BLUE PARK

SITE INTRODUCTION

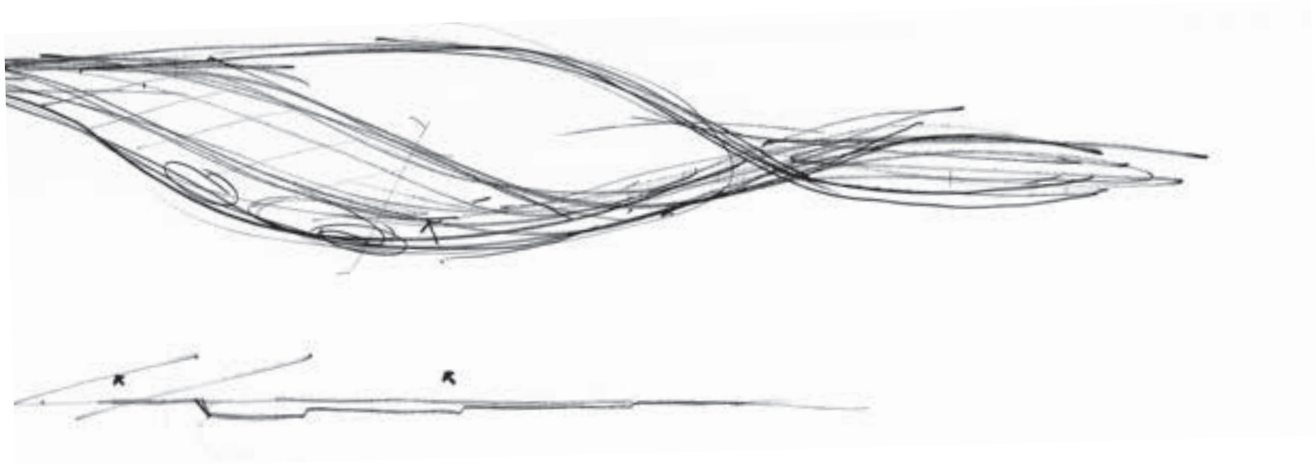
Despite the immense 115 acre footprint of the LA River and Rio Hondo channels within the project site, residents and stakeholders have generally had little access into the channel and are generally unfamiliar with its hydraulic functions as the channel was not built with intention for public access. The set of Blue Park channel modifications explored and proposed in this report target these opportunities for access and education through a low flow Braid Lab, sloped paths and terraces, and a new low flow crossing.

The Blue Park site is within the channel of the LA River south of the confluence with the Rio Hondo. The site extends south to the southern edge of Hollydale Regional Park. The 450 foot wide channel is a leveed concrete flood channel capable of conveying the 0.75% flood event (133 year event).

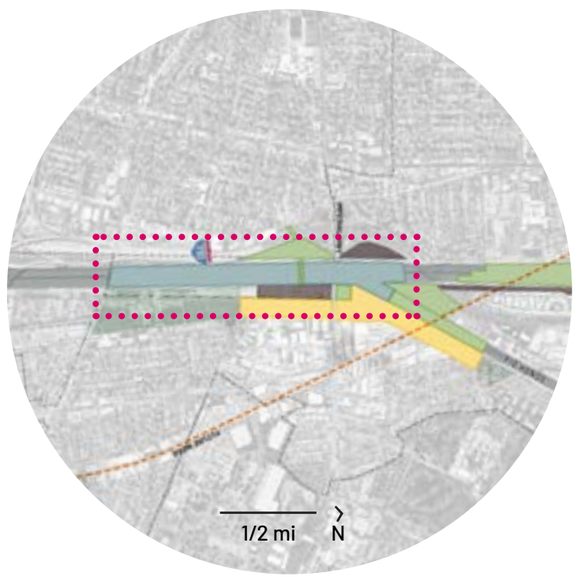
In the center of the channel is an approximately 40-foot-wide low flow channel that is depressed approximately 2.25 feet deep. The sides of the main channel are trapezoidal in shape and are made primarily of grouted stone with some smoother concrete areas. Currently the only access from the top of the levee into the channel is through a single maintenance access ramp just south of LACFCD Imperial Yard.

The top of the levee along most of the site is a bike path. South of the LACFCD Imperial Yard along the east bank, the levee elevation dips and the landside of the levee is armored, creating a spillway into Hollydale Regional Park for flows exceeding the channel capacity.

The series of interventions within the future Blue Park focus on increasing access to the LA River and Rio Hondo channels as well as program possibilities within the channel including unique outdoor education on flood risk management, sedimentation, ecology, and recreation. This set of channel features will finally leverage the infrastructure which can now provide an opportunity to unite communities and currently remains underutilized despite the multiple opportunities highlighted in previous and ongoing planning for the positive community impacts of the LA River and Rio Hondo within the SELA region.



KEY PLAN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IMPERIAL WETLANDS
PARQUE DOS RIOS
LA RIVER TRAIL
STAIRS
LOW FLOW DIVERSION TO IMPERIAL WETLANDS
BRAID LAB: LOW FLOW DIVERSION
WILDLIFE HABITAT
LA RIVER
EVENT SPACE
FLUME AND LOW FLOW CROSSING
IMPERIAL HIGHWAY
SELA BRIDGE PARK
EVENT SPACE
PARTIAL-TERRACES
LA RIVER TRAIL
TERRACES AND SEATING
FUTURE SELA CULTURAL CENTER
WATER EDUCATION CENTER
200'
N

PROJECTS

BLUE PARK

CHALLENGES

The future Blue Park is entirely within the LA River channel; therefore, changes to this site require detailed hydraulic and technical study to ensure flood conveyance capacity is not reduced by the improvements.

LA RIVER CHANNEL LOOKING NORTH AT CONFLUENCE

Source: OLIN

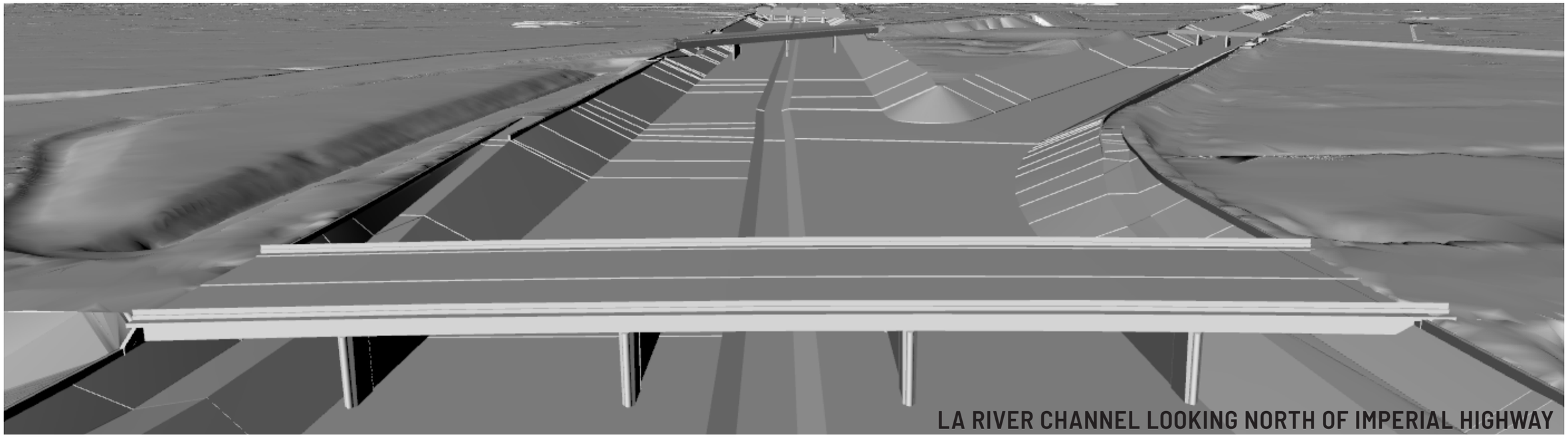
BLUE PARK

HYDRAULICS

The future Blue Park site has complex hydraulics due to the Rio Hondo inflow to the LA River and impingement on the Imperial Highway bridge deck at and above the design peak flood event. Detailed CFD modeling was necessary to evaluate hydraulic impacts of channel modifications in this region. Some basic design philosophies include:

- Maintaining the 'point' between the LA River and Rio Hondo to enable the two flows to merge together as smoothly as possible and per recommended practice,
- Smoothing the channel walls by replacing grouted stone with concrete to improve hydraulic capacity and mitigate potential reductions in capacity due to other channel interventions,
- Avoiding adding features with abrupt changes that may interfere in the flow, particularly in supercritical or near-critical locations.

The following pages provide additional details, including results of Computational Fluid Dynamics (CFD) modeling, on the design of a range of low flow channel modifications and addition of ramps and terracing.



LA RIVER CHANNEL LOOKING NORTH OF IMPERIAL HIGHWAY

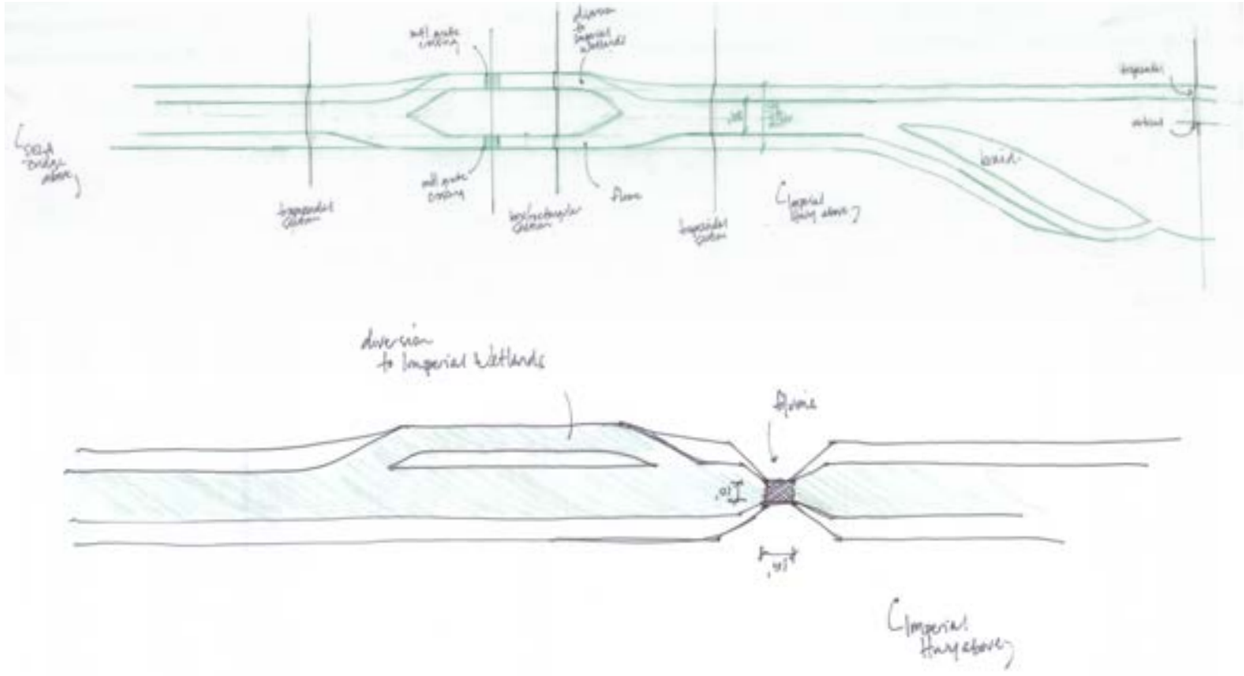
BLUE PARK

HYDRAULICS: LOW FLOW CROSSING

Hydraulic design of various configurations of the low flow crossing were evaluated using 1D HEC-RAS and considered the following:

- Keeping the low flow channel less than 30" deep to avoid requirement for a handrail,
- Contain dry weather flows without overtopping,
- Maintain existing channel grade and roughness.

A single channel configuration with a throat width of 10 feet was assessed in the CFD model for the design peak flood event as well as for a typical low flow condition of 100cfs.



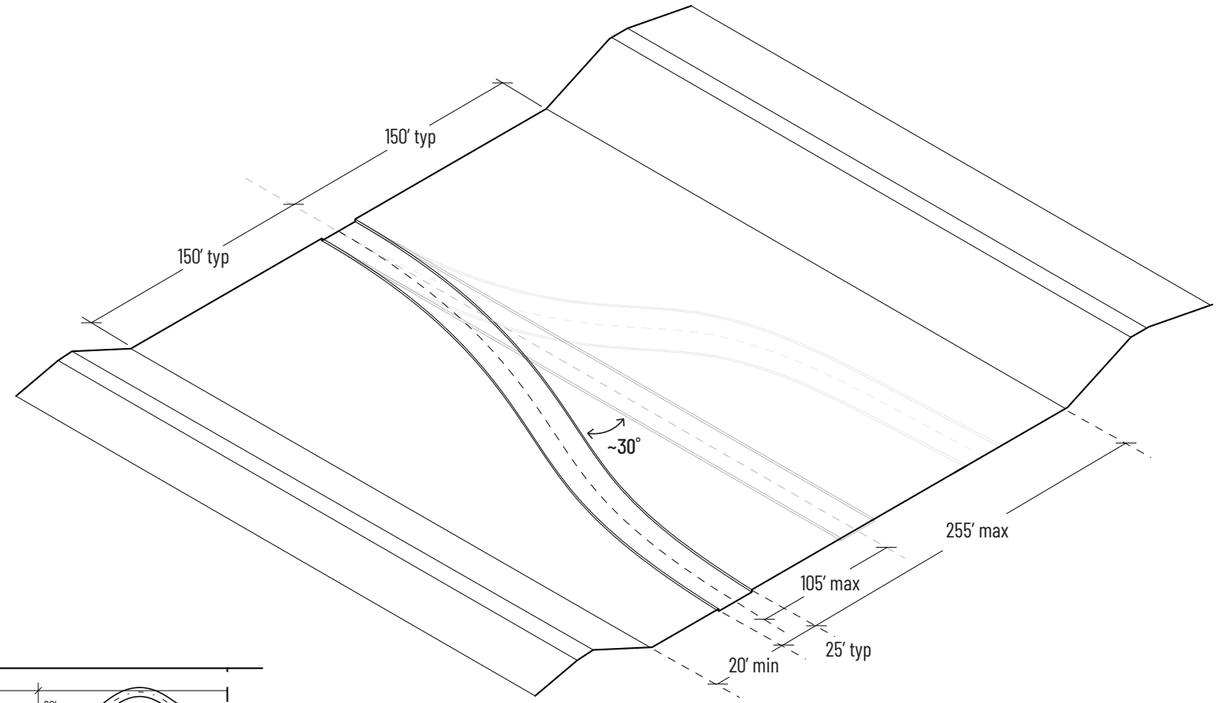
CONFIGURATION	DRY WEATHER LOW FLOW	THROAT WIDTH	OVERTOPPING?
Single Channel	120 cfs	10 feet	Barely
Single Channel	120 cfs	12 feet	No
Single Channel	100 cfs	10 feet	No
Twin Channels	100 cfs	10 feet	No
Twin Channels	120 cfs	6 feet	No

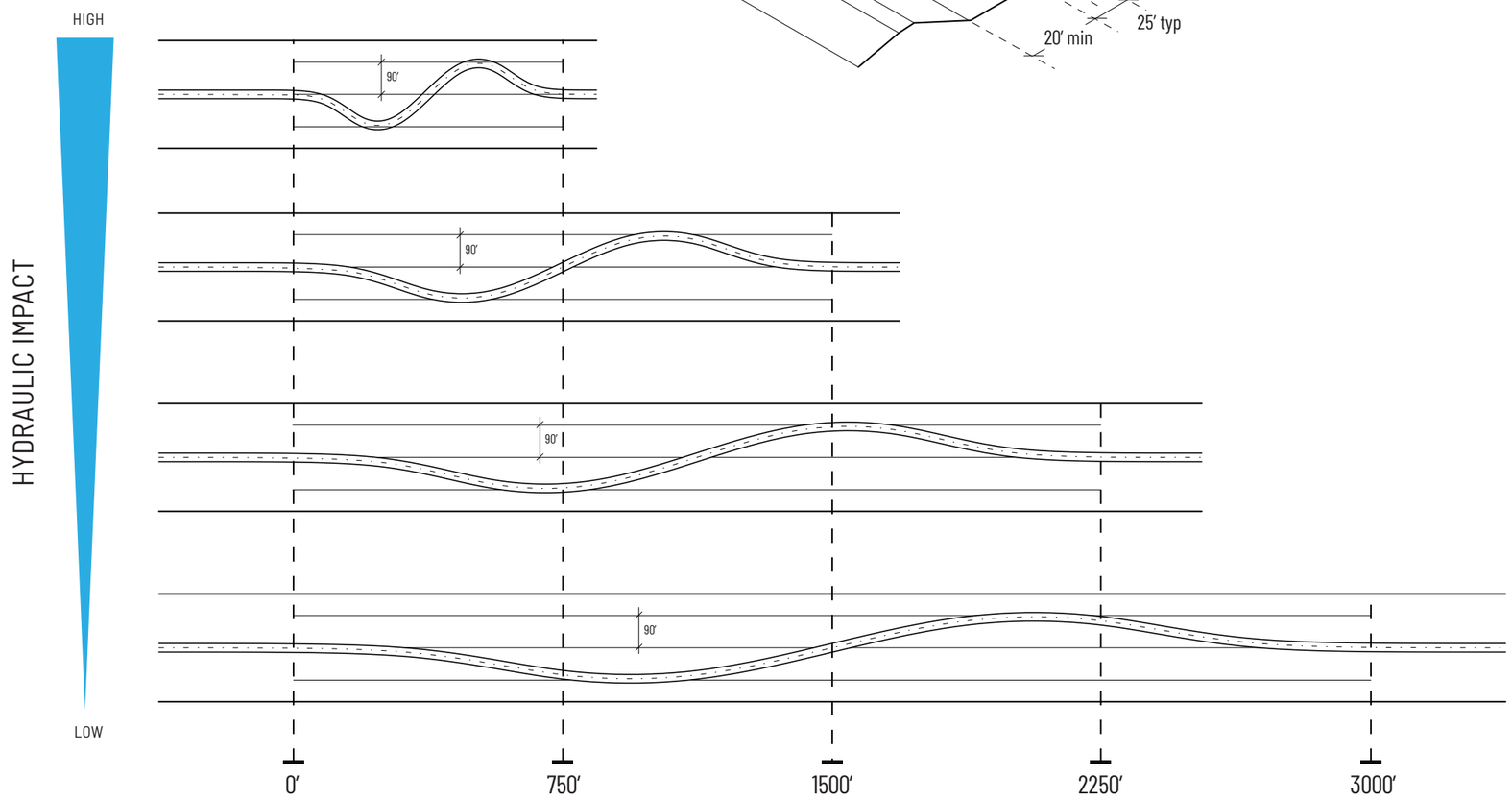
BLUE PARK

HYDRAULICS: LOW FLOW CHANNEL MEANDERS

Limiting the meander angle of the low flow channel to less than approximately 30 degrees (based on assessment of existing meanders around bridge piers) creates less of a hydraulic disruption. Steeper meanders are more likely to result in increased wave action at the design peak flood event.

These concepts were used to guide the design of the Braid Lab and the low flow channel shift to the western side of the river.





PROJECTS

BLUE PARK

HYDRAULICS: LOW FLOW MODIFICATIONS

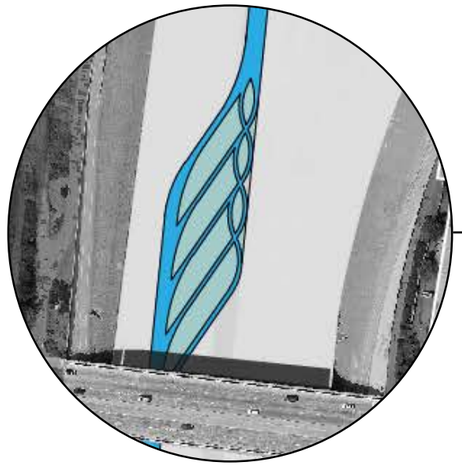
BRAID LAB

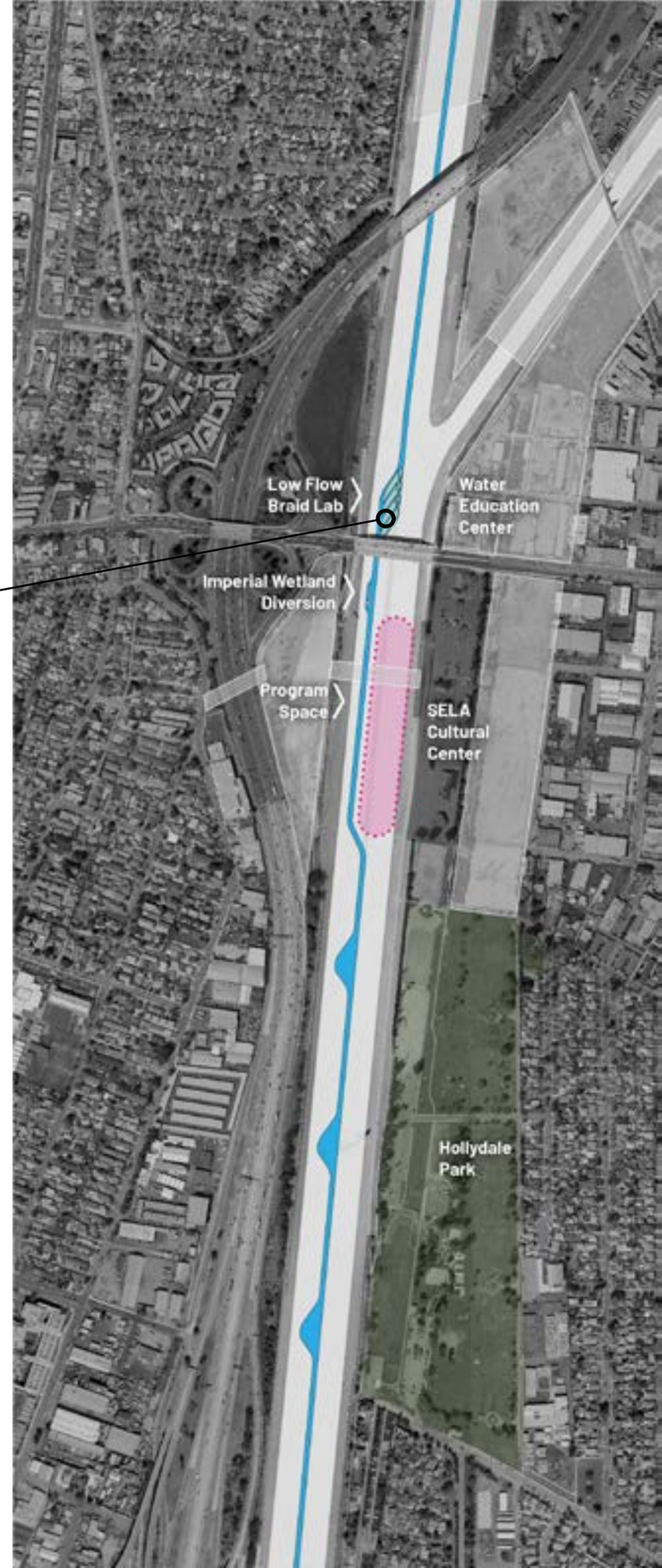
The Braid Lab, located at the intersection of flows from the LA River and the Rio Hondo, is visible from Imperial Highway, the future Confluence Point Park, adjacent levees, and the future Water Education Center. The braid divides the low flow channel into a series of channels of varying depths to show varied responses between hydraulics, sediment deposition, and ecology.

The Braid Lab hydraulic considerations included:

- Trapezoidal channels with relatively flat side slopes for reduced hydraulic resistance at design peak flood flows.
- Locating the braid in a subcritical region of the LA River.

The Braid Lab was assessed in the CFD model for the design peak flood event as well as for a typical low flow condition of 100 cfs.



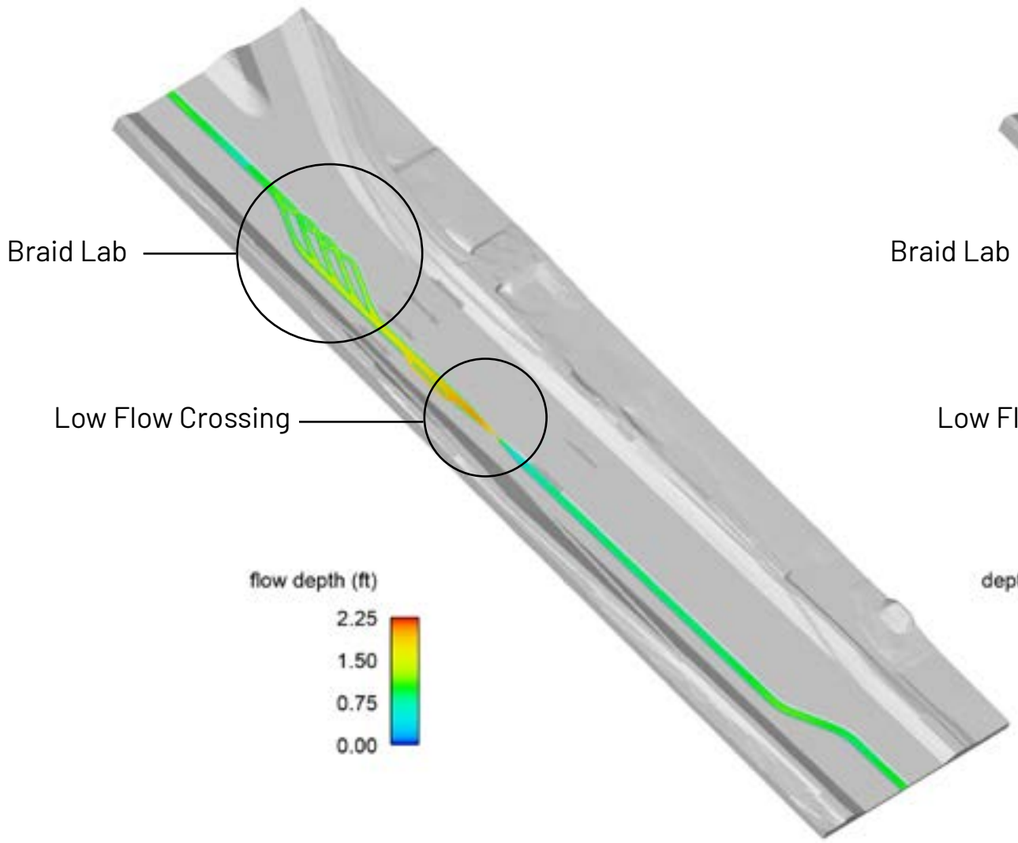


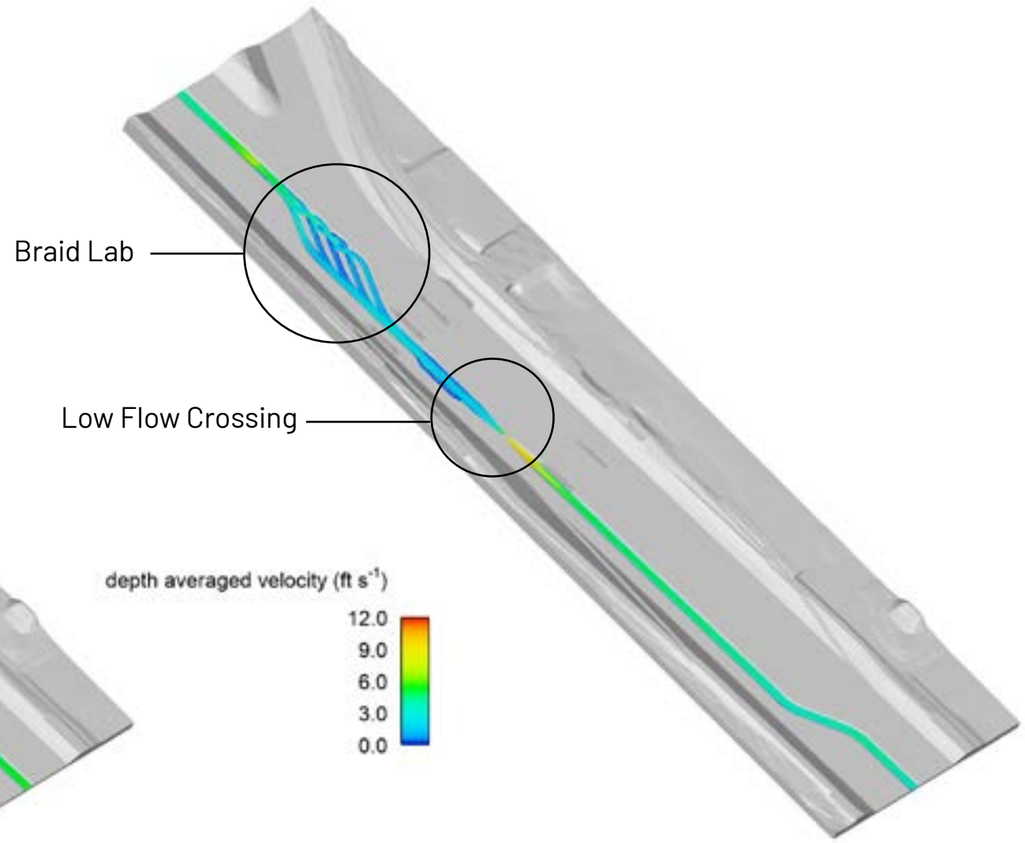
BLUE PARK

HYDRAULICS: LOW FLOW MODIFICATIONS RESULTS @ 100 CFS

BRAID LAB AND LOW FLOW CROSSING

The low flow crossing and flume hydraulics were evaluated using a 1D model since flows are contained within a simple geometrically confined low flow channel. The Braid Lab and Low Flow Crossing were then tested in the CFD model at the design peak flow rates to evaluate impacts to the design water surface elevation. Results indicated maximum depths of about 2 feet, which is contained in the low flow channel at a flow rate of 100 cfs.





BLUE PARK

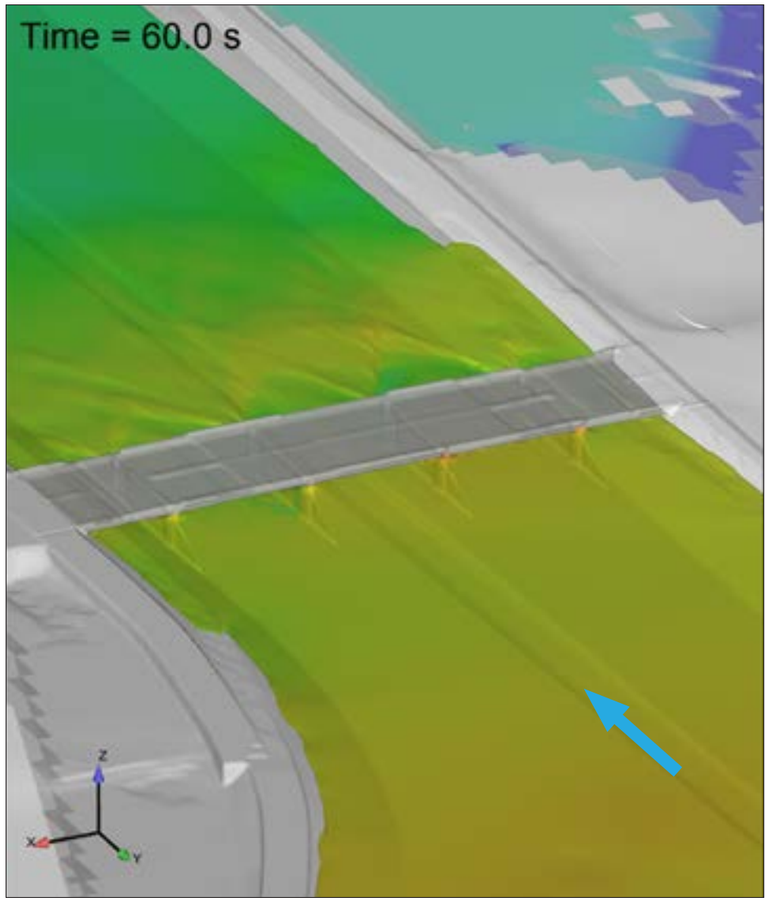
HYDRAULICS: LOW FLOW MODIFICATIONS

The Braid Lab and Low Flow Crossing were implemented into the CFD model.* Results indicated minimal impacts to the water surface elevation from these modifications to the low flow channel.

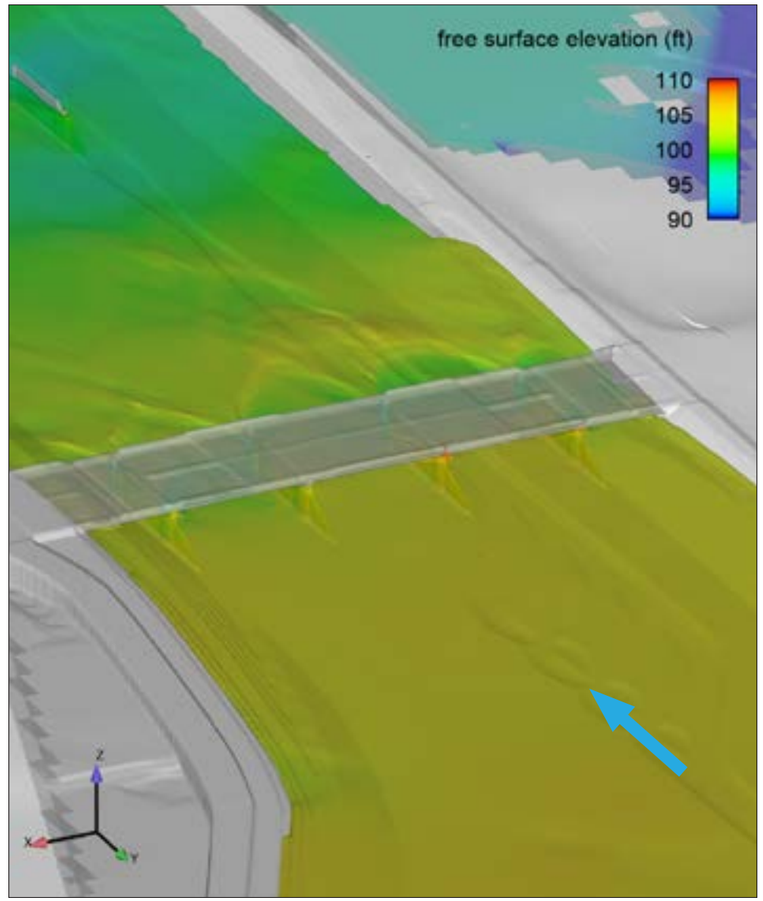
The impingement on the Imperial Highway bridge deck is generally to a similar degree as the baseline model. The impingement is not a steady-state process, and additional study and modeling will be required to fully evaluate in future phases.

Modeled free surface elevation for baseline (left) and Blue Park (right) for the RH design peak flow conditions (~0.2% event).

* The CFD model also included terracing and bridge piers for the SELA Bridge Park that are discussed shortly. Smoothing of the channel sides from grouted stone to concrete was also implemented in the model. Results are presented for the Rio Hondo peak flow, which was deemed the critical scenario for the designs considered here.



Baseline Model: Free Surface Elevation

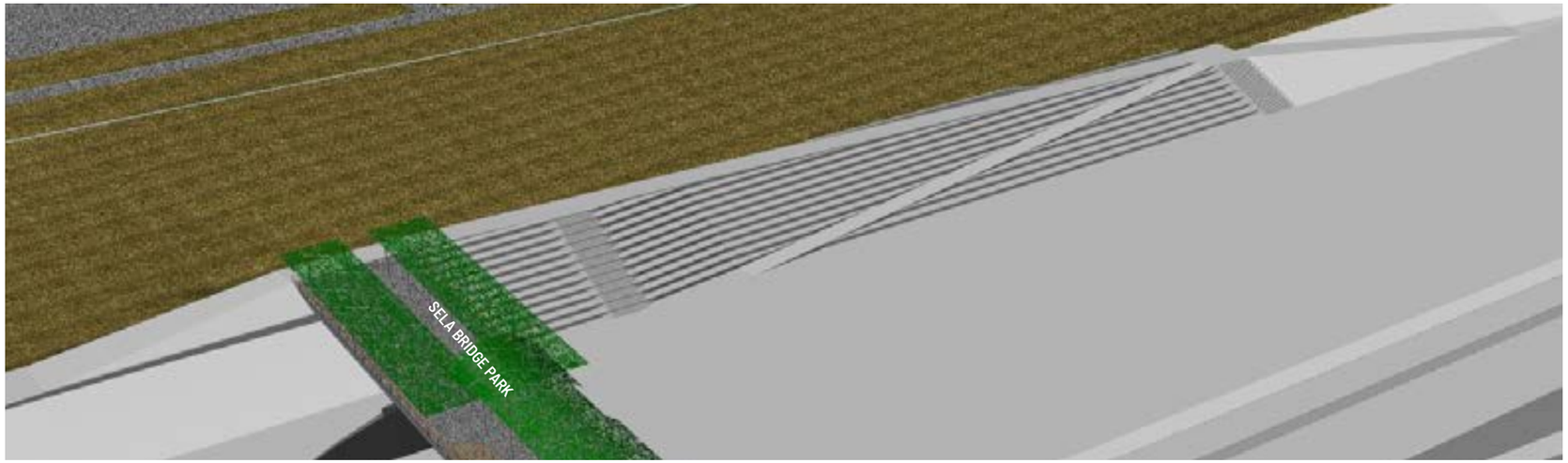


Braid Lab and Low Flow Crossing Model: Free Surface Elevation

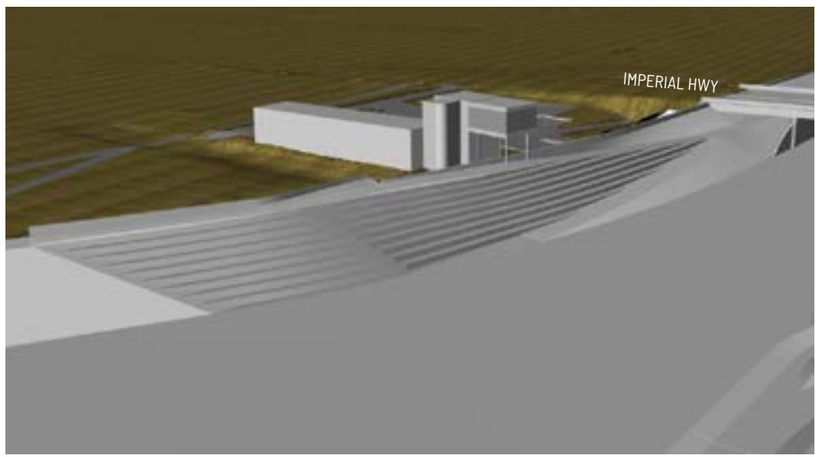
BLUE PARK

HYDRAULICS: TERRACES

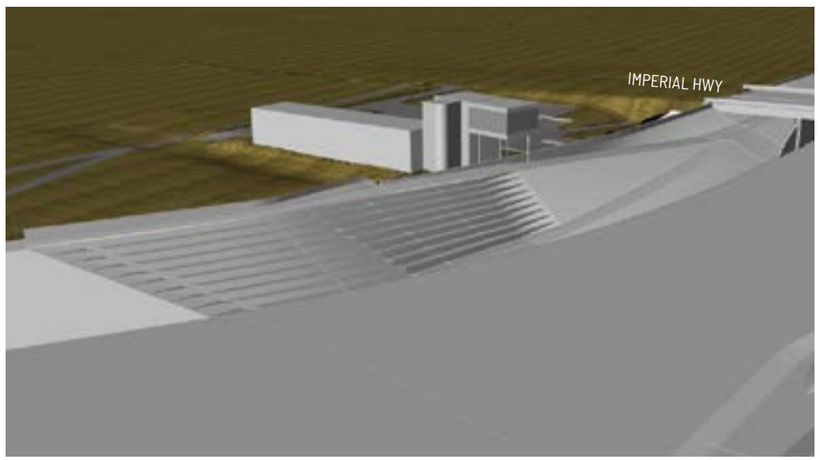
Several channel terracing configurations and locations were assessed for feasibility in the CFD model for the design peak flood event. The preliminary results indicated that the configurations shown here and in the “Blue Park Hydraulics” section of the Appendix caused increases in the design peak water surface elevation as compared to the baseline model that may not be able to be mitigated. Specifically, terraces with ramps facing upstream into the flow had the potential to increase impingement on the Imperial Highway bridge, and terraces and ramps downstream of the proposed SELA Bridge Park had the potential to increase flows over the overflow weir. Further detailed hydraulic analysis and refinement may enable terracing at these locations in the channel to be feasible.



Configuration 1: Channel terrace and ADA accessible sloped path at the SELA Cultural Center project site.



Configuration 2: Extended channel terrace and access path adjacent to the Water Education Center project site.



Configuration 3: Shortened channel terrace and access path adjacent to the Water Education Center project site.

BLUE PARK

HYDRAULICS: TERRACES

CFD model evaluations of preliminary terrace designs indicated benefits to positioning the terrace upstream of Imperial Highway on the east bank where the water velocity is lower due to the subcritical inflow from the Rio Hondo. A terrace and ramp geometry was developed with a long ramp facing downstream and terraces extending from the Rio Hondo to upstream of Imperial Highway bridge.

The CFD model indicated a slight increase in water surface elevation in the vicinity of the terrace, but still well within the channel and if necessary this could be mitigated by raising the walls slightly. The impingement on the Imperial Highway bridge deck is generally to a similar degree as the baseline model. The impingement is not a steady-state process and additional study and modeling will be required to fully evaluate in future phases.

Reconfigured extended channel terrace and access path adjacent to the future Water Education Center project site.

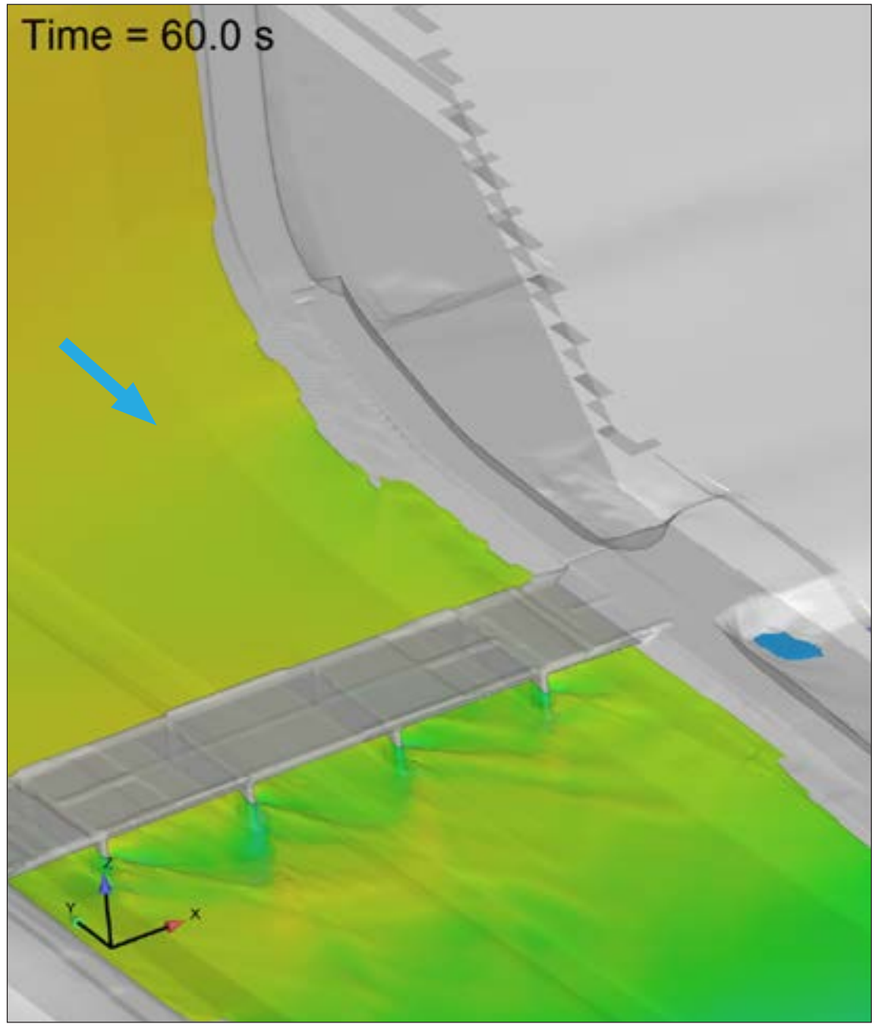
BLUE PARK

HYDRAULICS: TERRACES

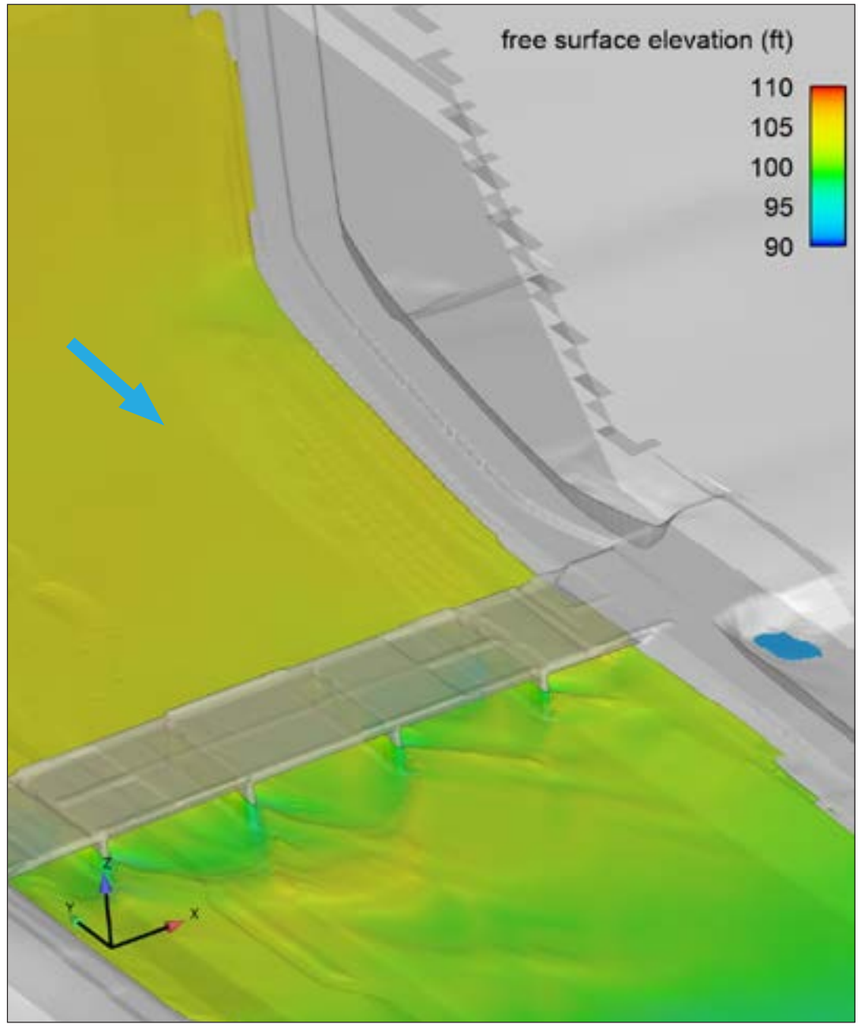
The terraces were implemented into the CFD model.* Results indicated a slight increase in water surface elevation adjacent to the terraces, but this could likely be mitigated by adding small parapet walls if necessary.

The impingement on the Imperial Highway bridge deck is generally to a similar degree as the baseline model. The impingement is not a steady-state process, and additional study and modeling will be required to fully evaluate in future phases.

*The CFD model also included low flow channel modifications and bridge piers for the SELA Bridge Park. Smoothing of the channel sides from grouted stone to concrete was also implemented in the model. Results are presented for the Rio Hondo peak flow, which was deemed the critical scenario for the designs considered here.



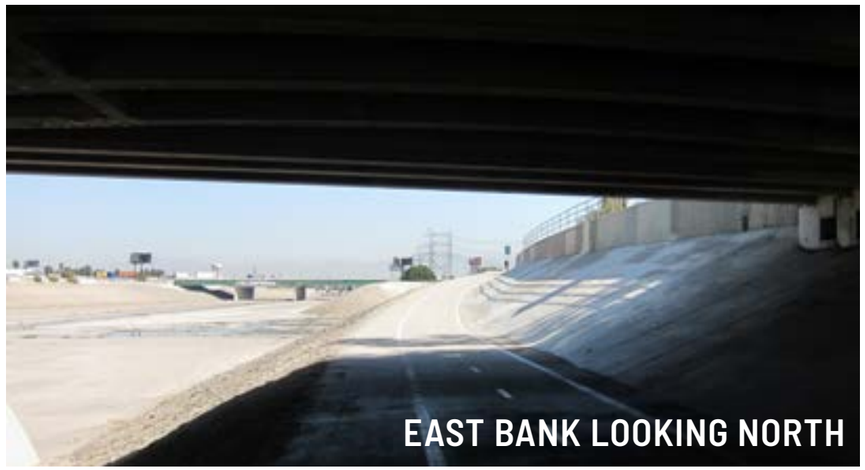
Baseline Model: Free Surface Elevation



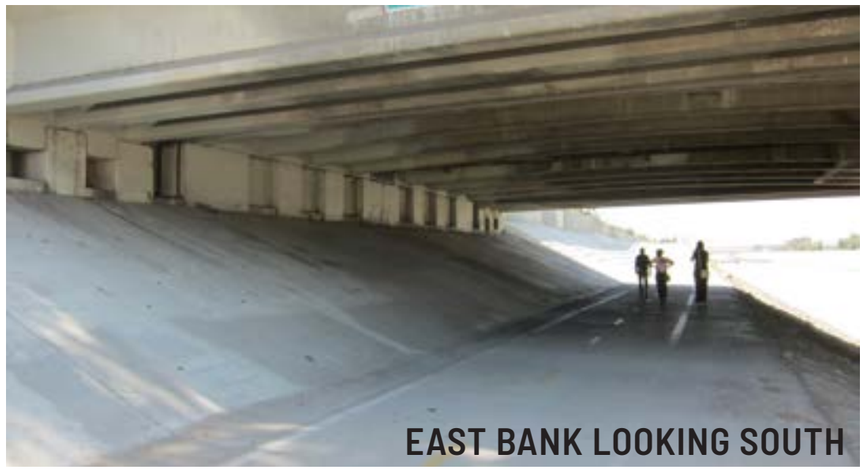
Terrace Model: Free Surface Elevation

BLUE PARK

HYDRAULICS: SLOPED PATHS ACCESSING THE LA RIVER CHANNEL



EAST BANK LOOKING NORTH



EAST BANK LOOKING SOUTH

LEGEND

- Top of Levee Path
- Existing ADA Accessible Sloped Path (slope <5%)
- Existing non-ADA Accessible Sloped Path (slope <5%)
- Existing Slope
- Existing Grade Break

EXISTING SLOPES

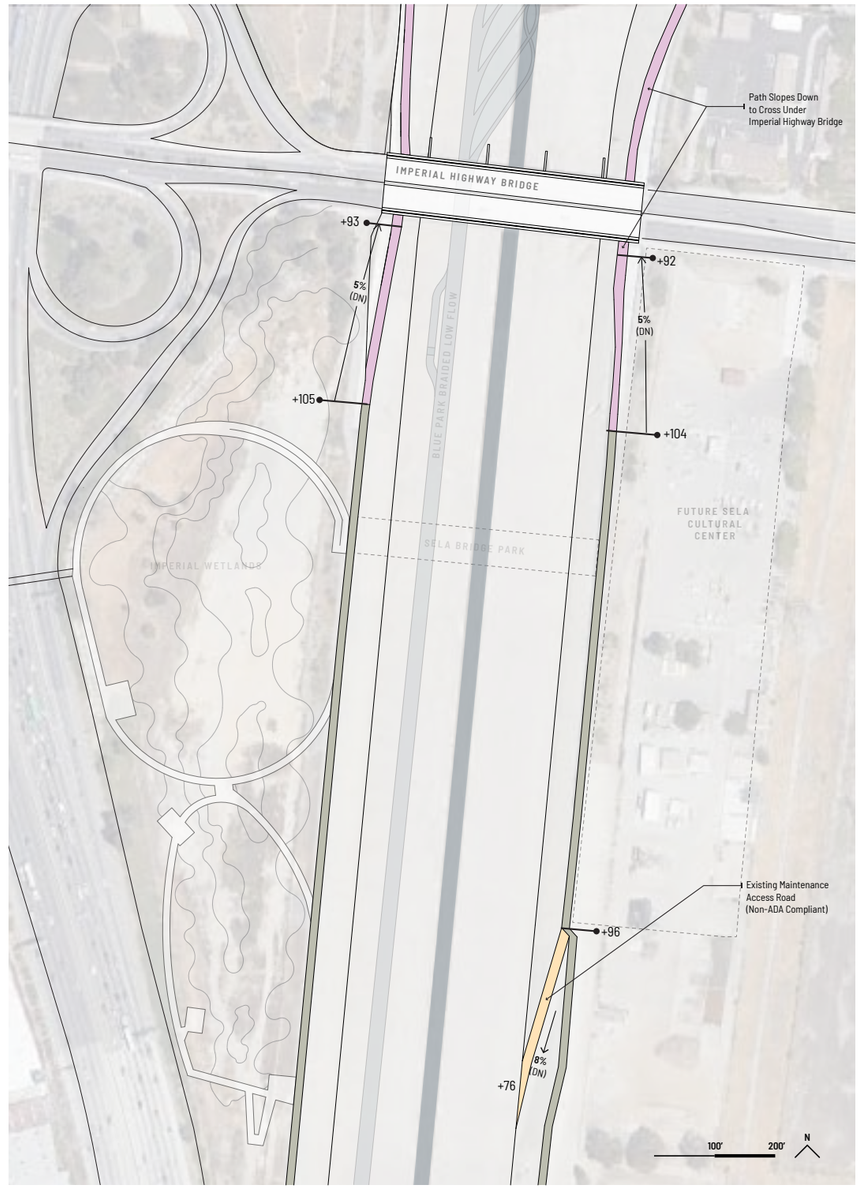


DIAGRAM NOTE: Sloped access ramps into the channel require additional and site-specific hydraulic analysis to minimize hydraulic impacts and ensure flood risk is not increased. Access ramps that slope down in the downstream direction are preferable, and create less of a hydraulic disturbance than access ramps sloping down in the upstream direction. A ramp on the West bank just downstream of the proposed SELA Bridge was evaluated in a preliminary CFD model and appeared to not greatly impact the water surface elevation. However, more refined CFD modeling is required to confirm this and in particular evaluate the potential for increased flow over the overflow weir.

Source: OLIN

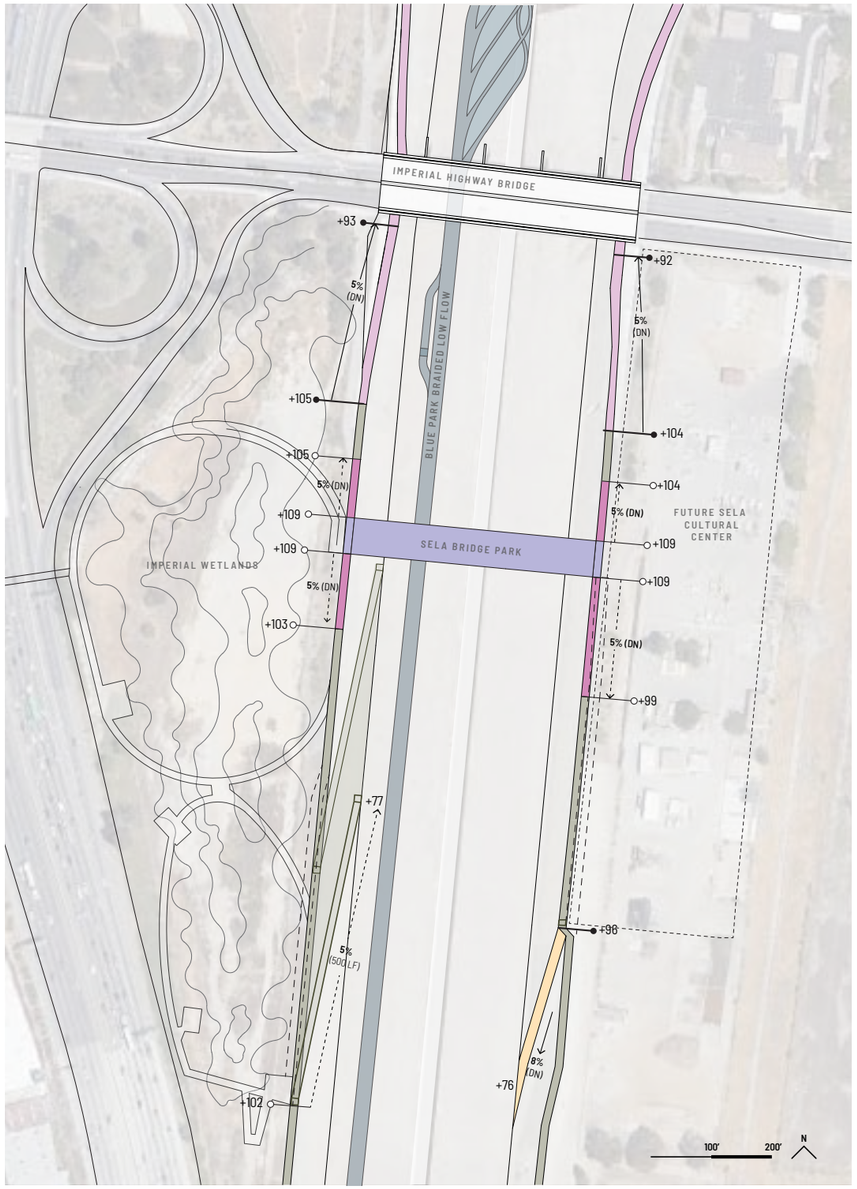
BLUE PARK

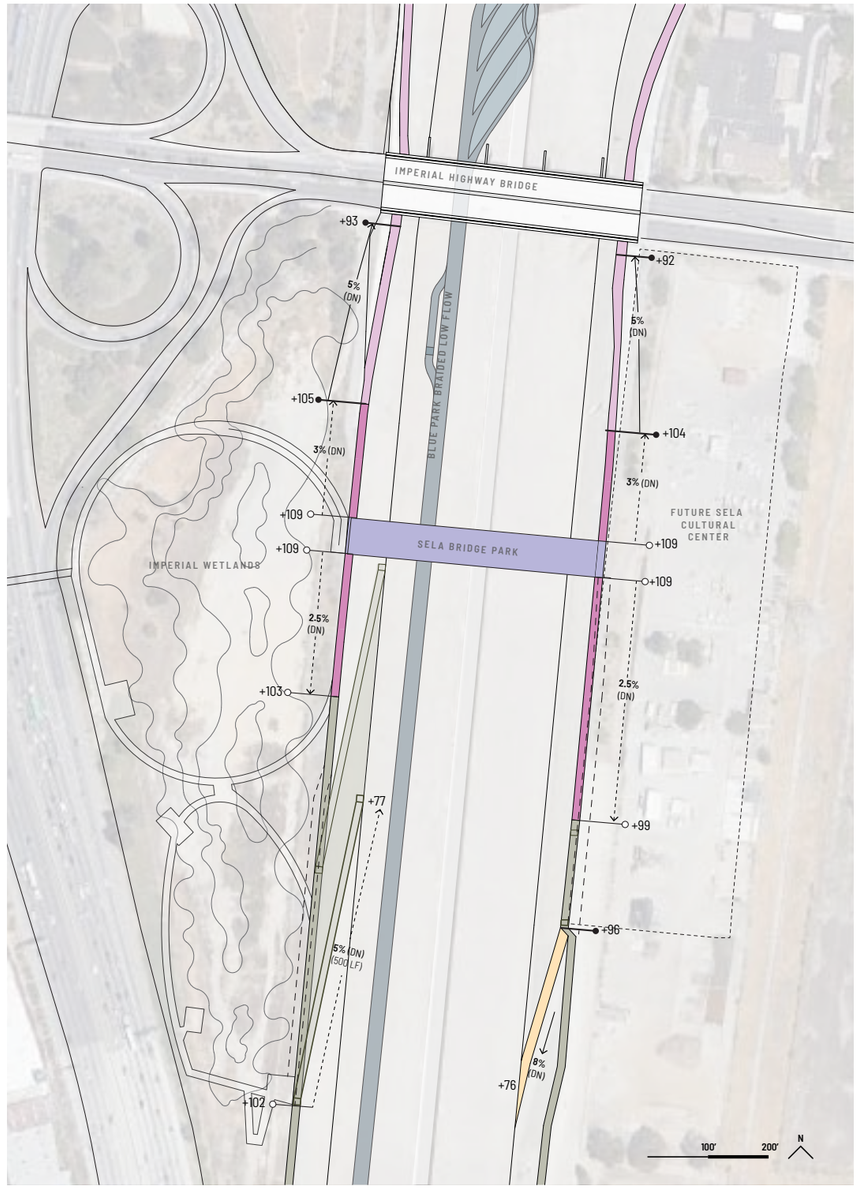
HYDRAULICS: SLOPED PATHS ACCESSING THE LA RIVER CHANNEL

LEGEND

- Top of Levee Path
- Existing ADA Accessible Sloped Path (slope <5%)
- Existing non-ADA Accessible Sloped Path (slope <5%)
- ADA Accessible Sloped Path (slope <5%)
- SELA Bridge Park
- ADA Sloping Path Zone
- ADA Sloping Path to Bottom of Channel
- Existing Slope
- Proposed Slope
- Proposed Path Offset
- Existing Grade Break
- Proposed Grade Break

MAXIMUM SLOPE STUDY





BLUE PARK

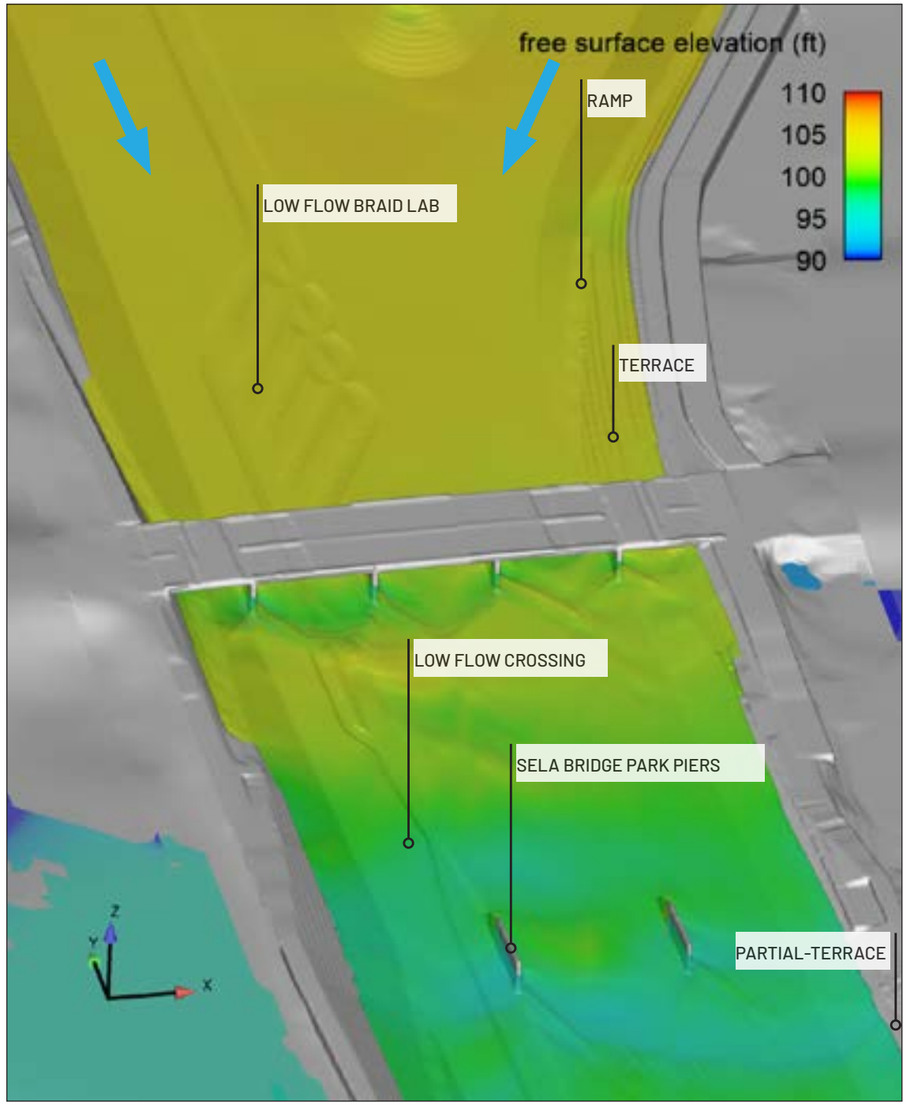
HYDRAULICS

KEY FINDINGS

Results indicate that the following elements are likely feasible:

- Low Flow Crossing
- Low Flow Braid Lab
- Partial-Terrace on east bank, at proposed SELA Bridge Park
- Full-Terrace on east bank, opposite the confluence
- Ramp on east bank, sloping in downstream direction
- Ramp on west bank, sloping in upstream direction
- SELA Bridge Park (discussed later)

The current results are based on a feasibility-level 3D hydraulic assessment. An emphasis was placed on minimizing impacts to the design water surface elevation. In some instances small localized walls may need to be added to mitigate slight increases in water surface elevation. Further detailed hydraulic analysis and refinement is required during future design phases as well as coordination with USACE.

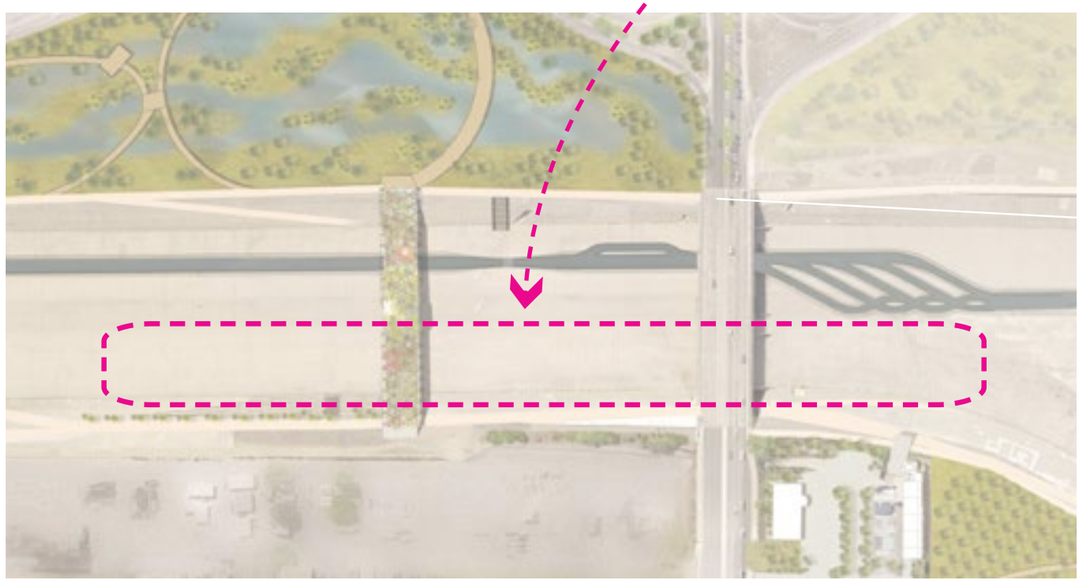


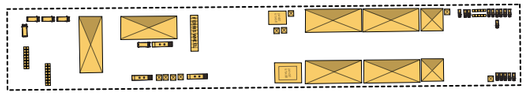
Composite Blue Park Model: Free Surface Elevation

BLUE PARK

PROGRAMMING: EVENTS AT THE LA RIVER

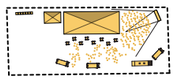
One of the main advantages to shifting the low flow channel is the ability to have a large summer festival and additional alternative event spaces like sporting events and movie nights. The area provides approximately 6-7 acres of program space.





SELA ARTS FESTIVAL (4-7 ACRES)

SPORTING EVENT (3-5 ACRES)



MOVIE NIGHT (1-3 ACRES)

NOTE: This document represents current sketches and diagrams only. Hydraulic testing and concept development is ongoing.

BLUE PARK

DESIGN

The design of the Blue Park involves a combination of channel modifications and access improvements to create new opportunities for connectivity and education.

The land-art scale braided low flow channel or "Braid Lab" just south of the confluence will reveal the dynamic interplay of the channel hydraulics, sediment deposition, and ecology in wet and dry weather events for visitors to the future Confluence Point Park and Water Education Center. From the varied vistas, overlooks, and platforms on both future sites, visitors and students can appreciate the graceful curves of the Braid Lab carving into the linear channel and activating the low flow to produce habitat as well as an artful water sculpture. Additionally, students from local schools with ongoing educational programming as well as students from across the region attending field trips can learn about the river and see the impact of the water they use in their communities when it enters previously hidden or unknowable infrastructure systems like the LA River.

Modifications to the levee near the SELA Cultural Center site connect the proposed esplanade of the Cultural Center to the levee through terraces along the LA River trail above, wide program sized plinths, and overlooks. Terracing and planting off the LA River Trail south of the future SELA Cultural Bridge will provide shade along the SELA Cultural Center for visitors along the trail.

Modifications north of the Imperial Highway bridge on the east bank of the LA River and Rio Hondo channels include a series of ADA accessible ramps and terraces providing expansive views of the braided low flow channel, confluence, and proposed Confluence Point Park. These ramps allow access into the river for potential programs within the channel including arts festivals and sporting events and will also further connect adjacent communities on the east and west banks of the levee through the future low flow crossing that is just south of the confluence.

The low flow crossing will act as a small pedestrian bridge over the low flow channel and can be accessed through the new ADA accessible ramps along both banks of the levee. These connectivity and access improvements will not only provide greater access to river for pedestrians and maintenance, but also to existing and new parks and cultural sites in the Rio Hondo Confluence Area such as Hollydale Regional Park, the future SELA Cultural Center, and many of the future parks and cultural sites associated the other future RHCAP projects. Smaller interventions like the low flow crossing in addition to the future SELA Bridge Park and Lynwood Connector will have a large impact on increasing the equity of access to the multi-benefits of each RHCAP project and existing resources in the SELA region for all of its residents and stakeholders.

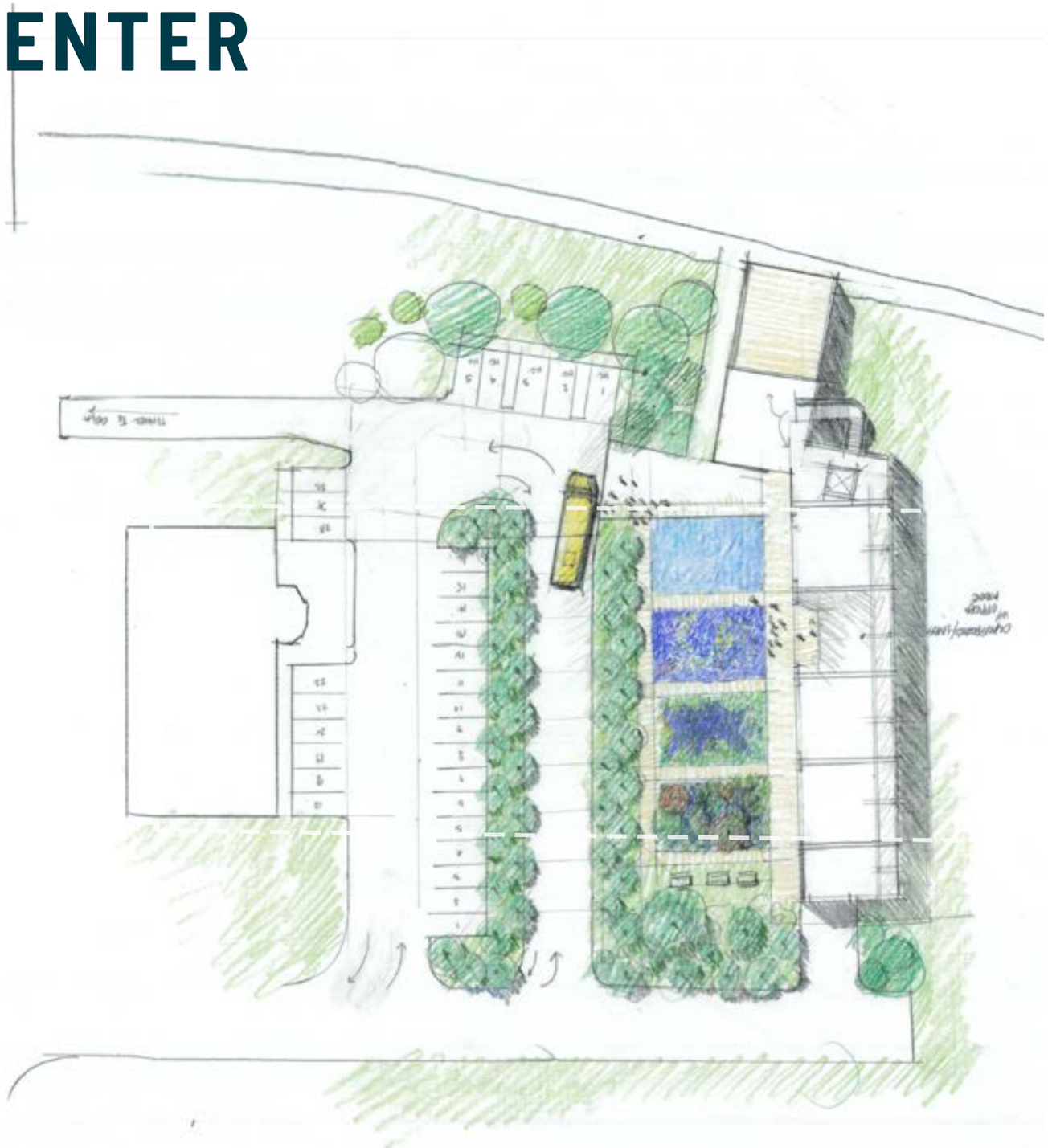

SELA BRIDGE PARK
IMPERIAL WETLAND
LYNWOOD CONNECTOR
LOW FLOW BRAID LAB
CONFLUENCE POINT PARK

WATER EDUCATION CENTER

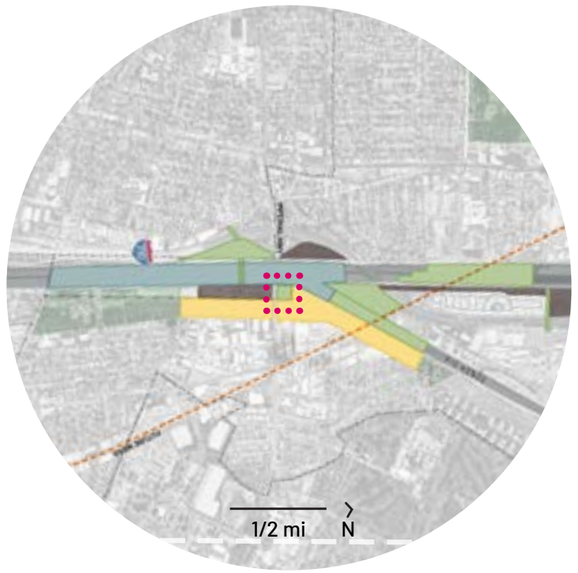
SITE INTRODUCTION

The mission of the LACFCD involves water conservation and flood risk reduction. In an effort to expand public awareness of the LACFCD's mission and provide education on flood control infrastructure and water resource management, the proposed Water Education Center would be built and operated alongside of the LACFCD's offices north of Imperial Highway. Education about these critical topics is essential as integrated water resource management will be increasingly important for future generations. The Water Education Center provides space for learning related to these topics and includes classrooms, a water museum, and a field lab. Youth from local schools and community members will visit the center to learn about water quality, flood risk reduction, and water conservation.

During a trip to the Water Education Center, students and visitors can explore the broader Water Education Story Loop connected by the LA River Trails. Following their visit to the center, they begin the loop by visiting the adjacent Blue Park's braided channel to see how water moves through channels firsthand. They then walk through the Imperial Wetlands to view a diverse ecological landscape and witness a natural water filtration system. Students cross the SELA Bridge Park to view the LA River and learn about its flood risk on the deck's pavilion exhibits. Before returning to the Water Education Center and jumping on a school bus home, students can grab a snack and rest at the cafe in the SELA Cultural Center. The Water Education Story Loop provides a dynamic learning experience, in which the community can observe up close the water infrastructure and systems that serve an essential role throughout the county.



KEY PLAN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LA RIVER
IMPERIAL HIGHWAY
BLUE PARK
LA RIVER TRAIL
BLUE PARK OBSERVATION PLATFORM
SEDIMENT EDUCATION POOLS
WATER EDUCATION CENTER
FLOOD CONTROL DISTRICT BUILDING (EXISTING)
FUTURE SELA
CULTURAL CENTER
NORTH IMPERIAL TRANSMISSION RIGHT-OF-WAY PARK
50'
N

WATER EDUCATION CENTER

CHALLENGES

LACFCD currently uses the facilities located on this site for LACFCD operations. Any additional future uses would likely need to accommodate their office space in addition to public program spaces. One method to address this challenge is to co-locate office space within the Water Education Center. For example, offices could be located on the second floor above the classrooms and field lab. It may be costly to reconstruct the LACFCD offices, but a full site redesign will result in the greatest flexibility in its redevelopment.

Alternatively, the LACFCD can maintain operations in the existing office space and the Water Education Center can be constructed to the north end of the site with vehicular and bus parking in between. This option allows for greater autonomy of the programs and may result in less daily disruption of LACFCD operations. This may be more economical for the LACFCD, but preserving the existing building constricts flexibility in the site's development.

Another challenge of the Water Education Center is its elevation relative to the river and its levees. The parcel stands lower than the levee and any at grade construction will not afford visitors views onto the river. As a facility dedicated to educating the public on the work and importance of the LACFCD, it is essential for visitors to have a visual connection to the river. As such, it is critical to elevate some building elements to provide views over the levee into the confluence.

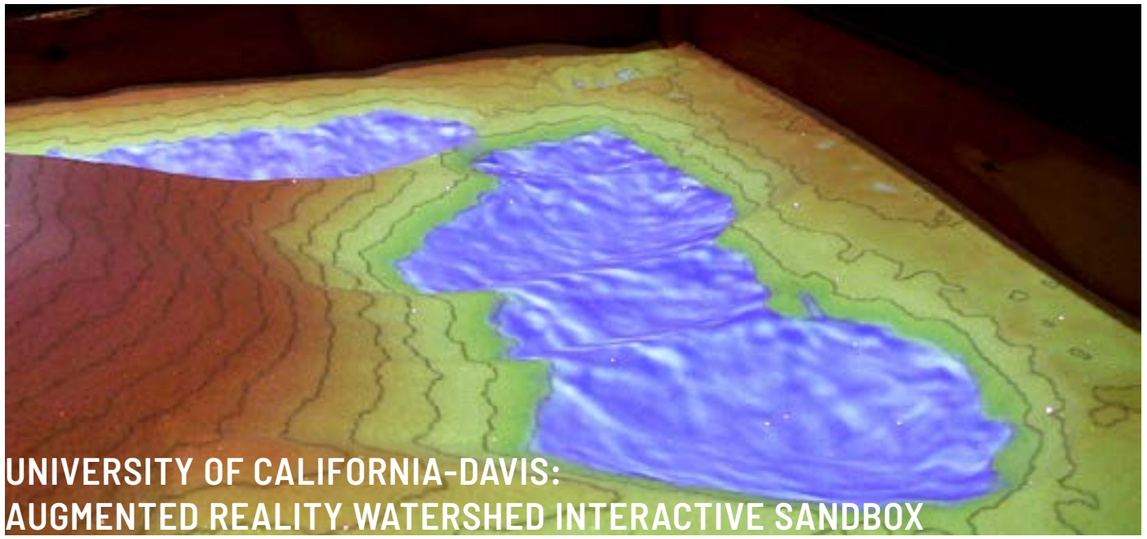
WATER EDUCATION CENTER

DESIGN

The current design of the Water Education Center site maintains the existing LACFCD offices and the center is composed of a simple shed structure for the field lab and classrooms and a more architecturally expressive, glass-enclosed pavilion for the water museum's exhibition space. This pavilion cantilevers from the river's levee wall and stands high above the channel providing an elevated and unobstructed view onto the Rio Hondo Confluence and Confluence Blue Park beyond. The pavilion is elevated high enough to also facilitate the required 14-foot tall LACFCD maintenance access road. There is a parking lot centralized between the LACFCD offices and the Water Education Center, that provides safe bus drop-off for students and adequate parking for visitors and employees alike.

During a trip to the Water Education Center, students and visitors can explore the broader Water Education Story Loop connected by the LA River Trails. Following their visit to the center, they begin the loop by visiting the adjacent future Confluence Blue Park's braided channel to see how water moves through channels firsthand. They then walk through the future Imperial Wetlands to view a diverse ecological landscape and witness a natural water filtration system. Students cross the future SELA Bridge Park to view the LA River and learn about its flood risk on the deck's pavilion exhibits. Before returning to the Water Education Center and jumping on a school bus home, students can grab a snack and rest at the cafe in the SELA Cultural Center. The Water Education Story Loop provides a dynamic learning experience, in which the community can observe up close the water infrastructure and systems that serve an essential role throughout the county.

PRECEDENT PROGRAMMING



UNIVERSITY OF CALIFORNIA-DAVIS:
AUGMENTED REALITY WATERSHED INTERACTIVE SANDBOX

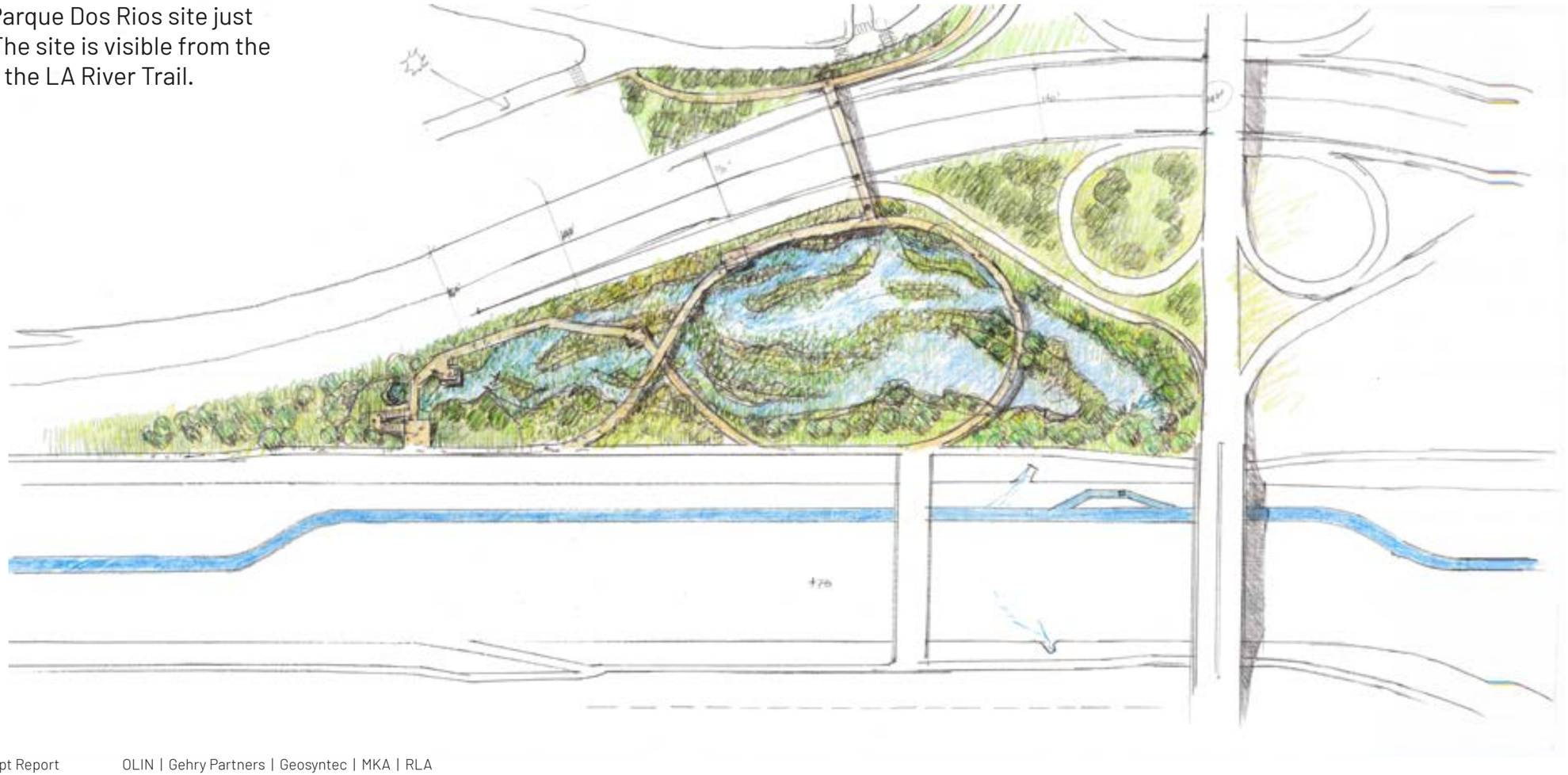
NATIONAL GREAT RIVERS RESEARCH CENTER:
EDUCATIONAL POOLS

Source: Top-Oliver Kreylos, UC-Davis KeckCAVES Courtesy National Science Foundation, 2012-13; Bottom-OLIN

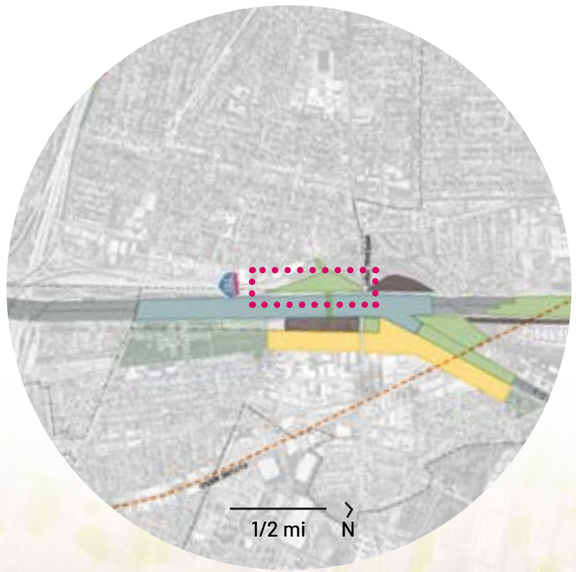
IMPERIAL WETLANDS

SITE INTRODUCTION

The Imperial Wetlands site currently sits on a vacant parcel sandwiched between the LA River, looping I-710 on-ramps, and the I-710 itself. There is an existing drainage culvert on the western edge for stormwater that drains from the residential Lynwood neighborhood directly west of the I-710 through the site and eventually to the LA River channel. Additionally, significant runoff enters the site from the I-710, the onramp areas, and flow that runs through the Parque Dos Rios site just north of Imperial Highway. The site is visible from the I-710, Imperial Highway, and the LA River Trail.



KEY PLAN



LYNWOOD CONNECTOR

710

WETLAND HABITAT

BOARDWALKS

WETLAND OBSERVATION DECK

PARQUE
DOS RIOS

LA RIVER

SELA BRIDGE PARK

BLUE PARK

IMPERIAL HIGHWAY

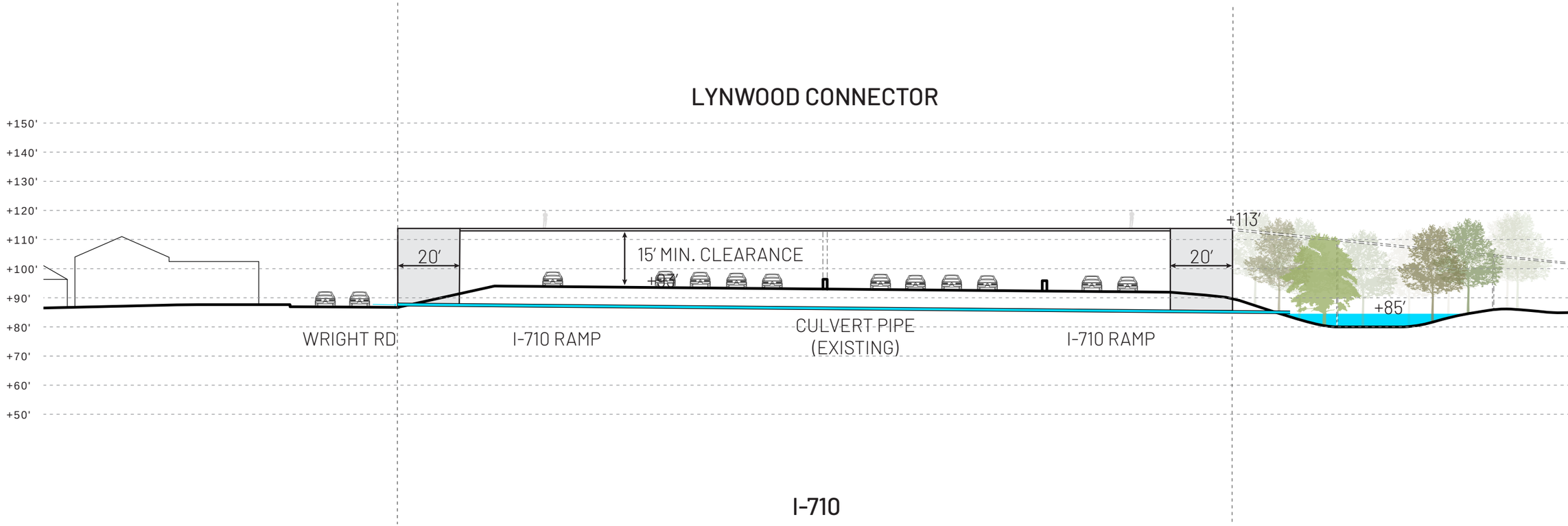
100'

N

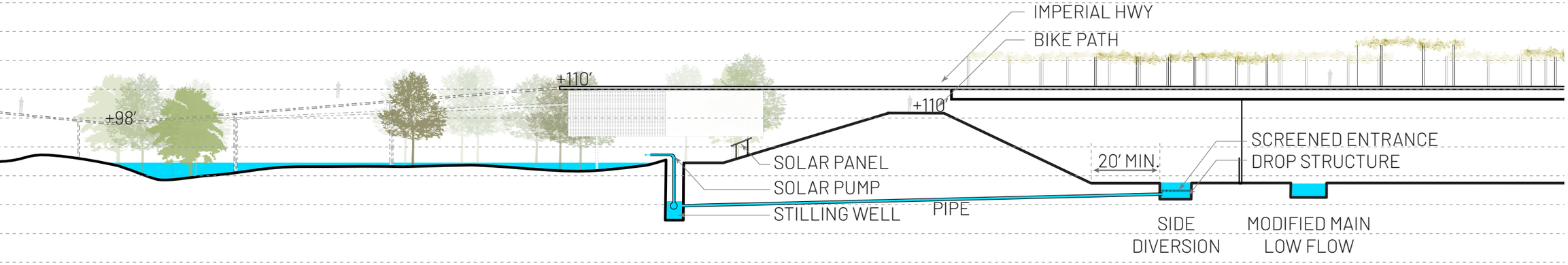
IMPERIAL WETLANDS

CHALLENGES

To the north and west of the wetlands, the elevation difference between the grade of current storm drain infrastructure and the existing grade at site will require a significant amount of cut and fill on the site to capture, treat, and eventually discharge to the LA River. To the east, the elevational difference between the wetlands and the low flow channel will require a solar pump that will also help circulate water during dry weather. There is significant noise on the site from the I-710 that may be mitigated by vegetated buffers.



SELA BRIDGE PARK



IMPERIAL WETLANDS

LA RIVER

PROJECTS

IMPERIAL WETLANDS

WATER QUALITY

- During the rainy season, stormwater runoff from 20+ acres within the adjacent neighborhoods west of the site, from the I-710, and the flow coming from and through Parque Dos Rios, would be conveyed through the wetlands where it can be treated and discharged into the LA River through the existing storm drain outfall.

- During dry times, water can be diverted from the low flow channel in the LA River and sent to a stilling well located beneath the wetlands. A solar pump can lift water up from the well and release the water to flow through the wetlands for treatment before being discharged back into the river.

- Solar pump operations should consider allowing the wetlands to seasonally dry in order to manage invasive vegetation.

PROJECTS


SELA BRIDGE PARK
WILDLIFE HABITAT
NATIVE PLANTS
WATER QUALITY
NATURAL TREATMENT SYSTEM

IMPERIAL WETLANDS

DESIGN

Transforming this static remnant space into a dynamic wet and dry season water filtration system will create habitat that increases biodiversity as well as treating stormwater runoff from Lynwood and the I-710 and dry weather flows from the modified low flow channel in the LA River. Treating stormwater protects the rich estuarine ecosystem at the mouth of the river as well as the health of communities downstream. Additionally, the Imperial Wetlands boardwalks and future SELA Bridge Park and Lynwood Connector provide a unique opportunity in SELA for residents to feel immersed in a native wetlands environment.

A system of boardwalks utilizing stairs and ramps from the SELA Bridge Park will bring people over the channel and levee into the wetlands. The network will continue to connect the communities on opposite banks of the river to the SELA Cultural Center, Hollydale Regional Park, and future Transmission Rights-of-Way parks and platforms. The boardwalks dip into the wetlands before returning to clear the I-710. At the moments where the boardwalk dips, the opportunity to bring people into the canopy of habitat will be utilized. Visitors will experience feeling in the trees as well as scenic views through the trees.

Water will circulate through winding paths allowing for native vegetation to grow in the wet season, which will help filter the water. Additionally, although dry season within the LA River low flow channel is treated in water reclamation plants before entering the channel, it still mixes with and contains toxins and pollutants from runoff as well as what is already present in the channel. As a result, lifting a portion of that water to circulate through the wetlands will improve the quality before a portion of that water returns to the low flow channel after it is released from the wetland outfall.

The system will rely on increasing the time of residence for water for filtration, sedimentation, and ultraviolet light exposure to improve quality, while allowing for seasonal dryness to help manage invasive vegetation. This will help ensure that the biodiversity in the wetland remains high for native plants, migratory birds, and other flora and fauna contributing to the important habitat and ecosystem linkage at the Rio Hondo Confluence for plants and animals throughout the LA River watershed.

IMPERIAL WETLANDS

SITE PHOTO

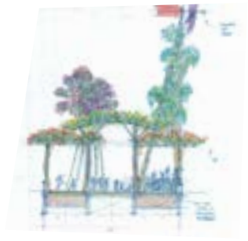
Source: OLIN

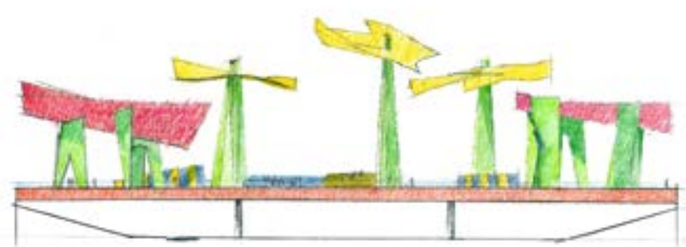
SELA BRIDGE PARK

SITE INTRODUCTION

The SELA Bridge Park is south of Imperial Avenue and connects the future Imperial Wetlands to the LACFCD Imperial Yard, slated as the future site of the SELA Cultural Center. It also connects the LA River Trails on opposite river banks that otherwise require a challenging crossing at the heavily trafficked Imperial Highway Bridge. While many planning studies have identified that a pedestrian bridge is highly desirable between Lynwood and Hollydale Regional Park, the hydraulics of this stretch of the river, particularly in relation to the confluence to the north and the spillway located along the eastern levee just south of the LACFCD Imperial Yard, are particularly complex. The RHCAP Feasibility Study identified the potential to construct a 60-foot wide bridge south of the Imperial Highway Bridge.

The SELA Bridge Park will serve as a pedestrian and bicycle crossing for the daily use of visitors of the LA River Trail and other Rio Hondo Confluence Area Projects. However, it will also serve as part of the Water Education Story Loop (including the Water Education Center, the Blue Park, and Imperial Wetlands), in which visitors crossing the bridge can observe the Rio Hondo Confluence and tour different exhibits that facilitate greater knowledge of the flood management infrastructure. The SELA Bridge Park provides an essential connection and facilitates greater access throughout the Rio Hondo Confluence Area.





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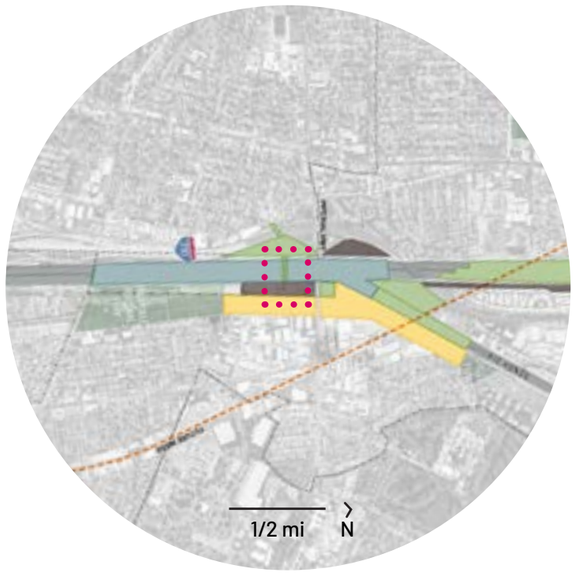
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IMPERIAL WETLANDS
LOW FLOW WINDOWS
EVENT SPACE + SEATING
SHADE STRUCTURE WITH FLOWERING VINES
BLUE PARK
FUTURE SELA CULTURAL CENTER
100'
N

SELA BRIDGE PARK

CHALLENGES

The SELA Bridge Park extends between Imperial Wetlands, at a low elevation, and SELA Cultural Center, at a higher elevation, requiring consideration of how to best facilitate comfortable and accessible movement for pedestrians and cyclists crossing between the two river banks. The bridge's structural depth determines its height above the levee walls. The approach to the bridge from the LA River Trail also requires significant attention, in which the paths must negotiate a gradual escalation from the trail on top of the levee to the top of the bridge's deck. The bridge is a destination, but must facilitate safe and comfortable passage.

Another challenge in the development of the SELA Bridge Park is how the bridge is programmed, which will significantly determine its level of activation. Programs on the deck should not impede movement for those crossing, nor create significant structural loads. Further, unlike the LA River Platform Park and the Rio Hondo Platform Park, the bridge is hardscaped. As such, additional considerations of shade structures and planting must be integrated to provide adequate shade to an otherwise exposed bridge. These elements must coordinate with the programming.

STRUCTURE

SELA Bridge Park is currently considered as a three span bridge supported by two 3-foot wide concrete piers, up to 60 feet in length. For the ~135 foot spans, it is anticipated that bridge girders would be approximately 6 feet deep spaced at 8 feet on center with ~8" of slab structure.

The SELA Bridge Park must cross an overall 410 foot span above the LA River. Despite its significant span, the bridge requires a shallow structural depth to closely align its ends with the elevation of the levees and LA River Trails. Large sculptural installations are anticipated to be located above pier supports and trellis framing to support light planting to be provided in a distributed manner.

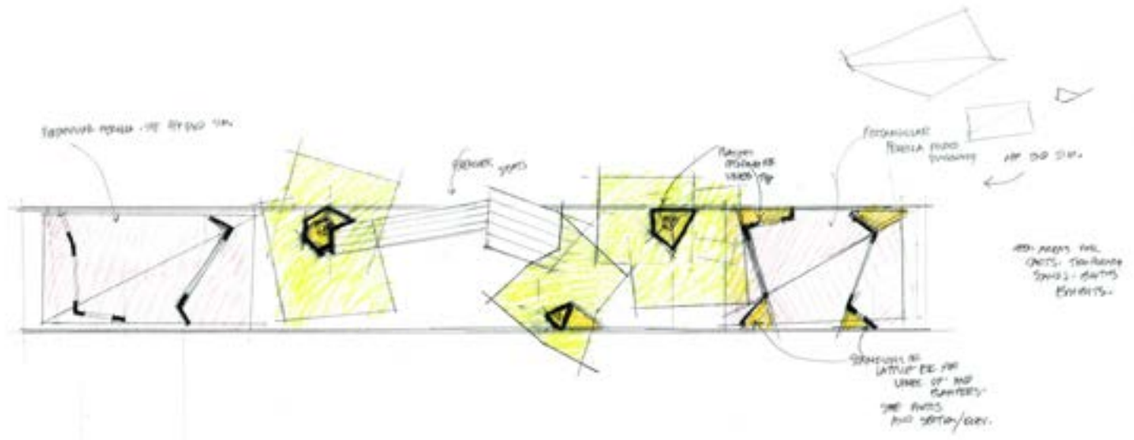
The bridge can be supported in a number of configurations. Options under exploration include various corbelled/cantilevered piers, precast concrete and steel framing, as well as openings or "apertures" in the bridge deck to allow views below. The materiality being investigated includes precast pre-stressed concrete girders considered for consistency with platform bridges and steel plate girders considered for flexibility for soil depressions and ease of attachment for trellis structures above. These schemes require customized structural solutions that must be optimized in the context of the desired shallow structural depth and design intent.

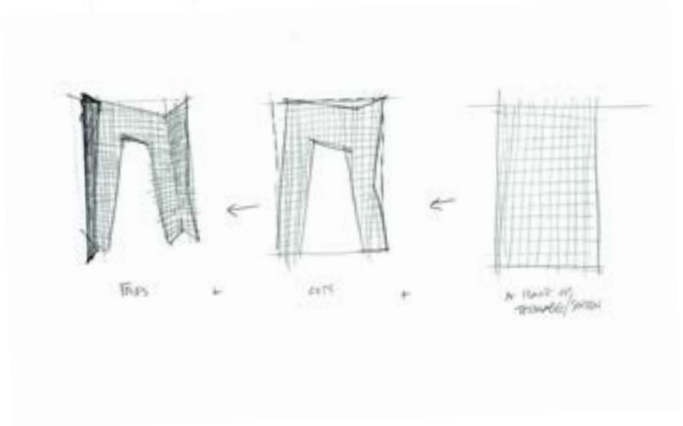
PROJECTS

SELA BRIDGE PARK

DESIGN

The SELA Bridge Park links the east and west banks of the LA River. The rectangular deck has asymmetrical, cantilevered platforms holding a series of pavilions, for community-based events and arts and culture programming. Apertures, linear cuts in the structural slab in between girders, flow in the direction of movement and look down onto the low flow channel and the various Blue Park elements below. The deck is also embellished by planters with trees to create a shade canopy for comfortable passage. The SELA Bridge Park allows visitors to engage the river below, facilitates safe crossing for pedestrians and cyclists alike, connects LA River Trails on opposite banks, and is a destination within itself.





SELA BRIDGE PARK

HYDRAULICS

Feasibility and conceptual design of project elements summarized below are based upon 3D hydraulic modeling analyses. An emphasis was placed on minimizing impacts to the design water surface elevation, and coordination with USACE will be required during future design phases.

KEY FINDINGS

- The existing hydraulics in this stretch of the LA River between Imperial Highway and the southern extents of the project area are very complex and sensitive to changes. This is due to a multitude of factors including the Rio Hondo confluence, the Imperial Highway bridge, the designated overtopping section, and sensitive flow regimes (i.e. Froude number near one)."
- (i.e., Froude number near one). These constraints likely preclude the construction of an extended platform, but a smaller pedestrian bridge is likely possible.

- The SELA Bridge deck would sit entirely at or above the elevation of the existing banks.

- CFD modeling indicated that two slender piers, up to approximately 3 feet thick, and 60 feet long, with standard debris noses are feasible.

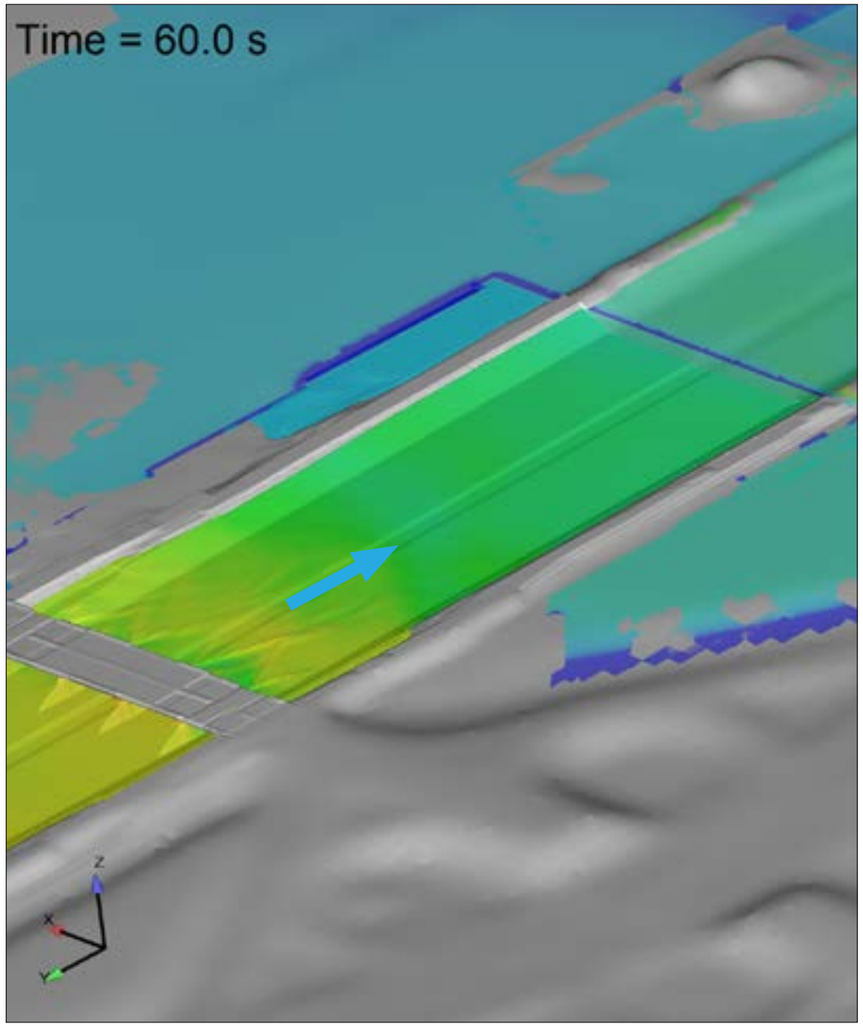
- The water surface elevation upstream of the SELA bridge may increase slightly, but this can be mitigated by adding some small walls to meet freeboard requirements. These walls may also be part of the design to enable access to the bridge deck.

PROJECTS

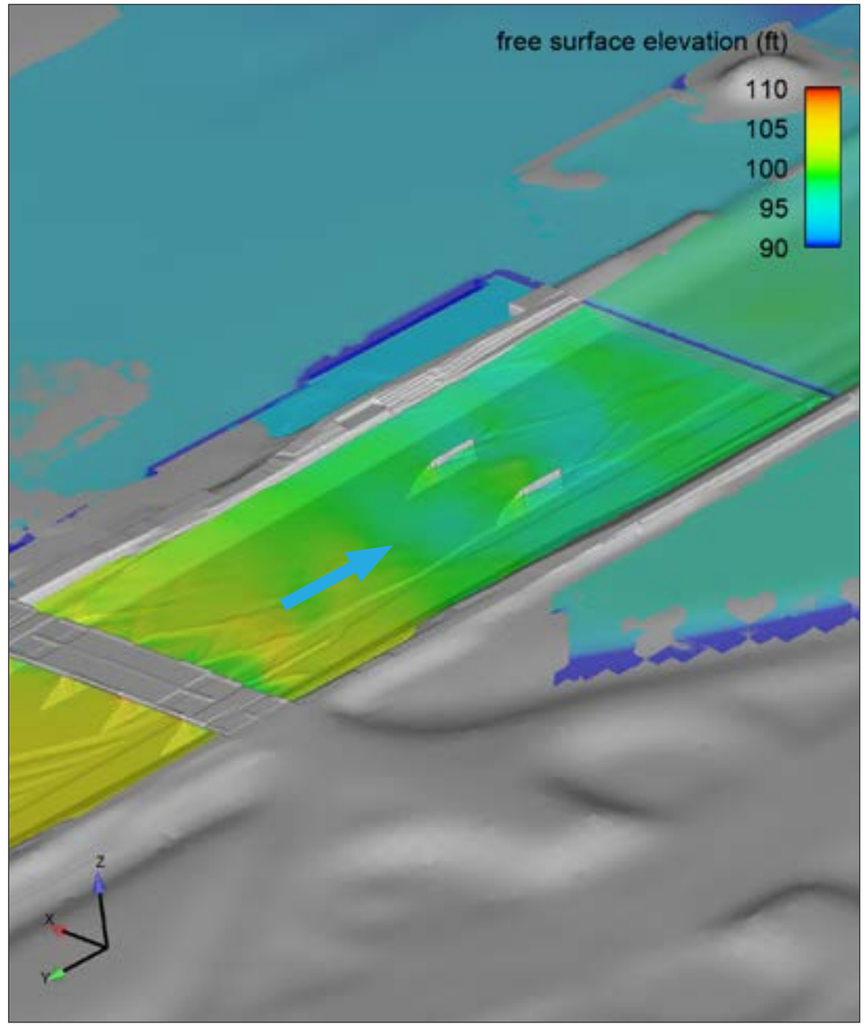
SELA BRIDGE PARK

HYDRAULICS

Modeled free surface elevation for baseline (left) and SELA Bridge Park piers (right) for the design peak flow conditions (~0.2% event). Model results indicate generally similar free surface elevations upstream of the SELA Bridge Park and slightly lower free surface elevations immediately downstream of the SELA Bridge Park.



Baseline Model: Free Surface Elevation

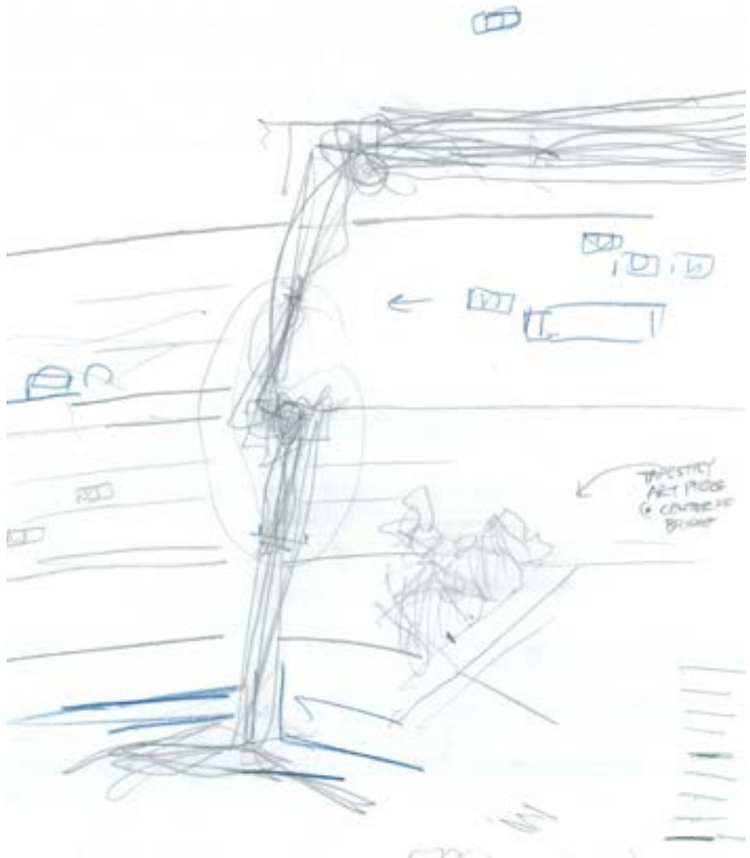


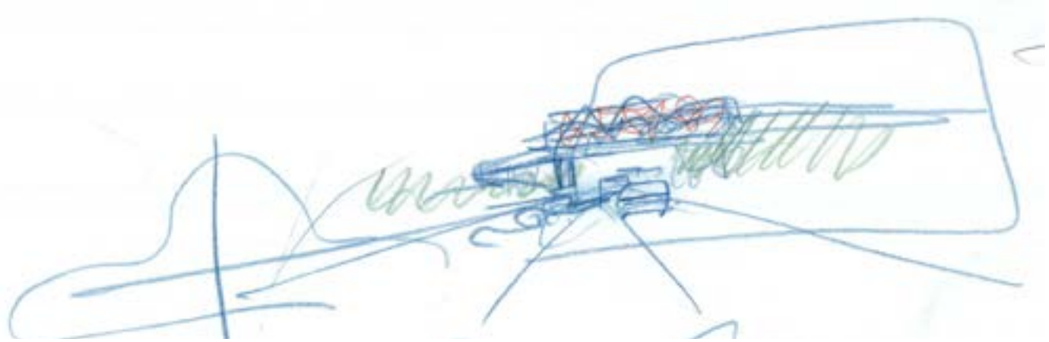
SELA Bridge Park Model: Free Surface Elevation

LYNWOOD CONNECTOR

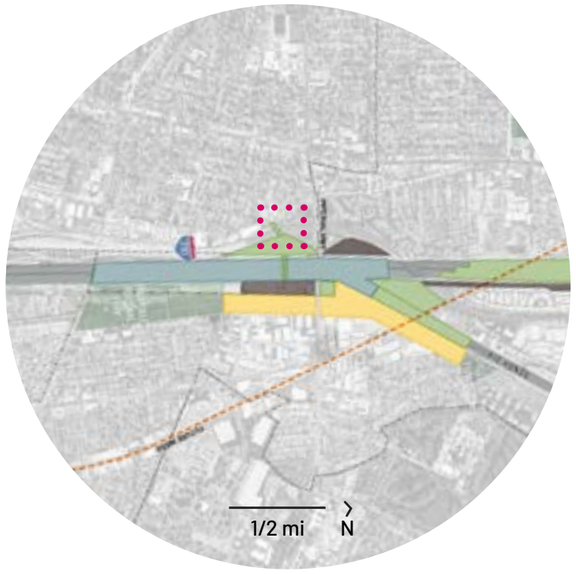
SITE INTRODUCTION

The Lynwood Connector is a pedestrian and bicycle connection over the I-710 to connect Lynwood's residents to the west bank of the LA River. It is a critical linkage for a community that can only access the river at grade along the busy Imperial Highway interchange. The bridge will provide broader connection to both existing and future assets including: Hollydale Regional Park, Imperial Wetlands, Parque Dos Rios, SELA Bridge Park, SELA Cultural Center, the Blue Park, the Water Education Center, and South Imperial Transmission Right-of-Way Park. The bridge will provide safe passage for pedestrians and cyclists alike, connecting to a broader network of public infrastructure and sites of interest.





KEY PLAN



BIKE HUB

WRIGHT ROAD

710

GATEWAY SIGNAGE

IMPERIAL WETLANDS

BOARDWALKS

100'
N

LYNWOOD CONNECTOR

CHALLENGES

The determination of the bridge's location is particularly challenging as the adjacent residential neighborhood is bordered by an industrial corridor. It is also important to consider connectivity to existing community assets, i.e. schools and parks, transportation networks, commercial corridors. Further, the landing of the bridge may fall within publicly or privately owned parcels, that may pose economic and political barriers to its eventual implementation. Lastly, distance to other RHCAP developments is a necessary consideration to further refine potential locations, namely the Imperial Wetlands, SELA Bridge Park, and SELA Cultural Center. All of these determinations helped to identify several siting options that were researched and compared, see Chapter 5: Additional Research: Lynwood Connector. (Option B was determined to be the most viable, and served as the basis for the Site Design Concept studies.)

The preferred location to site the Lynwood Connector is located south of the I-710 interchange and is the shortest potential span (250 feet, an approximate 2 minute walk), landing in a public right-of-way. This location closely aligns with the City of Lynwood's proposed pedestrian bridge and is the most direct connection among the options to the future Imperial Wetlands, SELA Bridge Park, and SELA Cultural Center. This location is also proximate to Imperial Highway and its commercial assets, namely food and automobile related.

A further constraint in the bridge's siting is that the western landing is opposite single story homes. Standing at more than 20 feet tall, the bridge's design must seamlessly flow into its landscape to avoid creating an element at a scale disjointed from its neighboring homes.

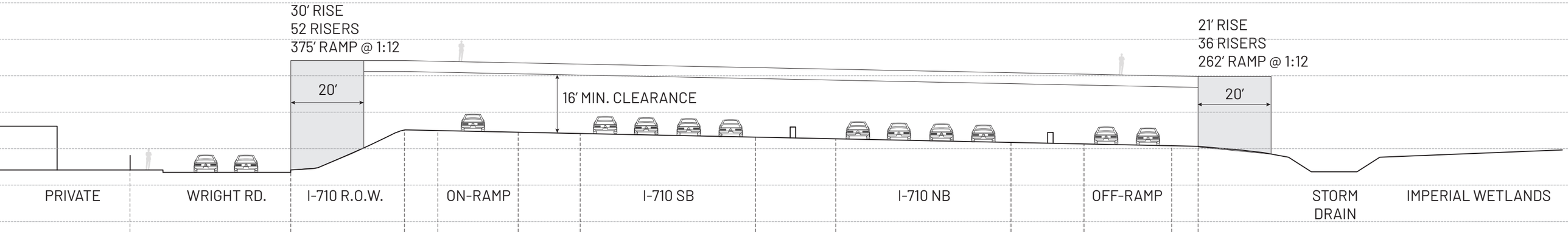
STRUCTURE

The Lynwood Connector crosses an overall 250 foot span above the I-710 with an intermediate support at the highway median. Supported on steel framed elevated structures at the ends for access and concrete pile caps and columns at the center highway median, the spans crossing I-710 and roadway intersection consist of box truss bridges. Intermediate steel framing supporting a composite concrete slab will make up the walkway structure supported by the lower horizontal truss to limit the height required for pedestrians and cyclists to climb. Access ramps to bring pedestrians from grade up to bridge elevations to be steel framed. Secondary framing at bridge pivot point to support signage or art installation for gateway design.

PROJECTS

LYNWOOD CONNECTOR

DESIGN



LYNWOOD CONNECTOR

DESIGN

The Lynwood Connector will provide a welcoming approach to the Rio Hondo Confluence Area projects and the LA River corridor for the Lynwood community. Further, it reflects an elegant structural solution and is well situated in its surrounding urban landscape. The bridge will provide an accessible connection for pedestrians and cyclists, up and over the 20 foot elevation change above the I-710. The bridge's landings will blend into their surrounding landscapes, with access descending through a tree line right-of-way to the west and integrated into the network of boardwalks of Imperial Wetlands to the east. As a gateway to the Rio Hondo Confluence Area, the connector bridge will offer a safe, convenient, and appropriate solution to Lynwood's current disconnection to the river, as well as serve as a visual beacon for those approaching the area along the I-710 from the south.

PROJECTS

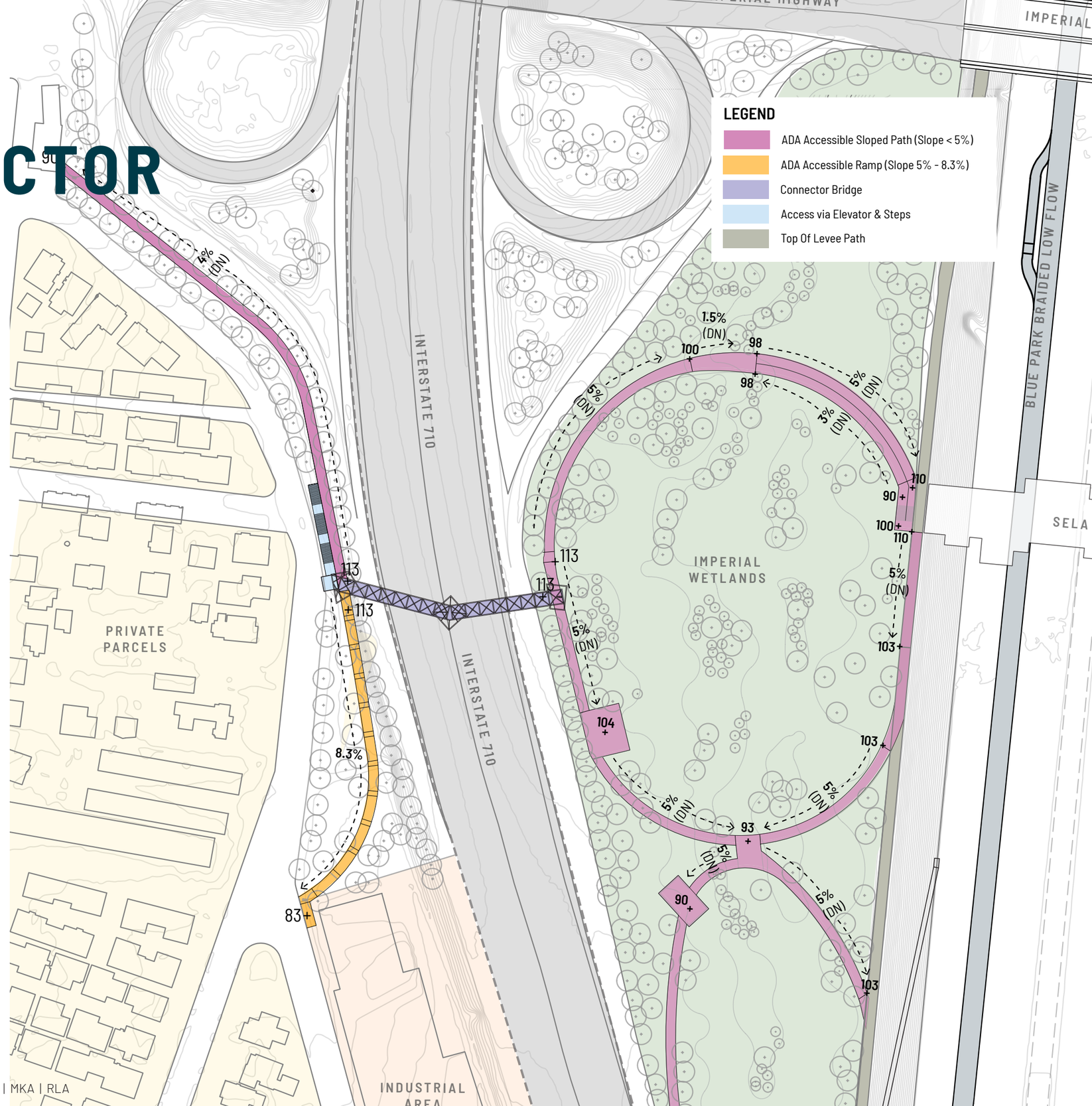

PEDESTRIAN AND BICYCLIST CONNECTION
IMPERIAL WETLANDS
I-710

PROJECTS

LYNWOOD CONNECTOR

ACCESSIBILITY

- Access from the north via 4% ADA accessible sloped path
- Access from the east via the Imperial Wetlands
- Potential for access from the south via 8.3% ADA accessible ramps and landings



PROJECTS

LYNWOOD CONNECTOR

ACCESSIBILITY

- Potential for access from the north via 4% ADA accessible sloped path
- Access from the east via the Imperial Wetlands
- Potential for access from the south via elevator and stair