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26 September 2025
Historic Design Review Commission
City of San Antonio

Subject: Brackenridge Park Improvements – Phase 2 Historic Design Review

Dear HDRC Commissioners,

Brackenridge Park is located at 3700 North Saint Mary's Street, San Antonio TX, 78212, and is listed as a State Antiquities Landmark (SAL) on the National Register of Historic Places.

As part of the 2017 Brackenridge Park City of San Antonio Bond Project, the project team and owner are seeking final approval for the project scope included within this application. The purpose of this set and associated deliverables is to define the project's scope and gauge appropriateness according to the Secretary of the Interior's Standards for Treatment of Historic Properties.

Phase I of the project was granted Historic Building and Structures Permit #1208 by the Texas Historic Commission on May 30th, 2023, and was granted approval by the City of San Antonio Historic Design Commission. This scope of work consisted of the rehabilitation of the Lambert Beach retaining walls, Grand Staircase, and Pump House foundation.

Phase 2 is located just South of E Hildebrand Avenue, and includes the rehabilitation and interpretation of several additional historic resources listed as contributing elements requiring THC approval. The primary goal of this project is to rehabilitate each historic feature in concordance with the Secretary of the Interior's Standards for Rehabilitation and additionally consider each feature within the context of a comprehensive cultural landscape rehabilitation – weaving together the park's cultural, historical, and ecological narratives.

Central to this goal is interprets the story of the San Antonio River's water and how it has been evolved ecologically and through anthropogenic influence over time. The design interprets the river's original flow, reactivates the lily pond, acequia, and raceway, and highlights historic structures of architectural and archeological significance and their associated functions. By removing invasive species, reducing contemporary hardscape, and stabilizing the water courses with indigenous plant species, the project aims to rehabilitate the local ecosystem and cultural landscape. New pedestrian connections aligned to historic pedestrian paths improve safety, while a Cultural Trail and plaza provide opportunities for cultural celebrations and education.

The current design proposal for Phase II assumes the completion of the Phase I Lambert Beach Rehabilitation project before Phase II construction. The current Limit of Work line will be reduced to the extents of the utility conversion and project site work following this submission once final site electrical alignments have been finalized.

PHASE 2 SCOPE OF WORK

As part of the 2017 Bond Project for Brackenridge Park, the Phase 2 scope of work includes the following:

- Uncovering and rehabilitation of the Upper Labor Dam.
- Improvements to the Brackenridge Lily Pond.

- Rehabilitation of the Upper Labor Acequia.
- Reversing the flow of the Upper Labor Acequia to flow in the historic direction.
- Pumping water to the Upper Labor Lily Pond, Acequia, and Raceway to interpret the historic water system.
- Rehabilitation of Historic Water Works Pump House.
- Excavation and Rehabilitation of original Pump House arches at Waterworks Raceway.
- Rehabilitation of 19th Century pedestrian bridge spanning the Upper Labor Acequia.
- Utility consolidation and overhead electric burial to enhance historic viewsheds.
- Site improvements (hardscape, planting, interpretive features, furnishings, lighting).
- Connection to San Antonio Spirit Reach Trail.
- Reduce impervious material.
- Interpret / Rehabilitate recently discovered historic pedestrian bridge.

ADD-ALTERNATE SCOPE

Three historic buildings were recently added to the project as Add-Alternates. All associated site utility work for these structures is included within the base bid of the project to ensure opportunities for rehabilitation within future projects should the funds be unavailable for the current project scope. The three add alternates include:

- Rehabilitation of two historic bathroom pavilions
- The rehabilitation and conversion of Electric Pump Station #3 into a storage building

Please see the following pages for a detailed design narrative regarding the scope of work for this phase. The scope of work is organized by each historic resource and its adjacent scope.

We thank you for your time in reviewing our application. As this is a large and complex scope of work encompassing the rehabilitation of several historic resources, the design team would be happy to answer any questions you may have regarding this submission.

Kind Regards,

Kinder Baumgardner

Managing Principal

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HISTORIC WATER WORKS PUMP HOUSE (1877-1887)

The Brackenridge Water Works Pump House played a significant role in the development of the City of San Antonio's municipal water supply and it was originally designed to deliver water to a reservoir at a higher elevation for water distribution to the city.

It is evident that the building originally had four symmetrical archways – two each on the East and West sides. The Lambert Beach-facing arches appear to have been significantly damaged in one of the several notable flood events in the early 20th century. The Raceway-facing arches were filled in and covered by the contemporary asphalt roadway.

The project proposes a historic rehabilitation of the Pump House, adapting its use from a currently vacant and unutilized park building to a multi-purpose community events space while retaining the building's historic character. Key aspects of the project scope will include stabilizing the historic structure, rehabilitating its architectural character, rebuilding the arches, and converting the interior into a tenant space flexible to accommodate a light café or other park-serving function. The existing stone kiosk is proposed to be disassembled, cataloged, and stored for relocation in a future Bath House Rehabilitation phase.

1. Architecture

    A. Scope of Work

        1. Scope of Demolition and Selective Dismantling Work:

            i. Demolition of non-historic rubble stone infilling historic arches at raceway level and removal of non-historic earthen backfill against the west façade of building. The removal of the earthen backfill will ease the long-term maintenance of the structure by eliminating the lateral loads currently exerted by the non-historic backfill on the unreinforced, historic, limestone masonry walls. These lateral loads currently cause the building to lean out of plumb toward the river channel. Removal of the non-historic backfill re-establishes the historic connection between the raceway and the river channel and contributes to a coherent historic interpretation of the building's original function as a water-driven pump house.

            ii. The removal of failing and unsuitable previous repairs to historic masonry walls, including metal tie rods, plates, and lintel angles. While the repairs were implemented early in the 20th century, they are failing due to excessive corrosion. The earlier repairs visually detract from the historic character of the building. Refer to Structural Engineer for appropriate replacement repairs and temporary shoring methods. See proposed options for replacing the failing repairs below.

iii. Selective demolition of non-historic, corrugated metal roof and highly deteriorated roof sheathing, fascia boards, and rafter tails. Retain all sound wood materials and features in situ for rehabilitation.

iv. Selectively demolish interior non-historic wood floor decking and deteriorated, over-spanned structure for replacement with a new floor finish and structure that meets dead and live load requirements proscribed by code.

v. Selectively demolish interior non-historic wood ceiling panels currently obscuring historic wood trusses and ceiling above.

vi. Deconstruct/relocate the limestone concession structure located to the southwest of the Pump House.

vii. Refer to Demolition Drawings and Specification Section 024296 – Historic Removal and Dismantling for more information.

2. Scope of Historic Rehabilitation Work:

i. Rehabilitate historic limestone masonry raceway by stabilizing the building's foundation and repairing damage to the masonry caused by failing and inappropriate previous repairs:

OPTION 1 - Remove and replace corroded and failing structural steel elements with new structural steel elements to properly support the surviving masonry materials. This option is not preferred by the Owner and the Consultant Team because it detracts from the historic character of the building and confuses the historic interpretation of the building's original function as a water-driven pump house.

OPTION 2 - Remove and replace corroded and failing structural steel elements with new limestone masonry arches at raceway level of east façade that will be modeled faithfully after the surviving arches at the west façade. This is the preferred option of the Owner and the Consultant Team because it does not rely on conjecture or speculation – we know exactly the original appearance of the damaged east façade by referring to the intact west façade currently concealed by the backfill. This approach respects the historic character of the building and contributes to a coherent interpretation of the building as a structure that originally bridged over the historic raceway. The original limestone material is still readily available in San Antonio and the city benefits from having several master masonry companies skilled in historic rehabilitation work. New work may be subtly distinguished from historic materials in a manner readily identifiable by experts but to recapture the building's historic character and appearance for the general public.

ii. Rehabilitate historic limestone masonry through gentlest possible cleaning methods, repair damaged masonry units with like materials, and repoint with traditional lime mortar. (Refer to Specification Section 040310 – Historic Stone Masonry Cleaning, Specification Section 040342 – Historic Stone Masonry Repair and Repointing, and Specification Section 040515 – Preparing Lime Mortar for Historic Masonry for more information.)

iii. Rehabilitate historic exterior wood features such as rafter tails, fascia boards, and trim boards. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information.)

iv. Rehabilitate historic interior wood features such as trim boards, roof trusses, and other wood elements. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information.)

v. Install a new roofing system over rehabilitated roof structure:

OPTION 1. - Install a new cypress shake roof on new underlayment and new wood sheathing to match existing sheathing., reconstructing what is believed to have been the original roofing material used on the structure historically. This option is not preferred by the Owner and the Consultant Team because of concerns about the fire rating of a cypress shake roof assembly not meeting code requirements and potential maintenance concerns.

OPTION 2: - Install a new corrugated metal roof to replace the existing, non-historic, corrugated metal roofing on new underlayment and new wood sheathing to match existing sheathing. This option is not preferred by the Owner and the Consultant Team because of concerns about the susceptibility of corrugated metal roofing systems failing and leaking over time due to the fastening methods typically employed.

OPTION 3 - Install metal roofing, with traditional crimped, standing seam details, on new underlayment and new wood sheathing to match existing sheathing. This is the preferred option of the Owner and the Consultant Team because it provides a high-quality, low-maintenance roof which

safeguards the long-term health of the structure. Traditional standing seam metal roofs are prevalent on historic buildings in the region and exist within the Park on other historic structures.

i. Install new wood floor structure over existing and new wood framing members spanning the raceway to meet code requirements for dead and live loads. (The current non-historic floor is over-spanned and deteriorated.)
ii. Rehabilitate historic wood windows and doors. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood window or door elements will be replicated using in-kind materials, dimensions, and profiles. Since most of the glass is missing or broken, windows will be reglazed with new, clear glass and traditional glazing putty materials. Door hardware may require replacement or modification to accommodate life safety and code requirements. (Refer to Specification Section 080314 – Historic Treatment of Wood Doors and Specification Section 080352 – Historic Treatment of Wood Windows for more information.)
iii. Reconstruct damaged or missing wood window screens with brass or stainless-steel screen material and mounting hardware. (Refer to Specification Section 080352 – Historic Treatment of Wood Windows for more information.)
iv. Rehabilitate historic interior plaster finish using traditional gypsum plaster materials and methods to repair cracks and water damaged areas. (Refer to Specification Section 090320 – Historic Treatment of Plaster for more information.)
v. Repaint rehabilitated historic and new materials and finishes with an historically appropriate color scheme. (Refer to Specification Section 090391 – Historic Treatment of Plain Painting for more information).

C. Strategy

1. General Strategy: The recommendations and methods for rehabilitating the Pump House are guided by the Secretary of the Interior's Standards for Rehabilitation, National Parks Service (NPS) Technical Preservation Briefs, and nearly thirty-five years of practice by the Historic Preservation Architect, Seventh Generation Design, Inc. A draft of the preservation specifications is included in the 60% Construction Documents Package.

2. Raceway: The design intent is to rehabilitate the building's historic appearance and relationship to its site for the purpose of interpreting its important role in water management, contributing to San Antonio's development and growth in the late 19th and early 20th centuries. The

project proposes re-establishment of the Pump House's historic raceway to the northwest of the structure by excavating a portion of the backfill placed into the raceway's channel and against the base of the building during previous park road construction. This backfill currently obscures two stone archways that remain intact at the base of the building but have been infilled with rubble stone and culvert piping extending under the nearby park road. The raceway will be excavated to its historic depth as confirmed by previous and ongoing archeological investigations and the infill rubble stone and culvert piping will be removed. The exposed arches will be cleaned and repaired using accepted methods in keeping with the Secretary of the Interior's Standards for Rehabilitation and NPS Technical Preservation Briefs (e.g., "Brief No. 1 – Cleaning and Water-Repellent Treatments for Historic Masonry Buildings," "Brief No. 2 – Repointing Mortar Joints in Historic Masonry Buildings," "Brief No. 6 – Dangers of Abrasive Cleaning to Historic Buildings,"), and similar technical publications and resources.

3. Removal of Previous Repairs & Raceway Arch Reconstruction: The arches at the base of the building appear to be intact on the north façade beneath the backfilled raceway channel, as discussed above. However, the arches at the base of the building on the south façade appear to have been severely damaged by a previous flood event in the early 20th century. Inappropriate structural steel members were employed to repair and stabilize the structure. These earlier repairs are now failing due to corrosion and appear to be contributing to the cracking of the limestone masonry walls. Additionally, the failing repairs are visually detracting from the historic character and visual aesthetics of the structure. The project proposes to remove the deteriorated steel members and reconstruct the missing south façade arches based on the extant north façade arches. The limestone and mortar materials are readily available for the reconstruction and repair work and may be subtly detailed to assist future investigators in distinguishing original from new material.

4. Replacement Roof: The Pump House's original roof material is unknown currently. It is hoped that some clues may be revealed through exploratory removal of a portion of the existing non-historic corrugated metal roof prior to completion of the construction documents. It is likely that the roof was originally composed of cypress shakes obtained from trees prevalently growing along the banks of the San Antonio River. For practical, maintenance, and fire protection reasons, the project proposes to replace the highly deteriorated, non-historic corrugated metal roof with a traditional field-crimped standing seam roof for its durability and low maintenance in the long-term interest of protecting the historic structure. Standing seam and flat seam metal roofs may be found on numerous historic commercial and residential buildings in San Antonio and appear on several historic structures within Brackenridge Park.

2. Structural

A. Scope

1. Rehabilitate structure to operability for occupancy meeting or exceeding IBC 2021 and ASCE 7-16 loading standards.

2. Expose existing river level stone archways and providing repair methods as necessary.

3. Rebuild previous river level stone archways at river side utilizing historical and modern methods of reinforcing.

4. Provide structural support and access for MEP units and Architectural modifications.

5. Provide direction for structural interface with adjacent Phase I modifications to Lambert Beach retaining walls.

6. Provide structural foundation work for new access ramp and stairs at building exterior and interface between Phase 1 walls.

B. Strategy

1. Rehabilitate structure to historical state utilizing reclamation, when possible, of existing materials. Due to the state of the structure, some new materials may be required to reinforce or stabilize the structure. The project team's intent is to have existing structure open and capable of supporting 100psf of live loading typical of congregating spaces. Lundy & Franke Engineering (LFE) will utilize the Secretary of the Interior's (SOI) Standards for Rehabilitation codes and methods in conjunction with modern standards and materials to rehabilitate the building.

i. Replace existing suspended floor framing with new structural steel floor framing to allow for new wood flooring to be placed to mimic existing floor architectural finish.
ii. Replace plywood floor sub-base for new architectural finishes
iii. Repair existing stone superstructure as necessary.
iv. Repair/preserve/replace roof framing members on a case-b-case basis.
v. Remove and replace existing roof sheathing with new materials that meet historical standards and look.

2. Infilled archways to be opened with intent of restoring building to original design. Structural will survey the archways for structural integrity and ability for removal without modification. Mason will utilize

the Secretary of the Interior's Standards for Rehabilitation for repair or replacement as necessary.

3. New riverside archways to be built to match existing archways at raceway side. Archways to be built to Secretary of the interior's Standard for Rehabilitation for replacement.

4. Mechanical units, plumbing, etc. for existing building will require least intrusive and obtrusive ingress to the building. Structural will coordinate with MEP to provide best method for penetrating existing structure and provide opportunities within renovated structure for MEP access.

3. MEP

A. Scope

1. Power and Lighting within Pump House.

2. Remove all existing plumbing from Pump House.

3. Provide new sink and plumbing infrastructure in Pump House.

4. Provide HVAC for Pump House.

B. Strategy

1. The existing 100A Load Center will be removed and replaced with a new 100A Panelboard in an electrical closet design by the architect.

2. Existing receptacles will be removed. New N5-20R GFCI and/or Tamper Proof receptacles will be added in the Pump House.

3. Existing Lighting will be removed. New LED pendant mounted lights will be added in seating area and above food prep. Select egress lights will be provided with integral battery backup.

4. All existing conduit and wiring within Pump House will be removed. All new conduit, above the floor, shall be EMT type with THHN insulated wiring. All conduit below the floor shall be RGC with water-tight fittings. Any exposed conduit will be concealed where possible and in compliance with NEC.

5. Lighting control devices will be replaced with new. Interior lights will be controlled via ceiling Occupancy Sensor with a manual dimming and on/off wall switch near the entrance doors. Exterior lights will be controlled via integral photocell.

6. Existing CPS Energy Gas service will be removed.

7. Domestic Hot Water - Will consist of one (1) electrical domestic water heater, undercounter tankless insta-hot type, to serve counter service sink.

8. The plumbing piping system will provide domestic water and sewer services to counter mounted single sink. Sink faucet will be specified as low flow to reduce domestic water use per Code.

9. Heat tracing shall be provided on all domestic hot & cold water piping and wrapped with insulation above floor.

10. New plumbing fixtures, faucets, and valves will be provided.

11. Sanitary waste and vent piping underground will be service-weight cast iron hub and spigot with neoprene gaskets and sanitary waste and vent piping aboveground will be service-weight cast iron pipe with hub-less connections.

12. The building will reuse existing sanitary sewer and domestic water lines to building.
13. It is our understanding that the existing building does not have internal roof drains; therefore, Architect will provide gutters with exposed leaders spilling over grade.

14. The plumbing designer will coordinate the sanitary sewer connections and domestic water connection point 5 feet outside the building with the civil engineer.

15. Heating, cooling, and ventilation will be added to the Pump House, which currently has none, to support the future use of the building.

16. Architectural, structural, acoustic, and historic preservation constraints require HVAC supply and return grilles to be located in the Pump House floor, ducted from below. This was determined based on a sloped roof, existing roof structure not designed to support the weight of HVAC equipment, no drop ceiling, preference to maximize available square footage, preference for no interior

walls, and preference for no HVAC equipment visible from inside the historic building.

17. Locating air handling equipment outside the footprint of the building would require the supply and return grilles to be ducted through the existing historic wall below grade and continuing underground, which is unlikely to be feasible for historic preservation, has not been structurally validated, and would be expensive mechanically. Thus, air handling equipment will be suspended below the floor and located as high as possible to minimize visibility from the river.

18. Similarly, to avoid routing ductwork through the historic central wall below the floor, two DX fan coil units were selected, one for each side of the building.

19. Because heat cannot be dissipated from the air conditioning system below the floor, condensing units will be located outside the footprint of the building and connected to the air handling equipment (fan coil units) with refrigerant piping. Refrigerant piping will be routed below grade.

20. Inside the building, floor access hatches will be provided for access to maintenance platforms for the fan coils.

21. Heat pumps were selected instead of electric heat to increase energy efficiency, reduce electrical load, and minimize the length of the fan coil units and access hatches. Gas furnaces were not selected because there is not a suitable route for flues, among other reasons.

22. Supplying air from the floor instead of from overhead requires a warmer than typical supply air temperature for cooling. Combined with the low insulative value of the existing historic structure, this results in a high airflow for the size of the building. Because occupants sitting or standing immediately adjacent to the supply grilles will experience a draft, grilles were carefully selected and placed for effective air distribution and to maximize usable square footage.

23. Sheet metal ductwork with elastomeric internal lining for insulation will be routed underfloor between the grilles and fan coils. Elastomeric internal lining was chosen as insulation due to durability concerns with external wrap, cost concerns with double-wall, and relative ease of cleaning.

24. Because warmer than typical supply air is needed for cooling, but air must still be cooled to typical temperatures to prevent high indoor humidity, reheat is necessary. To overcome the inherent energy inefficiency of cooling and reheating air, as well as to minimize electrical load, heat rejected from the cooling process is routed to hot gas reheat coils.

4. Landscape Architecture

A. Scope

1. Cultural plaza for dining and events.

2. Two accessible building entrances.

3. Guard rails adjacent to Lambert Beach walls and Pump House reveal.

4. Consolidated utility zone.

B. Strategy

1. Cultural plaza for dining and events.
    i. The Cultural Plaza outside the Pump House entry features a cut limestone paving pattern, and will be durable enough to withstand frequent maintenance access. Due to the soft and erodible nature of native limestone material and desire to contrast with the Pump House stone, the proposed stone in the plaza and on the upper terraces is a West Texas Cinnamon limestone. A sculptural limestone bench in the plaza complements the appearance of the stone on the Pump House, but will be a different type of limestone to distinguish a contemporary era of work.

2. Two accessible building entrances.

    i. The first accessible entrance on the Southern entry was considered within the Grand Staircase Rehabilitation during Phase I. During the first phase of improvements, the stairs will be slightly higher than the existing condition to ramp into the Pump House accessibly. Temporary concrete stairs and a landing built during Phase I will be demolished to provide a new stone entry that ties to the Pump House's finished floor elevation. To preserve the character of the

continuous limestone apron that perimeters the building, the design team proposes to inset the edges of the Raceway Reveal and preserve the visibility of a portion of the stone to indicate the building's architectural detailing. The western guard rail will be embedded in a modern wall completed as part of Phase I improvements, which will be adjusted for safety.

ii. The Northern building entry provides a ADA compliant ramp with a switchback and necessary railings. The design team studied many options to provide an accessible entry to this side of the building, however, the proposed option was the only solution that accommodated accessibility requirements due to grade constraints from adjacent historic structures. It was the client's preference to provide ADA access on both sides of the building. To ensure the Pump House finished floor elevation is met while avoiding damage to the newly rehabilitated features, the ADA ramp is proposed to be offset from the Historic WPA-era wall and built as a separate structure. A stone staircase surrounds the entry plaza to provide access to the upper cut stone entry terrace. Similarly, on the Southern side, a portion of the entry terrace is offset to reveal 6" of the stone apron detailing below the threshold of the Pump House. The stone staircase along the edge of the North Plaza creates a grand entry to the Pump House. The design team is proposing to leave the staircase without handrails in order to protect the viewshed to the Pump House entrance. This would require a variance request and letter from the THC if the THC agrees that this is a preferred solution since an alternative accessible route has been provided.

iii. Both entries to the Pump House contain a mini-slot drain between the Pump House stone stringer course and the proposed paving. This was provided in lieu of simply placing an expansion joint between the building and paving to prevent the entrapment of water along the building surface as the expansion joint erodes.

iv. Two scenarios for building access have been explored for the building threshold entry into the Pump House as depicted in details 04 & 05 on sheet L4.04. The design team currently needs more accurate spot grades for the stone stringer course at the Pump

House, and the adjacent building threshold. It is the design team's concern that the slope on the stone will be too steep to comply with current accessibility requirements. Following this submission to the THC, the design team will obtain further information and respond to the following scenarios:

Scenario 01 – Stringer course can be accessibly traversed

a) In this scenario, the stone stringer course meets or nearly meets ADA requirements (and can be granted a variance request at the recommendation of the THC). This would be the ideal situation as the proposed paving could align with the bottom portion of the stringer course as illustrated in detail 04/L4.04. In addition, the Pump House finish floor elevation could remain at the elevation it is today.

Scenario 02 – Stringer course cannot be accessibly traversed

a) Should the stringer course be too steep to accessibly transverse, the design team would propose a custom fabricated and slip-resistant bronze metal transition plate that would mount below the building threshold. This plate would be mortared to the top of the stone stringer course that meets threshold of the building. While this would hide the stone, the method would be reversible as the threshold could be lifted and the mortar can be removed. This scenario would cause the design team to lower the finish floor elevation below its existing elevation in order to reduce the vertical rise. This scenario is illustrated in detail 05/L4.04.

In either scenario, the design team may request a THC letter for accessibility variance if the condition inherently cannot meet modern accessibility standards.

1. Guard rails adjacent to Lambert Beach walls and Pump House reveal.
    a) Guard rails have been added on either side of the Pump House wingwalls, ADA ramp, and along the South Pump House Plaza on the river side. These

guard rails will complement the guardrails on the new pedestrian bridges in color, detailing, and style.

2. Consolidated utility zone.
    a) The design team has collaborated to provide a consolidated utility zone along the Zoo fence and across from the Historic Bath House. Due to the extensive electrical, mechanical, and operational requirements to rehabilitate the structures on site, large utility structures are needed. In order to protect the viewshed of these features, they have all been consolidated within a louvered fence area to conceal their impact on the landscape. This fence, while large, will be painted a tan or soft green color to conceal the weight of its appearance.

WATER WORKS RACEWAY (1877)

The Water Works Raceway is an earthen channel designed to direct water from the San Antonio River to the Water Works Pump House. The channel is now dry, but once utilized the force of the channelized water to power the Pump House turbines. Historic Sanborn fire maps indicate the location of a previous wooden bridge on the Raceway portion of the Pump House. Archival photographs through the early 1940s indicate the open arches provided views to the Raceway from Lambert Beach.

Stone column structures remaining today are believed to be remnants of a historic donkey trail bridge, and currently support a sewer pipe servicing the Restroom Pavilions. A large wall and roadway (late 1940s or later), separate the connection between the Raceway and Pump House, and enable a smaller portion of stormwater to enter through culverts serviced by two metal sluice gates. The Raceway contains portions with steep slopes that indicate evidence of erosion. Concrete rip rap lines portions of the raceway nearing the asphalt roadway.

The Raceway scope of work primarily consists of removing the asphalt roadway to reveal the Pump House Arches, providing a clay liner, and interpreting the historic flow of water through the dry channel. A pedestrian bridge will span at the approximate location of the historic wooden bridge to allow access across the channel as well as accommodate a view of the Pump House arches. Interpretive signage will inform visitors regarding the building's historic function.

The existing San Antonio River at Lambert Beach utilizes recycled water that is introduced by a San Antonio Water Supply (SAWS) pipe near the Witte Museum. The proposed rewatering scheme utilizes a pump vault built within the Lambert Beach Phase I project to pump this same water source to both the Upper Labor Lily Pond and Acequia. This project does not propose adding additional water volume to the current SAWS provided volume, and plans to redirect existing resources within a larger loop integrated into the same closed system. The Raceway inlet location would occur near the pedestrian and roadway bridges at the East end of the Raceway (furthest end of the river from the Pump House). The water course will be engineered to flow at a constant rate and maintain a

consistent water surface level. Three small weirs maintain the water level between 6”-1’ of water at the bottom of the Raceway until it reaches the reconstructed Pump House arches, where it gathers into a deeper pool and spills over a larger weir back into the San Antonio River.

1. Landscape Architecture

    A. Scope

        1. Raceway liner.
        2. Grading in the Raceway channel as well as channel slopes.
        3. Erosion control planting and seeding.
        4. Native planting.
        5. Pedestrian bridge.
        6. Interpretive overlooks.
        7. Terraced seating.

    B. Strategy

        1. Raceway liner.

            i. A liner is proposed in the Raceway to significantly conserve recycled water as it travels through the system, as well as to reduce erosion in the channel. The liner is comprised of bentonite clay sealant with a stone cobble overlay. The raceway would be excavated to provide 2’ of bentonite clay sealant to the bottom of the raceway. The clay liner will reduce permeability but is susceptible to erosion without the addition of a cobble bed. The current design assumes an overlay of 3”-5” regional limestone cobbles with larger boulders along the edges.

        2. Grading in Raceway Channel

            i. Following the removal of the contemporary asphalt roadway and wall, the slopes nearing the Pump House will be terraced with retaining walls and limestone blocks that serve as seating elements. A stone weir will be offset of the historic Pump House arches on the Raceway side (independently supported and unaffixed to the Pump House) will hold water to a desired water surface elevation (maximum 4’ static water surface elevation),

allowing water to spill back into the river. All new stone will be a distinguishable limestone material and complement the color and appearance of existing historic features.

ii. The landscape architecture team coordinated with the hydrological engineers to provide a concrete arch outlet for the drainage pipe from the acequia to the raceway in order to reduce the appearance due to the large size. The edges of the pipe will be adhered with mortared cobble to match the stone in the raceway, and recessed into the grade of the Raceway slope. The area immediately around the pipe in the raceway will be mortared to prevent the erosion of the clay liner at the bottom of the channel. The outlet from the pump to the upstream end of the raceway will outlet under the previously rehabilitated donkey bridge. Due to the smaller pipe size, a mitered end cap was proposed to reduce the appearance of the pipe. This will similarly be surrounded in adhered cobble to armor the surrounding context from water pressure and erosive forces.

iii. The design team carefully considered the feasibility of repurposing the 1940s sluice gates from the vehicular bridge in the landscape per THC's recommendation. Due to their large size (15' in height), the design team was not able to safely accommodate the structures within the current design. The team explored the following options:

Option 01 – Freestanding Sculpture within Landscape

a) The team explored embedding the gates in the landscape in the Raceway Overlook planter and the planter within the South Pump House plaza. This solution was problematic because their size necessitates having to bury a portion of the sluice in a deep concrete footing in order to withstand flooding, reduce risk of falling on park visitors, and allow them to stand independently, which would hide/irreversibly damage the structure. Additionally, the sluice mechanisms would need to be sealed or removed in order to prevent injury from park visitor misuse. When viewed outside of the original context without a vertical backdrop, the elements appear imposing and may be misinterpreted by the public as a guillotine structure.

a. Option 02 – Mounted on Pump House Wing Walls

a) This option explored mounting the sluice gates on the new Pump House wing walls. Due to their size, a portion of the gates would need to be buried under the Raceway liner, which would hide important parts of the sluice feature. Alternatively, these could be raised and mounted higher on the wall, but the tops of the gates would extend above the wall and would be above the beginning of the guard rail mounted on top. From an interpretive perspective, the team was concerned this would cause interpretive confusion with how the Pump House and Raceway operated historically, as the gates would not conceal a channel opening and would draw the viewer's attention away from the revealed arches.

After reviewing these possibilities, the design team recommends documenting the sluice gates within their original context and including these images on one of the interpretive wayfinding panels on the Pump House bridge as a part of the raceway's history, rather than trying to display the elements out of context. The team proposes to salvage and store the gates for educational use elsewhere in the park outside of the immediate project boundary for educational use, where it can be displayed at a higher elevation above the floodplain, against a large wall, or in a more open area with more passive foot traffic than the current project boundary.

3. Pedestrian Bridge

1. A pedestrian bridge spans the raceway in the approximate location of the historic wooden bridge, and provides views below the Pump House. The bridge incorporates a steel arch design that is informed by the character of both the historic St. Mary's Truss Bridge to the Southwest of the Pump House and the pedestrian bow bridge on the West side of Lambert Beach. The arch design and embedded footings were designed to prevent the introduction of large columns within the Raceway. In-grade path lights line the edge of the bridge on both sides, and interpretive signage highlight the history and significance of the Pump House. The steel bridge is to be painted a soft black to match the St. Mary's Bridge, as well as other bridge structures within the park such as the bow arch bridge on the downstream side of the river or the previously rehabilitated donkey bridge on the upper end of the Raceway.

E. Planting

1. Planting of indigenous plants and grasses in combination with bio-degradable wood fiber mats will be implemented on the existing slopes to reduce erosion and improve habitat value. Understory planting will be enhanced and indigenous shade trees will be added to further stabilize the slope.

F. Interpretive Overlooks

1. Interpretive overlooks connected to the cultural trail (limestone educational pathway) will provide access to the edge of the bank to educate visitors on the role of the historic raceway. A painted steel guard rail will feature interpretive signage. The current flagstone and cut stone edge proposed at the cultural trail and overlooks is comprised of a limestone from Florence, TX, as it is more durable than other native limestones found in the Hill Country when used as an exterior paving surface. However, natural clefting in this stone may render the pathway inaccessible, so the design team is proposing a secondary option to be determined at the time of mock-ups using an Oklahoma tan sandstone. While this is a non-native stone to Texas, it will provide long-term durability and accessibility. For the face of the overlook wall, the team is proposing a fossilized river rectilinear cut limestone to symbolize the ecological history of the river. This stone will be replicated on other vertical wall surfaces at the other cultural trail overlooks, ADA ramp wall, and Spirit Reach trail walls at the Lily Pond.

2. Structural

A. Scope

1. Pedestrian Bridge Foundation Design

B. Strategy

1. Lundy & Franke Engineering will provide the foundation design based on ASCE 7-16 Design loading, as utilized by pre-fabricated bridge designer.

2. Foundation design is expected to be drilled concrete pier footings founded in competent soils at a depth based on geotechnical report(pending) and pre-fabricated bridge engineer's design bearing and lateral loads as well as Hydraulic Engineer's lateral and flow pressures. Concrete piers may be straight shaft or belled based on pending geotechnical report.

3. Drilled concrete piers will support a foundational concrete abutment to receive the bridge members.

4. Piers may potentially support a vertical earth retaining wall based on final grades of raceway.

5. Intent is for abutments and piers to be as visually unobtrusive as possible within the raceway.

3. Civil

A. Scope

1. Demolition of selected contemporary retaining walls.
2. Remove/salvage sloped stone apron.
3. Demolish picnic pads.
4. Demolish roadway and drainage structures.
5. Remove trees to be replanted, clear out understory.
6. Demolish aerial sanitary sewer line and protect stone columns.
7. Re-establish a uniform raceway bottom and side slopes to new grades.
8. Place clay liner in raceway bottom and erosion matting on side slopes.
9. Install new aerial sanitary sewer line to new grades on top of new concrete piers/columns just behind existing stone columns with new saddle and tie-down straps.
10. Install new sewer line and manholes.
11. Move SAWS 20" water main blow-off box to just outside new sidewalk.
12. Replace existing water service lines to bathrooms and pump house.
13. The civil team is investigating an alternative strategy for the sanitary sewer system crossing the Raceway by gravity below the Raceway to a single lift station, however it is the Parks Department's preference not to include the lift station due to the smell, maintenance, and noise involved with a typical lift station. Due to the need to increase the slope of the existing pipe crossing the raceway, the civil engineers have proposed to remove the pipe from the historic donkey bridge piers and provide a new pipe in-line with the piers to achieve the needed slope without damaging the historic structure. The civil team will continue to investigate options for a lift station that limits the need to cross the raceway but does not cause the maintenance and sensory concerns of traditional systems as they work towards the 100% CD submission, but are proposing the relocation of the pipe as the best option based on all of the information available.

4. Hydrology

A. Scope

1. Pump design for required rewatering the historic Raceway.
2. Rewatering stormwater system layout.
3. Hydrologic analysis of losses.
4. Cross-section analysis.

B. Strategy

1. Pump(s) will be designed to allow sufficient water to flow through the historic raceway to mimic the original purpose of the raceway.
2. Rewatering circulation scheme will split flows being pumped to three separate locations: Lily Pond, Raceway and San Antonio River.
3. Water being pumped from the San Antonio River will be a max of 1-CFS which is the current SAWS permitted amount.
4. Flow Control valves will be programmed to operate on a timer. During the Park open hours the outfall to the Raceway will turn on and the outfall to the San Antonio River near the Witte will be turned off. During Park closed hours the outfall to the Raceway will be turned off and the outfall to the San Antonio river near the Witte will be turned on.
5. Parks and Rec department to coordinate with SAWS on actual operating hours.
6. Flow control valves will also control flows so that the 1-cfs being pumped is split to always allow 0.50-cfs to outfall into the Lily Pond and 0.50-cfs to the raceway during Park open hours or 0.50-cfs to the San Antonio River during Park closed hours.
7. The intent of the re-watering is to maintain the visual aesthetic of water running through the raceway as it did in its original inception.
8. A series of small weirs were designed to be installed within the Raceway to maintain a water surface elevation of at least 6” deep throughout the entirety of the Raceway. The proposed weirs will also include emergency slit openings that can be manually opened to allow the raceway to be fully drained if necessary.

9. Flow being pumped to the Lily Pond and Acequia will ultimately discharge back into the Raceway before discharging back into the San Antonio River.

10. Cross-section analysis shows that approximately 0.50-cfs would be sufficient to maintain a water surface elevation of approx. 0.5ft

11. Layout of pressurized storm pipe was designed to avoid existing trees, structures and historic walls. This may require an update to proposed tree planting between the acequia and raceway.

5. Electrical

A. Scope

1. Electrical Utility Upgrades.

2. Electrical Lighting and convenience power.

B. Strategy

1. All existing electrical utility overhead cabling, utility power poles, and pole mounted transformers are to be removed. New utility distribution for the parks is to be provided from Hildebrand and installed underground. With CPS Energy coordination, new pad-mounted transformers are to be installed throughout the park to new electrical services racks consisting of new N3R panelboards and lighting controls.

2. Existing pole lights are to be removed. New LED pedestrian poles and bollards (3000K) are to be provided along the new walkway path. New securable GFCI 120V L5-20R weather-rated receptacles will be provided throughout the park and integral at several light poles.

UPPER LABOR ACEQUIA (1776 / WPA ERA OR LATER)

The Upper Labor Acequia was built as an earthen ditch during the Spanish Colonial period. It served alongside the Upper Labor Dam to divert water from the West stream of the San Antonio River for drinking water and agricultural use through the intersection of desagues. The stone walls lining the acequia today are assumed to have been constructed in the 1930s by the Works Projects Administration (WPA).

The condition of the Acequia wall varies in states of degradation. Some portions are affected by existing trees, while others are failing due to erosive and gravitational forces. Recent archeological excavations of the walls revealed that the walls are a wythe of stacked limestone with a single

course of stone or cement cap lining the top of the structure, with no footing or steel reinforcement. Additional archeological excavations sought to find a historic bottom of the Spanish Colonial Acequia. Based on four excavation pits, the archeology team concluded that the excavation of the existing grade 19.69 inches below surface posed a negligible risk, 27.56 inches below surface posed a low risk, and 39.37 inches below existing surface posed a high risk of excavating past the original Spanish Colonial elevation.

Currently, the acequia flows backwards from its original direction. In a modern renovation, the acequia was filled with soil to change the elevations to flow towards the Lily Pond. Water is artificially pumped from the San Antonio River at Lambert Beach to an inlet near the San Antonio Zoo, and fills the Upper Labor Lily Pond. The rehabilitation project scope includes stabilizing the WPA walls, dredging the modern fill, and introducing a water source at the Lily Pond in order to restore the original flow direction within the acequia.

Recent excavation of the roadway crossing the Acequia near the San Antonio Zoo revealed a historic stone pedestrian bridge (believed to be from the 1800s), a series of low historic walls (unknown age and use at this time), a paleolithic stone hearth feature, a wood post in association with the historic bridge, and several pipes leading in various directions. The work for this area includes the rehabilitation of the historic pedestrian bridge but leaves the other artifacts protected in-situ.

1. Landscape Architecture

    A. Scope

        1. Acequia Regrading.

        2. Acequia Liner.

        3. Interpretive Overlooks.

        4. Historic Pedestrian Bridge Rehabilitation.

        5. New Pedestrian Bridge Crossing.

    B. Strategy

        1. The design team has studied the grading within the acequia. In order to avoid excavation past the historic bottom, the Acequia will to be graded with a minimal slope over the whole system and would be less than 1%. In order to convey water over the length of the acequia, the Lily Pond water surface elevation must be raised to 670 (2 ½ inches). Water will surface flow to a short weir under Brackenridge Way. Due to the Acequia's relatively flat grading, a wet well will pump water to a higher elevation on the other side of the weir, 671.5, in order to sheet flow to the end of the system. The weir will be built of a distinguishable limestone material that compliments the character of the acequia. The pipe for the wet well will

enter the acequia at an existing opening at the bottom of the channel, and the remaining portions of the opening will be infilled with salvage stone to match the historic structure and historically compatible mortar in accordance with the Secretary of the Interior's Standards for Rehabilitation.

2. A liner is proposed in the Acequia to prevent significant loss of recycled water as it travels through the system, as well as to prevent erosion in the channel. Stone cobbles are proposed in all three solutions but the size and feasibility must be determined with Hydrology studies. The liner will be composed of a bentonite clay sealant with cobble stone overlay similar to the detail within the Raceway.

C. Similar to the Raceway, the overlook at the Acequia will be integrated into the flagstone cultural trail, and will include interpretive signage.

D. The historic pedestrian bridge will be revealed through the removal of the asphalt roadway and concrete culvert sitting atop the historic structures. The back side facing the Zoo will be excavated to the top of the stone arches to interpret the bridge's span over the original acequia. Due to the varied and rough condition of the surface, new flagstone will adhere to a thick mortar bed to create an even walking surface for pedestrians. A slip sheet is proposed between the mortar bed and existing structure to ensure that the rehabilitation work is reversable per the SOI Standards for Rehabilitation. Since one of the historic wooden posts was found in the excavation and post holes are evident within the structure, the rehabilitation proposes new peeled cedar posts. These posts will be mounted to a plate on top of the historic structure and concealed under the new stone paving. This rail will serve as a guard rail to prevent a fall into the adjacent acequia which will be deepened from its existing condition. Due to the presence of historic walls adjacent to the structure, a special section of flagstone paving is adhered to a Glass Reinforced Concrete Base (GRFC) in order to reduce the depth of the paving section, and is set on a slip sheet over the historic structures to protect them in-situ. Underneath the bridge, the 18" cast iron inlet pipe for the acequia re-watering system will be hidden underneath the opening of the bridge in order to interpret the appearance that the water continues beyond towards the zoo. This pipe will have a cast iron decorative drain cover in case that it will be visible from the surface. The inlet pipe also has a 6" cross opening to allow the acequia to drain below the water surface elevation in the event that the pumps fail or maintenance needs to be performed to clean debris within the channel following large storm events.

E. A new pedestrian bridge will cross the Acequia in an interpretive alignment of the historic donkey bridge opposite of the historic bridge featured within archival maps. This bridge will mimic the handrail design, colors, and style of the Pump House pedestrian bridge, but will be more structurally simple due to the short span. The design of this bridge will not impact the walls of the acequia below, and will be held at the highest bank elevations on either side. Structural abutments

will be hidden within the grade. The bridge will be painted a soft black to match the character of historic St Mary's bridge and other dark metals found on-site.

2. Hydrology

A. Scope

1. Pump design for rewatering for the acequia.
2. Rewatering layout.
3. Hydrologic analysis of losses.
4. Cross-section analysis.

B. Strategy

1. Pump(s) will be designed to allow sufficient water to flow through the historic raceway to mimic the original purpose of the raceway.
2. Rewatering circulation scheme will split flows being pumped to three separate locations: Lily Pond, Raceway and San Antonio River.
3. Water being pumped from the San Antonio River will be a max of 1-CFS which is the current SAWS permitted amount.
4. Flow Control valves will be programmed to operate on a timer. During the Park open hours the outfall to the Raceway will turn on and the outfall to the San Antonio River near the Witte will be turned off. During Park closed hours the outfall to the Raceway will be turned off and the outfall to the San Antonio river near the Witte will be turned on.
5. Parks and Rec department to coordinate with SAWS on actual operating hours.
6. Flow control valves will also control flows so that the 1-cfs being pumped is split to always allow 0.50-cfs to outfall into the Lily Pond and 0.50-cfs to the raceway during Park open hours or 0.50-cfs to the San Antonio River during Park closed hours.
7. The intent of the rewatering is to maintain the visual aesthetic of water running through the Lily Pond as it did in its original inception.
8. Cross-section analysis shows that 0.50-cfs will be sufficient to maintain appropriate water surface elevation within the Lily Pond.

9. Due to existing grades and limited excavation allowed in the Acequia, Water from the Lily Pond will be pumped to a higher elevation within the Acequia to allow for water to flow within the acequia from the Lily Pond to towards the San Antonio Zoo. The pump is proposed to be installed approximately where the Lily Pond connects with the Acequia near the Brackenridge Rd Bridge Crossing.

10. A grate inlet is proposed approximately 600' downstream from the Lily Pond which will control the WSE within the Acequia. Excess water will be captured and conveyed by storm pipe into the raceway before discharging back into the San Antonio River. Two options were explored for the grate inlet outfall.

    a. Option 1 – Grate inlet structure to placed adjacent to the acequia wall to minimize disturbance within the acequia.
    b. Option 2 – Grate inlet structure to place underneath the existing bridge further into the acequia to be more concealed.

11. Based on previous discussions with the THC, the alignment that places the proposed grate inlet structure beneath the bridge—minimizing visual impact—was selected as the preferred option.

3. Structural

A. Scope

1. Provide rehabilitated wall stabilization for single layer stone wall liner of acequia.

2. Pedestrian bridge foundation.

3. Stabilization of Rehabilitated 1800s Pedestrian Bridge.

B. Strategy

1. Goal is to provide existing stone wall a stabilized foundation and backer wall utilizing cast-in-place reinforced concrete, anchors, and bonding agent. Backer/shadow walls will be L shaped/property line type retaining walls with keyways to prevent wall sliding.

2. Stone will be repointed/grouted as necessary with historically appropriate mortar and anchored to the wall at stones larger than a set size. Bonding agent will adhere wall to existing wall for all other sized stone.

3. In areas where stone is missing, salvage stone matching the historic limestone and finish will be used with historically appropriate mortar mixture in concurrence with the SOI Standards for Rehabilitation.

4. Shoring for rehabilitation of existing wall will be required. Regrading behind shadow wall will be required by civil/landscape.

5. LFE will provide the foundation design for the new pedestrian bridge based on ASCE 7-16 Design loading, as utilized by pre-fabricated bridge designer.

6. Pedestrian bridge foundation design is expected to be drilled concrete pier footings founded in competent soils at a depth based on geotechnical report(pending) and pre-fabricated bridge engineer's design bearing and lateral loads.

7. Based on current information, the 1800s historic pedestrian bridge will require minimal stabilization work other than repointing, but may need additional stabilization measures included in the final documentation set upon further study.

8. North and South ends of the pedestrian bridge will require stabilization of the end spans of the bridge to fill in void areas that have deteriorated. This will require rebuilding of end supports utilizing matching/salvaged stone and historical mortar while avoiding existing buried historical walls.

9. Historical pedestrian bridge to have non-historical concrete waffle slab paving to be removed and exposed surface to be cleaned to receive new mortar bed and flagstone.

4. Civil

A. Scope

1. Remove silt from acequia.

2. Remove trees to be replanted, clear out understory.

3. Demolish asphalt parking lot and roadway.

4. Demolish picnic pads.

5. Demolish sanitary, water, and conduits crossing acequia.

6. Re-establish a uniform acequia bottom and side slopes to new grades.

7. Place clay liner in raceway bottom and erosion matting on side slopes.

8. Install new sewer line and manholes.

9. Install new aerial sewer line crossing acequia in existing alignment.

10. The civil team is investigating an alternative strategy for the sanitary sewer system crossing the Acequia by force main line below the Acequia to a gravity manhole into SAWS sewer system, however this option can only be proposed if a lift station (as mentioned in the narrative regarding the raceway) could be implemented without traditional drawbacks to the system, and if the THC consider it suitable to run the pipe below the historic acequia bottom elevation to the other side. Based on the unknowns of this criteria at the time, the design team is proposing to keep the existing pipe in its original alignment crossing the acequia.

5. Electrical

A. Scope

1. Electrical Utility Upgrades.

2. Electrical Lighting and convenience power.

B. Strategy

1. All existing electrical utility overhead cabling, utility power poles, and pole mounted transformers are to be removed. New utility distribution for the parks is to be provided from Hildebrand and installed underground. With CPS Energy coordination, new pad-mounted transformers are to be installed throughout the park to new electrical services racks consisting of new N3R panelboards and lighting controls.

2. Existing pole lights are to be removed. New LED pedestrian poles and bollards (3000K) are to be provided along the new walkway path. New securable GFCI 120V L5-20R weather-rated receptacles will be provided throughout the park and integral at several light poles.

UPPER LABOR LILY POND (1776 / 19TH CENTURY / WPA ERA)

The Upper Labor Lily Pond is a remnant of the West branch of the San Antonio River that remains dry today. When the branch of the river still flowed through the site, the Upper Labor Dam diverted water into the Acequia. During the 19th Century, a stone wall (F2) (refer to Upper Labor Archeological Report, Mackenzie 2017 for wall labels) was added to retain the banks of the river/pond edge and were assumed in recent archeology studies to have been built during the 19th Century Dam renovations. Another wall connecting the edge of the Acequia and the Dam (F5 wall) appears from

another study to have been part of this same system. During the WPA period, the currently operational (F1) Lily Pond Walls were built further into the pond to stabilize the grade.

The existing Lily Pond was previously filled with recycled water that was pumped counter to the historic acequia flow direction towards and into the Lily Pond. Due to a lack of liner or steady flow from the wetland North of Hildebrand Ave., the pond had experienced significant water loss. A 30" concrete outflow pipe crossing through the Upper Labor Dam had diverted excess water into the San Antonio River. Stormwater outflow from the Olmos Dam had occasionally inundate the Lily Pond during significant storm events. Due to recent pump failures and a water main break, the Acequia and Lily Pond have been disconnected from the previous greywater circulating system and are currently dry.

The scope of this project includes stabilizing the WPA era walls, introducing a liner to prevent water loss, raising the normal water surface elevation to reverse the flow of water in the historic direction, and aerating the pond. Additionally, the project will include an interpretive overlook and a hike-and-bike trail connection to the future San Antonio Spirit Reach. The Spirit Reach elevated pedestrian bridge is not within the project scope, but will start at the end of the concrete walkway and extend under Hildebrand to a landing at the UIW campus.

The (F5) wall and (F4) Acequia head gate assessed within the recent UTSA College of Archelogical Research report will be left protected/buried in-situ within the project scope due to their complexity and instability.

1. Landscape Architecture

    A. Scope

        1. Lily Pond Liner
        2. Aquatic Shelf and Native Planting.
        3. Interpretive Overlook
        4. Spirit Reach connection

    B. Strategy

        1. A liner is proposed in the Lily Pond to prevent water loss and to maintain a consistent water elevation. The grade of the Lily Pond static water surface elevation must be raised from 669.79 to 670 in order for the Lily Pond to flow into the Acequia. The pond will be excavated deeper to allow better aeration. Two diffused aerators will be installed to prevent water stagnation and algae growth. The cabinet for this feature will be hidden along the backside of the Brackenridge Way bridge underneath the Faux Bois Bridge in order to conceal from the historic viewshed, along with the controllers for the Acequia wet well pump. The wet well will be submerged underground to reduce the concrete profile, and the aboveground vent feature will be painted to minimize its appearance within the landscape and historic viewshed. The pond liner will comprise

of a bentonite clay sealant and compressed soil. Around the outer edges, a wetland shelf contains a foot of soil to allow a space for aquatic planting species to grow. The water inlet pipe will be located below the height of the wetland shelf to protect the plant material from the forces of the water coming out of the pipe. This pipe will have a mitered end similar to the pipe at the North end of the raceway, and will have some stone armoring to protect the clay liner from erosive forces. Two aerators will be provided within the pond to prevent the water from stagnating. A remote manifold box will be buried adjacent to the pond and will connect the electrical line to a raised cabinet hidden behind the wall below the Faux Bois bridge.

2. Native plant species in the lily pond area will reduce erosion and provide habitat value. The wetland shelf will be limited to areas away from the Dam and other historic features to maximize viewsheds and reduce chances of overgrowth.

3. The limestone interpretive overlook will provide seating opportunities as well as a guard rail and interpretive signage. The location of the overlook was carefully selected to avoid the historic (F2) walls.

4. The hike and bike trail is a concrete path that connects to the San Antonio Spirit Reach. The path weaves between the Lily Pond (F1) wall and remnant portions of the (F2) wall in order to transverse the steep slope. A short retaining wall retains the grade on the West side of the trail, and the east side will be elevated with a stone clad wall to match. Some fill is required in the lower grades to avoid the historic blaze tree and adjacent heritage tree root protection zones, as well as provide a 3:1 slope for maintenance safety around the Lily Pond. The San Antonio Spirit Reach project will connect an elevated structure to the terminus of the concrete trail. A portion of guard rail matching those at the overlooks is required to maintain safety from a potential fall adjacent to the historic F1 pond walls.

2. Hydrology

A. Scope

1. Pump design for rewatering of Lily pond.

2. Hydrologic analysis of losses.

3. Cross-section analysis.

B. Strategy

1. Pump(s) will be designed to allow sufficient water to flow through the historic raceway to mimic the original purpose of the raceway.

2. Rewatering circulation scheme will split flows being pumped to three separate locations: Lily Pond, Raceway and San Antonio River.

3. Water being pumped from the San Antonio River will be a max of 1-CFS which is the current SAWS permitted amount.

4. Flow Control valves will be programmed to operate on a timer. During the Park open hours the outfall to the Raceway will turn on and the outfall to the San Antonio River near the Witte will be turned off. During Park closed hours the outfall to the Raceway will be turned off and the outfall to the San Antonio river near the Witte will be turned on.

5. Parks and Rec department to coordinate with SAWS on actual operating hours.

6. Flow control valves will also control flows so that the 1-cfs being pumped is split to always allow 0.50-cfs to outfall into the Lily Pond and 0.50-cfs to the raceway during Park open hours or 0.50-cfs to the San Antonio River during Park closed hours.

7. The intent of the rewatering is to maintain the visual aesthetic of water running through the Lily Pond as it did in its original inception.

8. Cross-section analysis shows that 0.50-cfs will be sufficient to maintain appropriate water surface elevation within the Lily Pond.

9. Due to existing grades and limited excavation allowed in the Acequia, Water from the Lily Pond will be pumped to a higher elevation within the Acequia to allow for water to flow within the acequia from the Lily Pond to towards the San Antonio Zoo. The pump is proposed to be installed approximately where the Lily Pond connects with the Acequia near the Brackenridge Rd Bridge Crossing.

10. A grate inlet is proposed approximately 600' downstream from the Lily Pond which will control the WSE within the Acequia. Excess water will be captured and conveyed by storm pipe into the raceway before discharging back into the San Antonio River.

3. Structural

A. Scope

1. Stabilize existing WPA Era Lily Pond Walls at East and West sides of Lily Pond and at transition between Lily Pond and Historic Acequia.

2. Rehabilitate/stabilize 19th century wall.

3. Preserve Acequia Headgate.

B. Strategy

1. Stabilize and rehabilitate to plumb existing walls utilizing multiple methods of shadow backer wall including pier and wall, L shaped retention wall, or pier and beam.

i. Stabilization is limited by existing subsurface historical walls, especially on East wall, that are to remain undisturbed. Soldier pile type shoring will be required to access the subgrade to place new backer walls so as to avoid disturbing the existing historical walls at subsurface conditions near the wall limits.
ii. Consultation with previous archeological reports will be required.

4. Civil

A. Scope

1. Relocate water main around pond.

2. Demolish and abandon existing water main.

3. Demolish selective retaining walls.

4. Demolish picnic pads.

5. Excavate pond to new grades.

6. Place clay liner in pond bottom and erosion matting on side slopes.

UPPER LABOR DAM

The Upper Labor Dam was built as a rock rubble dam in 1776 to divert water from the West branch of the San Antonio River into the Acequia. This Spanish Colonial Dam was labored by Indigenous Peoples. In the 19th Century, the dam was raised to increase the flow of water through the acequia with addition of limestone ashlar blocks that were cut with exceptional precision by German immigrant laborers.

Today, the Upper Labor Dam is covered by soil and is embedded into the bank of the river. Large gaps span the dam, and were the result of tree root damage, utility puncture, and likely intentional destruction to lower certain segments.

The original scope of the project entailed uncovering both Spanish Colonial and 18th Century portions of the Dam, but due to instability, proximity of other historically significant walls, and

river bank grading concerns, the design team has proposed stabilizing and uncovering the 19th century portion of dam only. Due to the large gaps in the dam and grading constraints, a smaller portion of the longitudinal length of the dam will be uncovered and rehabilitated, while the southern half will remain buried entirely.

1. Landscape Architecture

    A. Scope

        1. Regrade to uncover 19th Century Dam

    B. Strategy

        1. The bank between the Lily Pond and river will be regraded to uncover a portion of the 19th century dam. The Eastern side of the bank will continue to cover the back of the dam, exposing only the Lily Pond facing side and top of the ashlar blocks. The sides will be graded to transition flush to grade, giving some additional protection on the sides of the dam.

        2. Stones used in the rehabilitation of the dam will come from a historic stock pile to match the existing stone type to the greatest extent possible. If this is unavailable, modern quarried stone matching closely in color will be used and cut in a similar manner to existing stone. Qualifications for a stone mason familiar in historic treatments and extensive experience in other similar rehabilitation work will be required in the specifications, along with all other historic features within the site rehabilitation.

        3. Grading improvements and limestone cobble will separate the dam from the edge of the pond to keep the dam from touching the water elevation, and provide a view to the dam free of vegetation overgrowth. Lights will be mounted on a multi-fixture pole near the edge of the existing tree line in order to highlight the dam at night.

        4. Interpretive signage at the Lily Pond overlook guard rail will explain the history of the dam, celebrate the cultures that built it, and the water system's evolution over time while acknowledging difficult histories.

2. Structural

    A. Scope

        1. Provide options for selection to preserve, at minimum, and stabilize the existing dam and potentially expose portions of the dam.

    B. Strategy

1. Due to significant hydraulic forces from the upstream Olmos Dam, constricted Hildebrand Ave. opening, the Broadway / Hildebrand stormwater outfall, and location 6'-7' below the 100-year floodplain elevation, the environmental conditions surrounding the Dam differ greatly from its original setting. Due to climate change, aquifer depletion, stormwater engineering, and upland development, the dam's original relationship to a steady-flowing and abundant river has evolved to a typically dry condition that is inundated by severe rapid flood events. It is likely that any version of the options provided below will be damaged to varying extents under any flooding event that submerges the proposed exposed dam. The structural team explored five options presented to the THC at the 60% submission to stabilize the Upper Labor Dam:

OPTION 01 – Leave Upper Labor Dam Buried ***NOT SELECTED***
In this option, no structural intervention would be necessary. However, this would lead to a loss of opportunity to expose, rehabilitate, and interpret one of the City's most important cultural resources as well as fail to meet client expectations, reduce scope of a Bond Project approved by voters, and lose obtained funding to complete this project scope.

OPTION 02 – Historic Interpretive Dam ***NOT SELECTED***
This scheme would involve leaving the Upper Labor Dam buried as mentioned in Option 01, but reconstruct a replica of the Upper Labor Dam near the cultural resource. The imitation/ interpretative feature would require structural design details. The location of historical interpretation/imitation construction would be located offset from actual dam location so as to not intrude on existing dam footprint. A new wall would require hydrology analysis from hydraulic engineer for structural design. While this option provides an opportunity to interpret the dam, it fails to meet the City of San Antonio's expectations for this feature and may be difficult to interpret in context. The interpretive feature will disconnect the Dam's relationship to the Lily Pond in the historic viewshed.

OPTION 03 – Stabilize 19th Century Dam with Historic Mortar and Bounding Gravity Walls with Backing Slab ***SELECTED BY THC 06/04/2025***
Stabilization of historic dam with historic grade mortar would require a disassembly of the historic 19th Century Portion of the Upper Labor Dam to repoint/re-mortar the existing wall with historic mason-applied construction techniques in congruence with the SOI Standards for Rehabilitation. This method is structurally limited in its nature. The repointing will not be reversible within its construction. The chances of loss of the cultural resource in a severe flood event is highly likely. Length of the dam wall would be bound by two concrete gravity walls and a concrete cast-in-place backing slab buried below existing/new grading as designed by landscape and civil engineers. Backing slab will help mitigate sliding forces in one direction during some flooding events. It is recommended

that a hydrologic and structural analysis with finalized modeling be conducted by a licensed professional that has experience in the field of hydraulics and floodplain analysis with emphasis on structures. This will allow for a more informed view of how the exposed structure may react in all flooding situations in a multidirectional situation.

Rehabilitation of any form in the options provided does not guarantee that the historic structure will withstand any and all flooding events. The historic structure was not designed to meet any current standard and cannot be retrofitted to do so.

ADD ALTERNATE 01 – ELECTRIC PUMP STATION #3

The Electric Pump Station #3 was an ancillary structure built to pump water to an elevated storage tower. The existing structure contains a well within the floor that is encapsulated by a metal covering. Electrical panels and fans are mounted within the inside walls. The project proposes a historic rehabilitation of the Electric Pump House #3, adapting its use from a currently vacant and unutilized park building to a storage building to support park operations while retaining the building's historic character.

1. Architecture

    A. Scope

        1. Selective demolition of non-historic, low-sloped roof system and replacement with new low-sloped roof system. A torch-applied modified bitumen roofing system is proposed in the 60% CD Package. (Refer to Specification Section 075216 – Torch-applied Modified Bitumen Roofing for more information).

        2. Clean and reattach historic terracotta clay roof tiles at parapet caps. Replace any damaged tiles with new or salvaged tiles to match existing. (Refer to Specification Section 073213 – Clay Tile Roofing for more information).

        3. Rehabilitate historic limestone masonry through gentlest possible cleaning methods, repair damaged masonry units with in-kind materials, and repoint with traditional lime mortar. (Refer to Specification Section 040310 – Historic Stone Masonry Cleaning, Specification Section 040342 – Historic Stone Masonry Repair and Repointing, and Specification Section 040515 – Preparing Lime Mortar for Historic Masonry for more information).

        4. Rehabilitate historic metal casement windows and door. Reglaze with new, clear glass and traditional glazing putty materials. Door hardware may require replacement or modification to accommodate life safety

and code requirements. Refer to Specification Section 080351 – Historic Treatment of Steel Windows for more information).

5. Repaint rehabilitated historic and new materials and finishes with an historically appropriate color scheme. (Refer to Specification Section 090391 – Historic Treatment of Plain Painting for more information).

B. Strategy

1. General Strategy: The recommendations and methods for rehabilitating the Pump House are guided by the SOI Standards for Rehabilitation, NPS Technical Preservation Briefs, and nearly thirty-five years of practice by the Historic Preservation Architect, Seventh Generation Design, Inc. A draft of the preservation specifications is included in the 60% Construction Documents Package.

2. Structural

A. Scope

1. Repair and infill concrete slab and pump voids.

2. Replace existing roof structure.

3. Repair deficient structure on a case-by-case basis.

4. Provide structural adjustments for renovation as needed.

B. Strategy

1. Removal of deteriorated slab and replacement with new concrete doweled to existing perimeter footings. Infilling where abandoned pumps are located and capping with concrete.

2. Repair the entire roof deck and replace all 2x structural framing supporting roof utilizing materials to mimic original construction with slight modificaitons. Existing materials too deteriorated to be reused.

3. Provided needed structural supports, adjustments etc. based on architectural renovation and new building purpose including trenching and structure adjustment.

- **MEP**
  1. Scope
     1. Power and Lighting

  2. Approach

1. All existing electrical equipment will be removed. All conduit and wiring will be removed back to source.

2. Existing lighting will be removed and replaced with new LED utility linear lighting.

3. Lighting controls and scheme will be replaced with new.

ADD ALTERNATE 02 – HISTORIC RESTROOM PAVILION A (HISTORICALLY THE MEN'S-ONLY RESTROOM)

This bathroom structure was built around 1936 and historically served men. It is now used for storage and has not been operable for many years. The project proposes a historic rehabilitation of Restroom Pavilion A, retaining its current function as a public restroom facility while retaining the building's historic character. Similar to Pavilion B, this restroom structure will be rehabilitated to serve both men and women.

1. Architecture

    A. Scope

        1. Removal and stockpiling of historic terracotta clay roof tiles for cleaning and re-roofing. Assume 20% breakage, requiring in-kind replacement tiles (either new or salvaged). Demolish and replace deteriorated wood roof sheathing and beadboard soffits, assuming 100% replacement with new in-kind materials. Reroof structure with salvaged and replacement roof tiles with new underlayment, sheathing, waterproofing membrane, flashings, and roof accessories. (Refer to Specification Section 073213 – Clay Tile Roofing for more information).

        2. Rehabilitate historic limestone masonry through gentlest possible cleaning methods, repairing damaged masonry units with like materials, and repointing with traditional lime mortar. (Refer to Specification Section 040310 – Historic Stone Masonry Cleaning, Specification Section 040342 – Historic Stone Masonry Repair and Repointing, and Specification Section 040515 – Preparing Lime Mortar for Historic Masonry for more information).

        3. Rehabilitate historic exterior wood features such as rafter tails, fascia boards, and trim boards. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information).

        4. Rehabilitate historic interior wood features such as trim boards, roof trusses, and other wood elements. Where required, wood consolidants

and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information0>

5. Refurbish hardware on existing metal gates, if required, to comply with life safety and accessibility requirements.

6. Optional: Reconstruct missing wood window screens with brass or stainless-steel screen material and mounting hardware to match existing screens at Restroom Pavilion B.

7. Repaint rehabilitated historic and new materials and finishes with an historically appropriate color scheme. (Refer to Specification Section 090391 – Historic Treatment of Plain Painting for more information).

8. Demolish non-historic restroom finishes and fixtures.

9. Finish out restroom interiors with new tile, plumbing fixtures, decorative light fixtures, and toilet accessories.

B. Strategy

1. General Strategy: The recommendations and methods for rehabilitating the Pump House are guided by the Secretary of the Interior's Standards for Rehabilitation, NPS Technical Preservation Briefs, and nearly thirty-five years of practice by the Historic Preservation Architect, Seventh Generation Design, Inc. A draft of the preservation specifications is included in the 60% Construction Documents Package.

2. Structural

A. Scope

1. Preserve perimeter concrete beam and remove and replace deteriorated interior concrete slab.

2. Repair roof framing as needed.

3. Provide needed structural adjustments for renovation.

B. Strategy

1. Goal is to repair entire interior slab and replace with new fill and structural concrete slab doweled into existing perimeter footings.

2. Roof deck and roof framing members to be repaired as necessary with matching materials if possible.

3. Provided needed structural supports, adjustments etc. based on architectural renovation and new building purpose including trenching and structure adjustment.

3. MEP

A. Scope

1. Power and Lighting.

2. Update domestic and sanitary plumbing.

B. Strategy

1. Existing lighting will be removed. New LED Lighting will be provided for the new restroom layout.

2. Lighting control scheme will consist of a time clock and photocell input, with an override key switch.

3. New 208V/3-Phase power from the site will be provided to the pavilion. A new 100A panel will be provided and located within the plumbing chase, rated as NEMA 3R.

4. New 120V/20A power will be provided for the Heat Trace of plumbing piping.

5. New 120V power will be provided for the new electric water heaters.

6. Existing receptacle devices will be removed. New GFCI receptacles will be provided in the building.

7. All existing conduit and wiring within the building will be removed. All new conduits shall be RGC type with THHN insulated wiring.

8. All plumbing fixtures and piping will be removed. Plumbing piping will be removed to the point of building entry.

9. New porcelain type, high efficiency plumbing fixtures will be installed. Concealed push button type flush valves will be installed for toilets and urinals.

10. A new copper domestic water piping system will be installed.

11. A new tank type electric water heater mounted above the mop sink shall serve the lavatories and mop sink with a hot water loop with return line and re-circ pump.

12. Heat tracing shall be provided on all domestic hot & cold water piping and wrapped with insulation above floor.

13. Cast iron sanitary waste and vent piping will be installed above floor and PVC piping will be installed below floor.

14. Non-freeze, anti-siphon, integral backflow preventer, automatic draining, 3/4" wall hydrants in box with door and loose key will be provided for maintenance.

15. Water hammer arrestors will be provided on water lines connected to flush valves and groups of plumbing fixtures.

ADD ALTERNATE 03 – HISTORIC RESTROOM PAVILION B (HISTORICALLY THE WOMEN'S-ONLY RESTROOM)

This bathroom structure was built around 1936 and historically served women. It has been previously remolded to serve both men and women. Due to settling grade and sanitary sewer line issues, this restroom no longer operates properly. The project proposes a historic rehabilitation of Restroom Pavilion A, retaining its current function as a public restroom facility while retaining the building's historic character. Similar to Pavilion B, this restroom structure will be rehabilitated to serve both men and women.

1. Architecture

    A. Scope

        1. Remove and reroof non-historic asphalt shingle roofing system:

            OPTION 1 - Remove and reroof non-historic asphalt shingle roofing system with a new asphalt shingle roofing system. Assume 20% roof sheathing replacement.

OPTION 2 - Reroof structure to match Restroom Pavilion A with new and/or salvaged tiles with new underlayment, sheathing, waterproofing membrane, flashings, and roof accessories. This is the preferred option of the Owner and the Consultant Team because it provides a high-quality, low-maintenance roof which safeguards the long-term health of the structure and recalls the historic character of the building's Rustic Spanish Colonial Revival Style and original tile roof. (Refer to Specification Section 073213 – Clay Tile Roofing for more information).

2. Rehabilitate historic limestone masonry through gentlest possible cleaning methods, repairing damaged masonry units with like materials, and repointing with traditional lime mortar. (Refer to Specification Section 040310 – Historic Stone Masonry Cleaning, Specification Section 040342 – Historic Stone Masonry Repair and Repointing, and Specification Section 040515 – Preparing Lime Mortar for Historic Masonry for more information).

3. Rehabilitate historic exterior wood features such as rafter tails, fascia boards, and trim boards. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information).

4. Rehabilitate historic interior wood features such as trim boards, roof trusses, and other wood elements. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood features will be replicated using in-kind materials, dimensions, and profiles. (Refer to Specification Section 060312 - Historic Wood Repair for more information).

5. Refurbish hardware on existing metal gates, if required, to comply with life safety and accessibility requirements.

6. Rehabilitate historic wood windows. Where required, wood consolidants and epoxy patch repairs will be performed prior to priming and repainting. Highly deteriorated or missing wood window elements will be replicated using in-kind materials, dimensions, and profiles. Reglaze with new, clear glass and traditional glazing putty materials. (Refer to Specification Section 080352 – Historic Treatment of Wood Windows for more information).

7. Optional: Reconstruct missing or damaged wood window screens with brass or stainless-steel screen material and mounting hardware. (Refer to Specification Section 080352 – Historic Treatment of Wood Windows for more information).

8. Repaint rehabilitated historic and new materials and finishes with an historically appropriate color scheme. (Refer to Specification Section 090391 – Historic Treatment of Plain Painting for more information).

9. Demolish non-historic restroom finishes and fixtures.

10. Finish out restroom interiors with new tile, plumbing fixtures, decorative light fixtures, and toilet accessories. (Refer to Architectural Drawings and Specifications for more information.)

B. Strategy

1. General Strategy: The recommendations and methods for rehabilitating the Pump House are guided by the Secretary of the Interior's Standards for Rehabilitation, NPS Technical Preservation Briefs, and nearly thirty-five years of practice by the Historic Preservation Architect, Seventh Generation Design, Inc. A draft of the preservation specifications is included in the 60% Construction Documents Package.

2. Structural

A. Scope

1. Replace roof wood decking.

2. Repair, as necessary, damaged roof structure.

3. Provide structural adjustments as needed for renovation.

B. Strategy

1. Replace wood decking with matching material to ensure building sealed and operable.

2. Provided needed structural supports, adjustments etc. based on architectural renovation and new building purpose including trenching and structure adjustment.

3. MEP

A. Strategy

0. Existing lighting will be removed and replaced with new LED Lighting.

1. The lighting control scheme will remain. Control devices will be replaced with new.

2. New 208V/3-Phase power from the site will be provided to the pavilion. The existing panel located in the chase will be replaced with a new 100A, NEMA 3R, panel.

3. New 120V/20A power will be provided for the Heat Trace of plumbing piping.

4. New power will be provided for the new electric water heater.

5. Existing receptacle devices will be removed. New GFCI receptacles will be provided in the building.

6. All existing conduit and wiring within the building will be removed. All new conduits shall be RGC type with THHN insulated wiring.

7. All existing plumbing fixtures and piping will be removed. Plumbing piping will be removed to the point of building entry.

8. New porcelain type, high efficiency fixtures will be installed. Concealed push button type flush valves will be installed for toilets.

9. A new copper domestic water piping system will be provided.

10. New tankless insta-hot type water heaters will serve the lavatories.

11. Heat tracing shall be provided on all domestic hot & cold water piping and wrapped with insulation above floor.

12. Cast iron waste and vent piping will be installed above floor and PVC piping will be installed below floor.

13. Non-freeze, anti-siphon, integral backflow preventer, automatic draining, 3/4" wall hydrants in box with door and loose key will be provided for maintenance.

14. Water hammer arrestors will be provided on water lines connected to flush valves and groups of plumbing fixtures.

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