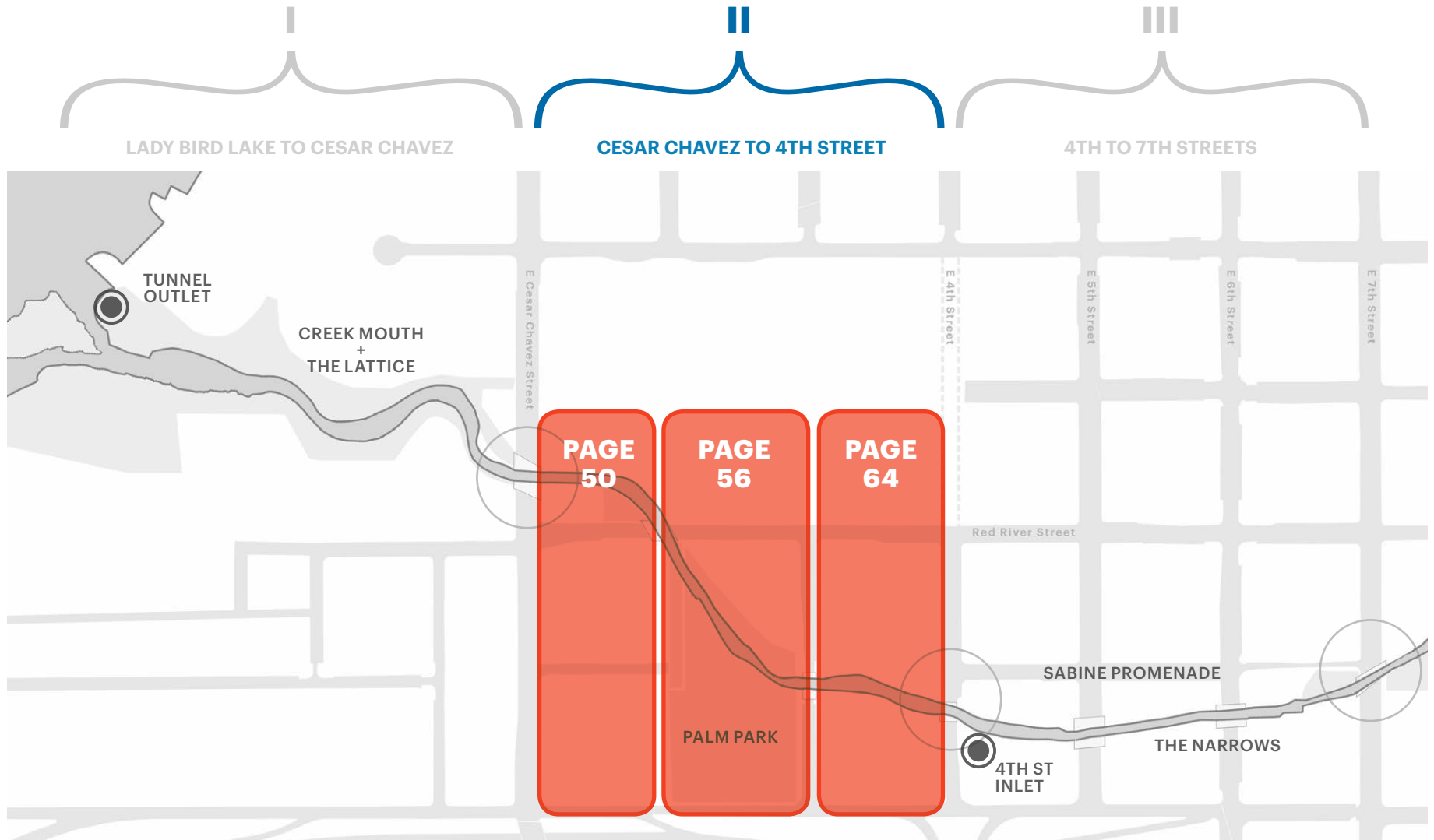
The design of Segment II should be guided by the following objectives:

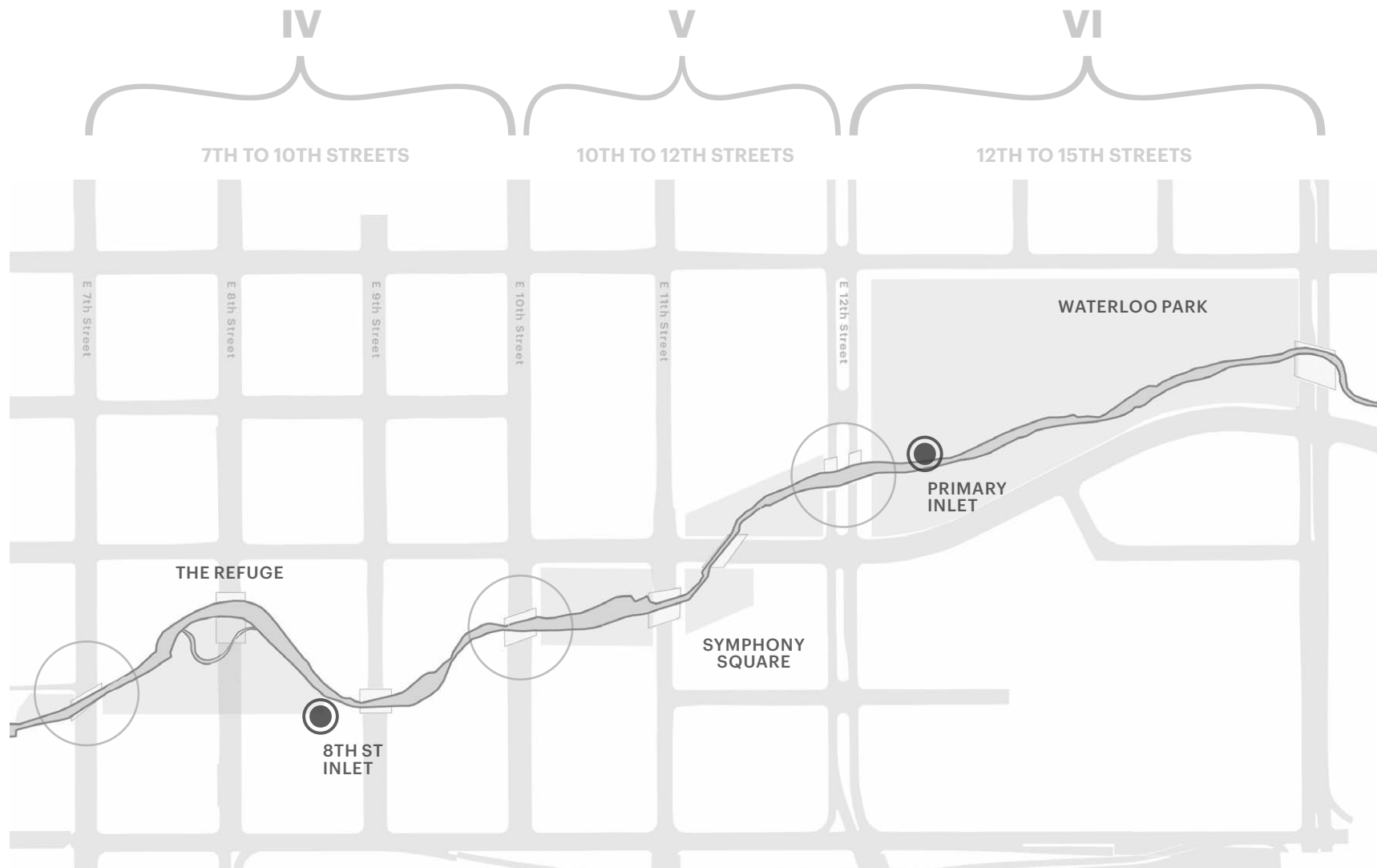
- Define a spatial connection between the interior of Palm Park and the creek landscape
- Create a safe, accessible, off-street trail connection to Lady Bird Lake by connecting the Sabine Street Promenade to Palm Park
- Maximize long views from the trail and disallow blind corners where the creek makes “dogleg” turns
- Increase visibility between trail and street
- Reshape the relationship of the Austin Convention Center to the creek as one that positively contributes to public space



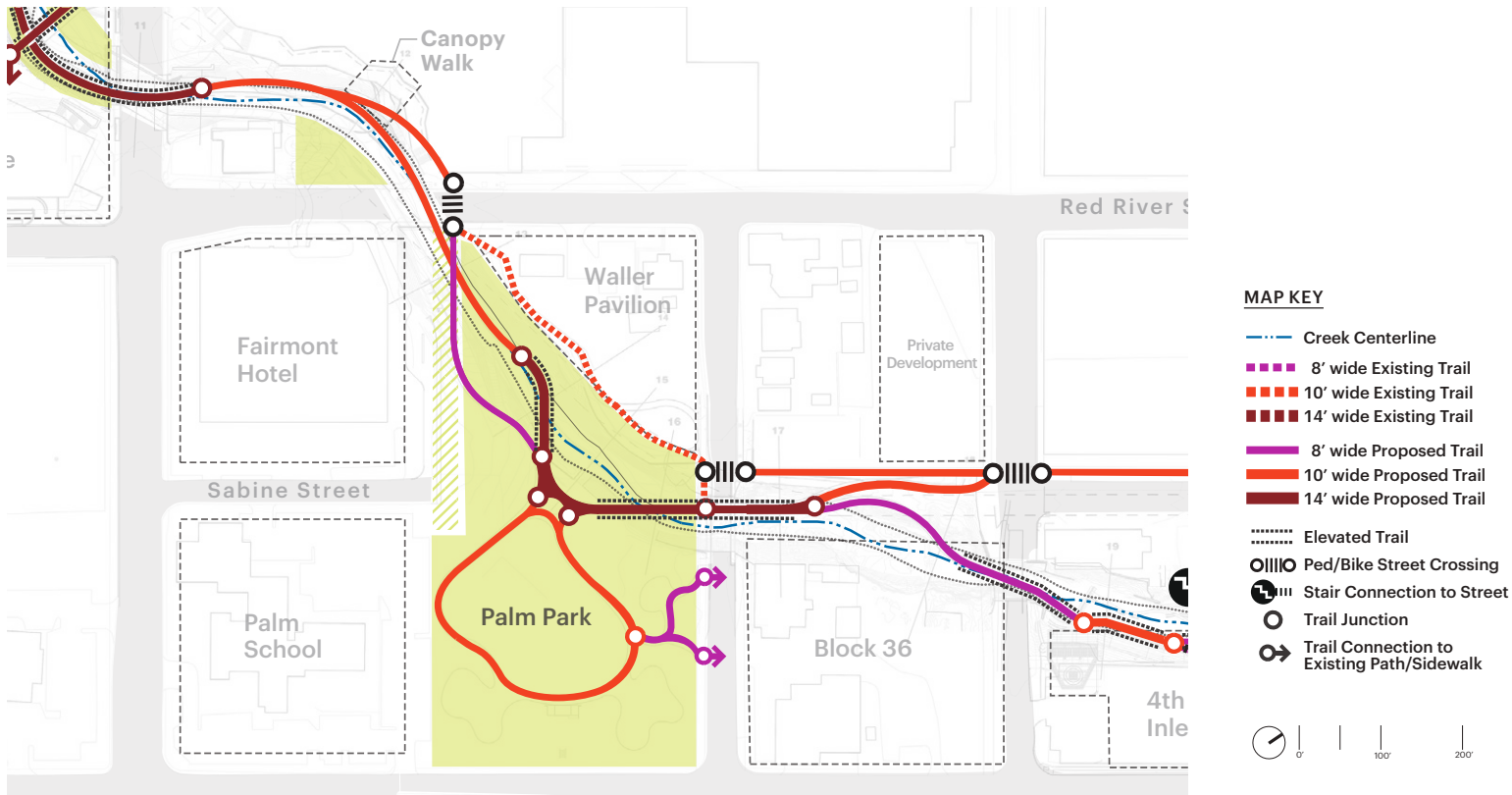
- Enhance aquatic habitat longitudinally along the creek by restoring existing riffle/pool sequences, adding complementary habitat features, and learning from the naturalized environment of the creek mouth
- Rebuild failing revetments as a planted system of slopes, restoring the riparian zone of the creek

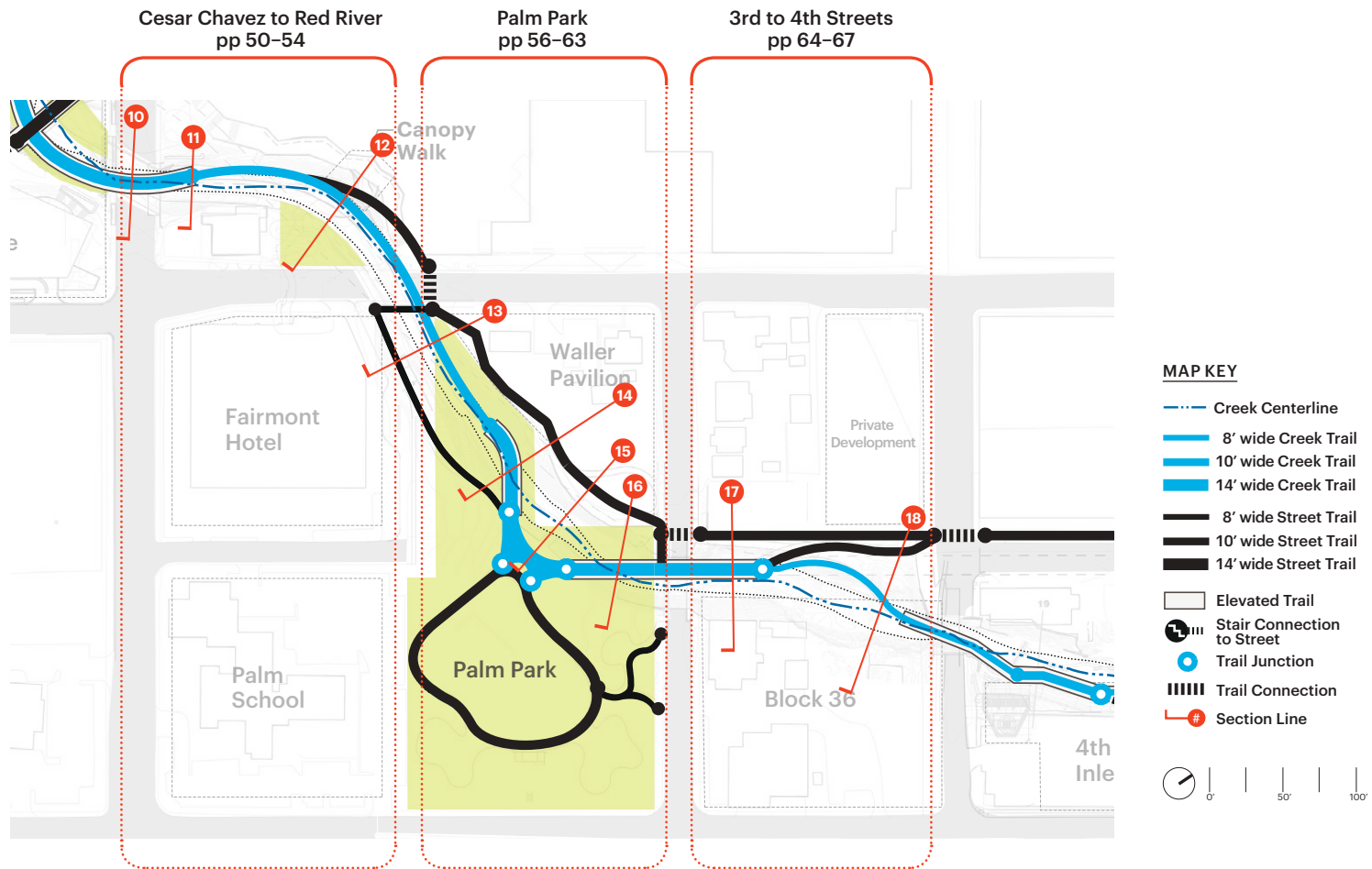
SEGMENT II: CESAR CHAVEZ TO 4TH STREET





SEGMENT II: CESAR CHAVEZ TO 4TH STREET



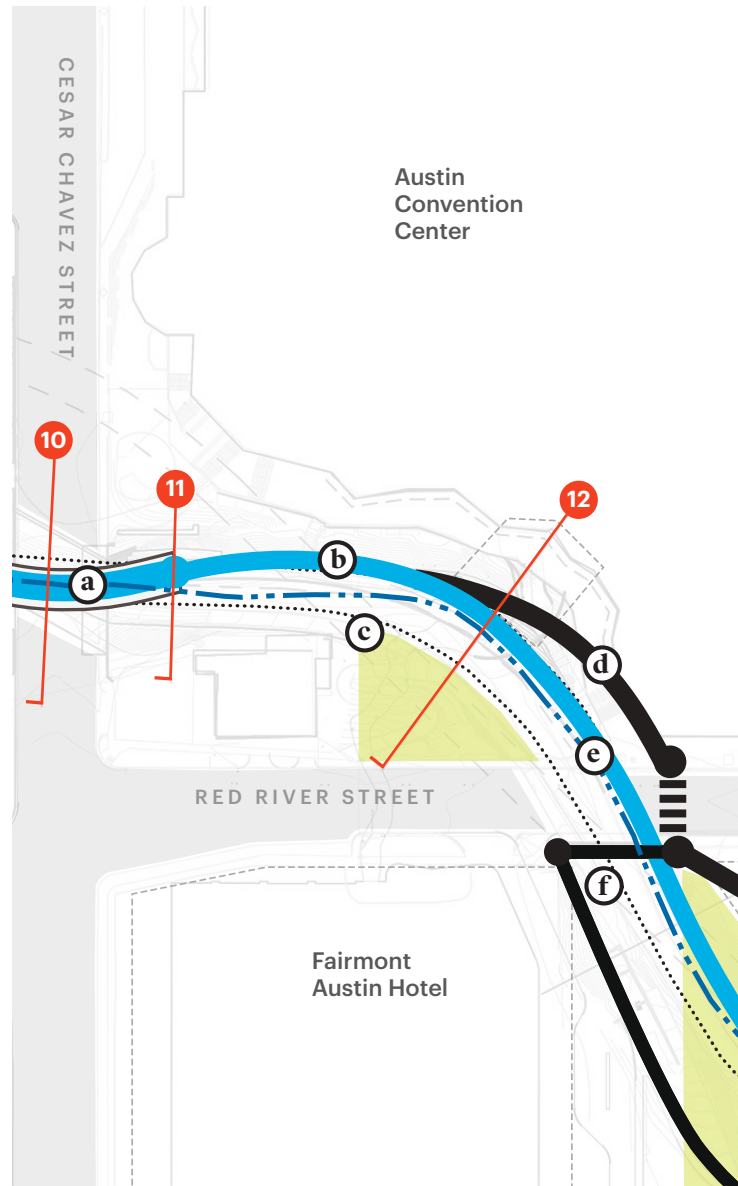


CESAR CHAVEZ TO RED RIVER



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. Elevated trail under Cesar Chavez Bridge crosses to west bank. Foundations to be coordinated with removal of existing grade control structure.
- b. West bank offers connections to Convention Center terrace and a street-level connection.
- c. Existing trail on east bank has deteriorated beyond repair. The east bank also has conflicts with stormwater outfalls, and grades preclude an accessible connection to street level without extensive bank reconstruction
- d. Accessible connection from creekside trail to street level at Red River Street. Fairmont Austin "Canopy Walk" Bridge overhead.
- e. Creekside trail on west bank.
- f. Connection to Palm Park to be coordinated with private development vehicle drop-off area. Mid-block crossing at Red River Street connects trail system to sidewalks.

HYDRAULICS & HYDROLOGY

- The existing channel is a wide pool contained by a concrete wall to the east and rock filled gabion baskets on the west.
- The existing trail crossing under Cesar Chavez acts as weir and will be removed. Weir removal allows the riffle/pool sequences from downstream of Cesar Chavez to potentially be extended upstream through this reach and connected to the existing pool riffle sequences near Palm Park.
- Channel construction within this block will increase the water surface elevations during large storm events; however, the 100-year water surface elevation should still be below the existing banks.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on April 2, 2015.
- Overall assessed condition is FAIR. (Riparian Zone = POOR, Geomorphology = FAIR, Aquatic Habitat = FAIR)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the vegetation coverage within the riparian area and structural diversity of canopy and understory trees, using natural materials such as native vegetation and rock to provide a stable channel form, adding riffle/pool sequences along channel bottom and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- On the west bank near Cesar Chavez, there is a steep bank between the Convention Center terrace and an existing retaining wall at the bottom of the slope.

Closest to Cesar Chavez, the slopes will require only minimal soil restoration and replanting.

- On the west bank at Red River Street, the construction of the Canopy Walk and mid-slope trail connection will require bank reconstruction; where possible, this work should accommodate existing canopy trees in good condition.
- On the east bank at Cesar Chavez, overbank runoff from an adjacent parking lot is suspected to contribute to severe bank erosion. The reconstruction of this bank should be integrated with stormwater management techniques.
- On the east bank near Red River Street, a small, existing park has walkways that exceed 5% slopes and are in disrepair. Proposed reconstruction of this bank will create a vegetated slope with a public gathering area adjacent to the sidewalk at the top of bank.

AQUATIC HABITATS

- The creek channel will be reconstructed on this block. Existing debris and in-water structures will need to be removed, and new trail construction will require rebuilding of the channel edge.
- Reconstructed channel form will include new riffle/pool sequences, including opportunities for cooling pools beneath bridges and other aquatic habitat.
- An existing riffle just downstream of Red River should remain and be protected.

HERITAGE TREES & EXISTING VEGETATION

- Three Heritage Trees on this block, two on west bank along Convention Center terrace, one mid-bank in parkland.
- Due to existing severe slopes on west bank, adjacent

Heritage Trees are cable supported back to uphill slope. Regrading in this area should be minimal.

- Other than the Heritage Trees, the dominant canopy species is chinaberry.
- The existing mid-story along the creek consists of non-native species (giant reed, golden raintree, ailanthus, poison ivy, english ivy).
- The existing groundcover and aquatic vegetation consists of Britton's wild petunia, johnson grass, elephant ear, papyrus sedge, and primrose willow.

UTILITIES

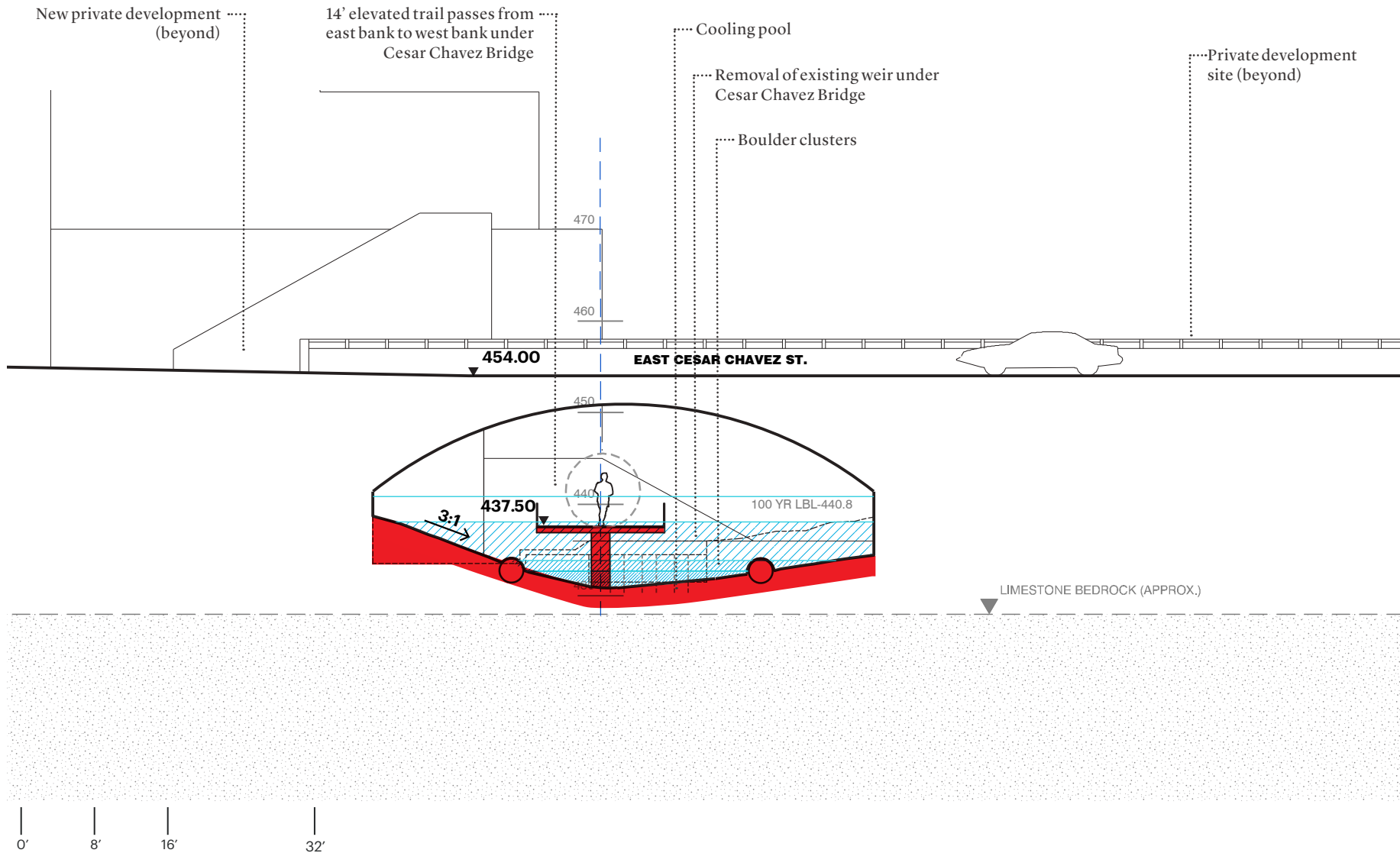
- On the west bank, existing stone-lined flumes direct roof runoff from the Austin Convention Center into Waller Creek. In their current configuration, these flumes conflict with proposed trail elevations and require selective modification.

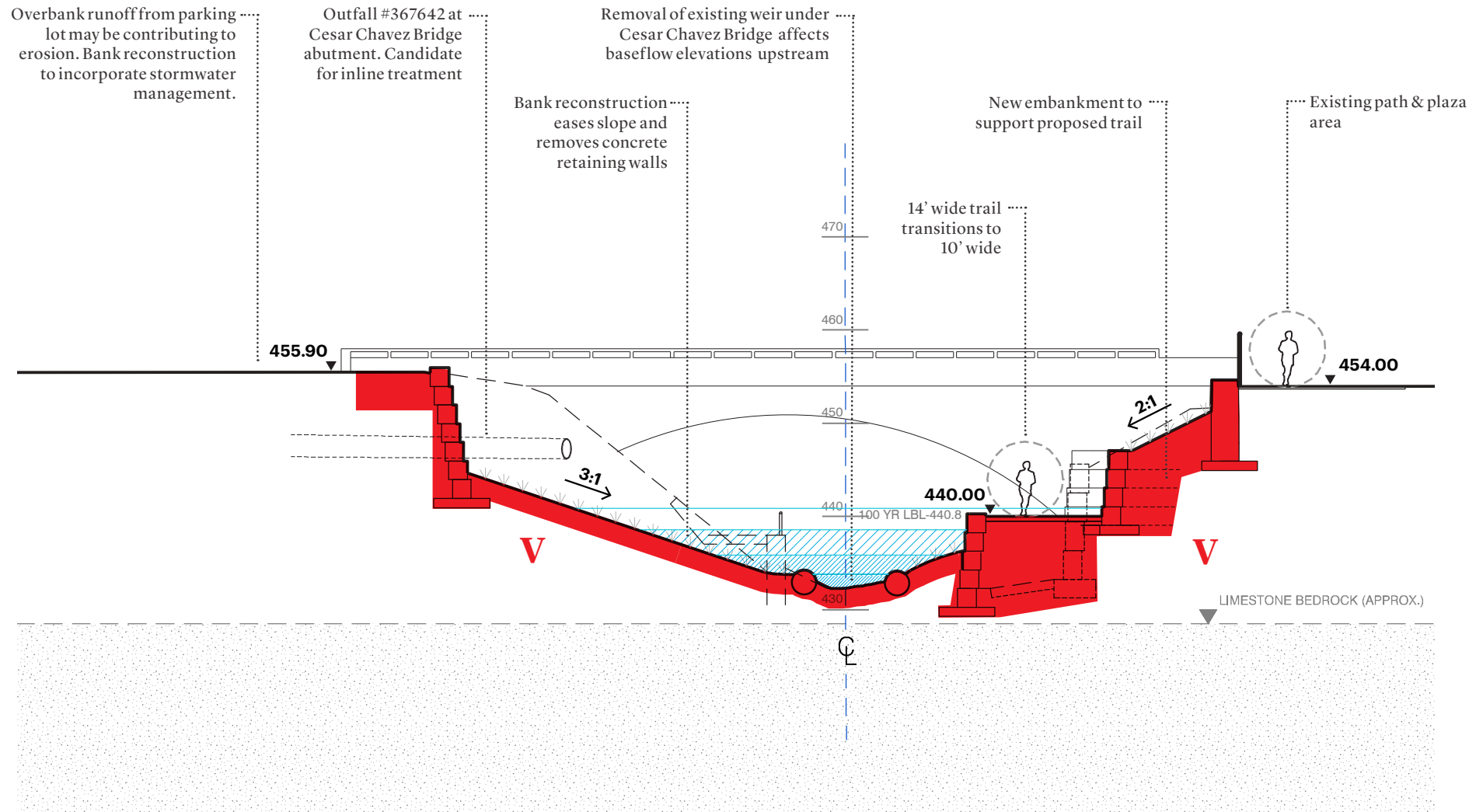
STORMWATER RETROFITS

- Outfall # 367642 discharges from east abutment of the Cesar Chavez Bridge. It is highly suitable for inline treatment, but would require an easement for access.
- Outfall # 364357 conveys relatively low volumes of water and emerges from a retaining wall in existing parkland on the east bank of the creek. The proposed reconstruction of this area as a vegetated slope creates an opportunity for landscape treatment.

MAINTENANCE & OPERATIONS

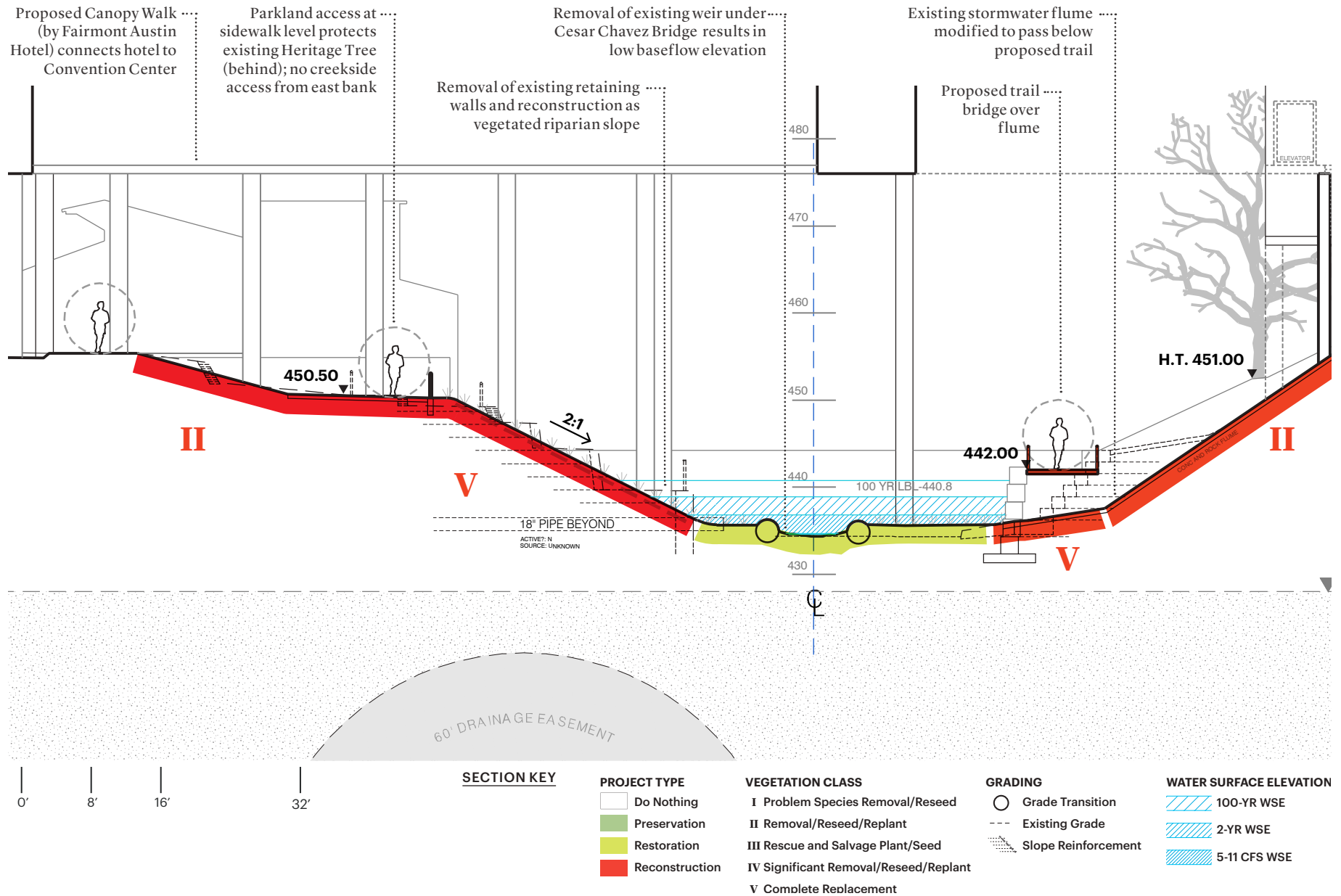
- Steep slopes on Austin Convention Center bank will be challenging to access.
- Maintenance of stormwater flumes on west bank and intersection with proposed trails to be coordinated with Austin Convention Center.



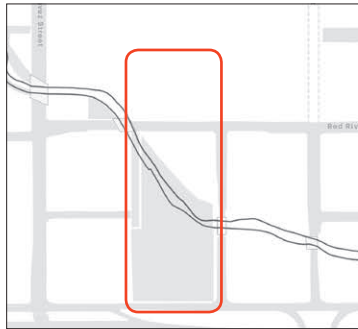


SECTION KEY

PROJECT TYPE	VEGETATION CLASS	GRADING	WATER SURFACE ELEVATION
Do Nothing	I Problem Species Removal/Reseed	Grade Transition	100-YR WSE
Preservation	II Removal/Reseed/Replant	Existing Grade	2-YR WSE
Restoration	III Rescue and Salvage Plant/Seed	Slope Reinforcement	5-11 CFS WSE
Reconstruction	IV Significant Removal/Reseed/Replant		
	V Complete Replacement		

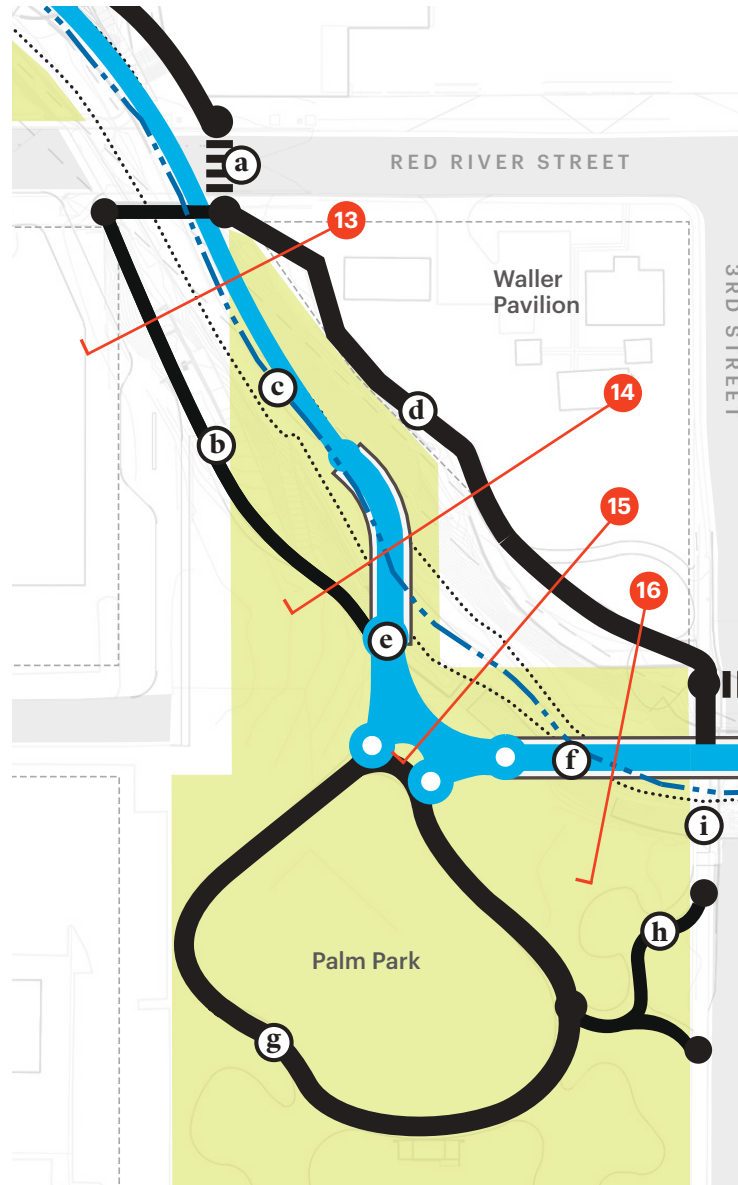


PALM PARK



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL NETWORK

- a. Street-level trail connection requires mid-block crossing at Red River Street (at former 2nd Street ROW).
- b. Trail connects Fairmont Hotel entrance to Palm Park. Requires coordination with Fairmont Hotel project.
- c. Creekside trail on west bank allows for generous sightlines; tall vertical retaining walls on opposite bank limit visibility.
- d. Top of bank sidewalk on Austin Convention Center property may be redeveloped as part of the Waller Pavilion project.
- e. Creekside trail crosses from west to east bank and provides access to Palm Park. Gently sloping banks and trail will replace existing vertical retaining walls. Creekside trail is intended to promote a gradual and welcoming transition to Palm Park and also offer a bypass route during events.
- f. Creekside trail crosses from east bank at Palm Park to existing ROW on west bank under the 3rd Street Bridge.
- g. A looped path within Palm Park offers a circuit of play areas for children of different ages. It also frames an open, gently sloping lawn that can be used for performances and other events.
- h. Trail connections to 3rd Street will be the primary means of accessing Palm Park from street level. 3rd Street will be a key pedestrian connection to East Austin upon the reconfiguration of I-35.
- i. 3rd Street Sidewalk is currently +/- 4' wide. Proposed widening and improvements anticipate greater pedestrian activity upon redevelopment of Palm Park.

HYDRAULICS & HYDROLOGY

- In most areas of this block, the existing baseflow channel should be sufficient to convey the post-tunnel baseflow regime.
- Due to upstream interruptions in sediment transport, this reach is at risk for sediment depletion. Consequently, this block is a strong candidate for regular stream bed monitoring.
- Existing grade control structure to be removed.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on June 3, 2014.
- Overall assessed condition is FAIR. (Riparian Zone = FAIR, Geomorphology = FAIR, Aquatic Habitat = GOOD)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the riparian zone width and structural diversity of canopy and understory trees, using log structures and natural materials such as native vegetation and rock to provide a stable channel form and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- On the east bank (Palm Park), existing vertical retaining walls are in poor condition and present a visual and physical barrier between the creek corridor and the park. These slopes will be reconstructed and integrated with the new trail system.
- Run-off from the Palm School parking lot currently flows across Palm Park via an open grass swale and may be contributing to bank erosion.

- On the west bank (Waller Pavilion/Austin Convention Center site), heavily eroded slopes will be restored and stabilized. Surface run-off from existing parking lots may be contributing to these conditions.
- Surface drainage improvements should be coordinated with bank reconstruction.

AQUATIC HABITATS

- Existing riffles should be protected during the reconstruction of adjacent banks.
- Bank vanes and/or rock toe protection will help maintain channels and protect banks.

HERITAGE TREES & EXISTING VEGETATION

- Fourteen Heritage Trees on this block; the 11 in Palm Park include Durand Oaks.
- Three Heritage Trees have been assessed to be in “Poor Condition” and one was recently removed (Spring 2015).
- Three trees have been identified as heritage class species in good condition that may mature into Heritage Trees.
- Removal of the existing swimming pool and surrounding fence may impact existing Heritage Trees. Careful inspection and establishment of protection areas should be performed prior to pool demolition.
- On the east bank, three Heritage Trees are at the top of bank, with roots exposed on heavily eroded slopes. Careful inspection and establishment of protection areas should be performed prior to slope reconstruction.
- The existing mid-story along the creek is dominated by a mix of species, both native (red mulberry) and non-native (chinaberry, golden raintree).

- The existing groundcover is dominated by the invasive Britton’s wild petunia and native giant ragweed.

UTILITIES

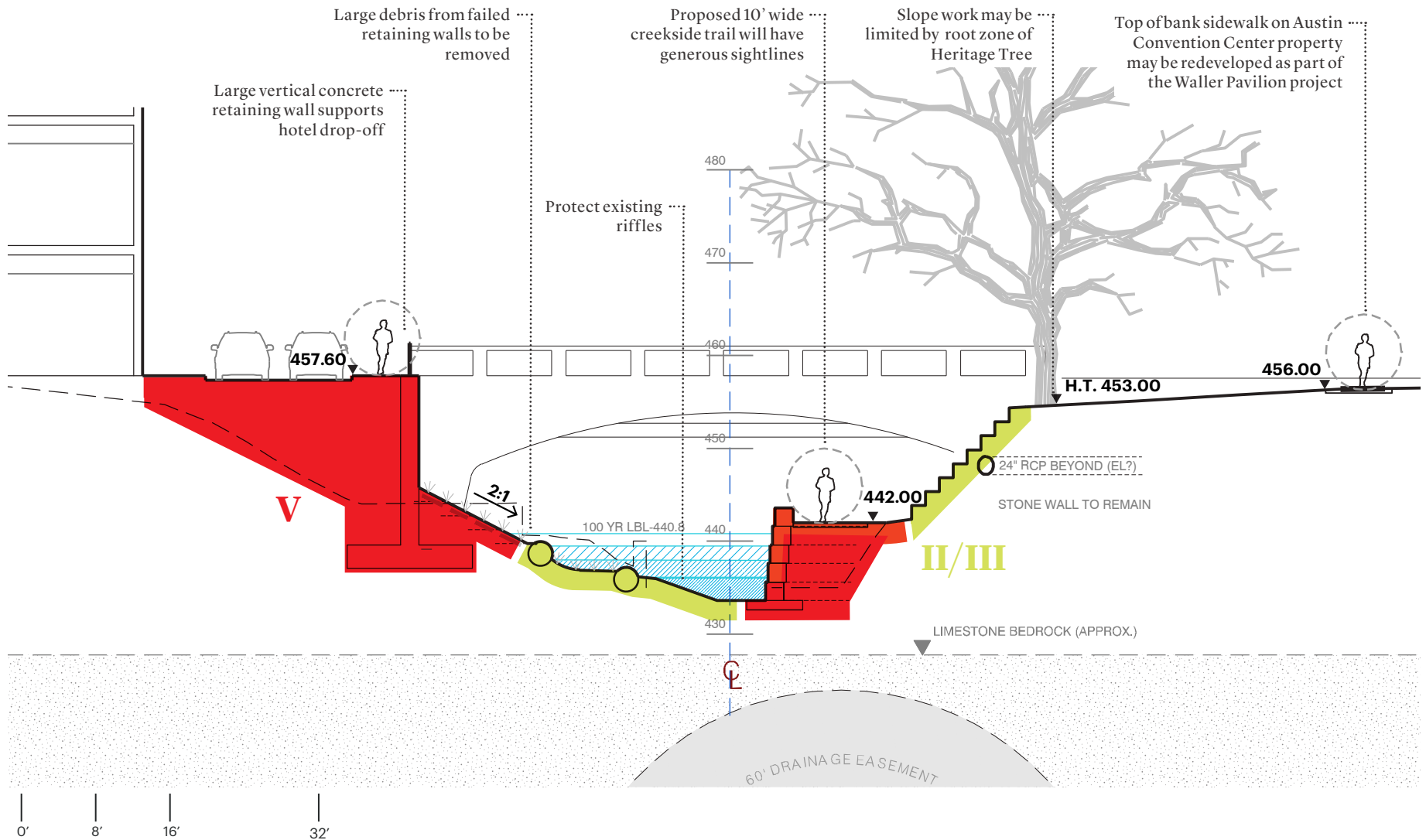
- An overhead utility line, running north-south, crosses Waller Creek at Palm Park and is recommended for rerouting. This line is known to contain both electrical service and telecom, and its services can be reconfigured.
- The overhead utility line that runs on the south side of the 3rd Street ROW is eligible for burial east of Waller Creek, pending redevelopment of the parcel on the east bank between 3rd and 4th Streets. The 3rd Street aerial utility crossing to the west must remain.
- The Waller Pavilion project is scheduled to be under construction by 2018, utility work, such as burial of overhead lines, should be coordinated.
- A 16” metal pipe daylights on the west bank of the creek but is not shown in COA system maps. Its alignment suggests that it may be related to the existing swimming pool in Palm Park.

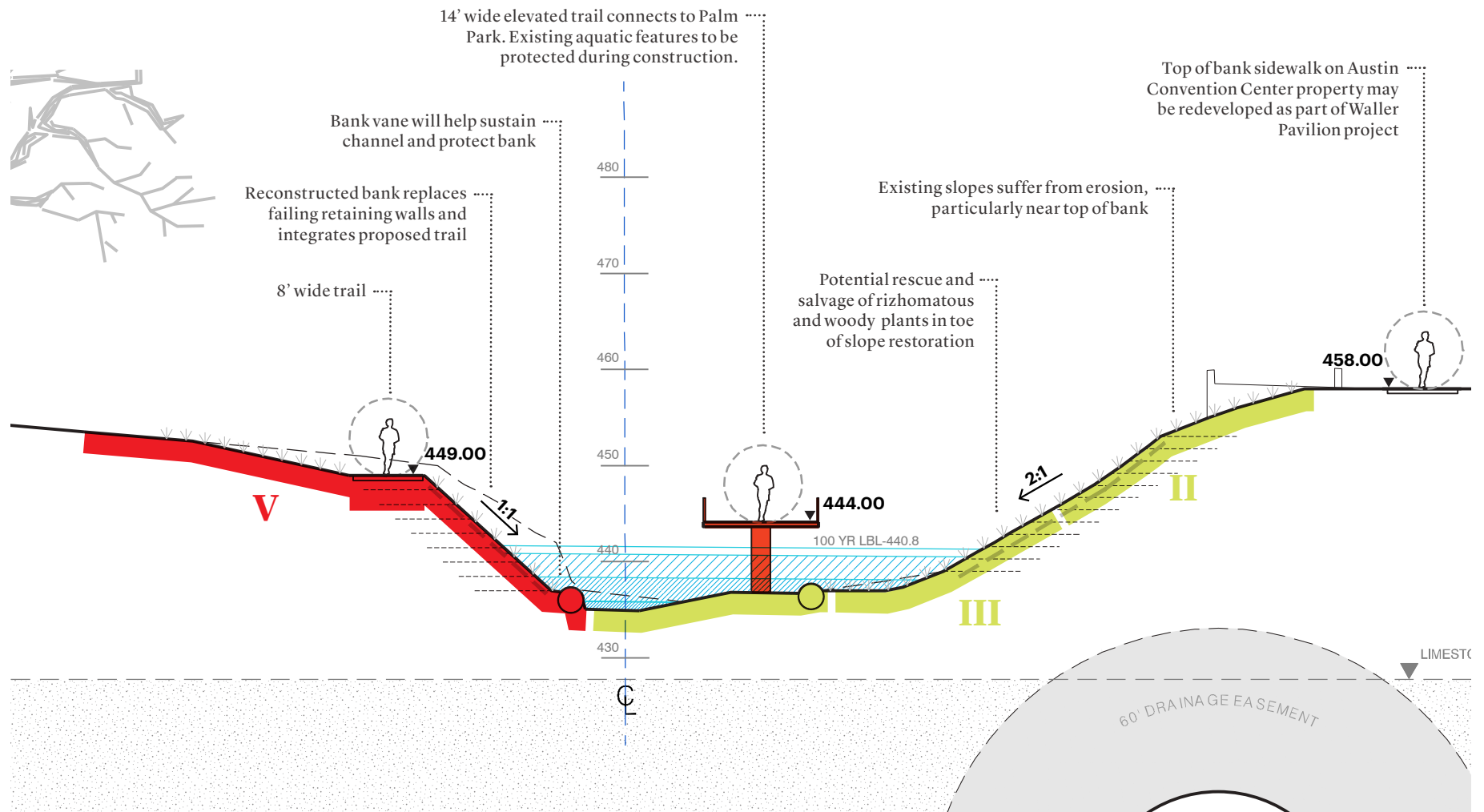
STORMWATER RETROFITS

- Three outfalls (#61495, #61557, #377456) are candidates for landscape treatment, but the design of reconstructed slopes will determine if there is sufficient area.
- Outfalls at the 3rd Street Bridge (#377434, #370053) are candidates for in-line treatment.

MAINTENANCE & OPERATIONS

- Palm Park will be redeveloped as a destination park for family programming; heavy public use is anticipated.





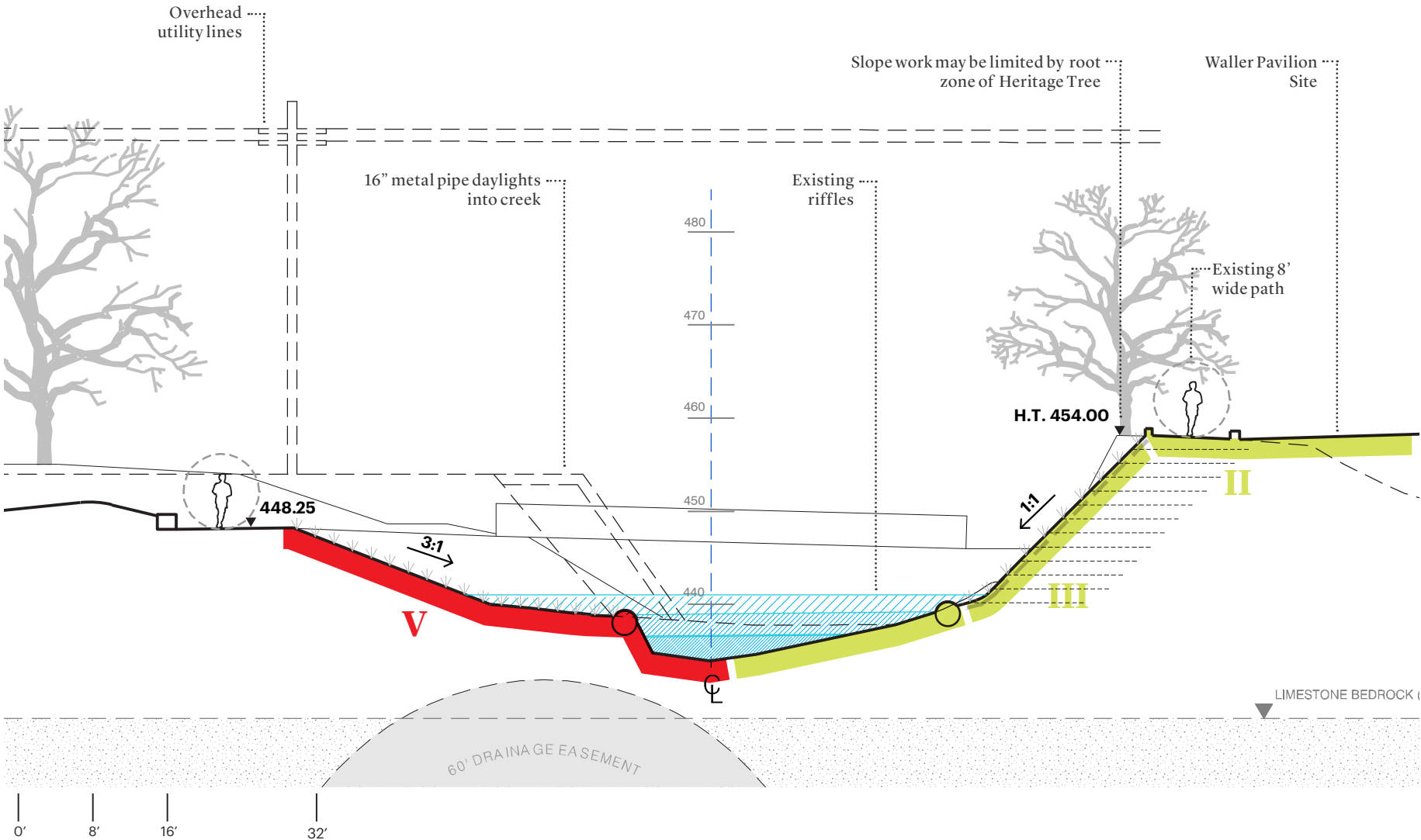
SECTION KEY

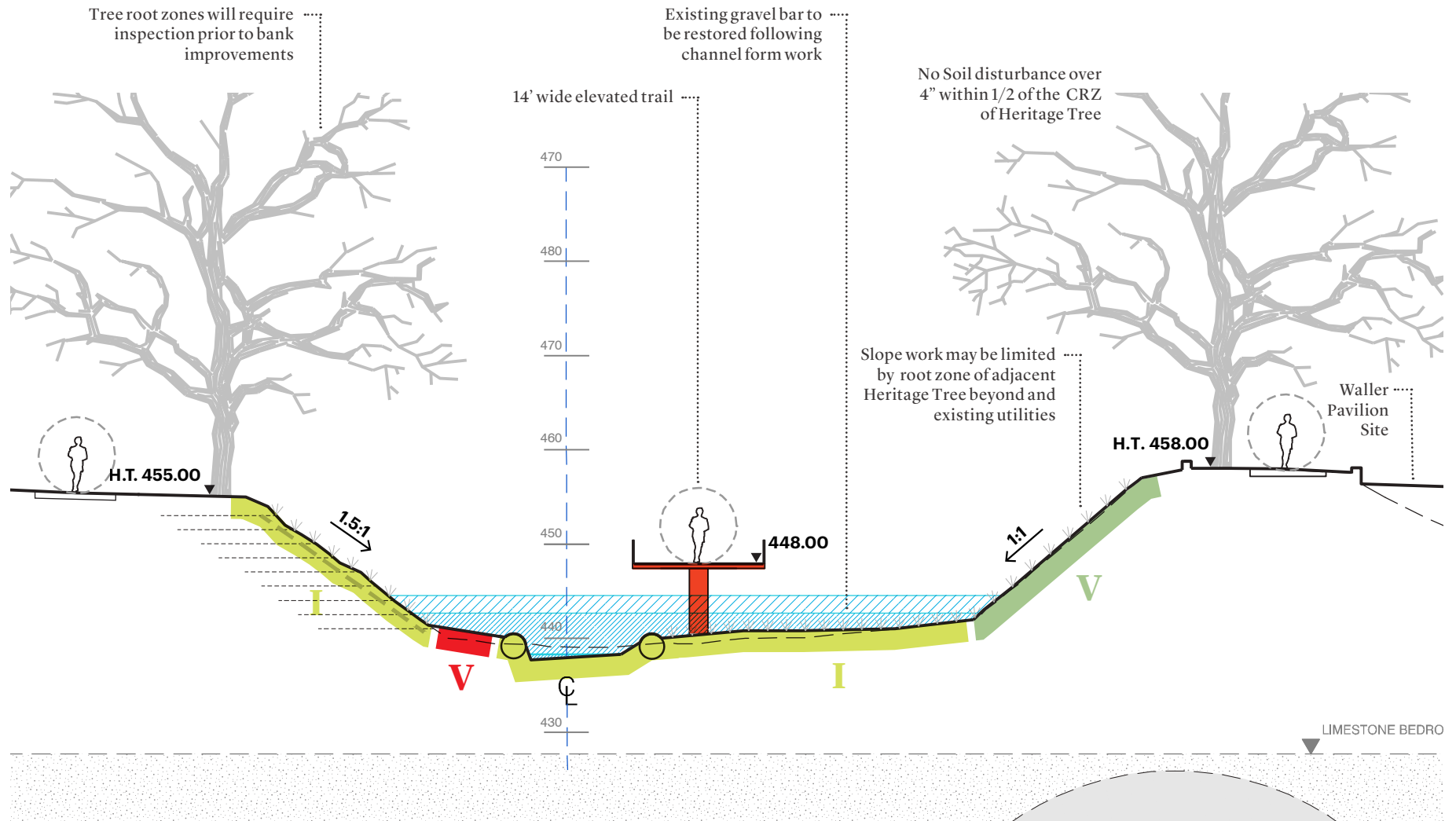
PROJECT TYPE
Do Nothing
Preservation
Restoration
Reconstruction

VEGETATION CLASS
I Problem Species Removal/Re seed
II Removal/Re seed/Re plant
III Rescue and Salvage Plant/Seed
IV Significant Removal/Re seed/Re plant
V Complete Replacement

GRADING
Grade Transition
Existing Grade
Slope Reinforcement

WATER SURFACE ELEVATION
100-YR WSE
2-YR WSE
5-11 CFS WSE





SECTION KEY

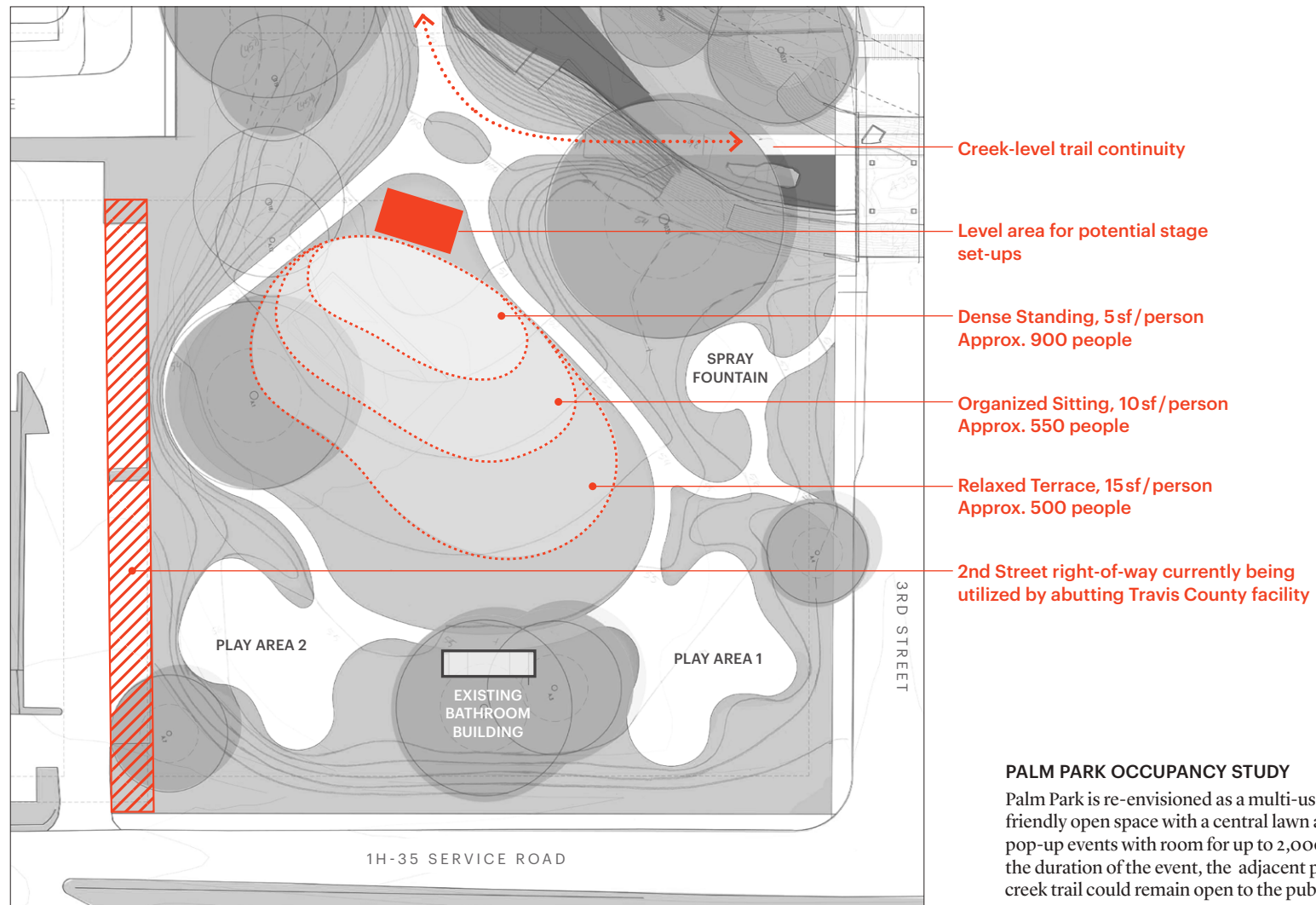
PROJECT TYPE
Do Nothing
Preservation
Restoration
Reconstruction

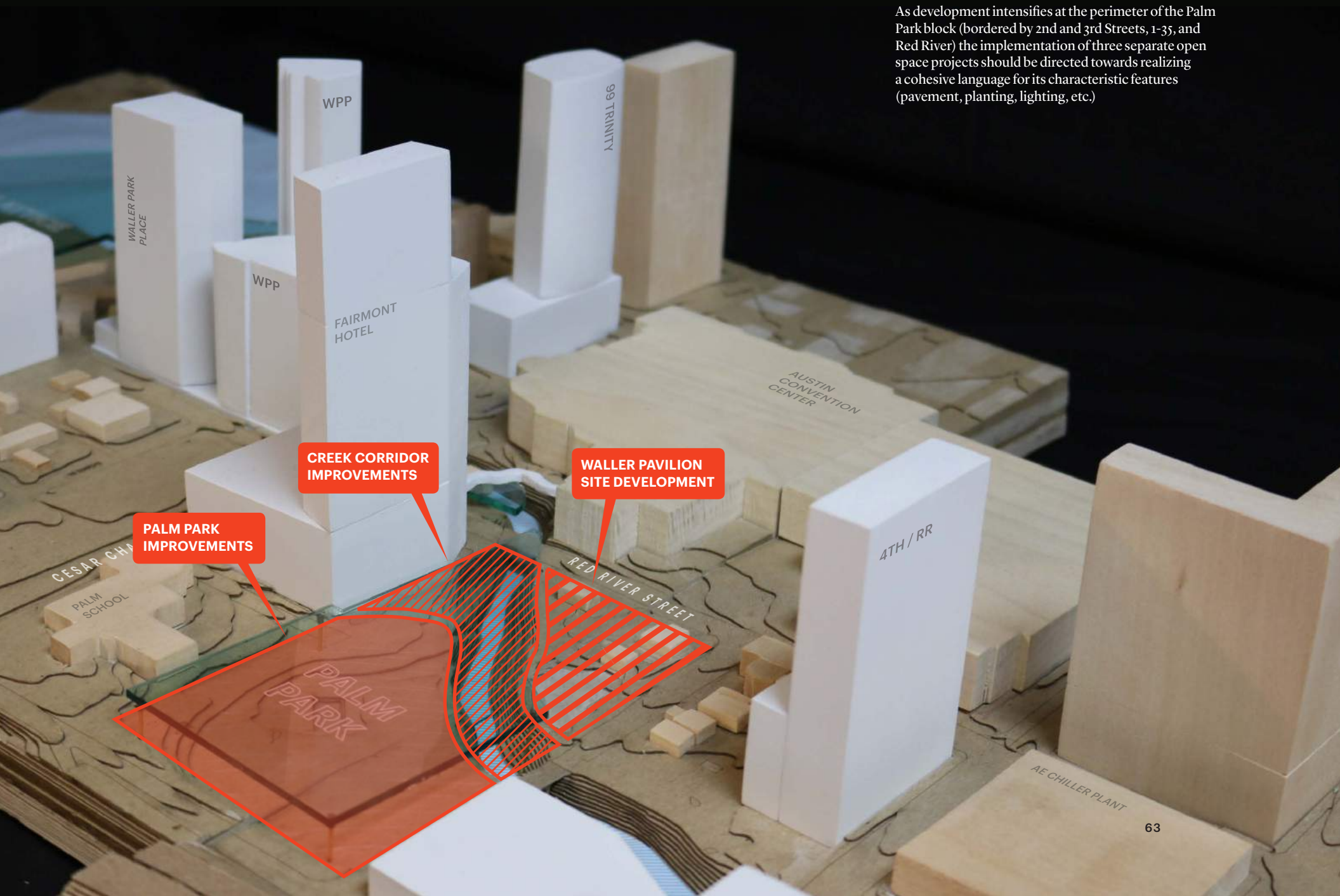
VEGETATION CLASS
I Problem Species Removal/Reseed
II Removal/Reseed/Replant
III Rescue and Salvage Plant/Seed
IV Significant Removal/Reseed/Replant
V Complete Replacement

GRADING
Grade Transition
Existing Grade
Slope Reinforcement

WATER SURFACE ELEVATION
100-YR WSE
2-YR WSE
5-11 CFS WSE

PALM PARK





THE PALM PARK BLOCK

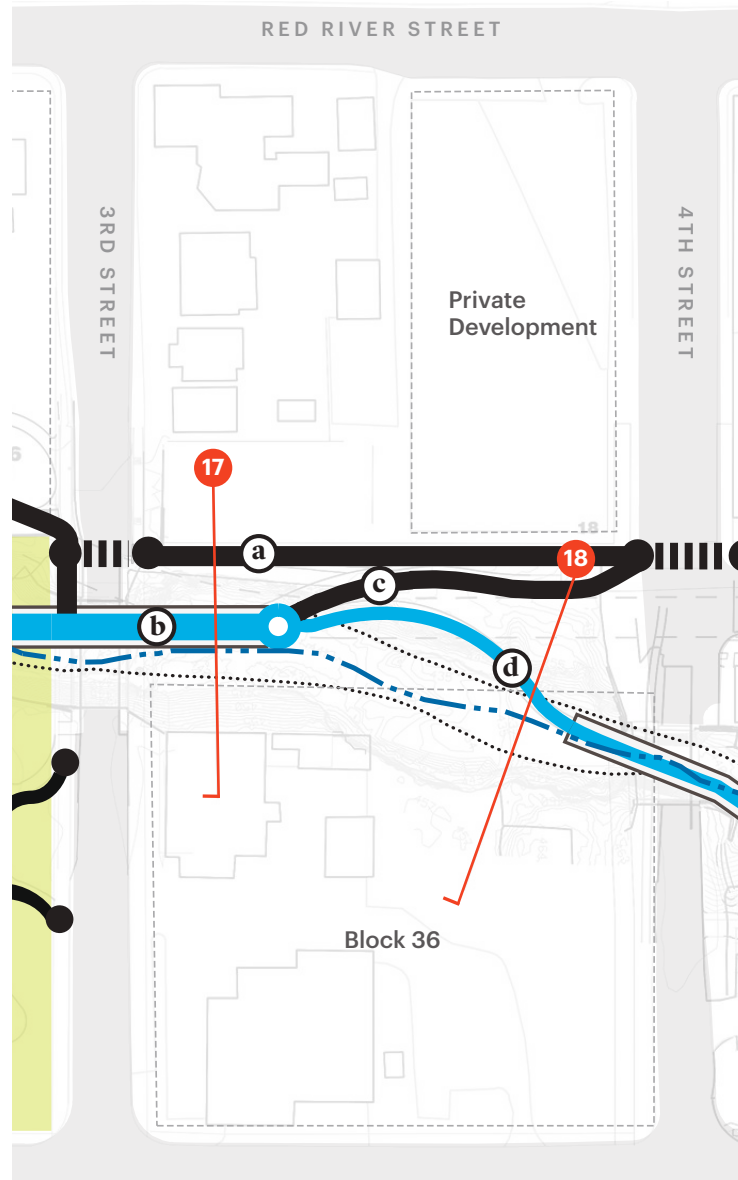
As development intensifies at the perimeter of the Palm Park block (bordered by 2nd and 3rd Streets, 1-35, and Red River) the implementation of three separate open space projects should be directed towards realizing a cohesive language for its characteristic features (pavement, planting, lighting, etc.)

3RD STREET TO 4TH STREET



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL NETWORK

- a. Street-level trail within existing ROW provides critical pedestrian and bicycle connection to Sabine Street Promenade north of 4th Street. Trail is currently closed to public access due to severe bank erosion.
- b. Elevated creek trail crosses from Palm Park (east bank) to west bank beneath 3rd Street Bridge.
- c. Accessible connection from creek trail to street level to be integrated with bank reconstruction.
- d. Creek trail crosses private property and connects to elevated trail at 4th Street Inlet structure (east bank). See pg. 82-83.

HYDRAULICS & HYDROLOGY

- This block is just downstream of the Waller Creek Tunnel 4th Street Side Inlet, into which most of the significant storm flows will be directed. As a result, this block is analogous to a headwater environment, and will be minimally impacted by upstream flows during storm events.
- Under post-tunnel conditions, the shear stresses along this reach will be greatly reduced, which should reduce scour potential as a result.
- Existing deep scour hole in this block may accumulate sediment entering from upstream; however, sediment capture behind the 4th Street weir will likely make bed filling rates in this block relatively low.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on April 2, 2015.
- Overall assessed condition is FAIR. (Riparian Zone = FAIR, Geomorphology = POOR, Aquatic Habitat = FAIR)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the riparian zone width and structural diversity of canopy and understory trees, providing shade along the channel, using log structures and natural materials such as native vegetation and rock to provide a stable channel form, and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- The west bank is severely eroded and the existing

sidewalk compromised by undercutting. Overbank run-off from existing parking lots may be contributing to these bank conditions.

- Reconstruction of the west bank should be integrated with trail construction and mitigation of the effects of surface run-off.
- The east bank is moderately eroded and requires restoration and possibly reconstruction in some places. Requires coordination with future development.

AQUATIC HABITATS

- There is an existing island and a pool-riffle sequence close to 3rd Street. These features should be preserved and protected during construction of trails and adjacent developments.
- Deep pools and emergent logs will be added to enhance aquatic habitat diversity.
- Wetland benches integrated into bank and channel reconstruction are placed to take advantage of the low-flow headwater like condition just downstream of the 4th Street Inlet.

HERITAGE TREES

- No existing Heritage Trees on this block.
- Some existing vegetation may be rescued and salvaged, but the severity of bank erosion requires significant removals and re-planting.

UTILITIES

- 4th Street Bridge will be rebuilt in phases by CapMetro; utility routing on new bridge to be coordinated between CapMetro and Waller Creek project.

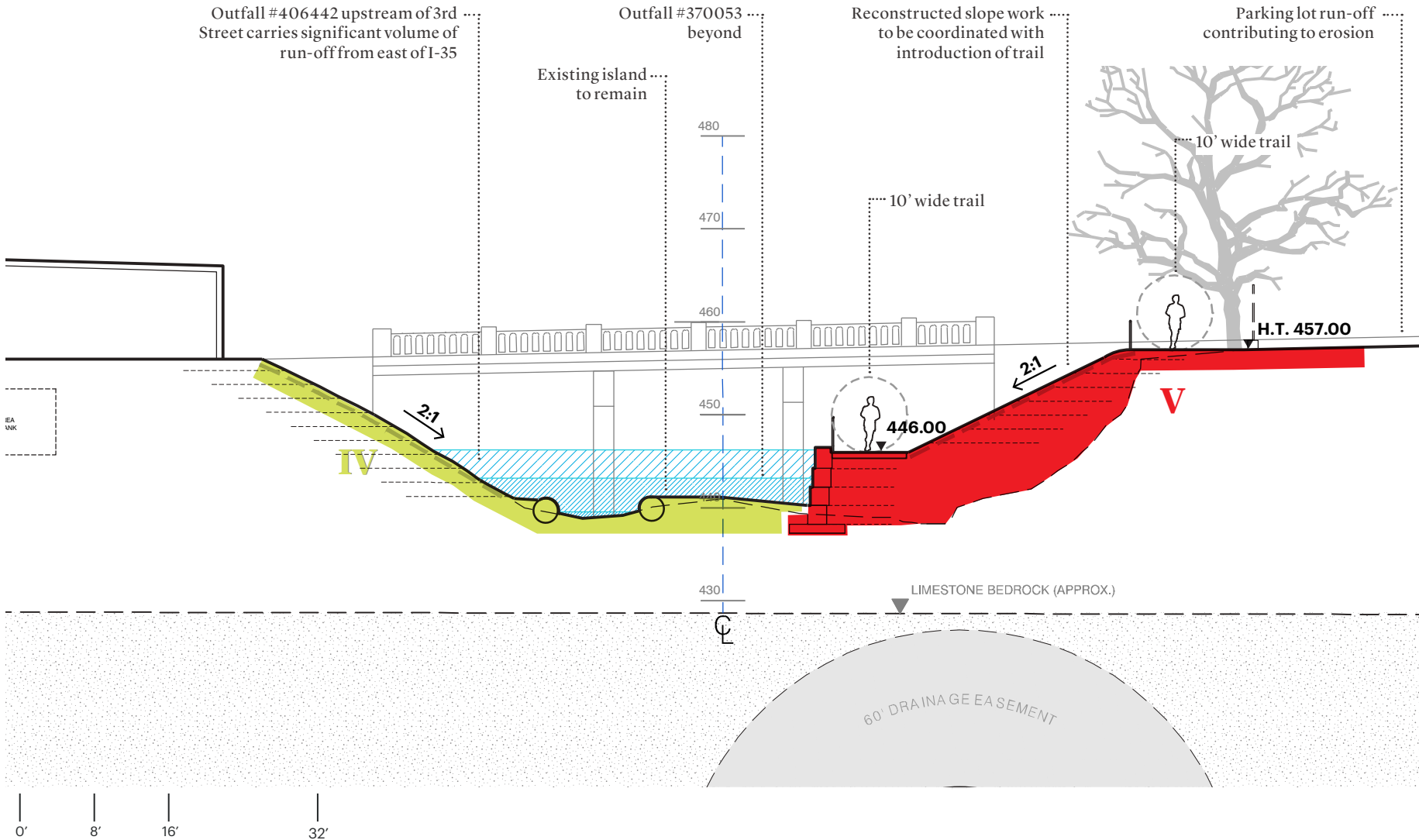
- Overhead utilities cross the creek at the mid-block alley. These have moderate to high potential for removal and relocation, dependent on adjacent private developments on east and west banks.
- 66" water line within ROW on top of west bank. COA plans show one line in this location but field investigations indicate that two buried utilities are present.
- Water line in 16" casing daylights on the east bank at mid-block. COA plans indicate that the water line is 4".

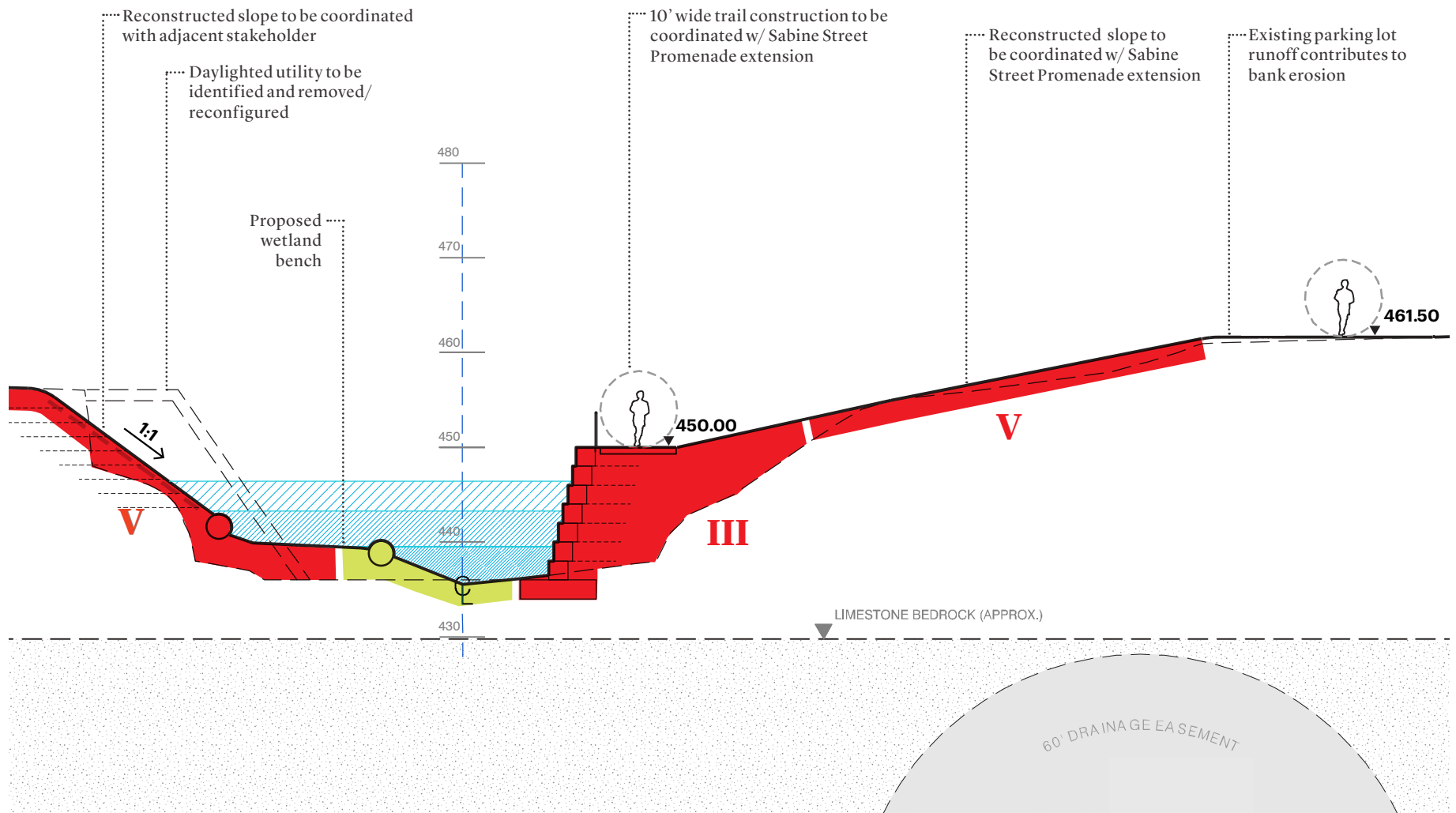
STORMWATER RETROFITS

- Stormwater outfall #94974 enters the creek from the west bank, below the existing undercut trail. It conveys a significant volume of water and is best treated in the sewershed.
- A very large stormwater outfall, #406442, located just upstream of 3rd Street, produces 30% to 50% of the storm runoff volume for this reach. The potential reconstruction of I-35 would reroute the stormwater outfall directly to Lady Bird Lake and reduce storm discharges at this location.

MAINTENANCE & OPERATIONS

- This block links the Sabine Street Promenade to Palm Park. During events and on weekends, heavy public use is anticipated.
- The privately owned sites that flank the creek on this block are anticipated to undergo densification and development. Monitoring for erosion and changes in vegetation due to changes in sunlight will need to be performed regularly.





SECTION KEY

PROJECT TYPE
Do Nothing
Preservation
Restoration
Reconstruction

VEGETATION CLASS
I Problem Species Removal/Reseed
II Removal/Reseed/Replant
III Rescue and Salvage Plant/Seed
IV Significant Removal/Reseed/Replant
V Complete Replacement

GRADING
Grade Transition
Existing Grade
Slope Reinforcement

WATER SURFACE ELEVATION
100-YR WSE
2-YR WSE
5-11 CFS WSE

Segment III

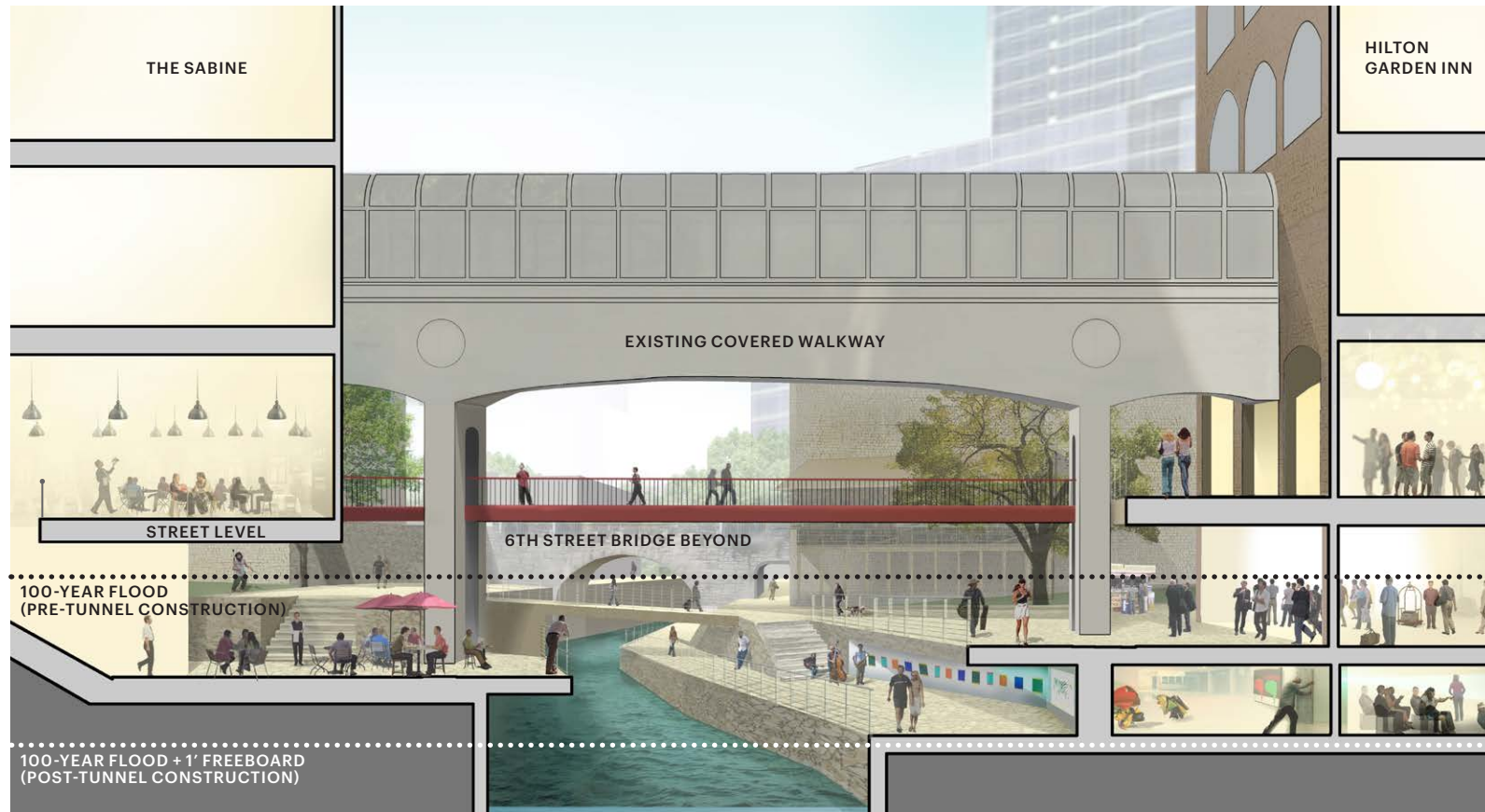
4th to 7th Streets

Segment III

4th to 7th Streets

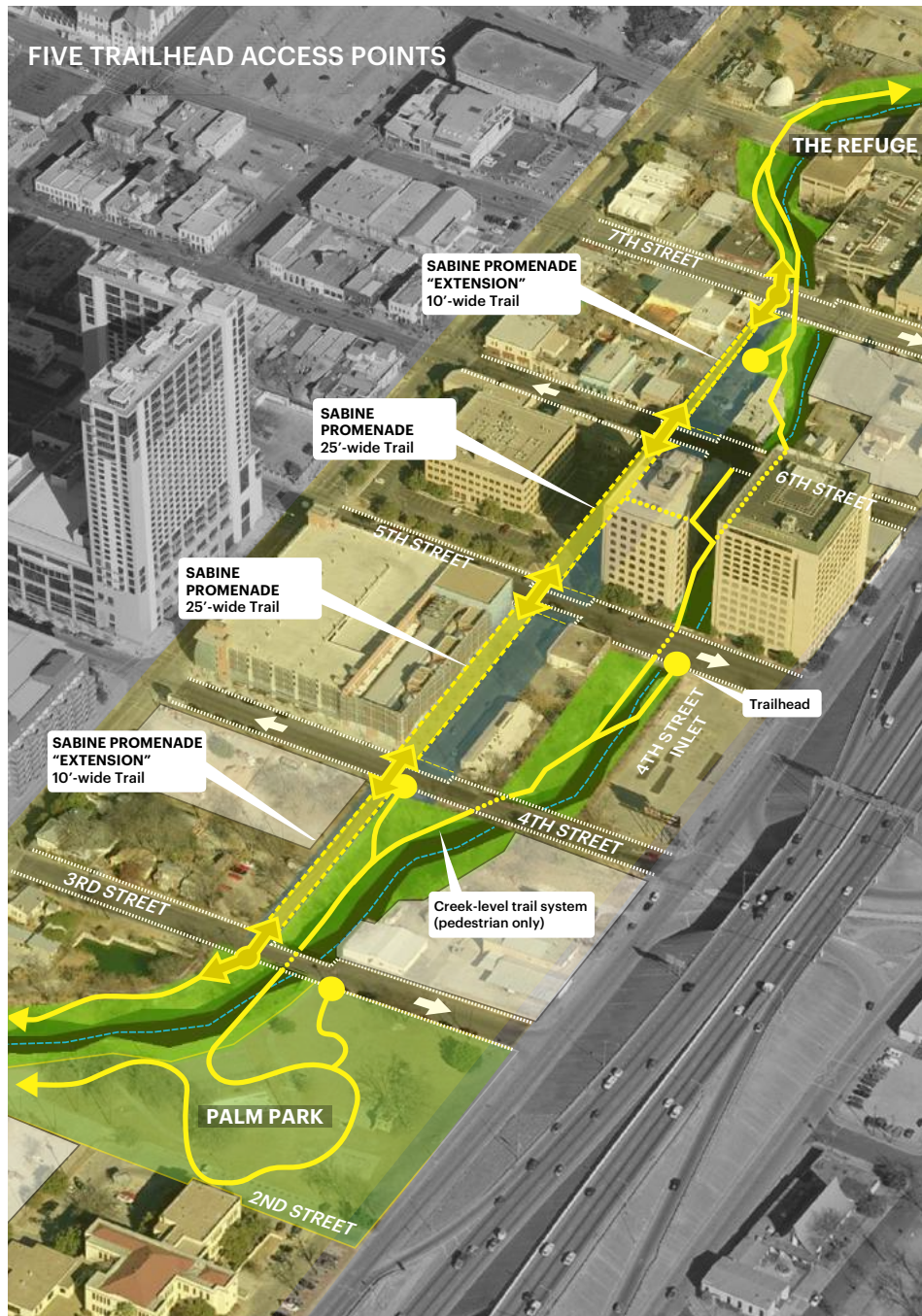


SEGMENT III: 4TH TO 7TH STREETS



PATIO URBANISM

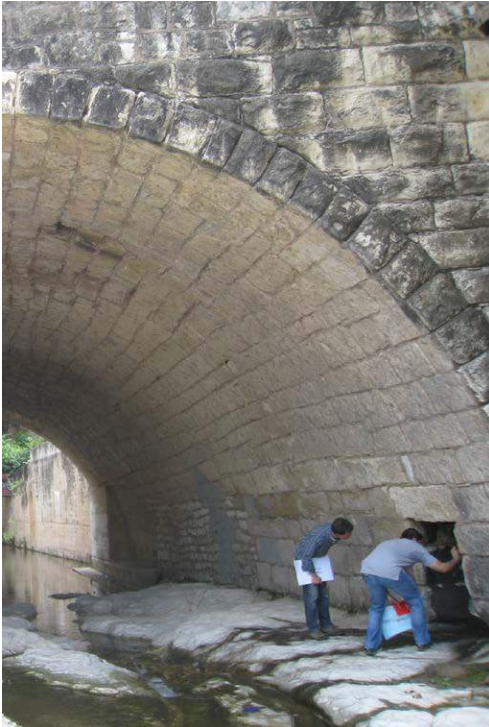
While Austin boasts a rich patio culture in the downtown, the elimination of high flood threats in the creek opens up the potential for basement spaces to be daylighted onto the creek and create an exciting urban rendition of patio culture. As the creek is almost entirely defined by architecture in the Narrows, it is imagined that the private sector would play a larger role in developing this reach.



SABINE STREET PROMENADE

The TxDOT and City of Austin funded bike and pedestrian promenade to be realized in 2017 was integrated into the Corridor Framework Planning effort, establishing how to best align bike and pedestrian crossings at 4th & 7th Streets for effective street-to-creek connections.

SEGMENT III: 4TH TO 7TH STREETS



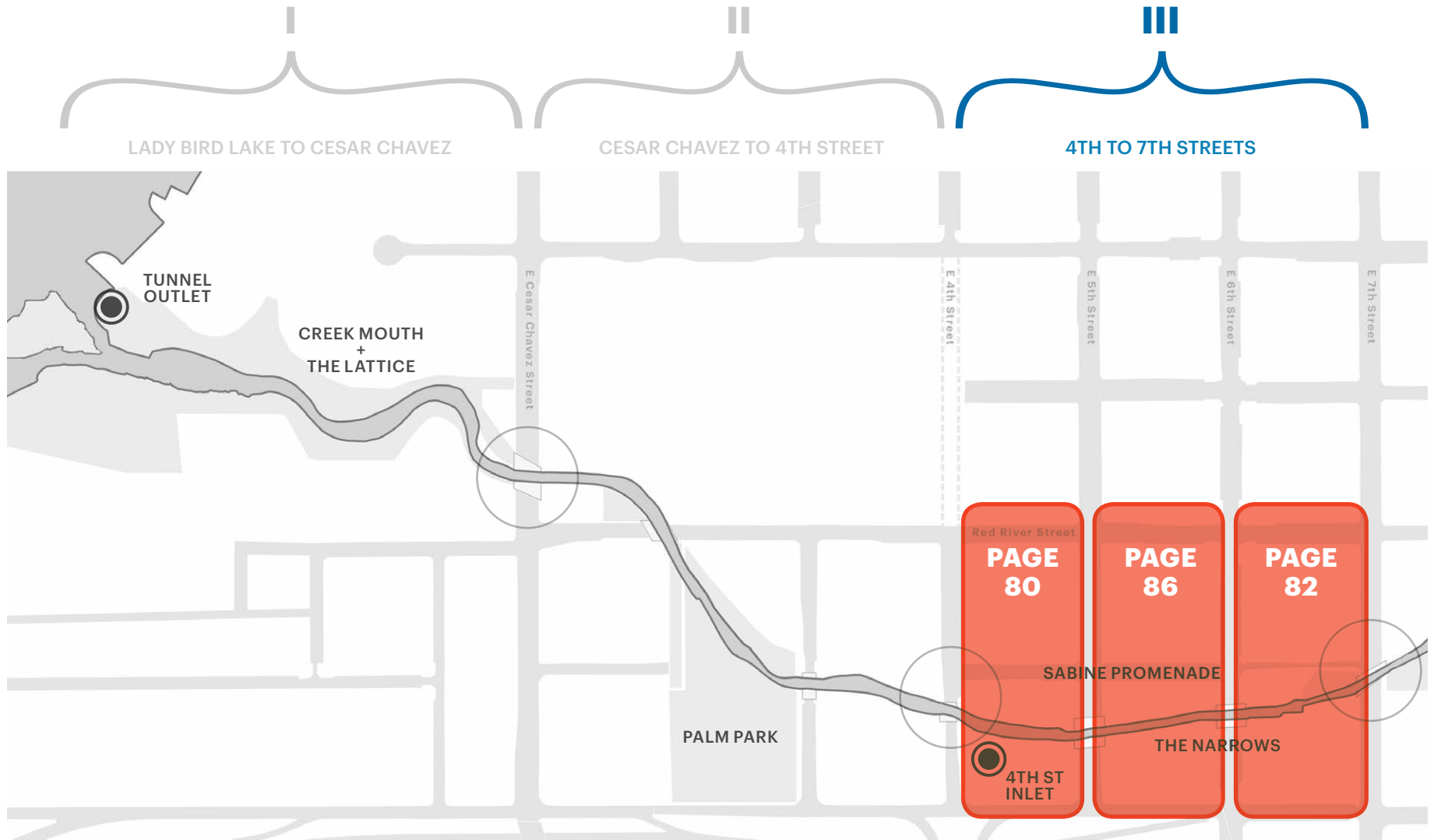
This segment of the creek channel, “The Narrows,” is bounded almost entirely by vertical building walls, and has the closest proximity to downtown Austin’s business and entertainment district.

The design of Segment III should be guided by the following objectives:

- Catalyze private sector redevelopment of creek facing property by creating continuous and welcoming north-south trail circulation and visual connections.
- Facilitate safe and intuitive pedestrian movement through this segment by providing multiple access points and routes for pedestrians and guiding bicycles to the Sabine Street Promenade.
- Improve accessibility by retrofitting/reconstructing strategic existing access points to comply with current national and Texas Accessibility standards.
- Celebrate the integration of the Waller Creek Tunnel’s 4th Street Inlet into the trail and open space system.

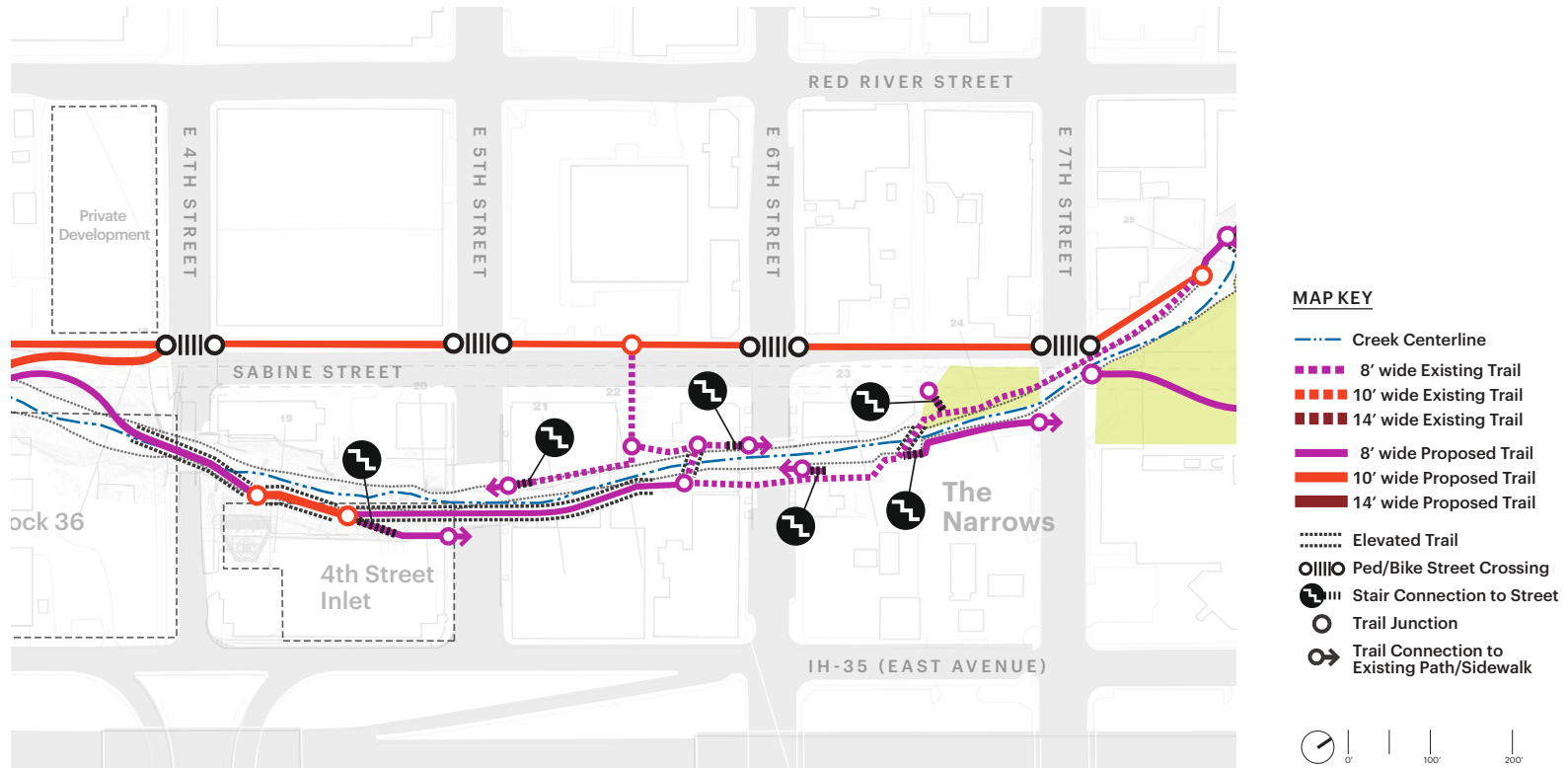


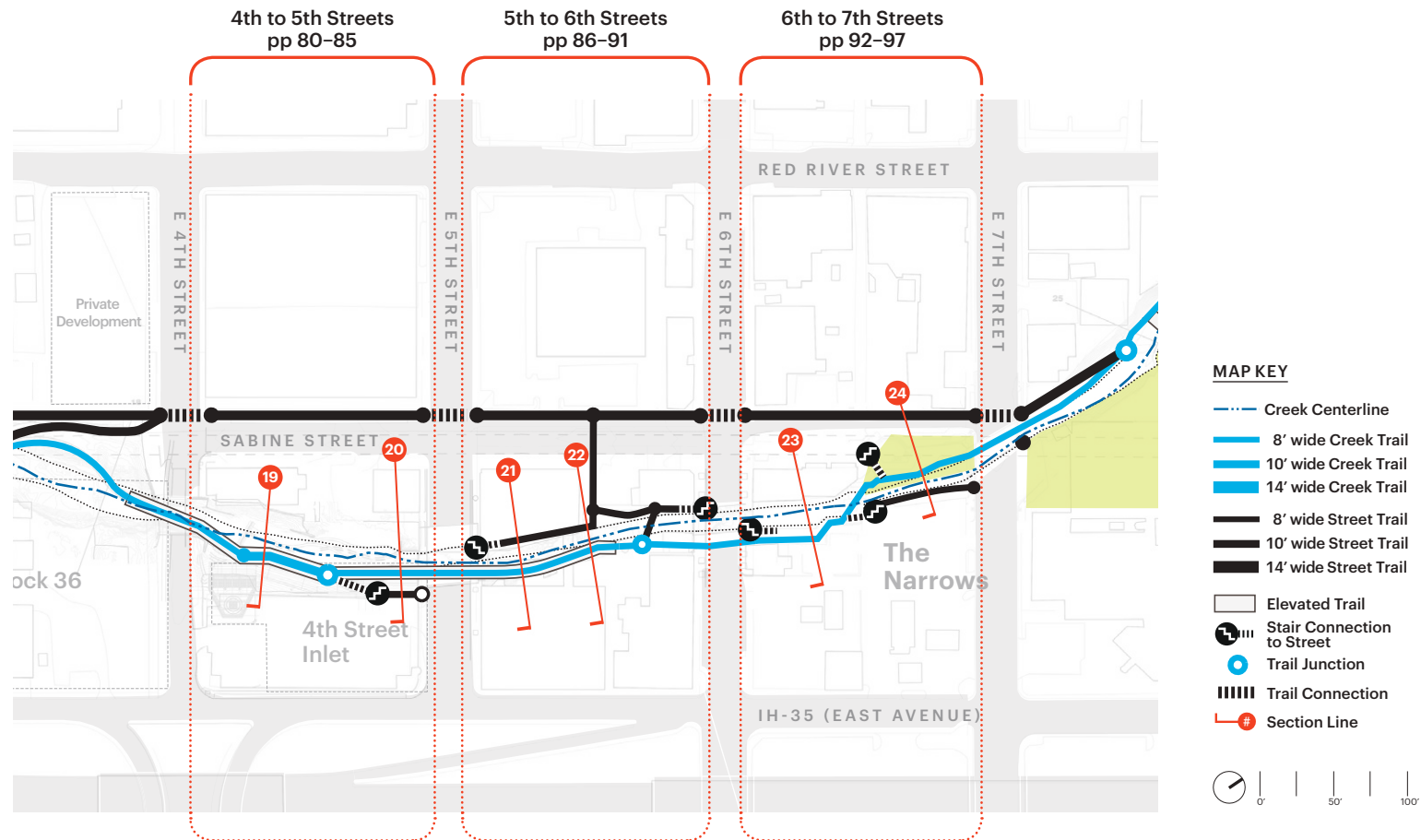
SEGMENT III: 4TH TO 7TH STREETS



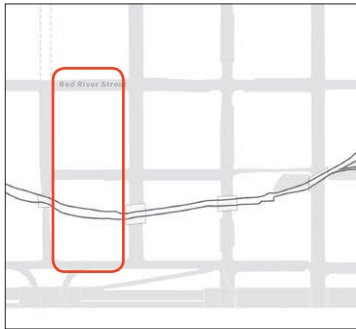


SEGMENT III: 4TH TO 7TH STREETS



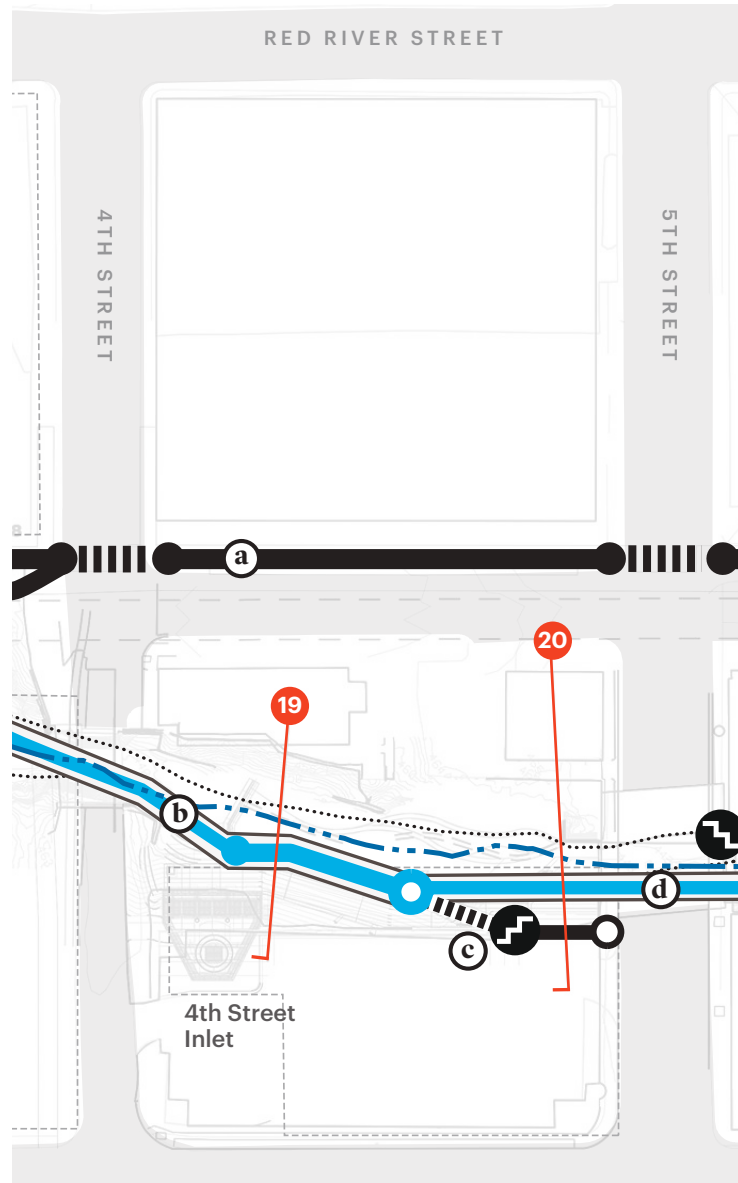


4TH TO 5TH STREETS



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. The extension of the Sabine Street Promenade between 4th and 5th Streets will be the primary north-south bicycle connection in the Narrows. Programmed as a 'festival street,' it will also be an attractor for pedestrian activity.
- b. An elevated creekside trail connection crosses from the west to the east bank, connecting to a trail on top of the 4th Street Inlet Facility. The vehicular lane of the 4th Street Bridge above is to be reconstructed for Capitol Metro expansion.
- c. A stair connection from the creekside trail meets a street-level trailhead at 5th Street. A stormwater manhole for a line entering the 4th Street Inlet will be located on this portion of the trail.
- d. An elevated creekside trail passes beneath the 5th Street Bridge. Vertical clearance under an existing wastewater line is a challenge — the trail elevation is governed by the water surface elevation created by the 4th Street Inlet.

HYDRAULICS & HYDROLOGY

- Waller Creek in this section is largely a pool that is controlled by the 4th Street Side Inlet and weir.
- The 4th Street Side Inlet diverts about 70% of the peak storm discharge to the tunnel, but only diverts about 25% to 40% of the total storm runoff volume. The leading and trailing tails of the hydrograph are not significantly altered by the inlet, but the peak discharges are significantly reduced.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River to 3rd Street on April 2, 2015.
- Overall assessed condition is FAIR. (Riparian Zone = POOR, Geomorphology = FAIR, Aquatic Habitat = FAIR)
- Improvements should increase the overall assessed condition to GOOD or EXCELLENT.
- Consider increasing the vegetation coverage within the riparian area and structural diversity of canopy and understory trees, using natural materials such as native vegetation and rock to provide a stable channel form, and providing floodplain connectivity to improve stream function.

RIPARIAN SLOPES

- The west bank is severely eroded. Lower slopes will be reconstructed as part of the 4th Street Inlet site reconstruction project. Upper slopes require

restoration and coordination with adjacent private property owners, as overbank runoff may be contributing to slope failure.

- The east bank will be completely reconstructed by the 4th Street Inlet structure.

AQUATIC HABITATS

- The 4th Street Inlet includes a stemwall backwater structure that creates a permanent pool at elevation 445.00.
- A fish run integrated into the downstream side of the backwater structure is intended to provide connectivity for fauna.
- The pool created by the inlet structure and associated weir will need a variety of in stream structures (such as boulder clusters) to enhance habitat, due to its large size and limited quality of existing habitat.
- Lunkers will provide aquatic habitat downstream of the new weir.

HERITAGE TREES & EXISTING VEGETATION

One existing heritage tree on this block is just upstream of the 4th Street Bridge, on the east bank. It is in poor condition.

UTILITIES

- Existing wastewater line runs beneath the 5th Street Bridge at an elevation of approximately 456.5. This creates a vertical clearance conflict with the trail.

- Manhole for re-routed stormwater line to be located in future trail connection to 5th Street.

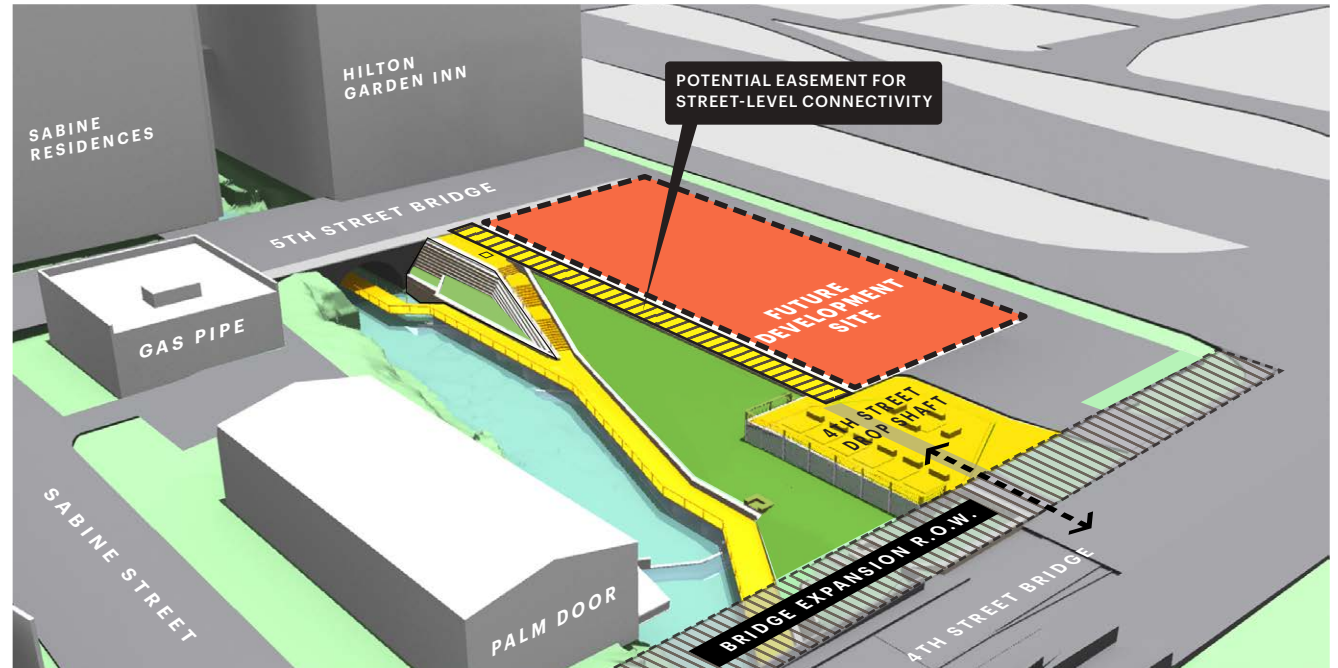
STORMWATER RETROFITS

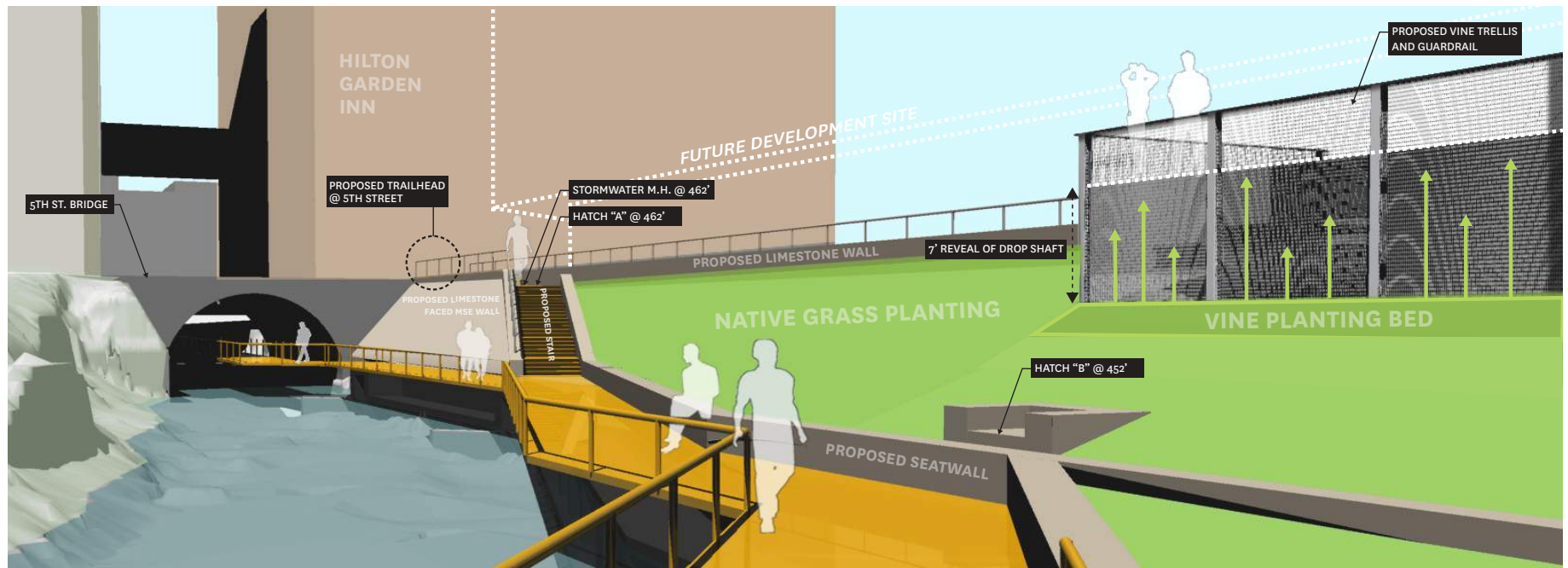
- On the east bank, there is one outfall (#61327) that will discharge directly into the 4th Street Side Inlet.
- #364912 is a 36" outfall which emerges on the west bank, just downstream of the 5th Street Bridge. It is best suited for sewershed treatment.
- #364899 emerges well above the trail on the west side of the 5th Street Bridge. It has high suitability for inline treatment if the device can be installed in the 5th Street ROW.

MAINTENANCE & OPERATIONS

- The debris removal facility for the 4th Street Inlet will be maintained by WPD, requiring truck access from 4th Street.
- Access hatches for 4th Street Inlet are integrated into the slope adjacent to the proposed trail.
- 5th Street Bridge, previously not maintained to anticipate pedestrian access underneath, has potential safety issues due to its old masonry structure.

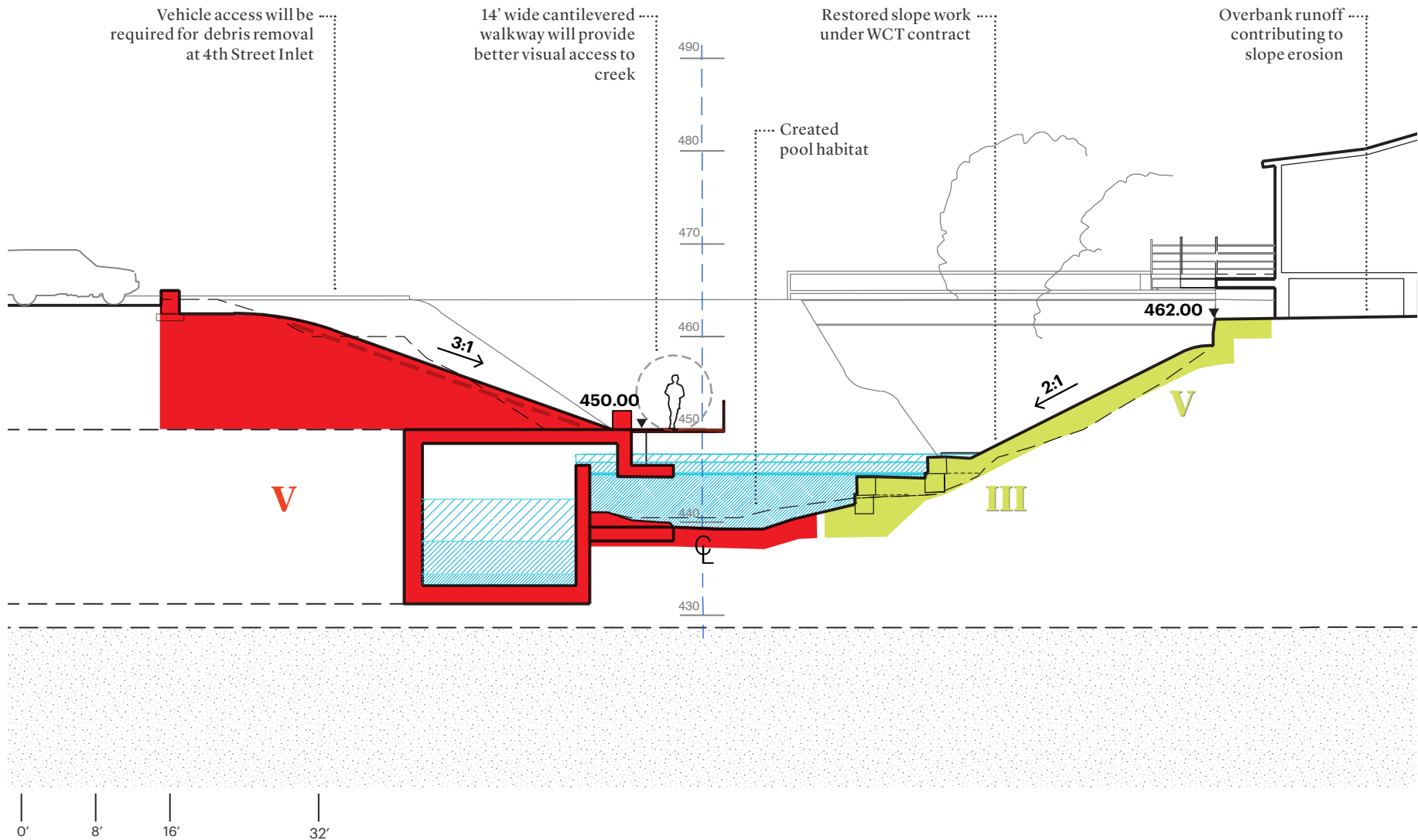
4TH TO 5TH STREETS

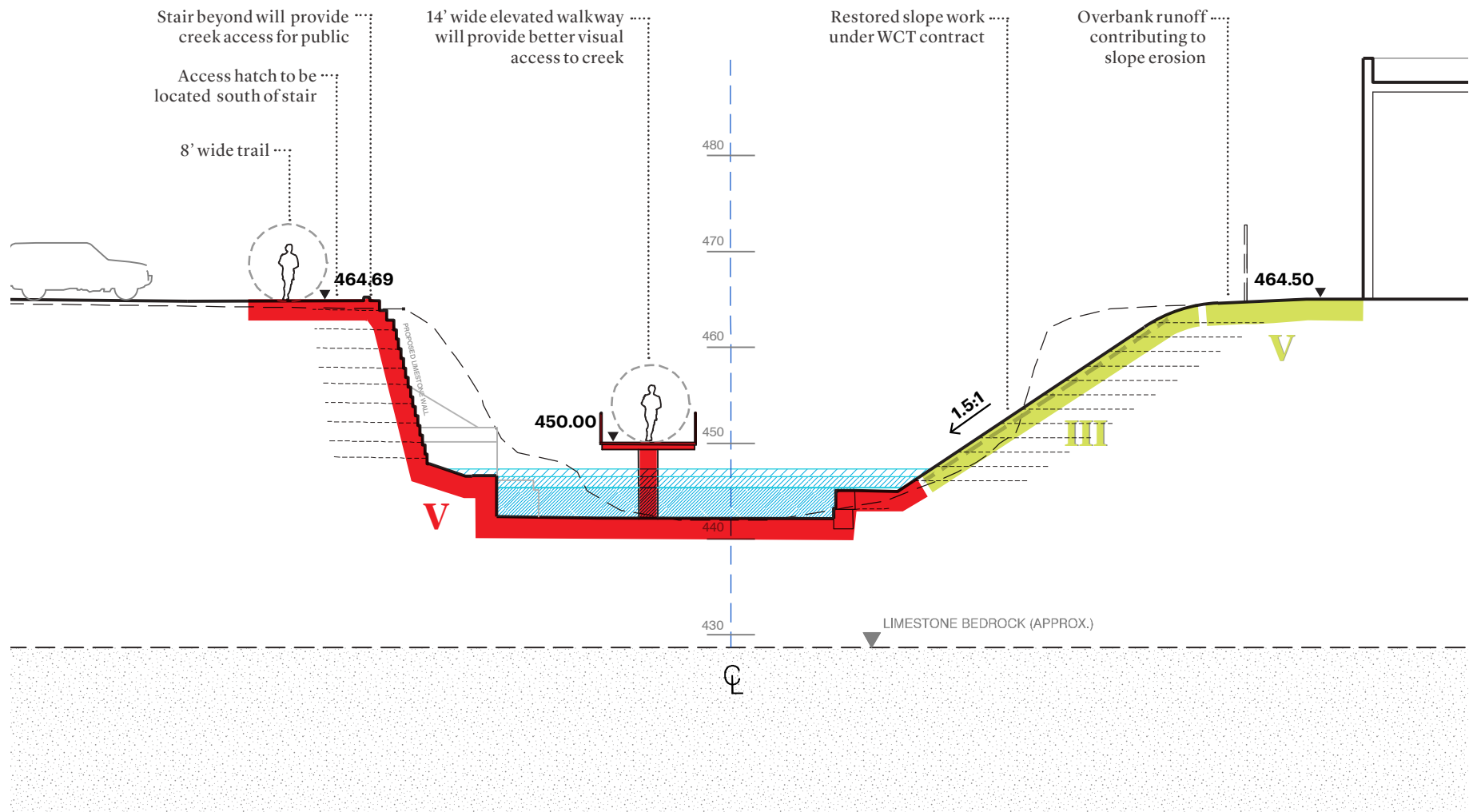




INTEGRATING TUNNEL INFRASTRUCTURE

During the development of the tunnel design and documentation, the 4th Street Inlet sponsored no public trail development in the surrounding area. Significant efforts have been devoted to modifying the tunnel contract to accommodate the future addition of a trailhead at 5th Street and a critical trail connection that would connect Palm Park to the northern creek-level trail system. This trail connection is conceived as a metal grating walkway so that the flood infrastructure beneath is revealed. The movement and sound of the creek waters entering the side-flow inlet would otherwise be imperceptible.

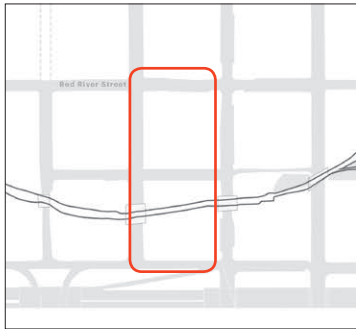




SECTION KEY

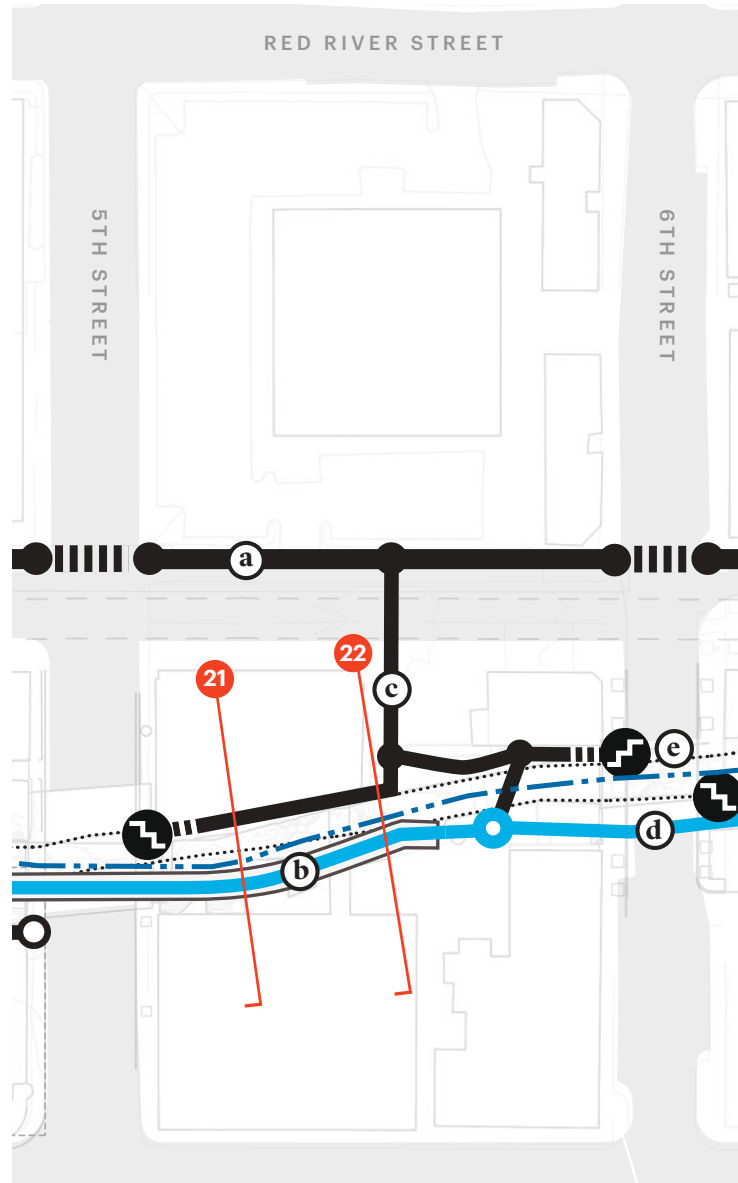
PROJECT TYPE	VEGETATION CLASS	GRADING	WATER SURFACE ELEVATION
Do Nothing	I Problem Species Removal/Reseed	Grade Transition	100-YR WSE
Preservation	II Removal/Reseed/Replant	Existing Grade	2-YR WSE
Restoration	III Rescue and Salvage Plant/Seed	Slope Reinforcement	5-11 CFS WSE
Reconstruction	IV Significant Removal/Reseed/Replant		
	V Complete Replacement		

5TH TO 6TH STREETS



MAP KEY

- Creek Centerline
- 8' wide Creek Trail
- 10' wide Creek Trail
- 14' wide Creek Trail
- 8' wide Street Trail
- 10' wide Street Trail
- 14' wide Street Trail
- Elevated Trail
- Stair Connection to Street
- Trail Junction
- Trail Connection
- Section Line



TRAIL ALIGNMENT

- a. The Sabine Street Promenade between 5th and 6th Streets will be the primary north-south bicycle connection in The Narrows. Programmed as a 'festival street,' it will also be an attractor for pedestrian activity.
- b. The existing east bank trail connects to street level, but has a number of stairs and is not ADA/TAS compliant. The proposed elevated trail passes beneath the 5th Street Bridge and connects to an intermediate terrace level at the Easy Tiger Patio. Further coordination with private property owners for trail alignment is needed.
- c. Existing trails are not ADA/TAS compliant, but provide an important connection via an alleyway to the Sabine Street Promenade.
- d. An existing passageway beneath the 6th Street Bridge is frequently locked and inaccessible to the public. Opening and improving this connection is critical to continuous north-south access without stairs or switchbacks.
- e. Street-level trail connection to 6th Street requires a mid-block crossing. Appropriate signalization to be coordinated with Transportation Department.

HYDRAULICS & HYDROLOGY

- The 5th Street weir crest is about 1.4 feet higher in elevation than the 4th Street weir. The baseflow depths upstream of the 5th Street weir range from 2–3 feet deep. In the absence of the 5th Street weir, the baseflow depths in this block would range from 0.5 to 1.5 feet deep.
- Because of the tunnel bypass, the creek water surface elevation will be considerably lower than the outfalls during storm events as compared to pre-tunnel conditions. Consequently, discharge from these stormwater outfalls will produce a plunging discharge (about 10 feet) to the creek surface, which could have implications for restoration design elements.

FUNCTIONAL ASSESSMENT

- Zone 3 Assessment performed along Waller Creek from Red River Street to 3rd Street on April 2, 2015.
- Overall assessed condition is FAIR. (Riparian Zone = POOR, Geomorphology = FAIR, Aquatic Habitat = FAIR)
- Opportunities to improve stream function are limited. With this in mind, any proposed change should consider improving the overall assessed condition, focusing primarily to modifications along the channel bottom.

RIPARIAN SLOPES

- The creek is channelized in this block, with vertical retaining walls and building faces forming the banks.
- The immediate adjacency of existing buildings

does not allow for restoring naturalized slopes; bank reconstruction will need to integrate adjacent structures.

- To compensate for limited opportunities for riparian restoration, planting on vertical surfaces (green walls or planters) and alternative shading should be encouraged.

AQUATIC HABITATS

- The channel bed in this reach is a mix of exposed bedrock and concrete.
- The highly constrained channel (formed by buildings) and the abundance of bedrock limit feasibility of habitat improvements; the placement of in-channel habitat features should be done opportunistically and wherever possible to increase quality and quantity of in-stream cover.
- Constructed in-channel habitat units that would be appropriate to this highly modified channel could include: alluvial bars, boulder clusters, and large woody debris.

HERITAGE TREES AND EXISTING VEGETATION

- There are four existing heritage trees on this block, all of which are in fair condition.
- Three heritage trees are integrated into existing hardscaped terraces; reconfiguration of these areas should have site-specific tree protection plans.
- A number of trees in good condition of heritage-class species are planted along 6th Street.

UTILITIES

- An aerial power line crosses the creek from the alley at Sabine Street and has high potential for burial or reconfiguration.

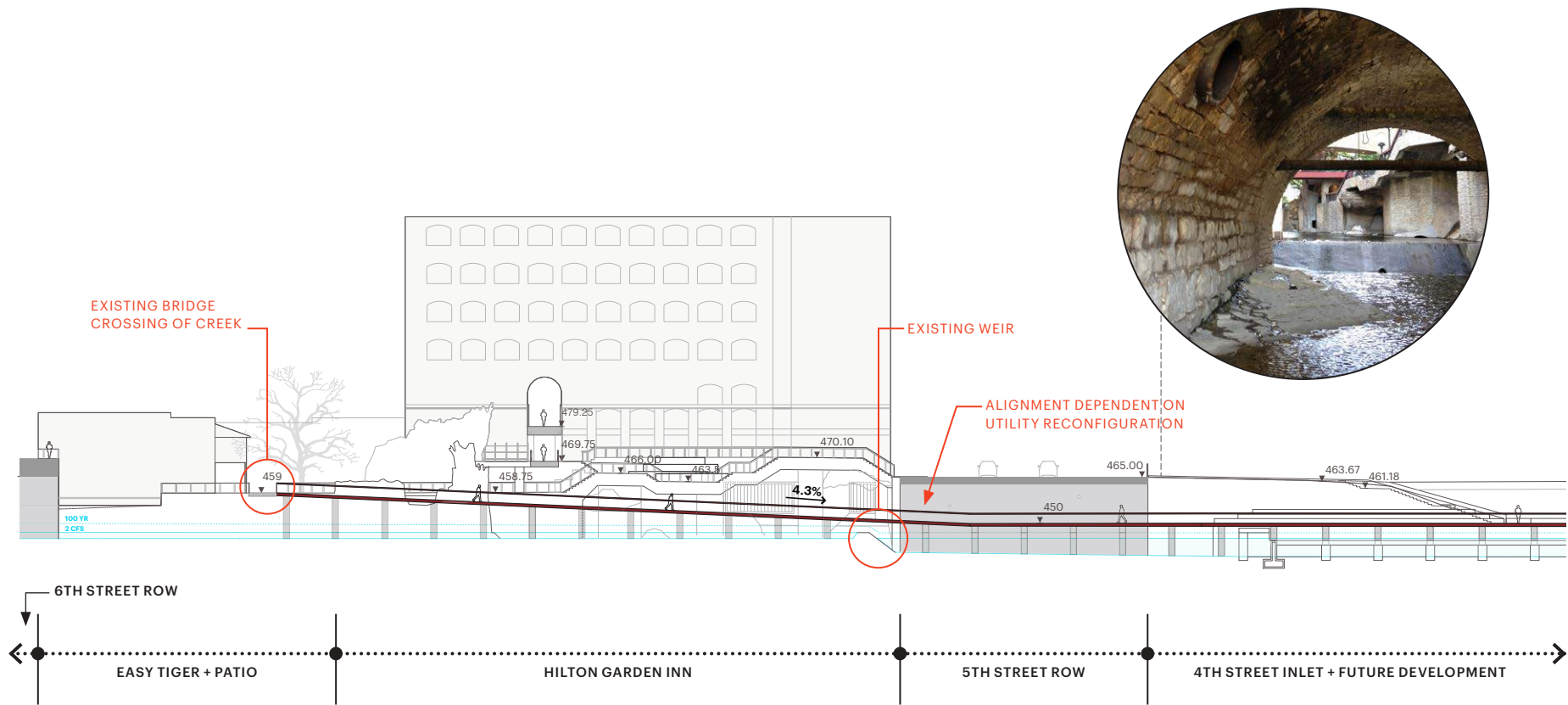
STORMWATER RETROFITS

- One outfall (#220629) is recommended for in-line treatment. This outfall enters the creek from the west bank at the existing alley, and there is both available area and access within the right-of-way.
- Other outfalls (#225185, 225169, 225194, 226993) either convey too much or too little water for inline treatment or they daylight beneath existing buildings and lack available area for retrofits.

MAINTENANCE & OPERATIONS

- High, vertical banks present a challenge to maintenance access to the channel.
- This block is expected to require a higher level of trash removal due to its proximity to the heavily used 6th Street commercial/entertainment corridor, as well as one of the few areas on the creek where there is programmed commercial space.

5TH TO 6TH STREETS





Millenium Walkway at New Mills, England

THREADING THE NEEDLE

There are two approaches to how trail continuity and accessibility might be achieved in this reach: as a composite of private landowner improvements coordinating the development of new patio spaces and circulation along the creek; or threading a single pedestrian walkway from the 4th Street Inlet to the terrace at Easy Tiger just south of 6th Street. The 'threading the needle' approach is efficient in terms of building a clear connection, but it limits the potential programmatic and economic benefits of developing the adjacent basement spaces that are no longer in the flood plain.