

**SANTA MONICA MOUNTAINS CONSERVANCY
GRANT APPLICATION**

Project Name: The Los Angeles River Recreation Zone
Ecosystem Feasibility Study

Amount of Request: \$172,000

Applicant Name: Friends of the Los Angeles River

Total Project Cost: \$172,000
Matching Funds:

Applicant Address:
570 W. Avenue 26 #250
Los Angeles, CA 90065

Lat/Long: 34.108818, -118.253068 to
34.094755, -118.236843

Project Address: 2595 Fletcher Dr. to
Metro Access Rd., end
of G2 Parcel

Phone: 323 223-0585

Email: marissa@folar.org

County	Senate District	Assembly District
Los Angeles	27	45

Tax ID:
954171497

Grantee's Authorized Representative:

Name and Title Marissa Christiansen, Executive Director

Phone 323 223-0585

Overhead Allocation Notice:

- Any overhead costs will be identified as a separate line item in the budget and invoices.
- The Conservancy encourages grantees to reduce overhead costs including vehicle and phone expenses.
- The overhead allocation policy has been submitted prior to, or with, the grant application.

Outreach and Advertising Requirement:

- Applicant has read the staff report and board resolution regarding contract policies.
- Applicant has adopted contract policies for the purpose of increasing outreach and advertising to disadvantaged businesses and individuals.

All check boxes must be checked

Brief Project Description: The proposed Study focuses on a stretch of River identified in the ARBOR Plan as the site for 1,000 linear feet of concrete removal, 300 feet of channel widening and over 20 acres of ecosystem restoration. This stretch also faces serious flood risk mitigation challenges which could supersede the City's ability to deliver ecosystem restoration. FoLAR has the unique ability to commission a multi-benefit Study that addresses the River modifications and ecosystem restoration described in ARBOR, while also enhancing the recreation zone and improving flood risk without being bound by jurisdictional boundaries. * attach additional pages with project detail

Tasks / Milestones:

Budget:

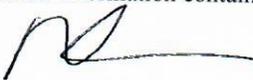
Completion Date

1	Sherwood Design Engineers Study & Report	\$120,000	October 2019
2	Collateral Design	\$5,000	October 2019
3	Project Management	\$25,000	October 2019
4	15% Administration Expense	\$22,500	October 2019
5	Total Cost	\$172,000	October 2019

For Acquisition Projects:

APN(s): N/A
Acreage: N/A

I certify that the information contained in this Grant Application form, including required attachments, is accurate.



Signature of Authorized Representative

July 15, 2019

THE LOS ANGELES RIVER RECREATION ZONE ECOSYSTEM ENHANCEMENT FEASIBILITY STUDY
Project Planning and Design

Background

Friends of the Los Angeles River (FoLAR) has advocated for an equitably accessible and ecologically restored Los Angeles River for over 32 years, with a priority focus in the Elysian Valley/Cypress Park section of the River. In recent years we co-authored the legislation that provided the basis by which the River’s recreation zones were established and provided \$1M to the City of Los Angeles and the US Army Corps of Engineers to complete what remains the most ecologically progressive study on the Los Angeles River – the LA River Ecosystem Restoration Study (ARBOR). That plan and Alternative 20 as its preferred alternative was successfully adopted by both agencies in 2016. The River now has the biggest opportunity to accomplish the ecosystem restoration envisioned in that plan as the City is currently engaged in planning and design for what is arguably the most important site in that plan – G2.

The Issue

G2 is 42 acres within 100-acre complex of current and future open space on the River. This stretch of River encompasses a recreation zone and is identified in ARBOR as the site for 1,000 linear feet of concrete removal, 300 feet of channel widening and over 20 acres of ecosystem restoration. This stretch of River also faces serious flood risk mitigation challenges which could supersede the City’s ability to deliver ecosystem restoration. This conundrum requires creativity beyond the jurisdiction of a single agency to solve. FoLAR has the unique ability to commission a multi-benefit study that addresses the river modifications and ecosystem restoration described in ARBOR, while also enhancing the recreation zone and improving flood risk without being bound by jurisdictional boundaries.

Grant Request, Deliverable and Timeline: We request \$172,500 of Prop 1 grant funding under the Project Planning criteria. The deliverable would be a Feasibility Report to be completed in just over two months. **Given the City’s impending decision on the design of G2 and channel modifications of the immediately adjacent stretch of river, this request has immediate urgency.**

Budget

ITEM	COST
Sherwood Design Engineers	\$120,000
Collateral Design	\$5,000
Project Management	\$25,000
Indirect Cost Recovery (15%)	\$22,500
Total Request	\$172,500

The Scope of Work

Working closely with Hargreaves Associates, Sherwood Engineering Design developed a strategy to successfully integrate the site engineering into the urban fabric of Los Angeles. A complex system of water resource management and recycling was devised, including steps to improve the quality of the LA River adjacent to the site. Base flows from the river will be utilized to sustain wetlands within the site and enhance their habitat, and a “greenstreets” program is being implemented in the neighboring community to optimize stormwater collection and enhance the urban landscape of downtown Los Angeles. Sherwood provided comprehensive sustainability and civil engineering services for this study. The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study is intended to underscore the opportunity Los Angeles has to utilize, feature, and benefit from the unique and

substantial natural resource offered by the Elysian Valley reach of the Los Angeles River, and to highlight alternatives in a comprehensive narrative that is supported technically. The result of this engineering study will assist regional and local stakeholders in evaluating watershed improvements that can significantly alleviate flooding in a vulnerable and developing neighborhood. Sherwood will collect and compile all available information to determine approaches for carrying out this feasibility study, and consistently communicate with the Design Team and Client to ensure new information is integrated. To ensure options are fully understood, including flood risk conditions studies by Army Corps of Engineers, the Study incorporates some investigation of surrounding urban hydrology dynamics.

PROJECT PHASING AND DELIVERABLES

The Civil Engineer proposes the following design phases relative to the preparation of anticipated feasibility study documents. Each phase is intended to enhance the design upon successive approvals so as to help the project realize the intended design upon completion. The proposed design phases for this project are:

PHASE I 1.1 Project Initiation / Data Collection

1.2 Opportunities and Constraints Study

1.3 Preliminary Alternatives

1.4 Program Alignment

1.5 Draft Feasibility Report

PHASE II 2.1 Refinement of Alternatives

2.2 Concept Engineering Cost Estimates

2.3 Illustrative Exhibit(s)

2.4 Final Feasibility Report

Details associated with tasks and deliverables associated with the proposed Scope of Work can be found at the end of this proposal.

Addressing Evaluation Criteria

The Project addresses 8 of the purposes set forth in Water Code Section 79732(a)

1) Protect and increase the economic benefits arising from healthy watersheds, fishery resources, and instream flow.

According to the Environmental Protection Agency, watersheds substantially affect the quality of life for people and the environment overall:

Reduced drinking water treatment and infrastructure costs. Natural landscapes filter pollutants and protect water quality. A review of treatment costs and watershed characteristics for 27 drinking water utilities found that for every 10% increase in forest cover of the source water area, chemical and treatment costs decrease by 20% (Ernst, 2004). In a separate case, New York City found it significantly more cost-effective to protect the watershed's natural land cover and forests to provide natural filtration, rather than installing a multi-billion dollar water treatment facility (Barnes et al., 2009). This study would prioritize natural landscapes, ergo enhancing water quality.

Reduced flood mitigation costs. Floods cause an average of \$8 billion in damage every year in the United States. Floodplains and natural landscapes minimize the area and impacts of floods, reduce the burden on public drainage infrastructure and increase groundwater recharge (Postel and Richter, 2003). One of the primary purposes of this study is to demonstrate the possibility of a natural, recreational, accessible river AND improved flood mitigation to surrounding communities.

Increased revenues and job opportunities. Healthy watersheds provide ample opportunities for fishing, boating, swimming, hiking, biking, wildlife viewing and ecotourism. Over 30 million

people in the U.S. fish recreationally and these anglers generate approximately 1 million jobs and over \$45 billion in retail sales annually (Southwick Associates, 2008). Overall, the outdoor recreation industry contributes \$646 billion annually to the economy, supports 6.1 million jobs, and generates \$79.6 billion in federal and state tax revenues (Outdoor Industry Association, 2003). <https://www.epa.gov/hwp/benefits-healthy-watersheds#economic>

2) Implement watershed adaptation projects in order to reduce the impacts of climate change on California's communities and ecosystems.

Los Angeles County will likely be affected by climate change in the following ways: more severe droughts, more intense heat spells and loss of California's native biodiversity. The design of this Project anticipates these changes and will mitigate them. Native plant landscaping will cover the easement area. This will serve as new and enhanced habitat and open space for wildlife, minimizing the threats of Global Warming on California's biodiversity. This study assumes that future capital improvements in the study area will also employ water treatment and conservation measures to improve the quality of water and reduce trash and other pollutants within Los Angeles River. Since this Study is adjacent to the soft bottom portion of the River, there is much more wildlife that survives there than in other areas. Additionally, the Study area is near Griffith Park which provides habitat to sensitive species. Improving the water quality within the River is essential to the survival of the area's wildlife species. Additionally, the density of trees and vegetation within the proposed study area will sequester carbon and cool the atmosphere.

3) Restore river parkways throughout the state, including, but not limited to, projects pursuant to the California River Parkway Act of 2004 (Chapter 3.8 (commencing with Section 5750) of Division 5 of the Public Resources Code), in the Urban streams Restoration Program established pursuant to Section 7048, and urban river greenways.

The Los Angeles River is both a River Parkway and an Urban Stream. The study area is directly adjacent, but not currently connected to, the Río de Los Angeles and "Bowtie" State Parks, and the Los Angeles River itself in the highly urbanized Los Angeles River watershed. Southern California contains a wonderful network of open space and trails throughout local mountains and the coastline, but it is not readily accessible to all urban residents as better linkages need to be made to existing public parks. The Study will examine new gateways to the directly adjacent River parkway and create a new Greenway along the River north bank and will bring nature to the urban community.

4) Protect and restore aquatic, wetland, and migratory bird ecosystems, including fish and wildlife corridors and the acquisition of water rights for instream flow.

From the ARBOR Plan:

As envisioned in the ARBOR plan, the River in this reach would be widened and sloped back to the east to restore freshwater marsh habitat, expanding the soft bottom. At the upstream end of the reach, a backwater wetland would be created within the "Bowtie" parcel. These measures would help restore some of the River's natural floodplain, restoring aquatic riparian habitat. This reach includes the G2 parcel of the Taylor Yard complex, which has long been identified as a cornerstone site for LA River restoration. The purpose of this study is to demonstrate the viability of that type of meaningful ecosystem restoration.

Open waterways, such as the River, function as habitat corridors for migratory birds and small mammals, and therefore provide an appropriate location for greening and restoration efforts. By prioritizing nature-based solutions, this project will address significantly reducing the amount of pollutants presently being expelled into the River untreated and thus improve the habitat potential and

water quality within the River and Pacific Ocean. As mentioned, the study area is the soft-bottom portion of the Los Angeles River where more species survive, fly and swim. It is also adjacent to Elysian Park and downstream from Griffith Park, which are home to many sensitive plant and animal species, and this study will support the types of natural solutions which create a habitat link and node within an important ecological and wildlife corridor.

9) Protect and restore rural and urban watershed health to improve watershed storage capacity, forest health, protection of life and property, stormwater resource management, and greenhouse gas reduction.

Sherwood Design Engineers is a civil engineering practice with 16-years' experience providing complex project deliverables for public agency, campus, land use, civic, and private development interests at scales ranging from single family to 20,000 acre land use frameworks. Founded as a professional practice that values the integration of design, ecology, and engineering, the firm has analyzed many river and stream projects including evaluation of levee and flood control structures, stream flows, channel geometry, and heavily regulated engineered conveyance systems. In addition to the provided project work, our direct channel engineering experience includes Permanente Creek in Mountain View, West Channel in Sunnyvale, flood canals in Guangzhou China, Strawberry Creek improvements at UC Berkeley Campus, Islais Creek in San Francisco, and current work on the Guadalupe River in San Jose. In response to our recent meeting in Los Angeles, the primary pursuit is to assess the viability of straightening a stretch of the LA River adjacent to the G2 Taylor Yard as an alternative to proposed flood control measures. To ensure options are fully understood, including flood risk conditions studies by Army Corps of Engineers, our proposal also incorporates some investigation of surrounding urban hydrology dynamics.

As mentioned in response #4 above, the Study will consider the need to reduce the amount of pollutants presently being expelled into the River untreated and will thus protect and restore the health of the watershed and improve storage within the local groundwater aquifer. Stormdrain daylighting projects proposed for the Study area will manage stormwater runoff by capturing, treating and infiltrating which will help to improve water quality, increase watershed storage capacity, and reduce the volume of water entering the River. Furthermore, proposed plans in the Study area call for installation of California native trees and shrubs, which will be promoted and prioritized by the Study. The purpose of the trees is to create habitat for local wildlife, provide shade for pedestrians, reduce the Urban Heat Island effect, generate oxygen, and remove pollutants from the air thus helping to address and reduce Greenhouse Gas (GHG) emissions and helping with the adverse impacts of global warming. The future spacing of the vegetation will maximize those benefits.

10) Protect and restore coastal watersheds, including, but not limited to, bays, marine estuaries, and nearshore ecosystems.

The Los Angeles River is a coastal watershed, and the Study addresses projects that restore natural processes and improve water quality.

11) Reduce pollution or contamination of rivers, lakes, streams, or coastal waters, prevent and remediate mercury contamination from legacy mines, and protect or restore natural system functions that contribute to water supply, water quality, or flood management.

The Study considers proposed designs to reduce sediment, trash, and organic matter from loading and contaminating the Los Angeles River draining the watershed thereby limiting sedimentation and encouraging ground water recharge. Per the ARBOR Plan, projects will be designed to capture, treat, and infiltrate the maximum amount of wet and dry weather urban runoff in order to remove various

pollutants including trash, metals, bacteria, and oil from the water before they can reach the river. Once implemented, the captured runoff will infiltrate thereby increasing the water supply in the local aquifer and will reduce the volume of water entering the river (helping with flood management). Furthermore, the G2 site is currently contaminated with many different metals, petroleum hydrocarbons, and chlorinated solvents from its historic use as a railroad facility. Site cleanup and multiple-benefit improvements will help reduce the opportunity for contaminants to migrate from the site during storm events, thereby protecting the watershed. Additionally, the Los Angeles River Ecosystem Restoration Plan (LARERP or “ARBOR” plan) also aims to restore a hydrologic connection from the River to the G2 site, which will help contribute to increasing local water supply, improving water quality, and enhanced flood management.

12) Assist in the recovery of endangered, threatened, or migratory species by improving watershed health, instream flows, fish passage, coastal or inland wetland restoration, or other means, such as natural community conservation plan and habitat conservation plan implementation.

The primary purpose of the ARBOR Plan, where the Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study takes place, is to reestablish riparian strand, freshwater marsh, and aquatic habitat communities and reconnect the River to major tributaries, its historic floodplain, and the significant ecological areas of the Santa Monica Mountains, San Gabriel Mountains, Elysian Hills, and Verdugo Mountains. The study area is within a globally scarce Mediterranean ecosystem, which covers only 2% of the Earth’s land surface but accounts for 20% of all known plant species. Over 90% of Southern California’s riparian habitat has been lost along with 95% of California’s wetlands and 40% of its reptiles and amphibians. The California Floristic Province is one of the top 25 global hotspots of rapid biodiversity loss. Approximately 140 federally protected bird species are supported by the LA River.

Applicants are required to provide a brief description of how the project furthers the goals articulated in the plan and meets one of the three following objectives:

- 1) More reliable water supplies;
- 2) **Restoration of important species and habitat;** and

This proposed Feasibility Study takes place in the L.A. River Ecosystem Restoration Area, also known as ARBOR. The ARBOR Study includes restoration of the aquatic riparian ecosystem native to the Los Angeles River along an approximately 11-mile stretch that would provide ecosystem benefits while maintaining existing levels of flood risk management. Recreation opportunities consistent with the restored ecosystem would also be provided. The G2/Taylor Yard site is considered “the crown jewel” of LA River Restoration as both the city’s Los Angeles River Revitalization Master Plan and the ARBOR Study indicate that removing concrete and restoring wetland habitat is feasible here.

Channelization of the Los Angeles River has degraded the remaining habitat values of the River by straightening the River’s course, diminishing its plant and wildlife diversity and quality, disconnecting it from its floodplain and significant ecological zones, and dramatically changing its appearance and function. The study area is within a globally scarce Mediterranean ecosystem, which covers only 2% of the Earth’s land surface but accounts for 20% of all known plant species. The California Floristic Province is one of the top 25 global hotspots of rapid biodiversity loss. Over 90% of Southern California’s riparian habitat has been lost along with 95% of California’s wetlands and 40% of its reptiles and amphibians. Approximately 140 federally protected bird species are supported by the LA River

- 3) More resilient and sustainably managed water infrastructure.

The project will provide multiple benefits related to water quality, water supply, and/or watershed protection and restoration.

The project will examine more reliable water supplies pursuant to the California Water Action Plan.

According to the California Water Action Plan:

Ensuring water security at the local level includes efforts to conserve and use water more efficiently, to protect or create habitat for local species, to ensure food security, to recycle water for reuse, to capture and treat stormwater for groundwater recharge and reuse, and to remove salts and contaminants from brackish or contaminated water or from seawater. But, mostly it requires integrating disparate or individual government efforts into one combined regional commitment where the sum becomes greater than any single piece.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study results in more reliable water supplies pursuant to the California Water Action Plan to:

· Improve Land Use and Water Alignment The Governor's Office of Planning and Research (OPR) continues to engage local land use authorities, California Native American tribes, water agencies and other stakeholders to develop recommendations to better align land use and water management. OPR will issue and incorporate recommendations as applicable into the general plan guidelines. OPR will give special consideration to improving consistency between local land use plans and decisions and local water management plans, including integrated regional water management plans.

The project results in restoration or protection of important species and habitat pursuant to the California Water Action Plan.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study addresses the following actions that result in restoration or protection of important species and habitat:

- Protect and restore degraded stream and meadow ecosystems to assist in natural water management and improved habitat. Meadows provide a natural storage opportunity, critically important with a changing climate, while properly functioning stream systems reduce downstream sedimentation and enhance critical aquatic habitat.
- Support and expand funding for protecting strategically important lands within watersheds to ensure that conversion of these lands does not have a negative impact on our water resources. By working with willing landowners, protection of key lands from conversion will result in a healthier watershed by reducing polluted runoff and maintaining a properly functioning ecosystem.

The project employs new or innovative technology or practices, including decision support tools that support the integration of multiple jurisdictions, including, but not limited to, water supply, flood control, land use, and sanitation.

Sherwood Engineering Design brings a deep toolbox of strategies that can be deployed, and a comprehensive approach that helps find synergies that result in multi-benefit projects. Most notable are their Proprietary Design Tools that include integrated water balance models, urban design metrics, design tools, and preliminary probable cost models.

The project uses renewable or non-potable water sources of water, such as reclaimed water, captured stormwater, or other method

Sherwood Engineering Design has expertise with and a reputation as integrated water infrastructure leaders. One of their many qualifications includes onsite water reuse and planning experience in California, which provides the ability to evaluate discharge and water quality influences on stream flows.

The project is located in or adjacent to communities defined no less than 81 percent disadvantaged as defined by the CalEnviroScreen 3.0 tool.

The proposed project is located in Glassell Park and the US Census tract occupied by the entire G2/Taylor Yard site is shown on CalEnviroScreen 3.0 to be a 95-100% Disadvantaged Community (DAC), with a pollution burden percentile of 99%.

The project has demonstrated capability of collecting and treating runoff from off-site sources.

This project/study focuses on a section that offers the opportunity to provide direct access to the Los Angeles River in historically-underserved communities. The G2/Taylor Yard project area is critical to the fulfillment of the ARBOR Study goals to restore ecosystem values in and along the Los Angeles River. The area presents an urgent opportunity to improve water quality, re-create wetland habitat, unique ecological resources of the LA River and ensure parks and open space for communities to enjoy. This study builds upon over 30 years of education, advocacy and stewardship to realize a Los Angeles River that benefits both humans and wildlife while also solving issues related to cleaning stormwater runoff and creating open- space in an urban, park-poor environment.

Applicant has proven that implementation of the project is feasible

As a result of their experience, the Sherwood Design Engineering team feels confident that they can evaluate visionary concepts for improvements along the LA River, advance these ideas, and if feasible, implement them. The primary pursuit is to assess the viability of straightening a stretch of the LA River adjacent to the G2 Taylor Yard as an alternative to proposed flood control measures. To ensure options are fully understood, including flood risk conditions studies by Army Corps of Engineers, this proposal also incorporates some investigation of surrounding urban hydrology dynamics.

Applicant has financial capacity to perform project on a reimbursable basis.

Both Friends of the Los Angeles River and Sherwood Engineering Design have the ability to sustain themselves during this project on a reimbursable basis.

Applicant, or active project partner, has successfully completed multiple projects of similar size and scope.

Sherwood Engineering Design is a civil engineering practice with 16-years' experience providing complex project deliverables for public agency, campus, land use, civic, and private development interests at scales ranging from single family to 20,000 acre land use frameworks. Founded as a professional practice that values the integration of design, ecology, and engineering, the firm has analyzed many river and stream projects including evaluation of levee and flood control structures, stream flows, channel geometry, and heavily regulated engineered conveyance systems. In addition to the provided project work, our direct channel engineering experience includes Permanente Creek in Mountain View, West Channel in Sunnyvale, flood canals in Guangzhou China, Strawberry Creek improvements at UC Berkeley Campus, Islais Creek in San Francisco, and current work on the Guadalupe River in San Jose.

The project is a partnership between two or more organizations and each organization has committed to contributing toward project implementation.

Friends of the Los Angeles River played a significant role in the adoption of the ARBOR study. Most significant is our raising funds for the city of Los Angeles and the U.S. Army Corps of Engineers to complete the visionary plan that identified projects focused on improving habitat along an 11-mile stretch of the Los Angeles River. By engaging Sherwood Design Engineers our goal is to build upon the data and hydrological modeling that informed both the city's Los Angeles River Revitalization

Masterplan and the ARBOR Plan to realize the wetland habitat restoration and flood protection recommended by both.

Completion of the project would assist a government agency in fulfilling a water resources protection, watershed ecosystem restoration, or multi-benefit river parkway plan.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study represents an opportunity to apply cutting-edge engineering techniques utilized in the local, national and international restoration projects Sherwood Design Engineering has implemented to answer questions associated with the impacts of climate change and current flood mapping projections to reveal implementable scenarios that will transform a barren landscape into precious wetland habitat that will restore decimated ecosystems that can clean and stormwater, recharge groundwater supplies, and show the world how urban restoration can also increase flood protection.

The project provides a plan or feasibility study that enhances cooperative watershed health protection and restoration important to two or more organizations.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study

Applicant, or project partner, has 1+ years experience maintaining and operating projects of similar size and scope.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study focuses on projects identified under the Los Angeles River Revitalization Master Plan and the ARBOR Plan. The proposed Study is meant to provide data and engineering schematics that can assist the Los Angeles Bureau of Engineering, the U.S. Army Corps of Engineers, State Parks, the Mountains Recreation and Conservation Authority, and any other agencies with the experience and missions associated with projects such as the G2/Taylor Yard Riverfront Park and the Bowtie Demonstration Project. Furthermore, the results of the proposed Study have the potential to inform and shape other projects in the ARBOR Plan, and further downstream.

The project implements a major component of an existing relevant plan related to a major recreational public use facility or watershed ecosystem restoration plan.

The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study supports visions and plans detailed in the city's Los Angeles River Revitalization Master Plan, and the city and US Army Corps of Engineers' ARBOR Plan to restore habitat and ecosystem function via green infrastructure projects. Both plans point to the Taylor Yard as an opportunity site where stormdrains are daylighted, riparian habitat is re-created, the channel is terraced for easy access to the River, and removing concrete is removed to widen the River and provide a place where stormwater retention that will mitigate flooding is feasible. The Study looks at a stretch River that flows through the Elysian Valley Recreation Zone, a popular place for kayaking and fishing that is sanctioned from Memorial Day until the end of September each year. The goal is to realize the plans to transform barren, polluted land into places where the public – especially the disadvantaged community members in the immediate vicinity, can access and enjoy the River.

The project provides a high quality access point for nearby open space, parkland, regional multi-modal trails, or water-based recreation.

The Los Angeles Bureau of Engineering has three preliminary park designs for the G2/Taylor Yard. All three designs feature amenities for the public including viewing platforms, walking trails, native plantings, and even a bridge that would connect the both sides of the River – from Taylor Yard River

Park to the MRCA's Lewis MacAdams Riverfront and Marsh Parks. Visitors will have opportunities to watch birds, attend outdoor concerts, and even kayak.

Applicant has conducted outreach to the affected communities.

FoLAR's programs and events connect diverse community members to the River as a way to change public perception and advocate for a River where both humans and habitat can thrive. Our Great Los Angeles River CleanUp is recognized by American Rivers as the largest urban river cleanup in the country. CleanUp sites located in the ARBOR sites are the most popular – bring from 500 to 1,200 out in a single day. Our proven track record of community engagement resulted in the purchase and creation of three River-adjacent parks that were slated for warehouse development: Los Angeles State Historic Park, Rio de Los Angeles State Park, and the Bowtie Parcel. We advocated and mobilized the public to promote the most robust version of the ARBOR Plan that was adopted by the Los Angeles City Council, the Los Angeles County Board of Supervisors, the regional and national U.S. Army Corps of Engineers. We were on the team that won the bid to create a vision for G2/Taylor Yard because of education and outreach successes, and we are on the team that is conducting outreach associated with the Bowtie Demonstration Project – a joint venture between the Nature Conservancy and the Prevention Institute working to protect ecologically important lands and waters for nature and people. The Project's goals are to treat stormwater using natural infrastructure, deliver additional benefits to urban residents, and enhance biodiversity across the urban landscape. One key strategy for achieving these goals is to create a proof-of-concept multi-benefit stormwater capture demonstration project.

The project includes interpretive programming or personal interpretation, and a plan to reach community audiences with meaningful information about a watershed resource.

Friends of the Los Angeles River's mission is to ensure a publicly accessible and ecologically sustainable Los Angeles River by inspiring River stewardship through community engagement, education, advocacy, and thought leadership. Our 38' mobile visitor and education center, the LA River Rover, brings the River to the people and the people to the River. Our Source to Sea watershed education program includes a standards-based curriculum for grades 2 through 12 where students learn about the River's past, present and possible future through in-class lessons, and hands-on activities on the River Rover as well as on LA River field trips. Projects envisioned for the Study Area incorporate recreation, engagement, programs and interpretive signage to enhance the public's experience and inform visitors about the areas rich history, cultural significance, and the abundant bird and wildlife that rely on wetland habitat for their existence. The Bowtie Demonstration Project involves community members from the Elysian Valley, Glassell and Cypress Parks, and Atwater Village in the visioning process for green infrastructure projects that clean stormwater runoff, enhance flood protection by retaining water, and provide a more natural environment for community members to use and enjoy. Interpretive programming and personal interpretation are integral now, before, during and after projects are built.

The project adds visitor-serving amenities, accessibility, and public safety improvements to public parkland with multiple ecosystem benefits.

Community members engaged during the outreach connected to the G2/Taylor Yard River Park convey that they want to see trees and other plants bring the barren landscape back to life. Another concern is associated with soil contamination and whether activities now and in the future may be harmful to their children's health. Improvements associated with projects in the ARBOR Plan look at both current conditions and possible changes needed to clean the soil, filter and clean stormwater, and provide landscaping for multiple habitat types. Both State Parks and the Mountains Recreation and Conservation Authority have expressed interest in providing buildings where Rangers would work and potentially live

on the Study sites. The three preliminary design concepts for G2/Taylor Yard River Park include natural plantings, viewing platforms, an amphitheater, a cultural center, and many more amenities that appeal to those who live in the immediate area and those who will flock to experience the River and the other amenities that will be available.

The project provides non-personal interpretive elements that will significantly enhance appreciation and enjoyment of a watershed resource.

Non-personal interpretive elements such as signage, exhibits and publications are integral to the projects envisioned in the Study Area. Visitors will be able to take in the sites, read about the area's history, flora, fauna, wetland treatment amenities, and more at their own pace.

The project creates a new venue for education and/or interpretation activities that promote water conservation and stewardship, or enhances an existing venue.

Projects planned for the Study Area significantly raise the bar for urban river restoration. With the data and engineering schematics compiled in this Study, stewardship, education, water conservation, quality and use will derive from experiences and on-site programming. Furthermore, the projects realized will provide a destination for visitors from all over the world. If we can achieve it here, the sky is the limit.

The project results in new public access to a watershed resource with high interpretive and/or educational value, or enhances existing access.

The Study Area includes the G2/Taylor Yard and Bowtie Parcel sites, as well as Rio de Los Angeles State Park. A bridge is being built slightly downstream from the Taylor Yards parcels that will connect the open space and habitat restoration projects in Glassell Park to the Los Angeles River Greenway and bike path in the Elysian Valley. This Study looks at the connections between recreational trails, open space, habitat enhancement, wetland habitat restoration and other amenities in an area that, when combined with the Bowtie Parcel, Taylor Yard and Rio de Los Angeles Park would make up 100 acres of park space in one of the most densely populated, park-poor communities in East Los Angeles.

Project will benefit specially protected species pursuant to the California Wildlife Protection Act of 1990.

According to the ARBOR Study: The Glendale Narrows contains considerable riparian habitat within the soft bottom channel that has potential for connection to adjacent habitat areas. However, its survival is threatened by infestation from non-native, invasive species. The Audubon Society has documented that there are already meaningful habitat connections for avian (bird) species between the LA River in the Glendale Narrows and nearby large habitat areas." Implementing restoration recommendations in the Study Area include:

- Restoration of rare southwestern riparian and aquatic habitats
- Potential to support two (2) federally threatened and endangered species
- Significant benefits to local and migratory species
- Restoration of floodplain connections
- Restoration of habitat nodes and movement corridors
- Opportunities for regional habitat connections
- Increased connection to the Pacific Flyway

EXTRA CONSIDERATION POINTS QUANTIFIABLE CARBON REDUCTION POINTS

The project develops or maintains multi-use trails that connect communities, provides access to public resources and reduces vehicle miles traveled.

There is a bridge being built upstream in Atwater Village for pedestrians, cyclists and equestrians, there is a bridge being built downstream from the Metro Train Yard and another proposed in the G2/Los Angeles River Park preliminary plan. All of these bridges connect the Los Angeles River Greenway and bike path to the other side of the River. Public transportation along Riverside Drive and San Fernando Road is available and the Metro Goldline runs alongside the River from Union Station with stops at Chinatown, Highland Park/Avenue 26. A Commuter Rail line stops in Glendale with bus connections to proposed projects.

The project engages local communities through outreach, education, and interpretation regarding long-term stewardship and climate change awareness.

Part of the Sherwood Design Engineering work plan includes outreach pertaining to the proposed Study. FoLAR's education, outreach, and advocacy programs along with our annual Great Los Angeles River CleanUp emphasize River stewardship. Messaging about how wetland habitats mitigate climate change and add to flood protection is integral to our current programs and is being planned for the proposed projects in the Study area.

ADDITIONAL CRITERIA

Completion of the project would assist in fulfilling a Federal water resources protection or watershed ecosystem restoration plan.

The Los Angeles River Recreation Zone Ecosystem Feasibility Study draws upon hydrological modeling conducted by the U.S. Army Corps of Engineers in association with the Los Angeles River Revitalization Master Plan and the ARBOR Plan. These efforts are also recognized and play integral parts in the Urban Waters Federal Partnership. The LA River Rover was recognized as one of eight original Urban Wildlife Refuge Partners because of our ability to connect with diverse community members in an urban environment.

Project is within 1 mile of public transportation.

Per above, there is ample public transportation in the Study area.



**THE LOS ANGELES RIVER RECREATION ZONE ECOSYSTEM ENHANCEMENT FEASIBILITY STUDY
Project Planning and Design**

Background

Friends of the Los Angeles River (FoLAR) has advocated for an equitably accessible and ecologically restored Los Angeles River for over 32 years, with a priority focus in the Elysian Valley/Cypress Park section of the River. In recent years we co-authored the legislation that provided the basis by which the River's recreation zones were established and provided \$1M to the City of Los Angeles and the US Army Corps of Engineers to complete what remains the most ecologically progressive study on the Los Angeles River – the LA River Ecosystem Restoration Study (ARBOR). That plan and Alternative 20 as its preferred alternative was successfully adopted by both agencies in 2016. The River now has the biggest opportunity to accomplish the ecosystem restoration envisioned in that plan as the City is currently engaged in planning and design for what is arguably the most important site in that plan – G2.

The Issue

G2 is 42 acres within 100-acre complex of current and future open space on the River. This stretch of River encompasses a recreation zone and is identified in ARBOR as the site for 1,000 linear feet of concrete removal, 300 feet of channel widening and over 20 acres of ecosystem restoration. This stretch of River also faces serious flood risk mitigation challenges which could supersede the City's ability to deliver ecosystem restoration. This conundrum requires creativity beyond the jurisdiction of a single agency to solve. FoLAR has the unique ability to commission a multi-benefit study that addresses the river modifications and ecosystem restoration described in ARBOR, while also enhancing the recreation zone and improving flood risk without being bound by jurisdictional boundaries.

Grant Request, Deliverable and Timeline: We request \$172,500 of Prop 1 grant funding under the Project Planning criteria. The deliverable would be a Feasibility Report to be completed in just over two months. **Given the City's impending decision on the design of G2 and channel modifications of the immediately adjacent stretch of river, this request has immediate urgency.**

Budget

ITEM	COST
Sherwood Design Engineers	\$120,000
Collateral Design	\$5,000
Project Management	\$25,000
Indirect Cost Recovery (15%)	\$22,500
Total Request	\$172,500

The Scope of Work

Working closely with Hargreaves Associates, Sherwood Engineering Design developed a strategy to successfully integrate the site engineering into the urban fabric of Los Angeles. A complex system of water resource management and recycling was devised, including steps to improve the quality of the LA River adjacent to the site. Base flows from the river will be utilized to sustain wetlands within the site and enhance their habitat, and a "greenstreets" program is being implemented in the neighboring community to optimize stormwater collection and enhance the urban landscape of downtown Los Angeles. Sherwood provided comprehensive sustainability and civil engineering services for this study. The Los Angeles River Recreation Zone Ecosystem Enhancement Feasibility Study is intended to underscore the opportunity Los Angeles has to utilize, feature, and benefit from the unique and



RIVER AUGMENTATION FEASIBILITY STUDY

CIVIL ENGINEERING
WATER & ENVIRONMENTAL ENGINEERING

PREPARED BY:



POINT OF CONTACT:

JOSIAH CAIN

415.685.4423

jcain@sherwoodengineers.com



COVER LETTER

May 25th, 2019

Yuval Bar-Zemer
Linear City Development
1855 Industrial St # 106,
Los Angeles, CA 90021

**Re: SCOPE AND FEE PROPOSAL FOR CIVIL ENGINEERING SERVICES
RIVER AUGMENTATION FEASIBILITY STUDY**

Dear Yuval Bar-Zerner,

Sherwood is a civil engineering practice with 16-years' experience providing complex project deliverables for public agency, campus, land use, civic, and private development interests at scales ranging from single family to 20,000 acre land use frameworks. Founded as a professional practice that values the integration of design, ecology, and engineering, the firm has analyzed many river and stream projects including evaluation of levee and flood control structures, stream flows, channel geometry, and heavily regulated engineered conveyance systems. In addition to the provided project work, our direct channel engineering experience includes Permanente Creek in Mountain View, West Channel in Sunnyvale, flood canals in Guangzhou China, Strawberry Creek improvements at UC Berkeley Campus, Islais Creek in San Francisco, and current work on the Guadalupe River in San Jose.



Image: Rendering of Permanente Creek in Mountain View

As a result of this experience, the Sherwood team feels confident that we can help Linear City Development evaluate visionary concepts for improvements along the LA River, advance these ideas, and if feasible, implement them. In response to our recent meeting in Los Angeles, the primary pursuit is to assess the viability of straightening a stretch of the LA River adjacent to the G2 Taylor Yard as an alternative to proposed flood control measures. To ensure options are fully understood, including flood risk conditions studies by Army Corps of Engineers, our proposal also incorporates some investigation of surrounding urban hydrology dynamics.

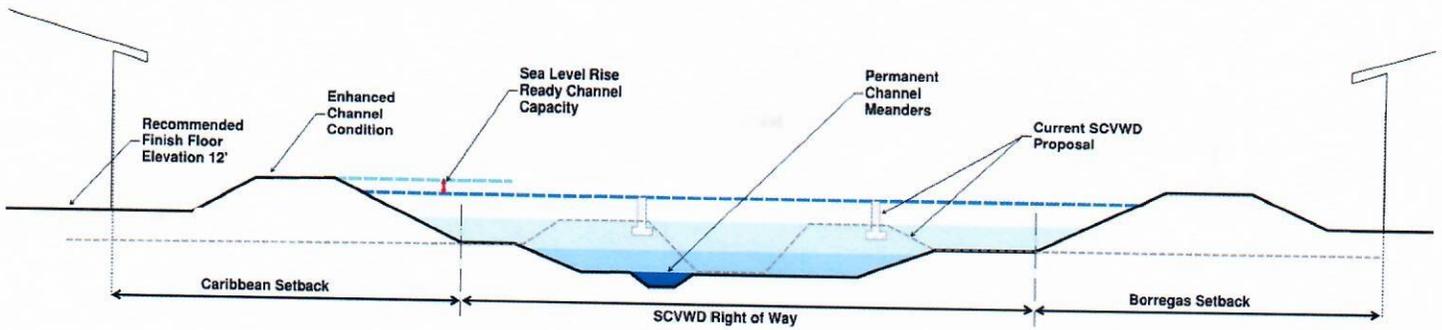


Image: Cross Section of Channel Design

The Sherwood Team brings the following differentiators to this project:

- **Civil Engineering expertise** with a reputation as integrated water infrastructure leaders.
- **Onsite Water Reuse and Planning Experience** in California, which provides the ability to evaluate discharge and water quality influences on stream flows.
- A **Proven Design Team** that has worked seamlessly on many planning and building projects, working to advance entitlements and permits in complex urban settings.
- **Leaders in Sustainability** known in the industry for a collaborative approach, innovation, and ability to deliver solutions that save time and money, get permitted and get built.
- **Leaders in Resiliency** who have worked throughout California on stormwater, flood control, stream restoration, and other water infrastructure concerns.
- **Client Satisfaction** that includes references from leading institutions and a practice built on long-term relationships with our partners and repeat clients.
- **Proprietary Design Tools** that include integrated water balance models, urban design metrics, design tools, and preliminary probable cost models.
- **Deliverables and Graphics** that are compelling, understandable, and tell a story.

Sherwood brings a deep toolbox of strategies that can be deployed, and a comprehensive approach that helps find synergies that result in multi-benefit projects. We understand the sensitive nature of the project, the need for discretion, and the complex stakeholder groups that may be affected. Our collaborative approach to engineering is proven to anticipate and solve challenges resulting in plans that save time and money, get approved and get built. We look forward to discussing the timeline and details of our proposal with you and your team.

Sincerely,

Josiah Cain
Principal
jcain@sherwoodengineers.com

QUALIFICATIONS

ORGANIZATION CHART

SELECTED KEY RESUMES



MEMORIAL PARK | HOUSTON, TX

Sherwood's work involved creating stormwater management strategies that reuse stormwater for irrigation by redirecting existing collection points and retaining water for later use. We also developed suggestions to mitigate erosion on the adjacent Buffalo Bayou, and proposed Low Impact Development techniques to retain water and help native ecologies flourish.

SELECTED PROJECT TEAM

**CLIENT
TEAM**

**SHERWOOD
DESIGN
ENGINEERS**

JOSIAH CAIN
PRINCIPAL-IN-CHARGE
Overall Conceptualization &
Implementation of Sustainable
Engineering

S. BRY SARTE
PRINCIPAL DESIGNER
Oversight of Key Designs
& Direction

**GABRIEL
KAPRIELIAN**
URBAN ENGINEERING
Execution Key Designs
& Strategies

JIMMY GALVEZ
PROJECT MANAGER
Oversight on Budget,
Scheduling, & Delivery of
Work Product

PETER HAASE
WATER &
ENVIRONMENTAL
ENGINEERING

JOSIAH CAIN

PRINCIPAL IN CHARGE / DIRECTOR OF INNOVATION



YEARS OF EXPERIENCE

20 years

EDUCATION

Harvard Graduate School of Design
Master of Design Studies (MDesS)
Design, Technology & Environment

University of California, Davis
Bachelor of Science, Sustainable
Community
Planning, Landscape Architecture
(BSLA)
Green Roofs for Healthy Cities
Green Roof Design Certificate
Humboldt State University
Constructed Wetlands Workshop
Graduate

Permaculture Institute of
Northern California
Permaculture Design Certificate,
Occidental

PROFESSIONAL REGISTRATION

Registered Landscape Architect

PROFESSIONAL AFFILIATIONS

American Society of Landscape
Architects

Josiah Cain serves as Sherwood Design Engineers' Director of Innovation. A student of design, ecology, and technology, his deep sustainable design experience and multi-disciplinary approach provide insight and opportunities for optimization of site and structure. His informed drive for ecology, enhanced systems performance, and integrated design has led to first of a kind permits in over a dozen jurisdictions; his work has advanced the public dialogue and application of rain harvesting, graywater, blackwater reuse, living roofs and walls, native plants, sustainable stormwater management, food systems, and sustainable materials.

In addition to managing Sherwood's Innovation Program, Josiah provides strategic leadership on influential projects with a focus on campus and large-scale urban systems. His project credits include on-site water reuse systems for high-density corporate and university campuses, urban farm applications, and urban ecological approaches for museum, mixed use, transit, and commercial clients.

Josiah is a landscape architect with over 20 years of deep and diverse experience in high performance ecology, resilience, natural systems, adaptation, and sustainable site design. Known as a multi-disciplinary integration strategist, his unique ability to create synergies enable projects to achieve multipole complex goals and metrics in concert. Josiah regularly lectures and presents at national universities and conferences, addressing civic and building ecology, green infrastructure, climate response, district resource systems, sustainable water management, and ecological development approaches.

In support of his project experience, Josiah holds formal design degrees from UC Davis and the Harvard Graduate School of Design. He also holds design certificates in Permaculture, Green Roof Design, and Constructed Wetland Treatment Systems. Josiah is an advisor to the Cradle to Cradle Product Innovation Institute, Sustainable Silicon Valley, International Living Future Institute, Greenbiz.org, and Stanford's ReNUWit Group. Among other media outlets, Josiah has been featured in Sunset Magazine, Home & Garden Television, Martha Stewart Living, and the New York Times. In 2016 he was featured by Water Deeply as one of "Eleven Experts to Watch on California Water Innovation."

S. BRY SARTÉ PE, LEED AP

DESIGN PRINCIPAL / FOUNDER / CEO



EDUCATION

University of California, Berkeley
Bachelor of Science in Civil and
Environmental Engineering; Emphasis:
Environmental Engineering
University of Canterbury, New Zealand
Masters research in Environmental
Engineering
University of California, Santa Cruz
Bachelor of Arts in Fine Arts

ACADEMICS

Adjunct Associate Professor of
Architecture
Columbia University: Graduate
School of Architecture, Planning and
Preservation
Master of Science in Architecture and
Urban Design

PROFESSIONAL REGISTRATION

Registered Professional Engineer,
Civil Engineering in the States
of: Arizona, California, Colorado,
Montana, New Hampshire, New York,
Pennsylvania, Tennessee, Texas, and
Virginia

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
UC Berkeley Alumni Association
SPUR: San Francisco Planning and
Urban Research, Member
Urban Land Institute, Member
U.S. Green Building Council, Member

PUBLICATIONS

[Sustainable Infrastructure: The Guide
to Green Engineering.](#) New York: John
Wiley & Sons, 2010. 400 page book.
"Integrated Water Resource planning."
American Society of Civil Engineers,
2010. White paper.
"Watershed-Based Stormwater
Management." American Society of Civil
Engineers, 2008. White paper.

Bry Sarté, founder of Sherwood Design Engineers, leads an international practice of civil and environmental engineers based in San Francisco, New York and Houston. As a leading designer and academic in ecological and sustainable engineering, he has been published internationally and has made significant contributions to contemporary research involving global environmental issues affecting water supply, civil engineering, urban design, resiliency and energy use. Bry has built an international reputation by providing engineering services and design solutions that reflect a deep commitment to executing well-planned, sustainable projects worldwide.

Bry has served as lead engineer for hundreds of the world's leading sustainable engineering projects. Many of the projects were the first-of-their kind in applying green engineering systems, strategies and concepts. From innovative planning projects on one end of the spectrum to implemented construction projects on the other, much of his work has been highly-integrated, highly-collaborative design developed in tandem with many of the world's leading architecture and landscape architecture firms.

Bry has led the engineering design for numerous completed construction projects that have changed the direction of how we build. The projects range from institutional buildings to civic infrastructure and include many LEED Platinum and Gold projects, more than a dozen Living Building Challenge Projects, three of the selected pilots for the Sustainable Sites Initiative, in addition to various other international green building standard rated projects. Projects of note that are currently underway include: comprehensive integrated stormwater reuse systems for New York's Water Treatment Plant at Croton, sustainable engineering design for Related's Hudson Yards in New York City, work for multiple technology headquarters in Silicon Valley, San Francisco Better Streets implementation, engineering for Brooklyn Bridge Park, and sustainable infrastructure throughout the southern half of the UC Berkeley campus.

For four academic years, Bry has served on the faculty at Columbia University's Graduate School of Architecture Planning and Preservation in the Master of Science in Architecture and Urban Design program. He is currently teaching the course Infrastructure, Resilience and Public Space. He regularly serves as a guest lecturer/speaker at the University of California Berkeley and Stanford University, as well as at conferences around the world, presenting on environmentally-sensitive design and construction.

JIMMY GALVEZ PE

PROJECT MANAGER



YEARS OF EXPERIENCE

15 years

EDUCATION

California Polytechnic State University
B.S. in Civil Engineering

PROFESSIONAL REGISTRATION

Registered Professional Engineer
State of California (No. 75568)

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers,
Member
National Diversity and Inclusion
Committee, Member
Society of Hispanic Professional
Engineers, Los Angeles Chapter,
Director of Programs and Professional
Development

Jimmy Galvez has extensive depth of design and management experience on projects at the private development, institutional/higher education campus, neighborhood-district, and city streetscape scales. He has served as project lead in coordination with government agencies, multi-disciplinary design teams, contractors and other stakeholders for clients in both the private and public sectors. Along with supporting the entitlement process, he has been responsible for site and utility design including cost and bond estimates for the preparation of improvement plans and specifications for a variety of land development projects.

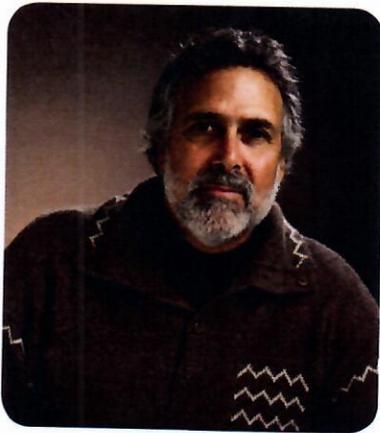
At the institutional level, Jimmy has worked on a number of Sherwood's leading edge sustainable projects including the UC Berkeley Lower Sproul Redevelopment Project, a 5 year project in Berkeley, CA, and Spirit Rock Center, a 4 year project in Woodacre, CA. In both projects he completed site grading, relocation of existing utilities, design of new utilities, stormwater treatment design and coordination between civil design and architectural/landscape architectural design while assisting in the permitting process and provided construction administration support.

At the city-scale, Jimmy is currently working on the Moscone Expansion Center in San Francisco, CA, a 6 year design to construction project which is set to reach substantial completion later this year in December. Earlier this year, he began leading Sherwood's efforts on stormwater low impact development design and sustainable framework support for the Los Angeles Union Station Forecourt and Esplanade Improvements as part of a multidisciplinary team and working with a number of city agencies including various departments at City of Los Angeles.

Jimmy's diverse experience applying technical innovation and solid engineering to projects at all scales result in outcomes that save time and resources and exceeded the expectations of stakeholders.

PETER HAASE PE

PRINCIPAL | WATER & ENVIRONMENTAL ENGINEERING LEAD



YEARS OF EXPERIENCE

31 years

EDUCATION

Humboldt State University
Master of Science, Environmental
Systems, International Development and
Technology, in Civil Engineering

Humboldt State University
Bachelor of Science, Environmental
Resource Engineering

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer
State of California (No. C055605)

PROFESSIONAL AFFILIATIONS

American Water Works
American Society of Civil Engineers
Water Environment Federation
California Environmental Health
Association

Peter is a Registered Professional Civil Engineer in the State of California with over 31 years of professional experience in the field of civil, environmental, and water resources engineering and international development in the water, sanitation and hygiene (WASH) sector. Peter has completed a broad range of engineering design and planning studies throughout California, China, Mexico, Hawaii, Fiji, Honduras, Costa Rica, Granadines (West Indies), Liberia, Rwanda, and Haiti.

Peter specializes in small community water and wastewater system design, surface water hydrology, water resource planning and management, surface and ground water pollution control, and water quality/quantity monitoring system design. Peter has successfully designed and supervised the implementation of projects domestically and internationally. Peter opened Fall Creek Engineering in 1997 in Santa Cruz, CA.

Peter is a recognized leader in the field of decentralized water, wastewater and stormwater management and low impact development. Peter is also an expert in ecological engineering and constructed wetland treatment systems. In his position at FCE and AQL Peter directs the design, construction and servicing of various decentralized water and wastewater treatment projects in California and internationally.

Peter conducts short courses and presents at international conferences on ecological engineering and small community water and wastewater management strategies and solutions. Peter participates on several technical advisory committees pertaining to decentralized water and wastewater treatment and reuse in California. Peter is the principal author of a technical note for the World Bank - Guide for Wastewater Management for Rural Villages in China and has been a lead technical consultant for the World Bank's New Socialist Countryside Project in Ningbo, China. Over the past few years Peter has consulted with the MASS Design Group and Partners in Health to develop appropriate water and wastewater treatment solutions for health care facilities in Liberia, Rwanda and Haiti.

GABRIEL KAPRIELIAN

URBAN ENGINEERING



YEARS OF EXPERIENCE

13 years

EDUCATION

University of California Berkeley
College of Environmental Design
Master of Architecture
Master of City and Regional Planning

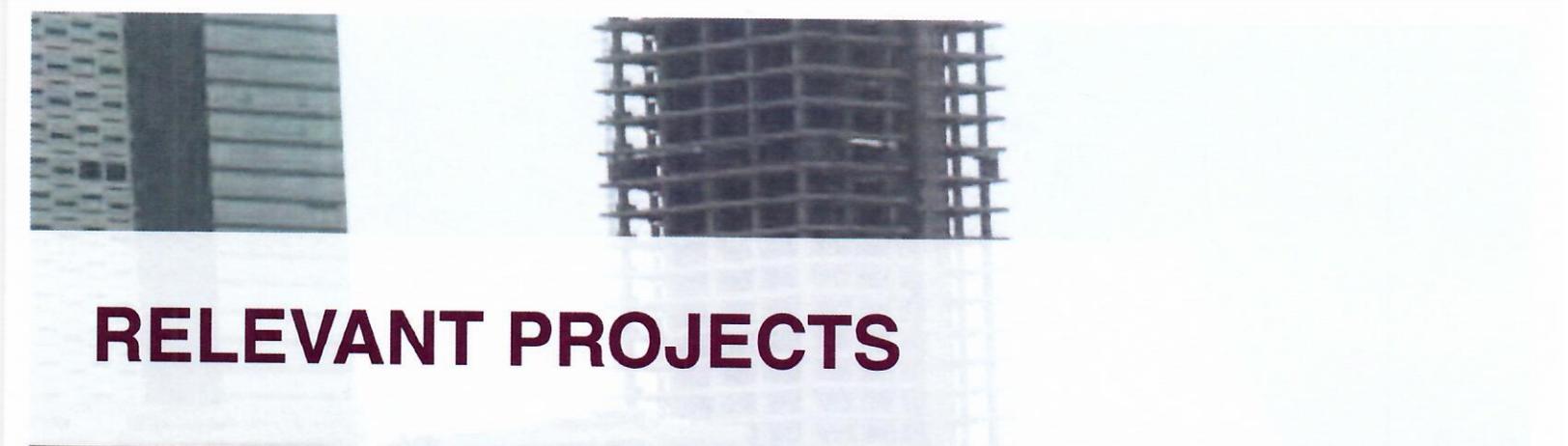
California Polytechnic State University
San Luis Obispo
Bachelor of Architecture

PROFESSIONAL REGISTRATIONS

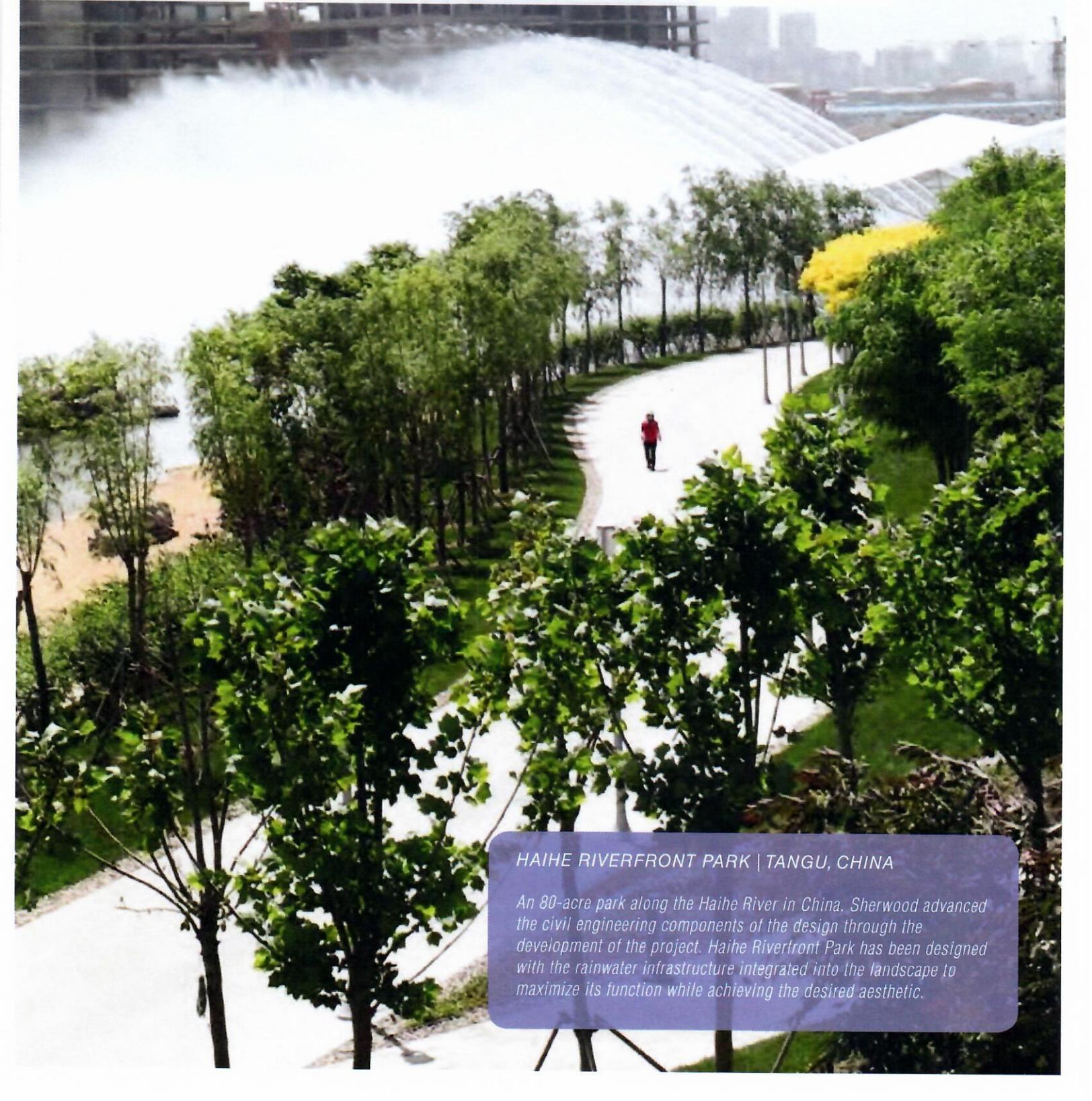
LEED Accredited Professional Certified

Gabriel Kaprielian is an Urban Design, Educator, and LEED AP, with over thirteen years of experience working in fields shaping the built environment. Gabriel heads Sherwood's Innovation Team that provides guidance and project integration with our clients and collaborative partners through visualization of complex design engineering solutions from the building to the district scale. Gabriel's interdisciplinary approach to sustainability explores an understanding of the interconnected relationship between the built and natural environment past, present, and future. Through site research and visual storytelling his work seeks to reveal design potential, build knowledge, and optimize project delivery.

Gabriel's professional experience includes working in traditional architecture firms, social non-profit architecture, public sector, and internationally. He has taught architecture and urban design at Temple University, California Polytechnic State University, California College of the Arts, and UC Berkeley where he is the Director of the Design and Innovation for Sustainable Cities program.



RELEVANT PROJECTS



HAIHE RIVERFRONT PARK | TANGU, CHINA

An 80-acre park along the Haihe River in China. Sherwood advanced the civil engineering components of the design through the development of the project. Haihe Riverfront Park has been designed with the rainwater infrastructure integrated into the landscape to maximize its function while achieving the desired aesthetic.

RBD ISLAIS HYPER-CREEK

District-Wide Vision for Naturalized Creek and Resilient Watershed Restoration

LOCATION

San Francisco Bay Area

CLIENT

City of San Francisco

DESIGN PARTNERS

Bjarke Ingels Group (BIG)

ONE Architecture

Strategic Economics

Nelson Nygaard

The Dutra Group

Moffat & Nichol

Stanford University

STATUS

Completed

PROJECT TYPE

City Infrastructure Planning



Image ONE BIG Sherwood

Above: Rendering of proposed pilot areas in Islais Creek. Below: Before and after rendering of the revitalized area.

Sherwood partnered with Bjarke Ingels Group (BIG) and ONE Architecture on a year-long, collaborative design challenge for Islais Creek in San Francisco, California. The team is tasked with co-creating resilient, community-based solutions to social and economic stressors in addition to environmental risks of sea level rise, storm surge flooding, and liquefaction. To create a comprehensive set of solutions, Sherwood enlisted the expertise of leading economists, transportation specialists, and key stakeholders to help reimagine the Baywaterfront through six pilot projects, proposing new expansive parkspace, clustered and stacked office and maker spaces, comprehensive creek daylighting, and wastewater treatment wetlands to name a few. Key to the project's longitudinal success, Sherwood has convened a core stakeholder working group comprised of residents, regulators, community advocates, and self-organizing groups rooted in the area to help champion the project from the conceptual phase through funding and building phases.



LA STATE HISTORIC PARK

Integration of Site Engineering & Water Resource Adjacent to LA River

LOCATION

Los Angeles, California

CLIENT

City of Los Angeles

California State Parks Department

DESIGN PARTNERS

Hargreaves Associates

SIZE

32 Acres

STATUS

Design Completed 2006

PROJECT TYPE

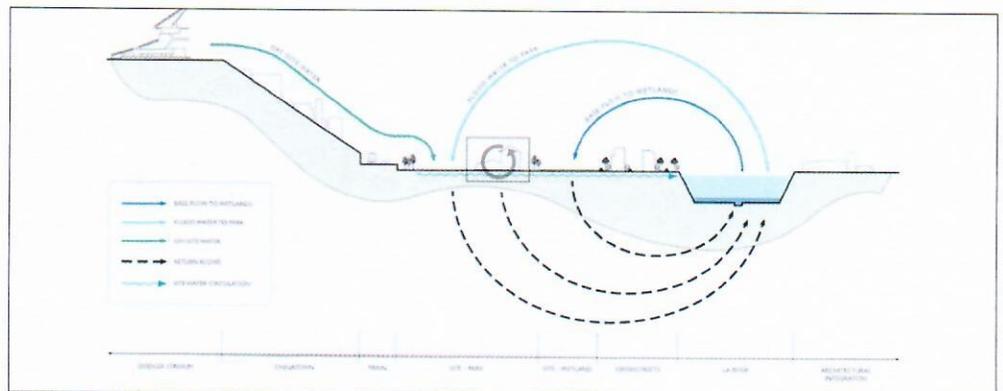
Park/Open Space



Image Compliments of Hargreaves Associates.

A rendering of the park design and a base flow diagram of the water utilization in the park.

Recognizing the importance of urban open space and conservation, the city of Los Angeles and the California State Parks Department have dedicated a 32-acre site in the heart of the City to recreation, education, and sustainability. Working closely with Hargreaves Associates, Sherwood developed a strategy to successfully integrate the site engineering into the urban fabric of Los Angeles. A complex system of water resource management and recycling was devised, including steps to improve the quality of the LA River adjacent to the site. Base flows from the river will be utilized to sustain wetlands within the site and enhance their habitat, and a “greenstreets” program is being implemented in the neighboring community to optimize stormwater collection and enhance the urban landscape of downtown Los Angeles. Sherwood provided comprehensive sustainability and civil engineering services for this project.



GUADALUPE RIVER PARK

Comprehensive Feasibility Study

LOCATION

San Jose, California

CLIENT

Guadalupe River Park Conservancy

DESIGN PARTNERS

Office of Cheryl Barton

SIZE

4.5 Acres

PROJECT TYPE

Urban Park Design



Image Compliments of Office of Cheryl Barton.

Photos around the park and site map.

Sherwood worked with the Office of Cheryl Barton and the San Jose Redevelopment Agency on the Guadalupe River Park – Arena Green. This 4.5 acre project site is bounded by the Guadalupe River to the west and Guadalupe Parkway (Hwy. 87) to the east. The park design studied accommodating a Cirque du Soleil show a few months of the year, which required that park layout and materials meet Cirque’s standard specifications. During the Cirque’s off-season, the park is to transform to accommodate other active and passive uses. Sherwood participated in the feasibility studies, provided conceptual level engineering design, and led the development of a comprehensive hardscape materials matrix that evaluated the cost/benefits of numerous impervious, pervious, permanent, and temporary paving systems to be used in different programming areas.



OKLAHOMA CITY CENTAL PARK

Integration of Sustainable Design for a 40 Acre Park and Open Space

LOCATION

Oklahoma City, Oklahoma

CLIENT

The Major's Office of Oklahoma City

DESIGN PARTNERS

Hargreaves Associates

SIZE

40 Acres

STATUS

Design Phase

PROJECT TYPE

Park/Open Space



An aerial view looking down from the north end of the park.

In the urban core of Oklahoma City, Sherwood is working with Hargreaves Associates and the Mayor's office to design Oklahoma City's new 40-acre Central Park as a paradigm of sustainable urban public space. Sherwood's role, as ecological engineer, is to integrate the principals of sustainable design including water conservation and aquifer recharge; ecosystem creation and green streets integration; materials and waste reduction; renewable energy generation and conservation and; community education. Sherwood has developed goals and metrics, and established strategies based on cost, climate, and program which not only make this park an example for others but will create a legacy for the city.



Image credit to Hargreaves Associates.

BROOKLYN BRIDGE PARK

Resilient Coastal Buffer & Wetland Along The East River

LOCATION

Brooklyn, New York

CLIENT

Brooklyn Bridge Park Conservancy

DESIGN PARTNERS

Michael Van Valkenburgh
Associates, Inc.

SIZE

85 Acres

STATUS

Completed 2016

PROJECT TYPE

Park/Open Space

SHERWOOD ROLE

Ecological Systems &
Open Space Engineering



Above & Below: Photos taken from Brooklyn Bridge Park.

Sherwood was brought into this aspirational project by MVVA and the BBP Conservancy to replace the previous civil engineer in 2012 and has been involved in all subsequent phases including the Dumbo Sections, Piers 2,3 5 and multiple infill sections that stick the park together. This transition of engineers was done based on our ability to create landscape integrated, subtle, low impact design that allows ease of construction, maintenance and acceleration of, NYSDEC, DOT, DEP, and MTA approvals. Given the site's interface at the jurisdictional boundaries of the East River (NYSDEC) and the public combined sewer system (NYCDEP), we developed a system of green stormwater management strategies that maximized the discharge of stormwater to the East River and saved on construction costs associated with NYCDEP requirements. In addition, our focus on resilient materials and design was critical due the site's vulnerability to storm surge and flooding. A critical element of the design was related to the integration of several mixed use building renovations and new construction. Through this process we provided a seamless integration of pedestrian and vehicular circulation in close coordination with the DOT and FDNY to provide access and fire suppression requirements. Our work resulted in a finished product that met the clients goals, reduced costs, limited permitting timeframes and raised the sustainability goals for the project. As site civil engineers for over 6+ phases of the Brooklyn Bridge Park network, Sherwood Design Engineers have proven that innovative thinking coupled with responsive engineering support throughout the process of design and construction has enabled a 21st century park become one of the most visited and resilient green spaces in New York City.



PIER 5 AT BROOKLYN BRIDGE PARK

Wetland Treatment & Reuse System

LOCATION

Brooklyn, NY

CLIENT

Brooklyn Bridge Park Conservancy

DESIGN PARTNERS

Michael Van Valkenburgh

Associates, Inc. (MVVA)

Architeturual Reserch Office (ARO)

SIZE

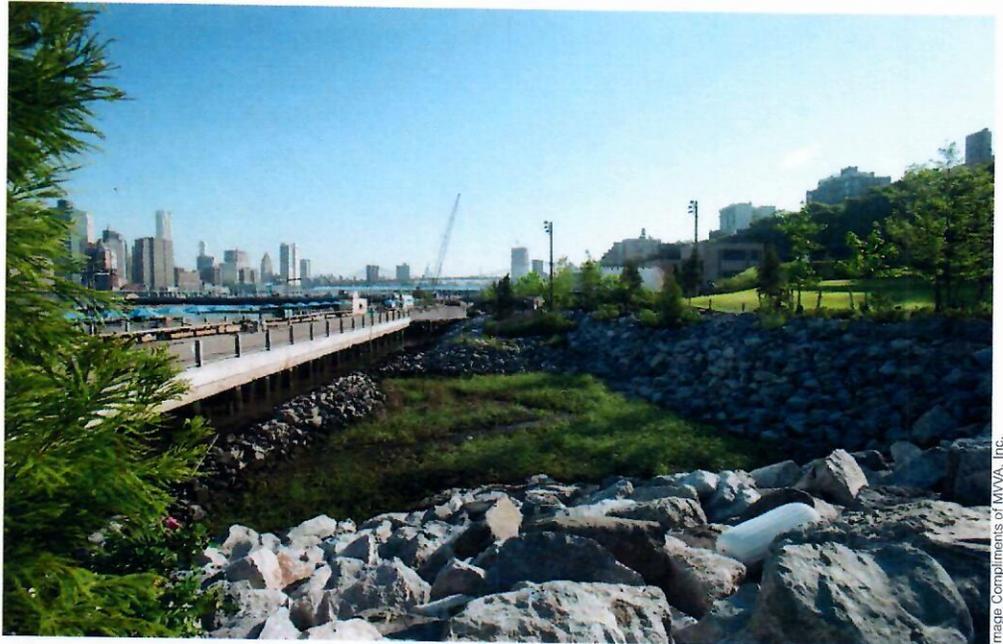
3.4 Acres

STATUS

Completed 2017

PROJECT TYPE

Park/Open Space



Above & Below: Photos from the site

As site civil engineers for the 3.4 acre park and open space, the operations and maintenance building (1 building) and the boathouse building, our design team worked closely with MVVA and the Park Conservancy. All aspects of the parks open space, pathways and site boathouse, and maintenance buildings were coordinated directly with both MVAA and ARO to ensure permitting, access and circulation patterns were adhered to. Our role helped the landscape architect achieve the proposed landscape aesthetic for the site while meeting construction, permitting and regulatory deadlines for the project.



ARROYO MOCHO CREEK CROSSING

Fish Passage Enhancement Project

LOCATION

Livermore, California

CLIENT

Lawrence Livermore National
Laboratories



The Arroyo Mocho Creek Crossing is located in the lower end of the Arroyo Mocho Canyon in Livermore, California. A concrete ford creek crossing was constructed across the stream at the Arroyo Mocho Shaft Road and was used by the Lawrence Livermore National Laboratories (LLNL) to access the Arroyo Mocho Pump Station, the primary water supply for the laboratories. The creek crossing was a complete barrier to both steelhead and resident trout migration. Sherwood was retained by the LLNL and led a multi-disciplinary team of engineers, biologists, geomorphologists and hydrologists to develop restoration plans and specifications for a clear span bridge. The project involved the development of a biological assessment, a geomorphic assessment and hydraulic analysis and preparation of engineering design plans and specifications for the restoration of the stream, the removal of the concrete ford, and the design of a new clear span steel truss bridge to provide year round access to the pump station. The project entailed the removal of the concrete ford, the reshaping of the stream channel, the installation of an 80 foot clear span bridge and concrete abutments, and the restoration of approximately 190 lineal feet of channel upstream of the crossing to establish a new stream grade and alignment. The newly restored reach included 4 vortex boulder weirs constructed to provide year round fish passage and grade control.

FRENCHMAN'S CREEK RESTORATION

Watershed Restoration & Stabilization

LOCATION

Half Moon Bay, California

CLIENT

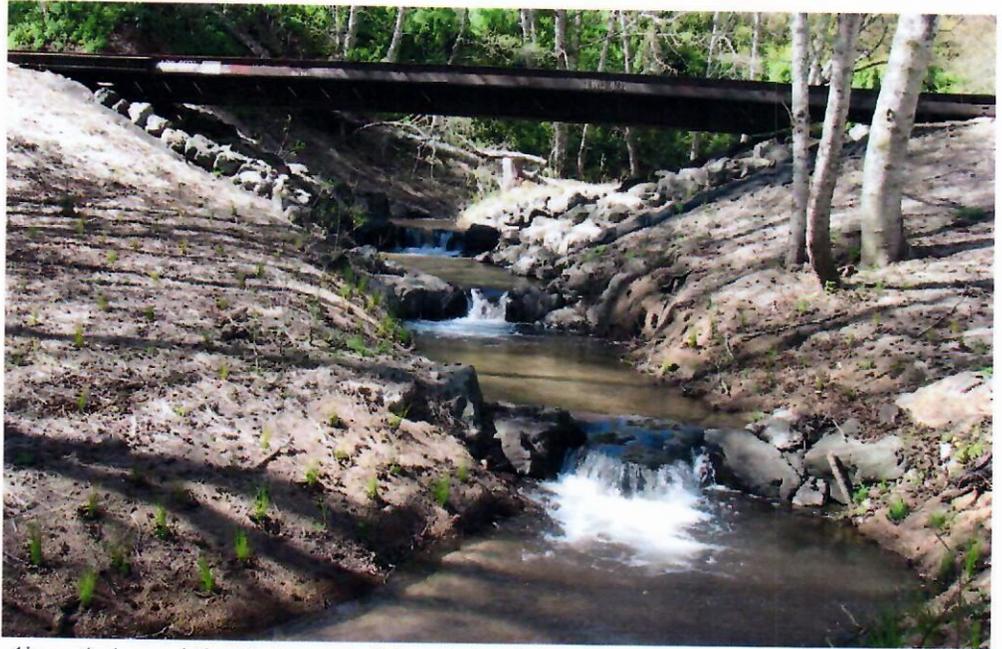
San Mateo County Resource
Conservation District

SIZE

4.1 Miles

PROJECT TYPE

Stream Restoration and Stabilization



Above: An image of the reflecting ponds. Below: A view of the south lawn and one of the bioswale ponds.

Frenchmen's Creek is a perennial coastal stream located in Half Moon Bay on the Central Coast of California. The stream is approximately 4.1 miles long and drains directly to the Pacific Ocean. The stream and riparian corridor are relatively undisturbed and intact, providing good habitat for coast steelhead and other riparian wildlife. In the early 1970's the landowner installed a six-foot diameter by 42-foot long culvert to provide a farm road crossing across the creek. Over time, the culvert became perched, and the invert elevation of the culvert outlet was approximately nine feet above the bed of the channel. The condition created a barrier to the passage of both juvenile and adult steelhead and did not allow fish to access the upper one and half mile of stream course. Sherwood was retained by the San Mateo County Resource Conservation District and led a multi-disciplinary team of engineers, scientist and biologist to remove the culvert and restore the stream for juvenile and adult fish passage. The perched culvert was replaced with a 65 long railcar bridge. The project included several biotechnical stream channel and bank stabilization measures to restore the channel to a stable, non-eroding condition. Eight one-foot high boulder step-pool weirs were installed to provide grade control and facilitate step-pool formation to enhance fish passage and habitat in the project reach.

HARLEM RIVER PROMENADE

Coastline Feasibility Study & Alternative Design Opportunities

LOCATION

Bronx, New York

CLIENT

New York City Department of Parks
& Recreation

DESIGN PARTNERS

Starr Whitehouse Landscape
Architects
Perkins + Will

PROJECT TYPE

Park/Open Space

At the Harlem River Promenade, one of the few parcels of land along the Harlem River that has actual river access, Sherwood was selected with a group of designers to perform a feasibility study and determine alternatives for development of a public program. The design process included multiple meetings with a steering committee composed of representatives of local government, community groups and public agencies, as well as multiple public meetings to present design concepts and receive feedback from the community. Sherwood was responsible for the infrastructure planning, which entailed a detailed existing conditions study and identification of infrastructure implications of alternative concepts throughout the design process, as well as conceptual design of stormwater management on site.

Proposed design for the waterfront edge.



SCOPE + FEE

LA UNION STATION ESPLANADE AND FORECOURT
IMPROVEMENTS | LOS ANGELES, CA

Sherwood is also tasked with assisting the client in identifying the most appropriate framework that is in alignment with the proposed improvements. Once a framework is identified Sherwood will be responsible for the tracking, maintenance and coordination associated with the chosen framework including documentation support.

Elysian Valley LA River Recreation Zone Los Angeles, CA



Scope and Fee Proposal for Civil Engineering Services: River Augmentation Feasibility Study

Sherwood Design Engineers
May 25, 2019



Scope and Fee Proposal

May 25, 2019

Linear City Development
Attn: Yuval Bar-Zemer

RE: Scope and Fee Proposal for Civil Engineering Services River Augmentation Feasibility Study

Dear Mr. Bar-Zemer,

In response to your request, Sherwood Design Engineers (the "Civil Engineer" hereinafter) is pleased to submit this proposal to Linear City Development (the "Client" hereinafter) for engineering services for a River Augmentation Feasibility Study for the Elysian Valley Recreation Zone of the Los Angeles River, within the City of Los Angeles, CA. This proposal describes professional civil engineering services to be performed by the Civil Engineer in collaboration, as appropriate, with the Client's other design team members and consultants (the "Design Team" hereinafter).

It is understood by both parties that concurrent studies may be under way by public and/or private entities, and that responsible agencies may be engaged in planning and/or other activities that contradict the proposed work.

The work proposed herein is described as a primary investigation with additional services which we feel can provide a better understanding of feasible enhancements, and/or allow for phasing of contractual work. We will initiate proposed services upon the approval of this proposal, and as directed by the Client.

1.0 PROJECT UNDERSTANDING

The Civil Engineer will work closely in a collaborative manner with the Design Team, Client, and other stakeholders as directed by the Client, to study and develop appropriate strategies for improving the characteristics of channel(s) within the described reach, that affect technical feasibility for flood control and other programmatic goals. These characteristics are intended to solve known and predicted flood risk and allow for protection of public and private property in Elysian Valley, and the improvement of public facilities adjacent to the river. Work undertaken will be done so will the ultimate goal to improve the human experience and public health of residents, sustainability and resilience of the urban fabric, and ecological value of the riparian corridor. The understood scope of work consists of civil engineering services from June 2019 to September 2019 and is detailed herein.

This Feasibility Study is intended to underscore the opportunity Los Angeles has to utilize, feature, and benefit from the unique and substantial natural resource offered by the Elysian Valley reach of the Los Angeles River, and to highlight alternatives in a comprehensive narrative that is supported technically. The result of this engineering study will assist regional and local stakeholders in evaluating watershed improvements that can significantly alleviate flooding in a vulnerable and developing neighborhood. Sherwood will collect and compile all available information to determine approaches for carrying out this feasibility study, and consistently communicate with the Design Team and Client to ensure new information is integrated. Every project is subject to specific requirements and conditions that cannot be fully anticipated and may require additional documentation and support not covered in this scope.

1.1 Limits of Work

The Limits of Work for this project encompasses the area(s) highlighted in Exhibit A- Area of Study, and further constrained as follows. The study area focuses primarily on the Los Angeles River channel from the Glendale Freeway overpass downstream to the Interstate Hwy 5 overpass. Of particular concern is the straightening and/or bypass of a bend in the river channel adjacent to Rios de Los Angeles State Park. Upon evaluation, other watershed impacts may be taken into consideration at the Civil Engineer's discretion, to address the stated flood impacts. Additional work not included herein may be scoped in an addendum or separate contract.

2.0 PROJECT PHASING AND DELIVERABLES

The Civil Engineer proposes the following design phases relative to the preparation of anticipated feasibility study documents. Each phase is intended to enhance the design upon successive approvals so as to help the project realize the intended design upon completion.

The proposed design phases for this project are:

PHASE I

- 1.1 Project Initiation / Data Collection
- 1.2 Opportunities and Constraints Study
- 1.3 Preliminary Alternatives
- 1.4 Program Alignment
- 1.5 Draft Feasibility Report

PHASE II

- 2.1 Refinement of Alternatives
- 2.2 Concept Engineering Cost Estimates
- 2.3 Illustrative Exhibit(s)
- 2.4 Final Feasibility Report

It is understood that the Civil Engineer will provide hard copies and/or electronic files to Client for their own use, to be shared at Client discretion. Refer to phase(s) below for specific deliverables.

PHASE I: Initial engineering analysis and draft feasibility study

2.1.1 Project Initiation / Data Collection

The Civil Engineer will coordinate with the Client to review available engineering data and information as collected and provided by the Client and agents thereof. To the extent feasible, engineering information will be acquired from public agencies and other sources. This phase will include the following services:

1. Project Kick-off Meeting
2. General Design Team and Client Coordination
3. Assist Client in contacting local agencies to collect relevant publicly-available information pertinent to the study, and explore other opportunities as feasible and possible.
4. Conduct a full-day site visit, including stakeholder engagement as approved by the Client.
5. Collection and review of infrastructure-based data and information including but not limited to stream flow rates and characteristics, recycled water parameters, water quality, precedent projects/studies, proposed interventions, engineering reports, and modeling of channel geometry and hydrology.
6. Develop internal basis of design to be referenced throughout, and formally incorporated into Final Study Report

Deliverables include:

1. Attend one (1) Design Team coordination meeting (local to site)
2. Attend one (1) all day site visit

2.1.2 Opportunities and Constraints Study

The Civil Engineer will complete an initial assessment of the information collected in section 2.1.1 and will identify opportunities and constraints associated with at least 2 and no more than 4 proposed project alternatives, which will assist in developing a strategy that can be communicated with the Client. This phase will include the following services and deliverables:

1. Existing Conditions Assessment
 - a. Assessment of existing conditions of flood risk, channel characteristics, and other factors deemed necessary and pertinent to the goals of the study.

- b. Identification of proposals for implementation of infrastructure improvements currently under way by others to meet the goals of this study.
2. Prepare Opportunities and Constraints Memorandum summarizing:
 - a. Site observations, site, regional, stakeholder, and existing infrastructure opportunities and constraints
 - b. Identification of overlapping, competing and/or synergistic opportunities as they pertain to the study goals
 - c. Incorporation of Design Team information as deemed relevant by the Civil Engineer

Deliverables include:

1. One (1) Opportunities and Constraints Map
2. One (1) Opportunities and Constraints Memorandum to accompany Map

2.1.3 Preliminary Alternatives

The Civil Engineer will complete a preliminary desk study of proposed designs and strategies that arise out of the documented opportunities and constraints map and memorandum, in coordination with the Client. This phase will include the following services:

1. Outline and confirm feasibility of proposed strategies for channel augmentation including:
 - a. At least 2 and no more than 4 channel improvement alternatives
 - b. Hydrologic studies to support the feasibility of proposed alternatives
 - c. Engineering response to opportunities and constraints as they pertain to each alternative

Deliverables include:

1. One (1) Preliminary Alternatives memorandum and accompanying exhibits to outline selected strategies and infrastructure improvement projects selected by the team.

2.1.4 Program Alignment

The Civil Engineer will work with the Client to ensure the proposed engineering alternatives properly address the program envisioned by property owners and stakeholders who may be impacted, including the following services:

1. Existing use entitlements, rights of way, easements, or other activity affected by the proposed alternatives
2. Public or private entities who have a known responsibility to manage or care for the LA River
3. Public or private entities with concessions or other business activities affected by the proposed alternatives
4. Identify known stakeholders who may be affected by the proposed alternatives
 - a. Public agencies with jurisdiction over the river channel itself
 - b. Public agencies with adjacent lands which relates to and/or access the river channel
 - c. Public or private entities with land which relates to and/or accesses the river channel

Deliverables include:

1. One (1) Set of Illustrative documents describing programmatic elements in response to each proposed alternative.
2. Memorandum describing potential program alignment and/or conflict, and potential resolutions/solutions.

2.1.5 Draft Feasibility Report

Upon completion of channel improvement alternatives and associated programmatic evaluation, the Civil Engineer will develop a Draft Feasibility Report to provide a concise summary of Phase I work product. The draft documents delivered in this phase are intended for the Client's use, and may not be sufficient for external negotiations with stakeholders. This phase will include the following services and deliverables:

1. Coordination/Meeting(s)
2. Compilation of basis of design, opportunities and constraints, engineering alternatives, program alignment and other information developed in previous phases.
3. Develop Draft Feasibility Report to incorporate all relevant information developed in previous phases.

Deliverables include:

1. Attend one (1) Design Team coordination meeting (local to site)
2. One (1) Submittal of hard and electronic copies of Draft Feasibility Study Report

PHASE II: Refinement of alternatives and associated design

2.2.1 Refinement of Alternatives

The Civil Engineer will evaluate alternatives with the Client, and update those selected by the Client to be advanced to Phase II of the project. Engineering analysis will be validated, refined, and reviewed for accuracy and feasibility including a site visit to confirm assumptions and additional data evaluation as seen necessary by the Civil Engineer. This phase will include the following services:

1. Site confirmation of assumptions
2. Outline and confirm feasibility of proposed strategies for channel augmentation including:
 - a. Evaluation and confirmation of alternatives selected by the Client
 - b. Review of hydrologic studies to validate the feasibility of proposed alternative(s)
 - c. Clarification of information, data, modeling, including procurement of additional information as needed and possible

Deliverables include:

1. Update to Preliminary Alternatives Memorandum and accompanying exhibits to further detail and refine selected alternative(s) and infrastructure improvement projects to be advanced and cost estimated.

2.2.2 Opinion of Probable Cost

The Civil Engineer will prepare a preliminary infrastructure opinion of probable cost based on quantities from the Refinement of Alternatives. The cost estimate will be provided in Microsoft Excel spreadsheet form, with unit costs assigned to each detailed line item. The Civil Engineer will use unit values based on available project data for known projects within the Los Angeles area, and RS Means catalog information will be used to estimate the associated costs if the data is not available. Costs for system operations will be included for each alternative. The costs will be for the Client's use and **not** be incorporated into the Final Feasibility Report.

Deliverables include:

1. One (1) electronic submittal of Upfront Capital costs and Ongoing O&M costs will be provided in Microsoft Excel format; this work will be incorporated into an internal evaluation process to determine project viability and subsequent advancement.

2.2.3 Illustrative Exhibits

The Civil Engineer will work with the Client to evaluate one or more alternatives to be presented to stakeholders, and prepare documentation to assist in stakeholder outreach. Illustrative exhibits are anticipated to provide graphic content to augment the Final Feasibility Report. The number of alternatives may determine how many exhibits are provided per project, and will be as agreed upon by the Client but not to exceed the deliverable unless deemed necessary by the Civil Engineer.

Deliverables include:

1. One (1) electronic submittal of at least three (3) exhibits elucidating and clarifying a visual narrative for the proposed alternative(s) to be shared with stakeholders and/or included in the Final Feasibility Report.

2.2.4 Final Feasibility Report

Upon completion of Phase II work, including stakeholder outreach, the Civil Engineer will incorporate new information into a Final Feasibility Report to provide a concise summary of all work conducted. A preferred alternative will be identified in collaboration with the Client. The Final Feasibility Report will be intended for external negotiations with stakeholders and communication with external audiences. This phase will include the following services and deliverables:

1. Coordination/Meeting(s)

2. Update of basis of design, opportunities and constraints, hydrologic studies, engineering alternatives, program alignment and all other information developed in previous phases to align the aggregate work effort and current status of the project.
3. Identification of a preferred alternative, and further refinement thereof.
4. Develop Final Feasibility Report to incorporate all relevant information and provide a complete work product.

Deliverables include:

3. Attend one (1) Design Team coordination meeting (local to site)
4. One (1) Submittal of hard and electronic copies of Final Feasibility Study Report

3.0 ADDITIONAL PROJECT SCOPE & SERVICES (NOT INCLUDED IN PROPOSED FEE)

The following are some services that are not included in this proposal. We would be pleased to provide these and other additional services that may become necessary as the project proceeds. Additional services will be provided for additional mutually satisfactory compensation.

1. Stake Holder Outreach
2. Field survey work
3. Engineering design in AutoCAD
4. Final design drawings

4.0 ASSUMPTIONS

The following items are to be provided by the Client prior to commencement of work:

1. Site plan backgrounds to be used for exhibits and plans
2. Available site utility information, record documents, existing engineering and utility analysis.
3. Environmental Assessments Reports.
4. Infrastructure Assessments

5.0 BASIC AND ADDITIONAL FEES FOR SERVICES

Fees below will be billed on a time and materials basis in accordance with Attachment 1. Fee estimates are based on the schedule below and are subject to revision based on changes to this schedule. Additional services can be provided upon written request and will be billed on a Time and Materials basis or by contract addendum.

A. BASIC SERVICES	Schedule (Completion Date and/or Duration*)	T&M Fee	Estimated Reimbursable Expenses
Section 2 Phase I			
1.1 Project Initiation / Data Collection	2 weeks	\$6,500	\$500
1.2 Opportunities and Constraints Study	2 weeks	\$14,500	\$200
1.3 Preliminary Alternatives	2 weeks	\$24,000	\$200
1.4 Program Alignment	2 weeks	\$5,000	\$200
1.5 Draft Feasibility Report		\$13,000	\$200
Section 2 Phase II			
2.1 Refinement of Alternatives	2 weeks	\$14,500	\$500
2.2 Opinion of Probable Cost	2 weeks	\$8,500	\$200
2.3 Illustrative Exhibit	2 weeks	\$7,000	\$200
2.4 Final Feasibility Report	2 weeks	\$12,000	\$200
Total Fee Estimate	10 Weeks	\$105,000	\$3,400

**Duration is defined as elapsed time from initiation of phase or scope of work upon our receipt of your written authorization to proceed.*

3 EXCLUSIONS CONSULTANT SHALL NOT BE REQUIRED TO PROVIDE THE FOLLOWING SERVICES.

1. Agency Fees
2. Geotechnical Report
3. Legal Descriptions
4. Foundation/ Structural Design
5. Mitigation of contaminants resulting from unidentified leaking above ground or underground storage tanks
6. Soils testing / remediation / removal
7. Percolation tests
8. MEP Design Service
9. Hazardous Waste Remediation
10. Flow/pressure or hydrant flow test
11. Materials Testing and Inspection reports.
12. O&M plans for Mechanical systems
13. Building Waterproofing – other than items in scope
14. Utility demand engineering for electrical service, gas services, telecommunication service, street lights and sidewalk lights
15. Connection location for buildings by others; electric meter and gas meter layout by MEP consultant
16. Site graphics
17. Traffic Engineering and Traffic Studies
18. Verification or inspection of construction activities in the field.
19. Utility Design in BIM or 3D format.

4 REIMBURSABLE EXPENSES

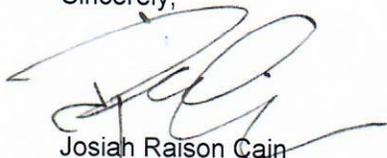
Reimbursable costs as defined in the schedule will be billed in accordance with Sherwood Design Engineers' Fee Schedule – see Attachment I. Ordinary expenses of approximately 10 percent of the labor budget should be anticipated.

5 RETAINER & INITIATION

For your reference, copies of our current fee schedule and our Standard Terms and Conditions have been included with this proposal and will be part of this agreement. In order to initiate services in support of this project we request a retainer of **\$25,000**. An invoice for the retainer will follow this proposal. Should you find the terms of this proposal acceptable, please sign and return one copy to our San Francisco office along with a check in the amount of **\$25,000**.

We thank you for this opportunity to submit this proposal and look forward to beginning work with you on this exciting project!

Sincerely,



Josiah Raison Cain
Principal / Director of Innovation

EXHIBIT A – LIMIT OF WORK



ATTACHMENT I – STANDARD TERMS AND CONDITIONS

1. Contracting Parties: Sherwood Design Engineers firm identified in the Acknowledgment below (“Sherwood Design Engineers” or “SDE”) shall perform the scope of work (“Services”) described in the Proposal in accordance with the following terms and conditions. The “Client” is the person or entity identified as such in the Acknowledgment below. The “Project” is the project identified in the Proposal.
2. Client Responsibilities: The Client shall provide a representative authorized to act on the Client’s behalf, provide full information regarding the Project, and shall render decisions on submissions by SDE in a timely manner relative to the schedule and comply with any obligations on its part identified in the Proposal.
3. Rates and Estimates: The hourly rates on which the Proposal has been estimated and which shall apply to Additional Services are:

<u>Personnel</u>	<u>Rate</u>
Senior Engineer	\$205
Senior Project Manager	\$195
Project Manager	\$180
Project Engineer	\$175
Design Engineer III / Designer III	\$165
Design Engineer II / Designer II	\$150
Senior CAD Drafter	\$150
Design Engineer I / Designer I	\$140
CAD Drafter	\$135
Graphic Designer	\$135
Project Assistant	\$110

Principals’ and Managing Principals’ time on projects is chargeable at \$210 to \$280 per hour. Senior Principals are \$450.

Charges for outside services, equipment, and facilities not furnished directly by Sherwood Design Engineers will be billed at cost plus 10%. Such charges may include, but shall not be limited to printing reproduction services; shipping, delivery, and courier charges; sub consultant fees and expenses; special fees, permits and insurance; transportation on public carriers, and consumable materials. Mileage will be charged at the prevailing IRS rate per mile.

These rates apply to the current period and are subject to increase by SDE each January 1 and July 1 or when foreign exchange rates cause the hourly rates to decrease in relation to the USD by more than 5% from the rate at the date of this Proposal.

Unless the proposal establishes a fixed fee or fee cap, any estimate in the Proposal is an estimate only. If it appears that the fee will exceed the estimate, SDE shall advise the Client. If the Proposal establishes a fixed fee or fee cap, the fixed fee or cap applies only to the basic services specified in the Proposal, and not to Additional Services.

The fee basis for Additional Services shall be at the rates set forth above. Additional Services are services beyond the basic services described in the Proposal, and may result from a variety of factors including (1) changes that increase the size, quality or complexity of the Project; (2) directives that are inconsistent with approvals previously given by the Client; (3) revisions to documents caused by a change in the construction budget and/or the schedule; (4) change in schedule; (5) additional deliverables requested by the Client.

4. Invoices: Unless other payment terms are set forth in the Proposal, fees for professional services and reimbursable expenses shall be billed monthly. Invoices will generally be for work and expenses performed or incurred during the fiscal month prior to the date of invoice for the defined scope of work.

Fees quoted in the Proposal and rates specified herein do not include any form of tax, which must be added and paid by the Client, if applicable (including but not limited to foreign withholding tax, value added tax, Hawaii GET, etc.). Any initial/retainer payment called for by the Proposal will be credited to the final invoice.

5. Reimbursable Expenses: Pass-through consultant fees and other expenses such as travel, printing, CAD plotting, reproduction, copying, postage, shipping, fax, telephone, special renderings, mock-ups, etc. shall be billed by SDE at cost plus 15%, unless otherwise stated in Attachment II – Professional Personnel Service Fees. Interoffice travel by SDE staff between SDE offices required to perform these services will be billed at cost without markup. See Attachment III - Schedule of Reimbursable Expenses.

6. Payment: All invoices are due and payable upon receipt regardless of the Client's project funding mechanism, non-performance of business partners, the approval of any government or agency of government, or the initiation of construction or sales. Sherwood Design Engineers expressly reserves the right to suspend its service and/or terminate this agreement should any invoice remain unpaid 45 days past the invoice date. A late charge and rebilling fee of 1.5% per month will be added to, and be payable with, all amounts not paid within 45 days of the invoice date. All rights of set off at common law or in equity which the Client would otherwise be entitled to exercise are expressly excluded.

7. Termination: Either party may terminate this agreement for any reason or for no reason after giving twenty (20) working days written notice to the other party. In the event of termination of this agreement, SDE shall be paid in full for all time (at standard bill rates above) and reimbursable expenses committed and incurred up to the date of termination or which cannot reasonably be avoided, or in the case of a fixed fee assignment SDE shall be paid in full for the percentage of work complete as reasonably determined by SDE. Save for the Client's obligation to make these payments neither party shall have any other liability to the other in case of termination.

8. Standard of Care: In the performance of its duties and obligations under and in connection with this agreement, SDE shall perform in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality. Notwithstanding any other provision of this agreement or the Proposal, no greater duty shall be imposed on SDE.

9. Instruments of Service: All SDE documentation for this Project shall be provided to the Client in the English (USA) language. All Instruments of Service shall be provided in either imperial units of measure or metric units unless specifically agreed otherwise between the Client and SDE.

Plans, specifications, concepts, designs, drawings, calculations and other documents, including those in electronic form, prepared by SDE or its consultants are Instruments of Service useful with respect to this Project. SDE shall be deemed the authors and owners of the Instruments of Service prepared by them and shall retain all common law, statutory and other reserved rights, including copyrights. SDE grants to the Client a non-exclusive, non-assignable license to use, and to sublicense contractors to use, SDE's Instruments of Service solely to construct, use and maintain the Project, provided that the Client complies with all obligations, including prompt payment of all sums when due, under this agreement. Unless otherwise agreed in writing, any termination of this agreement prior to completion of the Project shall terminate this license. Upon such termination, the Client shall refrain from making reproductions of Instruments of Service and shall return to SDE all originals and reproductions. Submission or distribution of Instruments of Service to meet official regulatory requirements or for similar purposes is not publication in derogation of the reserved rights of SDE. The Client shall not use the Instruments of Service for future additions or alterations to this Project or for other projects. Any unauthorized use of the Instruments of Service shall be at the Client's sole risk. If SDE's services described in the Proposal involve the provision of any prototypical design, the license granted hereunder shall extend only to such number of each prototype as is specified in the Proposal. Further use of the Instruments of Service shall require an additional license fee to be agreed between SDE and the Client.

10. Use of Sherwood Design Engineers Name and Depictions of Project. Notwithstanding the provisions in Section 1.9 restricting the use of Instruments of Service, the Client may use renderings, conceptual and schematic drawings, models and photographs of models, computer-generated depictions, and photographs of the Project ("Depictions") for marketing and promotional use. In using Depictions and in otherwise describing and promoting the Project, the Client shall give appropriate credit to SDE and indicate its role in the Project. Before using Depictions, the Client shall consult with SDE about the nature of the Client's intended use. SDE may revoke permission to use Depictions and SDE's name at any time, and such permission is personal to the Client and may not be assigned.

11. **Choice of Law.** This agreement shall be governed by the substantive law of the state or other jurisdiction in which the principal place of business of the SDE firm entering into this agreement is located, as designated in the Acknowledgement below, excluding its conflict of law rules. The parties further submit and agree to the exclusive jurisdiction of the courts sitting in that state or other jurisdiction.
12. **Time Limitations:** SDE reserves the right to renegotiate or withdraw this proposal in the event that the Client does not execute within two (2) months of the date of the Proposal. No action or proceedings arising out of or in connection with this agreement, whether in contract, tort, for breach of statutory duty or otherwise, may be commenced after the expiration of two (2) years from the earliest of (i) the date of completion by SDE of its services under this agreement, (ii) termination of this agreement, or (iii) substantial completion of the Project.
13. **Limitation of Liability:** The Client and SDE mutually waive consequential damages for claims, disputes and other matters in question arising out of or relating to this agreement. In addition, in recognition of the relative risks and benefits of the Project to both the Client and SDE, the risks have been allocated such that the Client agrees, to the fullest extent permitted by law, to limit the liability of SDE and its sub-consultants to the Client for any and all claims, losses, costs, damages of any nature whatsoever, or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, including those resulting from negligence, breach of contract, breach of statutory duty or otherwise (collectively "Claims") so that their total aggregate liability for and in connection with the entire Project which is the subject of this agreement, regardless of how limited in scope the services under this agreement may be, shall not exceed SDE's available insurance limits at the time of judgment, attempted collection or settlement. The Client further agrees not to hold any officers, principals, directors, employees, consultants or agents of SDE or its affiliates liable in respect of any Claims. All of the limitations on liability in this paragraph shall only apply to the extent permitted by law. If these limits of liability are not acceptable to the Client, SDE will negotiate a different limit in consideration of an alternative fee structure. The Client's signature on the Proposal indicates that the Client declines such opportunity to negotiate an alternative fee.
14. **Budgets and Cost:** SDE's participation in any budget process and any value engineering is provided only for determining general scope and quality parameters and to provide general assistance to the Client in developing budgets and estimates of construction cost. In no event shall SDE be deemed responsible for, or have any liability with respect to, the accuracy of any budget or cost estimate or the certification or verification of any payments to contractors. The Client shall have the sole responsibility to assure cost compliance and limitations in the Client's contracts with its contractors.
15. **Priority, Assignment, No Third-Party Rights:** This agreement supersedes all prior negotiations, representations, or agreements whether written or oral. This agreement can be modified only by a written document signed by both parties. All work carried out and services performed by SDE in connection with the Project prior to the date of this agreement shall be deemed to have been carried out subject to the terms and conditions of this agreement. In the event of any inconsistency between anything contained in the Proposal and these terms and conditions, these terms and conditions shall prevail. The Client may not assign the benefit of this agreement or any rights arising under it without the prior written consent of SDE. There are no third-party beneficiaries to this agreement.
16. **International Assistance.** If the Project is located in a place other than the United States, the Client shall use all reasonable efforts to assist SDE, its personnel and their dependents in obtaining: visas, work permits, customs and currency clearances for business and personal property and funds, emergency assistance, and the like, and access to organizations and information useful for the performance of SDE's services.
17. **Dispute Resolution.** Each party agrees not to commence any lawsuit against the other party without first complying with these requirements. Each party with a claim of any kind ("Claim") shall notify the other party or parties in writing of the Claim. Such writing shall describe the nature and location of the matter that is the subject of the Claim in reasonable detail (the "Claim Notice"). Within a reasonable period of time after receipt of the Claim Notice, which period shall not exceed sixty (60) days, the party or parties receiving the Claim Notice and the party making the Claim shall meet and confer in the County of the Project or elsewhere as agreed to discuss the Claim. If the parties cannot thereby resolve the Claim, the Claim shall be submitted to non-binding mediation pursuant to the mediation procedures adopted by JAMS or any successor entity thereto or to any other entity offering mediation services that is acceptable to the parties. The parties shall cooperate so that the mediation session can be held as soon as practicable, and no later than sixty days after the meet and confer of the parties referenced above.

ATTACHMENT II - PROFESSIONAL PERSONNEL SERVICE FEESJANUARY 1, 2018 – DECEMBER 31, 2018

<u>Personnel</u>	<u>Rate</u>
Senior Engineer	\$205
Senior Project Manager	\$195
Project Manager	\$180
Project Engineer	\$175
Design Engineer III / Designer III	\$165
Design Engineer II / Designer II	\$150
Senior CAD Drafter	\$150
Design Engineer I / Designer I	\$140
CAD Drafter	\$135
Graphic Designer	\$135
Project Assistant	\$110

Principals' and Managing Principals' time on projects is chargeable at \$210 to \$280 per hour. Senior Principals are \$450.

Charges for outside services, equipment, and facilities not furnished directly by Sherwood Design Engineers will be billed at cost plus 10%. Such charges may include, but shall not be limited to printing reproduction services; shipping, delivery, and courier charges; sub consultant fees and expenses; special fees, permits and insurance; transportation on public carriers, and consumable materials. Mileage will be charged at the prevailing IRS rate per mile.

ACKNOWLEDGEMENT

The respective obligations of the parties are set forth in the Proposal, including any schedules or exhibits referred to therein, and in the ATTACHMENT I - STANDARD TERMS AND CONDITIONS which is attached to the Proposal and made a part thereof. If both the Client and Owner have signed this Acknowledgement, both shall be responsible jointly and severally to pay amounts invoiced and due to Sherwood Design Engineers.

Proposal:

Letter dated _____ for the _____

Billing: Preferred Billing Method: US Mail Email Both

Billing contact name: _____

Billing contact email: _____

Special Instructions: _____

Client:
 Full Name: _____
 Attention: _____
 Address: _____
 Federal Tax ID _____

Owner:
 Full Name: _____
 Attention: _____
 Address: _____
 Federal Tax ID _____

x
 Agreed _____ Title _____ Date _____

x
 Agreed _____ Title _____ Date _____

Sherwood Design Engineers:

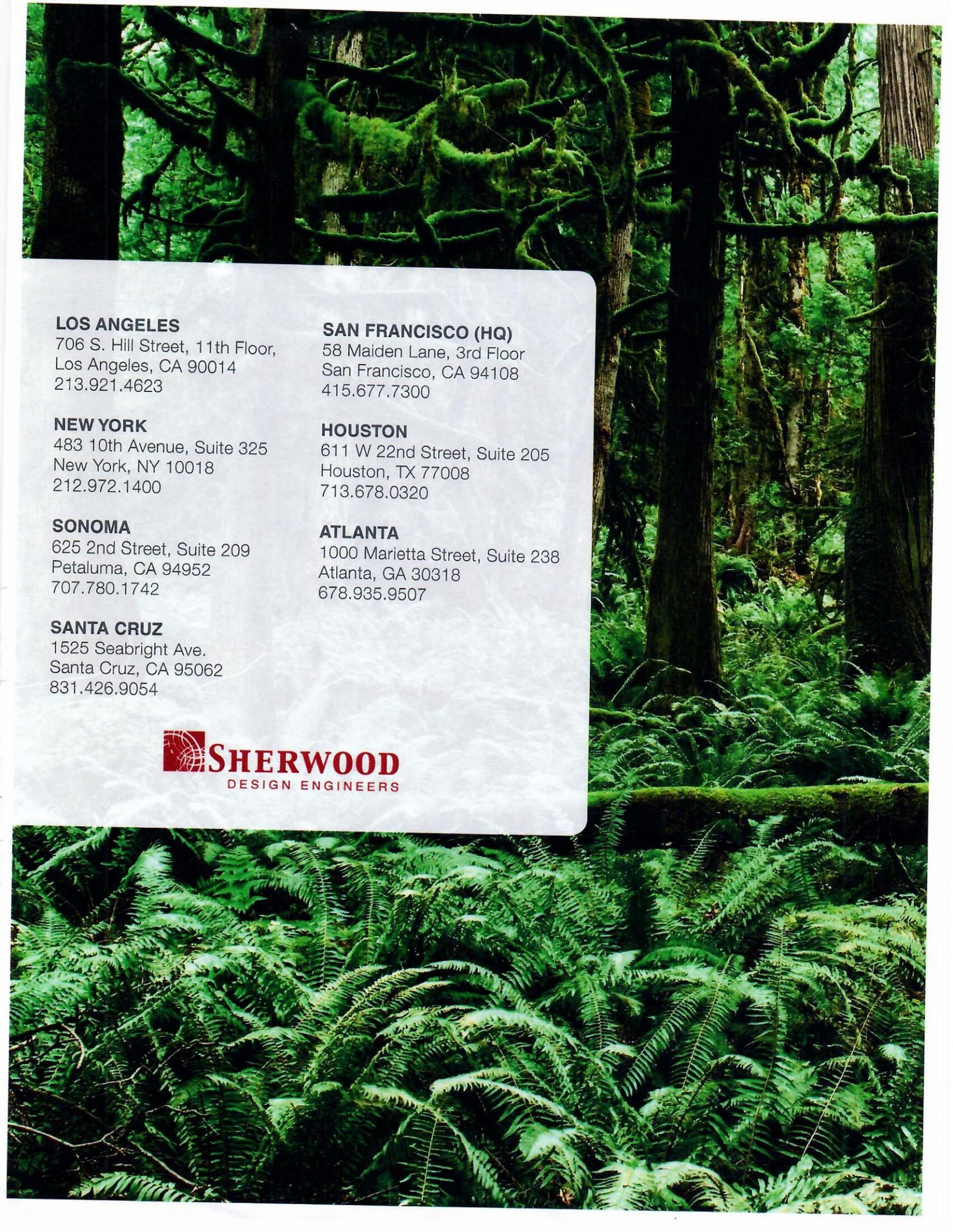
This agreement is with only the following identified entity which is solely responsible to provide the Service:

- Sherwood Design Engineers – 2548 Mission Street, San Francisco CA 94110, USA
- Sherwood Design Engineers – 483 Tenth Avenue, Suite 325, New York, NY 10018, USA
- Sherwood Design Engineers – 611 W. 22nd St., Suite 205, Houston, TX 77008

x
 Agreed _____ Title _____ Date _____

S. Bry Sarté
 Principal Engineer
 California Certificate No. 60244

John Leys
 Principal Engineer
 California Certificate No. 72828



LOS ANGELES

706 S. Hill Street, 11th Floor,
Los Angeles, CA 90014
213.921.4623

NEW YORK

483 10th Avenue, Suite 325
New York, NY 10018
212.972.1400

SONOMA

625 2nd Street, Suite 209
Petaluma, CA 94952
707.780.1742

SANTA CRUZ

1525 Seabright Ave.
Santa Cruz, CA 95062
831.426.9054

SAN FRANCISCO (HQ)

58 Maiden Lane, 3rd Floor
San Francisco, CA 94108
415.677.7300

HOUSTON

611 W 22nd Street, Suite 205
Houston, TX 77008
713.678.0320

ATLANTA

1000 Marietta Street, Suite 238
Atlanta, GA 30318
678.935.9507

