



# **GENERAL QUALIFICATIONS**



## **RECENT AWARDS**











#### 2021

Hall Street Reconstruction - Phase I, St. Louis Board of Public Service Project of the Year Award, American Public Works Association, Missouri Chapter

I-255 Roadway and Bridge Rehabilitation, IDOT Honor Award, American Council of Engineering Companies (ACEC) of Illinois

**Emerson Zooline Railroad Tunnel Repairs**, Saint Louis Zoo **Grand Award**, American Council of Engineering Companies (ACEC) of Missouri

Industrial Wastewater Pretreatment Facility, Kerry Ingredient & Flavors Grand Award, American Council of Engineering Companies (ACEC) of Missouri

#### 2019

Safety Improvements Design-Build, MoDOT Honor Award, American Council of Engineering Companies (ACEC) of Missouri

#### 2018

I-72 at I-55 Mobile LiDAR Scan, IDOT, Region 4, District 6 Special Achievement Award, Best in Category, American Council of Engineering Companies (ACEC) of Illinois

Martin Luther King Bridge Connector to WB I-55/64, IDOT, Region 5, District 8 Special Achievement Award, American Council of Engineering Companies (ACEC) of Illinois

S. Sprigg Street Bridge over Active Sinkholes, Cape Girardeau, Missouri Honor Award, American Council of Engineering Companies (ACEC) of Missouri Project of the Year Award, American Society of Civil Engineers (ASCE), St. Louis Section

I-70 at 5th Street & 1st Capitol Drive, St. Charles, Missouri Best Portland Cement Concrete Interchange Expansion/Improvement Project, Missouri/Kansas Chapter, American Concrete Pavement Association (ACPA)

#### 2017

Sutters Mill Road Bridge Replacement, St. Peters, Missouri Public Works Project of the Year (Transportation), Missouri Chapter American Public Works Association (APWA), St. Louis Branch

Drinking Water Plant Design-Build, Crystal City, Missouri Grand Award, American Council of Engineering Companies (ACEC) of Missouri

#### 2016

Maple Street and Lafayette Street Bridges, Fayetteville, Arkansas Excellence in Preservation Through Rehabilitation (Public) Award, Preserve Arkansas

Schroeder Creek Boulevard Extension, Wentzville, Missouri Best Portland Cement Concrete Urban Arterial & Collector Paving Project, Missouri/Kansas Chapter, American Concrete Pavement Association (ACPA)

#### 2015

Illinois 15 at Illinois 158 Interchange Reconstruction, IDOT, Region 5, District 8 Special Achievement Award, American Council of Engineering Companies (ACEC) of Illinois

**Cemetery GIS**, Marion, Illinois **Merit Award**, American Council of Engineering Companies (ACEC) of Illinois

#### 2014

Broadway Streetscape, Cape Girardeau, Missouri Honor Award, American Council of Engineering Companies (ACEC) of Missouri



## **FIRM OVERVIEW**

110 +

**EMPLOYEES** 

## **OFFICE LOCATIONS**

## **Corporate Headquarters**

401 S. 18th St., Ste. 400 St. Louis, MO 63103-2296 (314) 531-4321

## Bentonville, AR

3604 NW Frontage Rd., Ste. 6F Bentonville, AR 72712-9254 (479) 398-7250

Chicago, IL 8755 W. Higgins Rd., Ste. 325 Chicago, IL 60631-0019 (312) 332-4334

Edwardsville, IL 231 N. Main St. Edwardsville, IL 62025-1631 (618) 650-8440

**O'Fallon, IL** 604 Pierce Blvd., Ste. 300 O'Fallon, IL 62269-2588 (618) 622-3040

**O'Fallon, MO** 101 Laura K Dr., Ste. 101 O'Fallon, MO 63366-3991 (636) 329-9296

**Poplar Bluff, MO** 4061 Highway PP, Ste. 1 Poplar Bluff, MO 63901-3905 (573) 727-9666

**St. Charles, MO** 119 S. Main St. St. Charles, MO 63301-2802 (636) 277-9550 Horner & Shifrin, Inc. is a multidisciplinary professional services firm with the experience and capability to serve a wide variety of clients throughout the United States. Founded in 1933 by W.W. Horner and H. Shifrin in St. Louis,

the firm has grown to offer services to meet the ever-changing needs of our clients and to keep ahead of technological developments in the field of engineering.

We offer professional services in all phases of a project, from feasibility planning and development, funding

application assistance, land survey and

to engineering design and construction

3D scanning, and environmental planning,

administration, as well as GIS mapping services.

thorough review by senior-level staff, no matter

the size of the project. H&S has demonstrated

repeat assignments from 80% of our clients.

As a 100% employee-owned firm, every staff

completing work to the satisfaction of our clients.

These reasons and more make Horner & Shifrin the

member has a personal vested interest in

Our projects are managed in a way that allows for

innovative design on numerous projects, receiving

recognition in the form of professional awards and

## 40+

LICENSED PROFESSIONAL ENGINEERS

8 OFFICE LOCATIONS

## **SERVICES**

Active Transportation Planning Building Services Construction Services Drinking Water

Right Choice for any project.

Environmental Planning & Permitting Geospatial (GIS) Public Funding Assistance Public Involvement Site Development Surveying Transportation Wastewater Water Resources



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#### WWW.HORNERSHIFRIN.COM

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# ACTIVE TRANSPORTATION PLANNING



## **COMPLETE STREETS & ACTIVE TRANSPORTATION PLANNING AND DESIGN**









Since the early 20th century, personal transportation in the United States has been dominated by design and construction of roadways and transportation networks for the use of passenger vehicles. The culture of communities from urban to rural, and everything in between is evolving. The auto-oriented culture of the past is changing to include modal prioritization of cycling, walking, rideshare, and transit as critical elements of the transportation network as appropriate for communities. The relationships between transportation infrastructure modes is vital for our economy and the efficient distribution of goods and services. It is the diversification of personal transportation modes in all communities (urban, suburban, and rural) that leads to equitable and safe transportation options to serve people of all ages, socioeconomic status, and abilities. Building or rebuilding our streets with a Complete Street approach creates infrastructure for people to access housing, services, jobs, recreation by walking, bicycling, transit. The planning and design of equitable Complete Streets accommodates people who cannot afford to drive or those who choose other modes of transportation.

Horner & Shifrin's Complete Streets Group creates transportation systems and networks that focus on the needs of people, and the communities they live in. We create connected communities for walking, bicycling, rolling and using public transit. By choreographing the safe interactions between all modes of travel that use our roadways through thoughtful design and planning, individual choice, accessibility, and healthy lifestyles are possible.

Communities across the country are incorporating multi-modal transportation in projects as a standard practice. Horner & Shifrin is fully equipped to assist our clients with Active Transportation and Complete Streets planning and design with services that include:

- Complete Streets/Great Streets
   Planning and Design
- Trail/Greenway/Bikeway Feasibility
   Studies
- Trail/Greenway/Bikeway Planning and Design
- Pedestrian and Bicycle Active Transportation Plans
- Active Transportation Asset Management System
- Pedestrian and Bicycle Infrastructure Design and Layout
- Internal Roadways and Parking Design
- Bicycle Parking Design
- Local Road and Street Design
- Development of Funding Applications

- Major Investment Studies
- Recreational and Sport Facility Design
- ADA/PROWAG Design
- Safety and Accessibility
- Sidewalks and Curb Ramps
- Traffic Calming Design
- Traffic Capacity and Signal Design
- Mobility Hub Concepts
- Transportation Funding Alternatives
- Public Involvement/Community Relations/Virtual Engagement
- Wayfinding, Planning, and Design
- Comprehensive Planning
- Urban Design and Planning
- Community Facilitation





## **COMPLETE STREETS & ACTIVE TRANSPORTATION PLANNING AND DESIGN**

## South Grand Great Streets East-West Gateway Council of Governments

Horner & Shifrin provided traffic counts and intersection turning movements data to Nelson Nygaard, the design team's traffic engineer, for its use in the project traffic study.

Improvements included reducing traffic lanes from four to three, widening sidewalks, improved traffic signalization for flow and calming, enhanced safety of crosswalks with bulb-outs, ADA ramps and striping, adding landscaping, site furnishings and lighting, and upgrading paving to eliminate hazards in walkway.



#### I-70 Fifth Street Reconstruction St. Charles County Transportation Department

Horner & Shifrin provided conceptual design, extensive public involvement, a Design Report, Access Justification Report (AJR), and final plans, specification and estimates (PS&E) for 1.5 miles along I-70 from Fifth Street to Route 94. The project was completed on an aggressive schedule to meet funding milestones. The project included conversion of a portion of the two-way outer road to a one-way outer road, construction of a new one-way outer road, design of a diverging diamond interchange (DDI) at Fifth Street, addition of a roundabout at Fairgrounds Road, creation of new interstate access points at Fairgrounds Road, and addition of a lane along the interstate corridor at Route 94.

## Germania Street Improvements St. Louis Board of Public Service

Horner & Shifrin provided improvements to Germania Street from Gravois Avenue to I-55 Off Ramp. Improvements included mill & overlay, sidewalks, curb ramps, tree planting, and traffic signals. New sections of sidewalk were added along with a retaining wall to minimize impacts to adjacent properties. Extensive review of existing sidewalk infrastructure was completed for compliance with PROWAG guidelines. H&S directly coordinated with Metro to relocate bus stop locations and provide safe crossing locations. A public meeting was organized and presented by the design team which resulted in broad support of this STP-funded project.

Hall Street Reconstruction - Phase I St. Louis Board of Public Service Horner & Shifrin provided engineering design services for the reconstruction of 3,100' of Hall Street from East Grand Avenue to Adelaide Avenue in the City of St. Louis. Improvements involved the complete reconstruction of Hall Street concrete pavement, a new 5' sidewalk on the west side, a 10' shared-use path on the east side from East Grand to Prairie Ave, and a series of bio-retention ditches along the east side of Hall Street to minimize runoff and improve water quality. Traffic lanes were reconfigured to one vehicle lane in each direction and a shared traffic center turn lane. Other design elements included drainage improvements and MSD coordination, new street lighting, and landscaping throughout the biorention ditches. Project was partially funded by a grant through MSD's Project Clear Program with the remainder STP-funded through the LPA Local Roads Program.

#### Mexico Road Multi Use Path Bridge City of St. Peters, Missouri

The project involved design of a multi-use path bridge over Dardenne Creek with trail connectivity in St. Charles County. Its close proximity to the Mexico Road vehicular bridge and numerous utilities in the area made construction a challenge. The vehicular bridge limited hydraulic analysis and led to the use of a similar span arrangement and skew. The bridge consisted of four 75-ft long pre-engineered bowstring trusses made of weathering steel with a concrete deck. Soft soils required substructure to be founded on footings with steel h-piles. The hammerhead interior bents ranged from 11-ft to 25-ft tall. The east wall abutment is 16-ft high to minimize bridge length and

accommodate a trail running under the bridge adjacent to the creek. A modular block retaining wall at the east approach allowed connectivity to the trail below. About 400-ft of approach trail was also designed and constructed as part of the project. Trail profile and bridge details were selected to be in compliance with ADA requirements.



## Maryland Avenue Resurfacing City of Clayton, Missouri

Horner & Shifrin designed roadway, bike, and curb ramp improvements to Maryland Avenue in the City of Clayton, Missouri. Maryland Avenue is a well-traveled roadway on the north edge of the City's business district. The design team led an extensive public engagement process to identify the need and desire for bike lanes along the corridor. The team developed plans for parking-protected bike lanes and shared lanes to meet the project's goals.



## Marion Bicycle Master Plan Southern Illinois Metropolitan Planning Organization

Horner & Shifrin is preparing a detailed Bicycle Master Plan that will include an inventory of existing bike facilities and conditions for bicycling in the city, analysis of existing roadways that accommodate bike facilities and provide recommendations for specific long and





short-term bike infrastructure projects. The plan will include a community engagement process to include input from the public. The plan will include specific recommendations to promote access from residential areas to the recently planned and funded Crab Orchard Greenway, downtown Marion Tower Square Plaza, major employers, and park facilities and schools throughout the city. Horner & Shifrin will include programmatic elements that will encourage bicycling in the city, address education for bicyclists and drivers, provide recommendations for enforcement of traffic laws, evaluation of progress and engineering design guidelines for implementation. As an early action of the plan, an application for Illinois Transportation Enhancement will be prepared for one specific improvement recommended by the plan.

## Grant's Trail Conceptual Design City of Kirkwood, Missouri

Horner & Shifrin is assisting the City in developing a preferred option for a Grant's Trail extension from the existing terminus of Grant's Trail to Downtown Kirkwood by developing several route options, evaluation of those options and working through evaluation and alignment selection with the Steering Committee and stakeholders.



## Downtown Pedestrian Way Placemaking

## City of Edwardsville, Illinois

The challenge of addressing parking conditions, supply and connections in downtown has been present for many years. Recently, the opportunity to address parking, as well as create a downtown destination in the northeast corner of North Main and Vandalia Street has emerged. The goal of this project is to create a unique place where the businesses and residents of the east side of Main Street are connected by a linear

park or promenade and where one can dine, stroll, visit, and connect in a vibrant destination. The large expanse and slope of the existing parking lots create an opportunity for address a long challenging parking situation through deck parking or a parking structure thereby substantially increasing the parking supply and serving the vision the City and community has for this area. While the parking improvements are one of several focus points for the effort, solutions for parking expansion are certainly a value-added strategy to support a vibrant downtown. The opportunity has become about vibrancy, economic sustainability, connectivity, community, and mobility. The community of Edwardsville clearly values their parks and trails. Over the last year, we have been reminded that it is the open spaces, trails, greenways, and parks that provide healthy spaces to share and connect through a common experience. The project defined the community benefits and economic case to allow Edwardsville leadership to move toward implementation.



## Complete Street Policy City of Roeland Park, Kansas

Recently, the City of Roeland Park completed the development of a complete street policy. Horner & Shifrin was hired to update this existing complete street policy and develop an updated ordinance based on the state of practice that will score high marks as a Complete Street Policy based on the National Complete Streets Coalition to which the City submitted to previously developed policy for review. This effort will define and document values and goals for complete streets in Roeland Park, as well as specific policy elements that will formalize processes and actions for making complete streets a practical and normal approach to decision making for infrastructure investments and redevelopment in the city.

## Woodson Terrace Airport Connection City of Woodson Terrace, Missouri

While with his previous firm, Paul Wojciechowski was the Project Manager and Lead Planner for the development of the Comprehensive Plan for the City of Woodson Terrace, Missouri. The plan provides the direction needed to achieve the vision and goals of the community, including what, where, and how future development will occur in the City. Public input was critical in defining these questions and included meetings with the comprehensive plan steering committee, a public workshop, community surveys, stakeholder interviews, and focus groups discussions.



# Active Living Community of Practice Technical Assistance

**City of Owensville, Missouri** Horner & Shifrin was retained to provide technical assistance to identify opportunities for safe routes for walking and bicycling as a part of the Active Living Community of Practice grant program. Services that were provided by H&S included public engagement, recommendations for locations of bicycle and pedestrian routes, treatment types, and network prioritization information.







## REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

## Angela Lairmore, Parks and Recreation Director

City of Owensville, Missouri (573) 437-2812 parkrec@cityofowensville.com

#### Matt Malick, Public Works Director City of Clayton, Missouri (314) 290-8547 mmalick@claytonmo.gov

#### Shannon Inman, Senior Materials Inspector

Missouri Department of Transportation (573) 358-0796 shannon.inman@modot.mo.gov

#### John Kohler, Planning & Programming Manager

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## Kevin Trapp, Bridge Engineer

St. Louis Board of Public Service (314) 589-6606 TrappK@stlouis-mo.gov

## Cody Moake, Chief of Staff

City of Marion, Illinois (618) 997-6281 cmoake@cityofmarionil.gov

Jonathan Raiche, Director of Planning & Development Services City of Kirkwood, Missouri (314) 822-5800 raichejd@kirkwoodmo.org

## **Eric Williams, Director of Public Works** City of Edwardsville, Illinois (618) 692-7535

publicworks@cityofedwardsville.com

## Donnie Scharff, Public Works Director

City of Roeland Park, Kansas (913) 722-2600 dsharff@roelandpark.org

## Lawrence Besmer, Mayor

City of Woodson Terrace, Missouri (314) 427-2600 mayor@woodsonterrace.net



# BUILDING SERVICES

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## **BUILDING SERVICES (MEP/FP)**











Horner & Shifrin delivers exceptional mechanical, electrical, plumbing and fire protection (MEP/FP) engineering design systems that maximize the economic and environmental potential of each project. Our integrated consulting engineering services allow us to plan, design and manage projects from concept to completion, leading to long-term satisfaction with our clients.

Our portfolio of experience includes a variety of building types including higher education, health care, K-12, multi-family, municipal facilities such as firehouses and police stations, recreational facilities, commercial, corporate, and government. Our high percentage of repeat clients have shown that our responsiveness and quality are key factors to a successful relationship.

#### **Regulations and Codes**

Horner & Shifrin's engineers have substantial experience with regulations and codes, and have established strong relationships with agencies that oversee code regulations including International Building Codes, NFPA, Life Safety Codes, industry standards, and state and local code agencies.

#### **Innovative Cost Savings**

Horner & Shifrin uses our experience to assist our clients in determining the best possible outcome for each project. We design solutions that best meet the end user needs and budget. Each project is unique, so we first seek to understand the project goals so we can provide options that give the client the best value for their budget. We then thoughtfully develop a design that will maximize systems to achieve goals. Analysis consists of gathering data, analyzing information, verifying costs, evaluating function-cost-worth relationships and saving alternates. Our engineering design services cover a huge spectrum of possibilities.

#### **LEED Requirements and Energy Efficiency**

Horner & Shifrin has a thorough knowledge of LEED requirements and certification processes. We have senior-level engineers that are LEED accredited, and utilize green building practices on several projects. We strive to incorporate energy efficient technology systems into all of our designs.

Building Services we provide include the following:

- HVAC Systems Analysis and Design
- Electrical Systems Analysis and Design
- Critical Power System Design
- Lighting System Design
- Low Voltage Power Design
- Fire Protection System Design
- Energy Audits and Reports
- Energy Monitoring and Management
- Energy and Control Systems
- Facilities Engineering
- Feasibility Studies
- Historic Building Renovations
- Site Lighting

- Instrumentation and Control Systems
   Design
- Facility and Code Assessment
- Power Distribution
- Plumbing System Design
- Code and Regulatory Review
- Infrastructure Analysis
- Boiler Plant Upgrades
- Emergency Generators
- Building Automation Systems
- Environmental Air Quality
- City Engineering and On-Call Service

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- Peer Reviews
- Design Assist

## **BUILDING SERVICES (MEP/FP)**

#### **Dixon High School Upgrades Dixon R-1 School District**

Horner & Shifrin provided MEPFP Design services for the \$2.8 million bond issue to the school district. The scope of work included replacing the furnaces serving classrooms and administration offices in the Middle and Elementary schools. The scope of work for the High School included a 6,140 square foot cafeteria and kitchen addition, new entry and concessions. The kitchen is a fully cooking kitchen with walk-in freezer and fridge, commercial kitchen hood and dish washing station. The 3,000 square foot gymnasium renovation includes a basketball court, bleachers, locker rooms and restrooms.



#### **Expansion and Renovation Projects** Windsor School District Provided MEP/FP services for:

- **Elementary Classroom Additions**
- Intermediate Classroom Additions
- Middle School Renovations
- High School Auditorium Renovation
- New Administrative Offices



New Jesuit Residence Hall Saint Louis University Horner & Shifrin provided MEPFP engineering design bridging documents, bid review and construction administration services for the new 34,900 square foot

Jesuit Residence Hall at Saint Louis University. The building includes dormitories, office space, kitchen, dining, library, chapel, and other living space. Project scope included system design to achieve LEED Silver Certification.



Washington University Medical **Campus Student Housing Renovation** Washington University in St. Louis Horner & Shifrin provided mechanical, electrical, plumbing and fire protection engineering design services for the renovation of two historic buildings on Washington University's medical campus. The buildings included the 3-story, 77,671 square foot Shiners Hospital for Children and the 4-story, 51,207 square foot Central Institute for the Deaf. The buildings undergone a gut rehab and was converted into 160 multifamily residences geared toward medical students and admission suites with full amenities. Both state and federal historic tax credits were used in realizing the rebirth of these historic institutions. The engineering scope of work included replacement of all underground and above plumbing system, new domestic water systems, new mechanical systems and new electrical systems.



#### New Police Station City of Creve Coeur, Missouri

Horner & Shifrin provided MEPFP and low voltage engineering design services for the new 2-story, 21,810 square foot Police Station for the City of Creve Coeur. This building includes 5 holding cells, threebay sally port, large evidence storage rooms, fitness room, offices and training rooms. The lower level utilizes an energy recovery unit to reduce the overall building energy consumption. The new building is located directly east of the existing municipal building that housed the police department.

The project was awarded rebates from the local utility company based on electrical consumption savings with energy efficient measures implemented.



Fire House #2 Replacement **Creve Coeur Fire Protection District** Horner & Shifrin provided MEP/FP services for the replacement of the existing Fire House #2 for the Creve Coeur Fire Department. Project consisted of replacing the existing fire house on site with a new 5 bay drive through fire house. The new house was constructed in two phases, such that the existing house could remain in operation during construction. The new fire house has a fitness room, day/living room, commercial kitchen, offices, training room and bunk rooms.



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## New Municipal Building City of Rock Hill, Missouri

H&S provided MEPFP design and construction administration services for the new municipal/police building and separate fire house. The new 12,400 Sq Ft two story municipal/police building houses the police, city administration. council chambers and other city departments. The police department is located on the lower floor and includes holding cells, sally port and interview rooms. The upper level includes city hall with council chambers and city administration offices. The new 6,045 two story fire house has two bays and support spaces on the lower level and bunk rooms, day room, training and kitchen on the upper level. Closed Circuit television and access control systems were installed in all buildings with connection between all buildings.



#### Ambulance District Headquarters St. Charles County, Missouri

Horner & Shifrin was contracted to provide MEPFP engineering design for the new 140,000 square foot headquarters building for St. Charles Ambulance District. This facility combines multiple existing buildings and district functions into one location. The new building houses ambulances for scheduling, repair facilities, storage, administrative offices, training facilities, and a medical clinic. The ambulance storage area, bulk storage and repair area are conditioned to 80 degrees for occupant comfort and product storage. An emergency generator is installed to power portions of the building for emergency situations and central control.

The headquarters is the location of the main data center for the ambulance district. The data center has a UPS and distribution system for the main data room which also feeds to the emergency operations center located in the building.

Fuel/Oil tanks are installed for fuel delivery in the repair facilities. A wet-pipe sprinkler system is provided for the entire facility with a Pre-Action system for the Server Room.

The district offices is the primary location of the closed circuit television (CCTV) and access control for the district. Design of the CCTV system and access control system allows the district offices to monitor and control the cameras and door access to all ambulance houses and ancillary buildings throughout the district.



## Castlereagh Apartment Building Quadrangle Housing

Horner & Shifrin provided mechanical, electrical, and plumbing engineering design services for the gut renovation of the existing six-story Castlereagh Apartment Building located at 6820 Delmar Blvd in University City, Missouri. Historic Preservation Tax Credits were utilized for this project and the exterior facade and interior corridor walls were preserved with the construction. Renovations included a new roof, new historic windows, masonry and terracotta replacement/restoration, hanger rod canopies, aluminum front entry system, refurbished passenger elevator, new freight elevator, mechanical, electrical and plumbing system improvements, carpentry and insulation, restoration of the early 1900s hotel lobby and corridors, new lounge and bike storage rooms, trash chute with trash rooms off each corridor, new flooring, premium interior finishes and stackable washers and dryers in each unit. The project also included a sitework package, consisting of demolition of a one-story garage, civil work, new concrete parking lot, port chochere driveway, rear patio, walkways and stairs. The new work included new MEP systems for 61

apartments on four floors, and retail on the first floor.



Cottages of Lake St. Louis Focused Senior Communities Horner & Shifrin provided MEP-FP, civil and structural engineering design services for two future focus senior living communities. The project site is located in the City of Lake St. Louis, MO. The site is being designed to provide a 60-bed skilled nursing community in six "Green House" homes, along with an administration building.

The project included a small 30KW generator for each building, LED interior lighting, variable refrigerant flow HVAC system in the resident rooms with individual thermostat control, variable air volume handling unit for common spaces, PEX domestic hot and cold water piping, high efficiency gas water heaters, zone wet pipe sprinkler system, separate water meters to each building for isolation, wide walkways around each building, parking access in front of buildings, and a large parking lot near the administration building for staff parking.



O'Fallon Market City of O'Fallon, Illinois

Horner & Shifrin provided mechanical, electrical, plumbing and fire protection services for design of a four season open air market and event center for the Fairview Heights Park and Recreation





Department. Building is used for Farmers Market, Rental for parties and receptions, Santa Claus and other Community Events.



Russellville Aquatic Center City of Russellville, Arkansas

Horner & Shifrin is providing mechanical, electrical, plumbing and structural services for the new 24,022 square feet indoor aquatic center with a 25-yard, eight-lane competition pool with 1 meter diving boards and optional play equipment that could be included. Included is an 1,800-square-foot therapy pool with ramp and therapy rails as well as an 800-square-foot splash pad for younger children, three party rooms, two family rooms, concessions, a manager's office, a lifeguard break/training room, ticket office and two storage rooms.



The Rec Complex of Fairview Heights City of Fairview Heights, Illinois Horner & Shifrin provided mechanical, electrical and plumbing engineering for a new 68,000 square-foot recreation center for Metro East suburb of Fairview Heights.

The facility at the northwest corner of Bunkum Road and Interstate 64 is part of the larger \$18 million Fairview Heights Recreation Complex that will include a dog park, playgrounds, running track and a 1.5-mile walking path and nature trail on 30 acres. The recreation center includes a 12,000 square-foot indoor aquatic center with a lap pool, children's spray grounds, slides and lazy river. The new center will also include a billiards and game room, 6,000 square-foot fitness center, a gymnasium, elevated running tracks, a locker room, multi-purpose and event rooms and administration offices.

Additional phases of construction are dependent on future funding. EWR Architects, Inc. of Fairview Heights developed the master plan for the facility.



## Cabot Aquatic Park Bath House City of Cabot, Arkansas

Horner & Shifrin provided MEP and Structural engineering services for the new Aquatic Center Bath House for Cabot, Arkansas. Project included new toilet/shower rooms, party rooms and concession areas for the outdoor aquatic park. Project is part of a 4.3 million aquatic center that includes a lazy river, two slides, a diving pool, a lane pool and a zero-entry area with splash pads.



# Ambulatory Surgical Center St. Lukes Hospital

Horner & Shifrin performed mechanical, plumbing and fire protection engineering for the conversion of the current ambulatory surgery center to a hospital. Work included upgrades to the medical gas and mechanical systems to meet state and federal hospital codes. Work also included modifying two operating rooms to accommodate a wider range of surgeries. A new air handling unit and air cooled chiller was installed to serve operating rooms 1 and 2. The design was to accommodate temperature ranges from 63 to 65 degrees at 40 to 50% humidity.



## Hybrid Operating Room Memorial Hospital Belleville

Horner & Shifrin provided MEPFP services for the new Hybrid OR for Memorial Hospital. Project included renovating two existing operating rooms into a single hybrid operating room. Work included provided a dedicated HVAC system, relocating power and fire protection, new medical gas articulating columns and power and telemetry articulating columns.



One-Pod and Two-Pod Clinics Mercy

Horner & Shifrin completed structural and MEPFP design for new Mercy Clinics located in St. Louis, Arkansas, and Oklahoma. The design included development of a prototype 14,000 square foot building, which could be adapted to multiple sites. The one story structure was constructed with cold formed stud walls and roof joists spanning to interior steel framing. The building layout utilized input from Mercy staff to provide a consist experience across multiple sites.





The building utilized prefabricated cold form panels and roof trusses which were brought on site. Following the installation of the foundation, the exterior walls for the building were set in one day and the roof trusses and decking soon after. This construction method allowed the project to be enclosed quickly to facilitate interior work. This reduced the construction schedule for the clinic to approximately six months.

A variable refrigerant flow mechanical system was designed to minimize roof penetrations, to provide ease of maintenance, avoid screening requirements, and minimize the need for roof access. The system was provided with an active de-humidification sequence to minimize over cooling during lightly occupied times.



Sheldon West Walkway & Parking Lot Powers Bowersox Associates. Inc. Horner & Shifrin provided electrical and structural engineering design and construction services for the 15,000 square foot outdoor studio at the intersection of Grand Boulevard and Washington Avenue. The Public Media Commons, dubbed the "white room" during the design process due to its all-white facade, runs predominantly north to south from Olive Street. The plaza includes a forecourt entry, a central gathering space with an elevated cafe terrace or stage, a shady hangout, and landscaping Steps integrated into the Commons and leading toward the Fox Theatre create ample seating for the viewing of a large media screen. The programmable LED uplighting is splashed against white, perforated aluminum walls. The surfaces invite a diversity of media expression, from touch screens to largeformat projection, and QR patterns incorporated at various intervals along

them link the physical facades with the virtual space of media and visitors' mobile devices.



#### New Rehabilitation Facility Pinckneyville Community Hospital

Horner & Shifrin provided MEP/FP and Low Voltage design services for the new 16,000-sq-ft wellness and rehabilitation center owned and managed by Pinckneyville Community Hospital. The building includes private therapy rooms for physical, occupational and speech therapy, a separate space for work hardening and massage therapy. Cardiopulmonary rehabilitation and sleep studies will move from the hospital to the Wellness Center. The 24/7 fitness center includes a 32-foot by 25-foot pool that will be available for therapy or fitness, an indoor running or walking track, exercise machines, weights, group fitness area and locker rooms.



## Parks, Recreation, and Arts Office Manchester Parks & Recreation Horner & Shifrin performed structural, mechanical, electrical, plumbing, and civil engineering design services for the expansion and renovation of the Parks and Recreation Administration Building in Manchester, Missouri. The design included a partial demolition of the existing building, a 4,000 square foot, two story addition for a garage and maintenance space, and a 10,000 square foot addition

housing conference rooms, an activity space/multipurpose room, and offices for the Parks and Recreation Department. The existing masonry building was maintained in place for additional storage and as it was a requirement for the grant funding received for the project.

The garage addition was constructed with reinforced masonry walls supporting an elevated garage floor constructed of precast concrete planks and a wood truss roof structure. The office and activity center has wood walls supporting prefabricated wood roof trusses. The trusses were used to provide open, column free space for the multipurpose room and were stained and left exposed to blend with the exposed wood in the office and conference rooms.



#### C1 North Office Renovation Bayer

Horner & Shifrin provided mechanical, electrical and plumbing engineering services for Bayer C1 North Office Renovation. The scope of work included renovation of approximately 12,000 square foot of office space on the 1st Floor North of C-Building. Renovation includes open workspaces, two phone rooms, huddle rooms and conference rooms.







## REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

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## **CIVIL / SITE DEVELOPMENT**







Horner & Shifrin offers a wide range of civil engineering services including planning, design, construction, maintenance and operation of infrastructure. Infrastructure can include gas, electrical and water supply, sanitary and storm sewer systems, drainage and flood control, water mains, pollution control, environmental concerns, and resource protection and management.

Our engineers are responsible for producing safe, economical and environmentally healthy sites and structures for numerous types of projects including buildings, roads, streets, towers, water and wastewater treatment plants, landfills, pipelines, bridges, levees, dams, airports and railways. Horner & Shifrin has also been selected to assess the environmental impact on small to large-scale projects.

- Site Assessments
- Site Investigations
- Hydraulic System Design
- Construction Procedures
   Determination
- Contract Administration and Verification
- Commercial And Recreational Site
   Plans
- Site Grading and Drainage Development
- Retaining Wall Design
- Environmental Impact Studies and Reports
- Specifications, Plans and Bid Documents
- Construction Administration and Oversight

- City Engineer and On-Call Services
- Stormwater Detention and Water Quality Design
- Floodplain Delineation and Analysis
- Erosion and Sediment Control
- Stormwater Pollution Prevention Plans (SWPPP)
- Storm and Sanitary Sewer Analysis and Design
- On-site Utility Design
- Municipality Coordination and Permitting Assistance
- Utility Company and Agency
   Coordination
- Municipal Code and Ordinance Review







## **CIVIL / SITE DEVELOPMENT**

#### Mt. Clare Parking Expansion Ameren Services

Horner & Shifrin provided Surveying and Civil/Site and Electrical Engineering services for a site expansion at Ameren's Mt. Clare Operating Center in Mt. Clare, Illinois. Topographic survey was performed on approximately 4 acres of the 5.5-acre property, including utility locates. The site expansion consisted of increasing pavement for employee parking, expanding the equipment and material storage yard, replacing deteriorating pavement, and replacing security fencing. Electrical Engineers provided light and electrical upgrades, making allowances for security upgrades, both outside and inside the Operating Center facility. The project required coordination with the Illinois Department of Transportation for work within the IDOT right-of-way, with the Illinois Environmental Protection Agency for Land Disturbance activities, and the City of Mt. Clare for permitting requirements. Horner & Shifrin Environmental personnel provided documentation to the State Historic Preservation Office for cultural resource impacts and the Department of Natural Resources for Ecological Compliance.



## The New Broadview New Broadview, LLC

Horner & Shifrin provided Professional Land Surveying and Civil Engineering Services for renovation of an existing historic hotel for use as a new senior living facility. The existing building had been abandoned for nearly two decades, so all utility connections into the building were designed for replacement. Coordination with Illinois American Water for domestic and fire service, Ameren Illinois for electrical service, and the City of East St. Louis for sanitary and stormwater

connections was performed by H&S. All existing site elements were designed for replacement, including ADA compliant sidewalks and parking stalls, new parking lot, trash enclosure, storm sewer collection, security fencing, and utility connections. Duties also included coordination with the project Owner, Architect, MEP Engineers, Structural Engineer, Contractor, Illinois EPA for Land Disturbance permitting, and Bi-State/ Metro for use of their property for a parking lot expansion.



## Frost Avenue Service Center Missouri American Water

H&S provided civil/site, electrical, and structural engineering for the site design of the new Service Center for Missouri American. The Civil site design included detention basin design, piped storm sewer collection, Water Quality BMP design, parking layout per current zoning requirements and owner needs, permitting assistance, and construction administration. Electrical site design included photometric plans, lighting specifications, and construction administration. Structural design included design of large block walls for material storage bins and design of a concrete retaining wall to provide adequate detention volume. H&S attended multiple City of Berkeley Planning & Zoning Commission, Variance Board, and City Council meetings to assist the client with Lot Consolidation, Fence Variance, and Site Plan approvals. H&S also provided USACE permitting for work within a tributary to Coldwater Creek, floodplain modeling to provide no-rise certification for work near the tributary, and CLOMR-F permitting for the project with FEMA. Construction administration included shop drawing review, RFIs, Contractor

coordination and meetings, and will finish with site visits and punch list verification.



## Great Beginnings Daycare Parking Addition

Horner & Shifrin provided survey and civil and electrical engineering for a parking expansion for Great Beginnings preschool. The success of the school lead to a need for more parking for teachers. The expanded parking area was coordinated with survey, previous design plans, and the owner's desire to minimize impacts to the playground. Electrical sight lighting, storm drainage, and ADA compliant walkways were designed, permitting assistance was provided, and bidding and construction assistance was performed to ensure the project was constructed as designed. The expansion provided an additional 16 spaces to the existing 27 parking spaces.

#### O'Fallon Multi-Family Redwood Construction, Inc.

O'Fallon Multi-family consists of 11 new multi-family building consisting of 168 housing units and a clubhouse with pool. Horner & Shifrin provided civil engineering for the 11.67 acre site consisting of paving, accessible grading, and utility layout. Extensive utility coordination between new sanitary sewer, storm sewer, water, gas, and electric services was required to serve 12 buildings. Detention and water quality volume requirements were provided in two separate areas: two above ground basins with water quality rain gardens. Coordination between local architect, project developer in California, contractor, and local municipality and governing agencies was essential to project success.



## Mehlville High School Bleachers Mehlville School District

Horner & Shifrin provided surveying and civil and structural engineering design for the replacement of the concrete bleachers at Mehlville High School. The fast-paced schedule was defined by the opening football game of the season. As a subconsultant to Kozeny-Wagner, H&S provided civil engineering as part of a design-build effort, gaining St. Louis County and St. Louis Metropolitan Sewer District permitting. ADA compliant paths were created to the track level, and the engineers worked with the aluminum bleacher manufacturer to provide concrete slab design to hold their system in place. Additional drainage catch basins were designed to collect stormwater before ponding on the track surface could occur.



## High School Entrance Drive Bowling Green R-1 School District

Horner & Shifrin prepared a topographic survey on a portion the High School property for the purpose of a new entrance road. All improvements within the limits including pavement, curbs, utilities, sewers, buildings, fences, walls and trees were located along with ground elevations and 1 foot contours. Deed and plat research was performed and sufficient property corners were located to establish the location of the schools lot lines in the areas where new construction would take place. In addition, all easement documents furnished by the school district were plotted on the topographic survey drawing.

#### Element St. Louis Midtown St. Louis, Missouri

Development of a new Element by Westin hotel mixed-use development in the City of St. Louis. Horner & Shifrin provided the Civil/Site design, including parking layout, stormwater management, stormwater detention, water quality design, storm and sanitary sewer design, site utility routing, and ADA accessible pedestrian routes. Project management by H&S included coordination with the architect, MEP and structural engineers, developer, Marriott, and contractor during design. Additionally H&S coordinated with outside agencies such as MSD, the City of St. Louis Streets and Water Departments, and the St. Louis Fire Department for project requirements and permitting submittals.



## O'Day Park City of O'Fallon, Missouri

Horner & Shifrin provided civil, structural, and site electrical design services for O'Day Park in the City of O'Fallon, Missouri. The park amenities included an activity center with a 325-person event space, outdoor amphitheater, large feature playground with water play area, group camping area, mulit-use trails, group picnic shelters, restroom facilities, a salt storage building, and a maintenance facility. The park is located adjacent to O'Day Creek, which was protected from the construction activities to remain in its pristine condition. H&S's design services included site layout, grading, culvert design, drainage, detention, water quality, sanitary sewers, traffic analysis, water distribution, electrical distribution, site lighting, and structural building design.

The stormwater design included seven detention basins, five of which also included water quality Best Management Practices (BMPs). The existing and proposed site hydrology was modeled with PondPack to provide assurance that the proposed condition would not have an increased flow rate over the existing at the downstream point of the property. Additional prairie was added into open space of the park to attract butterflies and other wildlife. H&S's services continued through construction. The success of the new park provides opportunities for walking, hiking, picnicking, camping, and outdoor entertainment or weddings at the amphitheater. The multi-purpose facility is used for meetings, retreats, day camps, and wedding receptions. The park maintains the natural character of the surrounding wooded area, while enhancing the habitat for wildlife.



Twin Oaks at Stone Ridge Villas Twin Oaks Estate

H&S provided civil engineering for Preliminary and Final Development Plan approval for 51 senior living units in a Planned Development within the City of Wentzville. The development required public street and utility layout, drainage and stormwater detention design, and coordination with the Post Office and Fire District for plan approvals. Rezoning and plat approvals required meeting attendance at multiple Planning and Zoning Commission and City Council meetings.

## New Fire Station City of Kennett, Missouri

Horner & Shifrin provided Civil, Structural, Mechanical, Electrical, Plumbing, and Fire Protection Engineering and Surveying for demolition of the existing 2,200 square foot fire station and construction of a new 10.000 square foot station adjacent to the Kennett Airport. Topographic survey included utility locations along Airport Road and the MoDOT Right-of-Way for First Street. Civil Engineering included replacement of parking area, new drive entrance from Airport Road for truck turning, and new 60 foot wide entrance onto the four-lane First Street to avoid firetrucks stopping in busy roadway. The team provided utility coordination through City utilities. Provisions were made for an adjacent helicopter landing pad because of the adjacency to the Kennett Airport.



## Hermann Stadium Improvements & Student Athlete Champion Center Saint Louis University

Horner & Shifrin provided Civil engineering design for a new stadium building at the south end of the existing St. Louis University Soccer Field at Hermann Stadium. As a sub-consultant to Hastings + Chivetta, Horner & Shifrin provided detailed topographic survey in the area of proposed improvements within Hermann Stadium, including extensive public and private utility research, location of all walks, sewers, buildings, existing athletic field, fencing, walls, drives and grades to be utilized for conceptual level design for grading, utility connections, track relocation, fence/retaining wall relocation, and stormwater management was provided to the University for funding and donor presentations prior to full design of the project.

## Eberwein Trail Design City of Chesterfield, Missouri

Horner & Shifrin was contracted by the City of Chesterfield to provide a conceptual planning report and exhibits for possible solutions to erosion experienced along the gravel trail withing Eberwein Park. The City repaired the trail multiple times, but the condition persisted. Therefore, H&S provided an analysis of the existing slopes, trail material options, and stormwater routing solutions. Cost estimates provided in the conceptual plan enabled the City to allot funding for the engineering and construction of trail improvement in the fiscal budget. After the concept was approved, H&S created construction drawings for sewer district permitting, and included Job Special Provisions for bidding and construction.

## Hospital Master Plan

**Pinckneyville Community Hospital** As a sub-consultant to the Architect for a clinic addition to Pinckneyville Hospital, Horner & Shifrin provided civil engineering design. The services provided include demolition, utility connections, grading, paving, and stormwater management. The clinic building is constructed within the footprint of the existing parking lot, so a larger surface parking lot was design to provide the relocation of spaces and more spaces for the addition. The entire parking lot was reviewed for proper

ADA compliant spaces, and several more were added to meet current Illinois Accessibility and ADA code requirements. Utility revocations were coordinated with local agencies to minimize impact. Land Disturbance permits were coordinated by H&S with the Illinois EPA, and included historic preservation and environmental clearances.

## Union Station Theater Parking Lot Woodcrest Capital

Horner & Shifrin provided topographic and boundary survey, including a lot consolidation plat, for the demolition of the existing movie theater at Union Station in downtown St. Louis. The existing building had been constructed around the existing bridge piers of Interstate 64 overhead, and the building was demolished to provide additional parking for the newly renovated buildings within the complex of Union Station. Demolition of the building provided necessary acreage to provide approximately 200 new parking spaces for growing businesses. The parking lot design included incorporation of stormwater volume reduction measures as required by the St. Louis Metropolitan Sewer District (MSD), accomplished by designing a pervious paver area with underdrain system. The existing sewers were researched for location and condition for suitability to reuse. The project was awarded a \$118,800 grant for reimbursement of the paver system, as applied for by the H&S Project manager. Additionally, H&S coordinated plan approval through the City of St. Louis and MSD for permitting. H&S also provided construction phase services including shop drawing review and site visits.



## Union Station Parking Lot Design Lodging Hospitality Management Horner & Shifrin provided civil conceptual layout through design and construction

documents for the reconstruction of an approximately 13-acre parking lot at Union Station in St. Louis. Site improvements such as the St. Louis Aquarium, Carousel, and The St. Louis Wheel required additional parking stalls in the inefficiently laid out parking area. The new parking lot provided an additional 64 parking spaces within the existing boundary, while accommodating water quality requirements with the use of irrigation from a rainwater harvesting pond. The existing parking lot was resurfaced and re-striped, and regraded in areas to comply with ADA accessibility requirements. Coordination with City Streets and Building departments were vital for permitting. Coordination with the City Fire Department for access provided confidence the large fire apparatus will have access to the updated facilities. And coordination with Metro for work over and near their light-rail tunnel that runs below the parking lot was imperative to contractor safety and project success. Coordination by H&S was also required for overhead monument signage, parking booths, site lighting, electric vehicle parking stations, bus parking, fire access, and tram movements within the proposed improvement area.



## Shredder Relocation PSC Metals

Civil, structural, mechanical, electrical, and plumbing engineering associated with the installation the shredder. Horner & Shifrin was responsible for the design of the conveyor foundations, the shredder building that houses a 4,000 hp electric motor on the second floor, and the associated electric utilities and hydraulic power packs necessary to operate the shredder and the conveyor line. We also provided coordination with local utilities and applications for all necessary permits.





## REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

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# CONSTRUCTION SERVICES

## SERVICES

## CONSTRUCTION SERVICES











It is imperative that good practices are followed throughout the course of a project, from preliminary plans to construction completion, including close coordination, construction surveillance, procurement, as well as cooperation and communication among the stakeholders involved with the project, such as our client, the contractor, designers, utility companies and property owners. Our construction staff is experienced in project monitoring and control, value engineering, scheduling, cost control, procurement and logistics and project accounting.

Horner & Shifrin's construction staff have taken numerous documentation and materials classes for certification to provide complete and accurate construction administration services. This training provides each of our clients with continuity in construction observation practices and procedures, and helps to ensure a project that is completed on time and within budget. Certifications are through the United States Army Corps of Engineers (USACE), Missouri Department of Transportation (MoDOT), Illinois Department of Transportation (IDOT), American Concrete Institute (ACI), Occupational Safety and Health Administration (OSHA), State of Missouri Department of Health and Senior Services, The Society of Protective Coatings (SSPC), and National Association of Corrosion Engineers (NACE).

Construction Administration services we provide include the following:

- ADA checklist and ADA documentation
- Assist with bidding, award and preconstruction phases
- Coordinate and direct weekly progress
   meetings
- Document material acceptance or rejection
- Erosion control checks and SWPPP
  inspections
- Final inspection
- Maintain daily diary
- Maintain pay diary
- Manage and review RFIs
- Manage environmental control measures
- Measure and document daily quantities
- Measure, quantify and document performance
- Monthly progress reports
- Monthly reimbursements
- Perform construction inspection and documentation
- Perform contractor quality management functions

## **Special Inspections/Certifications**

- Missouri Lead Occupation License
   Lead Paint Contamination
  - Inspection per DNR

- Pre-final inspection/punch list
- Project closeout
- Quality assurance
- Quality control
- Review and approve contractor work
   plans
- Review and coordinate change orders
- Review contractor invoices for payment
- Review, approve and/or submit shop drawings
- Schedule QA and QC inspections of daily activities
- Track contractor exposure hours
- Traffic control checks
- Utility coordination meetings
- Value engineering
- Verify and review material tests and procedures
- Wage rate, DBE and CUF interviews
- Bituminous Plant Inspection & Testing
- NACE/SSPC Bridge Coating Inspector Certification Level 2
  - Check/maintain dew points
  - Measure dry film thickness (DFT)
  - Track/documentation of recycled materials.





## **CONSTRUCTION SERVICES**

## I-70 Resurfacing, St. Louis City MoDOT, St. Louis District

Horner & Shifrin provided construction administration for project J6I3257, which consisted of Pavement rehabilitation, resurfacing, guardrail improvements and ADA upgrades along I-70 from Kingshighway Blvd. to Branch Street in downtown St. Louis. Total length of the improvements were 3.93 miles. This project included over 50,000 tons of asphalt mix and included IRI profiling.

## Howard George Bridge Repair City of Manchester, Missouri

The single span bridge over Grand Glaize Creek had a deteriorated deck and required additional repairs. The project included replacement of the deck, new sidewalk and barriers, substructure repairs and bearing replacements. One bent was made integral and the other semi-integral to improve corrosion resistance. Minimal girder repairs and painting were also included. An adjacent gabion wall was repaired. Project included structural and roadway plans as well as construction inspection services.



## Green Park Road City of Green Park, Missouri

Horner & Shifrin provided construction services for the complete removal and replacement of a 0.50 mile stretch of Green Park Road. The new typical section included an 8' shared use path that connected to popular Grant's Trail in south St Louis County. This project required numerous construction stages, and traffic handling meetings, to keep the motoring public moving throughout construction with a sizable 9,000 ADT on this road. The road section was 10.5" HMA on 6" Base Rock with Enclosed Drainage, Curb & Guttering, & Fully ADA Compliant New Construction. This project was completed

within budget and traffic was on the new pavement section months ahead of the contract completion date.



## Bopp Road Resurfacing City of Des Peres, Missouri

Horner & Shifrin provided design for the resurfacing of 1.25 miles of Bopp Road in the City of Des Peres from Manchester Road to the City limits north of Doubletree Lane. The design included mill and overlay, replacement of deteriorated curb, replacement sidewalk ramps with ADA compliant ramps, and new rectangular rapid flashing beach pedestrian improvements. Construction oversight and documentation during construction phase of work. STP-funded project through the LPA Local Roads Program.



## West Drive Reconstruction University of Missouri - St. Louis Horner & Shifrin provided construction services for the reconstruction of West Drive. Construction consisted of full depth replacement of 8" concrete and ADA upgrades located along the roadway. This project was located on the campus of University of Missouri – St. Louis and construction was set to start at the beginning of summer and be completed by the time classes began for the fall semester. Coordination between the contractor, the owner, and designer was crucial throughout construction to meet

the required deadline. Construction consisted of a 60' wide roadway with a raised center median, 8' wide sidewalks, and 10 ADA compliant curb ramps. This project was completed on time to have the roadway open prior to students arriving for the fall semester.



## Spring Meadows Bridge City of Manchester, Missouri

Horner & Shifrin performed the design and construction engineering for a replacement bridge carrying Spring Meadows Drive over Grand Glaize Creek for the City of Manchester. This project included federal funding. The new 58-ft long single span structure utilizes 21-inch prestressed precast concrete spread box beams with a full depth concrete slab. The substructure consists of concrete integral end bents supported by steel h-piles. The project includes extending an existing sidewalk across the bridge to Baxter Road. Raising the roadway profile resulted in the need to rebuild the driveway and parking lot for nearby Baxter Acres Park. We utilized a slab boulder wall under the south end of the bridge and stabilized the creek face adjacent to the park with new riprap.



Lindy Boulevard Bridge City of Manchester, Missouri Horner & Shifrin Construction Services, performed the following Construction



Administration services for Lindy Boulevard Bridge Rehabilitation: Total surface Hydro Demolition and Monolithic Beam Repair, Approach Concrete Repair, Shear Key Repair, use of Rapid Set Concrete patching material - Vertical and Overhead repairs and the use of Steel Fiber Reinforced Concrete Wearing Surface.



#### Construction On-Call Jefferson County Public Works Department

As part of an on-call contract, Horner & Shifrin provided construction services for a 2" coldmilling, 4' from gutter line into roadway, of existing concrete pavement followed by a 2" overlay of bituminous pavement in Fenton Park II subdivision. Roads included in project are Fenton Crossing and Fenton Ridge Drive. Total length of project is 0.488 miles.



#### Pontoison Drive Stormwater Improvements City of Manchester, Missouri

Horner & Shifrin provided construction services for the Pontosion Stormwater Project, which included : removal of "Clearing" items listed in the Standard Construction Specifications for Sewers and Drainage Facilities, Metropolitan St. Louis Sewer District along with the removal of 12 trees on the project. Supervised the use of "RECP" Rolled Erosion Control Product for erosion protection. Removal and replacement of permanent fence material. Utility coordination, worked with a Certified Arborist to take steps to preserve and protect trees that were indicated on the project plans. Connection of Storm Sewer to Existing Structure, placement of 4 Single Area Inlets, placement of 12 & 18 inch PVC Pipes, Erosion Control devices and the protection and restoration of site.



## Salt River Road Extension City of St. Peters, Missouri

Design and construction management services for one-mile long extension to Salt River Road that is helping to relieve congestion on I-70 by removing local traffic. New four-lane, 5,000-ft-long road included traffic signal at the intersection of Mid Rivers Mall Drive and Salt River Road and two bridges over Spencer Creek and Dardenne Creek. Both bridges accommodate four lanes of traffic and a 10-foot-wide pedestrian/bicycle trail.



## Litzsinger Road Improvements City of Ladue, Missouri

Horner & Shifrin designed improvements to Litzsinger Road from Lindbergh Boulevard to McKnight Road. Project included mill and overlay to approximately 2.5 miles of 2-lane roadway, pavement repairs, 3,500 lin. ft. of new ADAcompliant sidewalk, new concrete curbs, drainage improvements including new storm sewers and other associated roadway work. The new sidewalk provides much needed access for many Ladue residents to St. Louis County's Tilles Park which lies on the east end of the project corridor. The project includes milling and overlay, addition of sidewalks, drainage improvements and pavement repairs. Horner & Shifrin also provided construction administration services for this federally funded project.



#### McKnight Road Improvements and Bridge Replacements Citv of Ladue, Missouri

This project includes the replacement of two bridges, resurfacing of McKnight Road, construction of ADA compliant sidewalks and curb ramps, installation of curbs and storm sewers, modular block retaining walls and landscaping. The south bridge is a 50' single span bridge consisting of integral steel H-pile end bents and type 3 prestressed concrete girders. The north bridge is a 29' prestressed concrete slab bridge consisting of detached wingwalls and 17" prestressed concrete slab beams. Our services include coordinating utility relocation, addressing drainage issues, site distance evaluation and adjustments, construction inspection and management, material testing, and documentation. Our team included TSi Engineering as our DBE material testing sub and Gonzalez Companies as our DBE construction inspection sub. Gershenson Construction was the general contractor. This project was locally and federally funded.





## REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

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# **DRINKING WATER**

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## **DRINKING WATER**











Horner & Shifrin's water engineers use their skills in every project to design processes and infrastructure that minimizes the effect of human activity on the environment. Our objective is to apply these skills by providing clean water supplies, treating wastewater and solid waste, developing technologies to minimize industrial pollution, and managing water resource systems. We offer full-service planning, designing, permitting and construction management of engineering for potable water storage, distribution and treatment; wastewater treatment; sanitary collection systems, and stormwater systems.

We have Certified Floodplain Managers, Certified Inspectors for Sediment and Erosion Control, and Certified Professionals in Sediment and Erosion Control on staff. Our numerous services in water engineering include the following:

- Potable Water Distribution and Storage Facilities
- Ground and Surface Water Supplies
- Well and Booster Pump Stations
- Hydraulic Analyses and Computer Modeling
- Pipe rehabilitation
- Rate Studies
- Potable Water Treatment Facilities
- Facilities Inventories with GIS
- Facility Planning
- Permitting
  - Funding Assistance



## DRINKING WATER

## North Elevated Water Tank City of Jackson, MO

Seismic-zone-three design of new multicolumn, 400,000-gallon capacity water tank constructed in North Industrial Park situated adjacent to Well No. 7. At 197.5 feet above foundation, one of the tallest elevated water tanks in Missouri. The new tank improves storage capacity of the system as well as fire flows and water pressure in City's north area. It was also designed for future communication antennas.



## Water System Task Order Contract City of Cape Girardeau, MO Horner & Shifrin is currently serving the

City of Cape Girardeau under a task order contract. Task orders to date include:

## Meadowbrook Ground Storage Tank:

Design of a 1.0 million gallon ground storage tank adjacent to the existing Meadowbrook Storage Tank.

## Water Treatment Plant No. 1 Equalization Basin:

Design, bidding, and construction phase services necessary for a reinforced concrete equalization basin that will lower the pH level and dechlorinate the water below the levels required in the new NPDES permit for discharge to the Mississippi River.

## Plant #2 Clearwell:

Study, design, bidding and construction administration for the replacement of a 250,000-gallon steel ground tank serving as the plant's clearwell.

## LaSalle Tank:

Planning and design of a 750,000-gallon storage tank on a green site. .

## Cape/Perryville Booster Pump Station:

Planning and design of a 2,000 gpm above grade package booster station to replace two aging booster stations, fill the new Meadowbrook Storage Tank, and improve system pressures and fire flows.

## Water System Master Plan and Hydraulic Model Update PWSD No. 2 of St. Charles County

H&S was responsible for the preparation of a Water System Master Plan for the largest water district in the State of Missouri serving a population of 100,000 people and over 400 square miles, which contains 10 different water systems, the Main Water Systems and nine small remote systems. The Main Water System consists of 5 wells, 14 storage tanks, 9 booster stations, and 11 pressure zones. The project evaluated the existing water system and the 15-year growth rate projects to identify system deficiencies for current and future growth and identified Capital Improvement Projects to eliminate the deficiencies and supply the future growth areas. These improvements were identified and evaluated through the use of the GIS-based water system hydraulic model software InfoWater...



## High Service Pumps and Controls Illinois American Water Company

Design services for the addition of a 20-MGD high service pump for the East St. Louis treatment plant. The project included equipment selection, architectural, mechanical, electrical, control and instrumentation, construction drawings and specifications.

The program involved installing a new vertical 20-MGD high-service pump and discharge piping on the roof of an existing concrete clearwell and providing a 30-ft by 58-ft prefabricated metal building to house the new pump and other existing equipment. A new structural support frame and roof slab constructed in and over the

existing clearwell were required for support of the pump and building. Electrical control and instrumentation to operate and monitor the high service pump were integrated into the existing control panels.



## Raw Water Transmission Line and Residual Outfall Line w/ Diffuser City of Hannibal, MO

Horner & Shifrin is designing the replacement of existing 14" and 20" diameter transmission lines with two new parallel 18" diameter, Class 350, ductile iron pipes approximately 4,300 feet in length. The alignment of the new transmission lines runs from the presedimentation basins at the City's water treatment plant through City Park property to the existing raw water intake and pump station located on the Mississippi River just north of the Interstate 36 Bridge. In addition to the parallel raw water lines, the alignment provides a common corridor for a new SCADA communication line, a secondary power source between the plant and pump station, and new outfall pipe for the residuals line. The new residuals outfall line consists of about 4.600 feet of 24" gravity sewer and a 200 foot diffuser pipe that will discharge residuals directly to the Mississippi River.

## Group 1A Water Main Design City of Jackson, MO

H&S performed the design of approximately 29,000 feet of 8-inch diameter water main throughout the City to replace aged and undersized water main. 8,500 feet of the replaced main consisted of 2-inch cast iron main and the remainder was 4-inch. A three year phasing plan was developed to determine the order of main construction based on the main size and frequency of breaks.



The project was divided into three bidding packages to bid one each year for three years.

A large majority of the mains were located in the congested downtown area and within concrete street pavement. Since the City requires full slab concrete replacement, the new main was located as much as possible under sidewalks or within easements to prevent expensive concrete street pavement replacement.

The design phase included detailed plan and specification development, easement preparation, utility coordination, and Corps of Engineer and MODOT permit approvals. The project also included easement preparation, bidding phase services, construction phase services, full-time inspection, and as-built survey as the main was being constructed.



# Water Treatment Plant Improvements City of Hannibal, MO

Horner & Shifrin performed the facility plan of the Hannibal Board of Public works Raw Water Pump Station and Surface Water Treatment Plant and the resultant design of significant improvements to the plant and pump station.

The design improvements included updating the main control panel at the water treatment plant to allow for control of entire plant and digital recording capability, providing an emergency back-up power supply to the raw water pump station, electrical improvements to the existing equipment to update it to current building and electrical codes, updated/modified process equipment, design of two 24" bypass lines around two sedimentation basins to improve maintenance capabilities, design of a new head structure to replace the existing deteriorating structure, design of modified pipe supports at the raw water pump station, design of several chemical feed

systems, and design of an ultraviolet (UV) disinfection system to achieve an additional 1.0 log inactivation Cryptosporidium, in accordance with the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).



## Distribution System Improvements City of Hannibal, MO

Design of significant improvements to the water supply and distribution systems, including:

## Booster station improvements:

Multiple improvements to three booster stations: tuck-pointing, new doors, and improved siding and security fences. HVAC and electrical improvements include backup emergency generators, grounding of existing equipment and new cooling/heating systems. The Paris Gravel Station is being upgraded with a new fire pump and suction piping upgrades to increase existing 8- and 6-inch diameter mains to a 12-inch diameter main.

#### New supply line:

New 12-inch main and booster station to help maintain system pressures and adequate fire flow.

## New elevated water tank:

New 200,000 gallon elevated tank to replace an aging and too-small existing tower.

## Peverly Farms Water Treatment Plant Improvements

#### **Missouri American Water**

This project consists of final design for upgrades to the Pevely Farms Water Treatment Plant. Treatment consists of aeration, chlorination, detention, iron and manganese removal through greensand filters and post chlorination for system residual. Plant capacity is currently 150 gpm per MDNR design guidelines. Project consists of new aerator and detention

tank with mixer for chemical feed, new greensand filter, new low service and high service pumps and piping, raise all electrical gear above flood level and new backup generator supply. A new potassium permanganate feed system will also be installed. Additional work includes replacement of two 33,000 gallon bolted steel clearwell tanks and construction of a new 200,000 gallon welded steel distribution storage tank. The new distribution tank contained an electric mixer to prevent deterioration of water quality and the formation of disinfection byproducts.

# Water Facility Plan Phase 2, Project 2A City of Jackson, MO

H&S performed the bidding and construction of approximately 8,000 feet of 8-inch diameter water main at five locations throughout the City to replace aged and undersized 2-inch and 4-inch cast iron water mains. This project is part of Phase 2 of a 9 year \$10M bond issue. The mains were designed under Phase 1 of the bond issue but not constructed due to fund limitation in Phase 1. The construction phase services includes the preparation of as-built drawings for incorporation into the City's GIS system.



## Central Plant Basin Modification Study Missouri American Water

Planning and preliminary design including geotechnical investigations, topographic survey, equipment selection, alternatives analysis, and preliminary site and facility layouts. Project is a planning and preliminary design effort to modify or replace primary and secondary settling process trains and filters in an existing 217 mgd surface water treatment plant. Two basin alternatives were identified by the owner(1) construct trains C & D as planned by H&S in 1993 at 100 MGD finished water capacity; (2) Rehab basins





1,2,3,4, 5, 6, and 7 to create (4 was partially upgraded in 2008) treatment trains for four primary floc/ settling and two secondary floc settling steps to create 100 mgd finished water capacity. The second alternative included replacing all existing flocculation equipment and installing new plus new circular solids removal rakes and drives. Study also includes an option to add new filters to replace existing Filter Plants 1 and 2 or rehab existing filter building and floc basins. In addition, owner has proposed that new sodium hypochlorite bulk tank facility with day tanks and metering pumps per AWC T2 standards to replace existing gas chlorination system.\



#### Drinking Water System Rehabilitation City of Birch Tree, Missouri

Project includes the replacement of the City's entire distribution system. Funds for the \$2.56 million dollar project were secured through the Missouri Department of Natural Resources State-Revolving-Fund (MoDNR SRF), Horner and Shifrin was able to secure \$1.96 million in grant funding and the remaining \$0.6 million in low-interest loans. The project includes replacement of all distribution mains, valves, hydrants and meters. It also includes tank coatings, well house rehabilitation, and control replacement. The goal was to reduce the City's current 40-50% water loss which has been occurring for many years.

## Water System Design City of Alton, MO

Horner & Shifrin provided engineering design services for the Alton, MO Drinking Water System Rehabilitation Project which includes the replacement of the City's entire distribution system. Funds for the \$3.6 million dollar project were secured through USDA-Rural Development and Community Development Block Grant

(CDBG). Horner & Shifrin was able to secure \$2 million in grant funding and the remaining \$1.6 million in low-interest loans. The project was successfully completed in 2018. The project included replacement of all distribution mains, valves, hydrants and meters. It also included tank rehabilitation, coatings and safety improvements, two new well houses with controls, and deep rock well refurbishment.



Filter Backwash and Sludge Pump Stations, Central Plants 1, 2 and 3 Missouri American Water Company Horner & Shifrin prepared plans and specifications for two submersible pump stations to pump filter backwash water and sludge to the Missouri River during high river stages when gravity flow is not possible. Two 10,000 gpm pumps were installed in each station. The project included innovative construction techniques and structural engineering design to enable the existing flow structures to remain in service during construction. Sheet pile excavation with tremie concrete bottom was used during construction to minimize dewatering costs.

## VFD High Service Pump City of Highland Park, IL

The City of Highland Park's George B. Prindle water plant provides treated potable water for 60,000 people in Highland Park, Deerfield, Lincolnshire, Bannockburn and Glenbrook Sanitary District. It is a Lake Michigan plant which employs ultrafiltration (Evoqua) technology installed in 2013-14. The plant has six High Service pumps, 5 with 500 HP and one with 350 HP motors. Two of the 500 HP pumps are VFD equipped with the remaining 4 controlled by soft starters. High Service pump VFDs are particularly valuable as the City's distribution system is a closed system. The City determined that a third VFDequipped 500 HP High Service pump was necessary to better match flow and pressure to match customers' demands and to provide redundancy to the two existing VFD-equipped pumps.

#### Disinfection Byproducts Study City of Hannibal, MO and Ralls County PWSD No. 1

This study reviewed water treatment plant unit processes. Alternatives were formulated and analyzed for unit process improvements and operational changes to help ensure maximum TOC removal and reduction of disinfection byproducts. The study included quarterly sampling and jar testing to determine DBP kinetics to be used to screen alternate treatment improvements.



Crystal City Water Treatment Plant Capacity Rerating City of Crystal City, Missouri

This project was a study for a rerating of the City's water treatment plant from 600 gpm to 840 gpm. H&S originally designed the plant at the 840 gpm capacity; however, DNR reviewed and approved the plant capacity at 600 gpm as the existing collector and vertical wells were classified as groundwater under the influence. During design and construction H&S assisted the City in applying for a well reclassification. Shannon & Wilson, Inc. hydrogeologists assisted with this effort. MDNR approved the well reclassification as groundwater, therefor allowing the plant to treat more water as a true ground water plant. MDNR requires and engineering report to rerate the plant at the higher 840 gpm rating that it was originally designed to hydraulically treat. .





## REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### **Emmanuel Gomez, City Engineer** City of Highland Park, Illinois

(847) 432-0800 egomez@cityhpil.com

## Kensey Russell, Director of Public Works/City

City of Mexico, Missouri (573) 581-2100 krussell@mexicomissouri.org

## Don Jensen, Water Plant Superintendent

City of Highland Park, Illinois (847) 433-4355 djensen@cityhpil.com

#### Bruce Alton, Director of Engineering Missouri American Water (314) 996-2319 bruce.alton@amwater.com

#### Derek Linam, Engineering Manager

Missouri American Water Company (314) 991-3404 derek.linam@amwater.com





## **GIS MAPPING**











Horner & Shifrin (H&S) offers a full range of Geographic Information System (GIS) and City Management System (CMS) services from mapping to hosting, field inspections to on-call services. GIS improves communication and collaboration between multiple private and public agencies, the community, firm, or municipality. Our GIS/CMS services allows you to see trends, relationships, or patterns not possible with traditional maps and spreadsheets and can help with various assumptions to view outcomes as you can view past, present, or future data. The analysis from these services can provide accurate data for current status of any assets, forecasting for repair and replacements, and budgeting projections, which assists with a more streamlined funding process and may lead to additional funding sources.

A hosted GIS/CMS solution lets you publish targeted data to the public or selected secure users. Your solution can be published quickly to a separate website or within your own organization's website; without the need for your organization to employ a technical expert. Our simple subscription model enables you to plan costs and budget for your service provision and is highly scalable, providing customers with the flexibility to increase or decrease number of users and data volumes.

By opting for a fully or partially managed hosted GIS/CMS solution you outsource technical tasks relating to the installation, configuration, and maintenance of an ArcGIS Enterprise server. We take care of all server upgrades, security fixes, load the data for you, and configure an HTML5 template in the requested coordinate system. Importantly, a hosted solution removes all the traditional barriers associated, such as long lead times and the technical complexities of operating your own infrastructure.

H&S's Skyview GIS/CMS is a cloud-based hosted solution for municipalities and organizations to manage assets, workflows, and tasks and allows for deployment of GIS/CMS applications quickly and easily without additional software, hardware, or infrastructure costs. Common uses include utilities, streets, parks, inspections, service requests, permits, code violations, and others (see next page Skyview GIS/CMS feature list for all features we currently deploy). Our hosted solution allows multiple users to quickly access digital data and view, edit, track, analyze, and report on multiple asset data features on a single pane of glass via desktop computers, tablets, and smartphones. Current paper maps can be digitized into the system and new information can be easily added. Through our hosted services you benefit from our professional specialized and degreed staff expertise to deploy your solution to organizational staff, additional agencies, field crews, or the general public via the Internet.

#### **HOSTING BENEFITS**

- Deploy maps with public and/or secure
   access
- Deploy your maps to others in your organization utilizing only an Internet browser
- No need to buy and maintain hardware or software license fees
- No need to hire permanent server & database administrators
- Off-site data access provides redundancy during disasters for emergency response

## **GIS HOSTING SERVICES**

- 24/7 technical support and monitoring
  Automatic server upgrades to latest
- ArcGIS enterprise server
- ESRI ArcGIS Enterprise platform
- ESRI ArcGIS SDE database access
   Configured HTML5 template
- deployment
- Mobile application development access
- Ongoing data management (data updates, backup, and archive)

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## **Skyview GIS/CMS Features and Capabilities**

- API Integration
- Boundaries City Limits / Zoning / Wards
- Bridge Inspections
- Building / Code Violations
- Cemeteries
- CCTV / Video Inspections
- Census Analysis
- Community Events / Festivals
- Community Input / Feedback
- Custom Application Consultation / Programming
- Data Integration / Migration
- Data Governance and Quality Assurance
- Easement Approvals
- Election / Alderman
- Emergency Services
- Field Verification
- Historical / Document Preservation
- Leaf and Limb Removal
- Map Digitization
- Memorials Brick / Tree
- Mobile Data Collection
- Mobile Tracking / Parade / Floats
- NextGen 911
- Parcel / Subdivisions

- Parks
- Pavement Inventory, Maintenance, and Future Cost Analysis
- Permits Building, Occupancy, Sign, etc.
- Photogrammetry / Imagery
- Railroads/FRA Requirements
- Risk Management
- Route Network Analysis
- Service Requests and Work Orders
- Sewer Private Lateral Inspections
- Sewer Sanitary and Storm Inspections
- Sidewalks / Sign Inventory
- Smoke Testing
- Spatial Analysis & Modeling
- Tax Increment Financing (TIF) Districts
- Transportation Development Districts Sales Tax Participants
- Tourism
- Trail Systems
- Trash Schedules
- Tree Inventory
- Utilities Water, Sewer, Electric, Gas,
- Vertical Clearance Diagrams
- Water Valve Exercising
- Yard Sales

Our Geomatics team of managers, analysts, pilots, programmers, and surveyors along with our engineering and construction staff are able to provide comprehensive solutions for any client's tasks. Our team is made up of degreed professionals with certifications and proper training to complete any project thrown at them. As an ESRI Bronze partner, our team maintains memberships with professional organizations to keep up with the local market, share ideas, community involvement and growing technology along with attending and presenting at conferences throughout the year.

#### Certifications

Geographic Information Systems Professional (GISP) FAA Part 107 Small Unmanned Aircraft Pilot National Association of Sewer Service Companies (NASSCO) OSHA 10 Certified Missouri and Illinois PLS

## Training

ESRI ArcGIS Server: Configuration and Administration Microsoft SQL Server Database Administration Pix 4D and Trimble Trident Autodesk and Microstation product conversions ArcGIS and ArcGIS Pro Geocortex, API's, ArcGIS Online Visual Studio, Exchange, SharePoint C#, .NET, Java, C++, JavaScript, HTML, CSS, XML, Python and Xamarin





## **GIS SERVICES**

## GIS Hosted Service Pike County, Ohio

Horner & Shifrin was retained by Pike County, Ohio to provide a GIS solution with an online, multi-user application allowing the staff and public to have real-time access to map data which would be easy to deploy, backed up and costeffective. In addition, H&S updates the parcel system on a monthly basis from files received from the county and migrates it into the system. Once the Pike County, Ohio Skyview GIS system was structured, the staff and public were able to access map data such as parcel, addresses, municipal boundaries, sections, townships, land use, soils, multiple imagery layers and FEMA Flood Boundaries, etc. from any workstation throughout their offices and from any cellular enabled mobile devices such as Apple iPads.



## **GIS Hosting and On-Call Services** Rock Creek Public Sewer District Since 2009. Horner & Shifrin has worked side by side with Rock Creek Public Sewer District (RCPSD) multiple engineering and GIS projects. Beyond hosting RCPSD data since 2012, our Geomatics group has provided inspections services including smoke testing, a custom private lateral module, automated RCPSD UMS system to integrate with the private lateral module, created a service request module, a flushing module, and have tracked rehab and backups of their sewer system. The Private Lateral Investigation (PLI) application provides the RCPSD staff the ability to schedule via a calendar or map and inspect private laterals for any new construction or existing housing that changes ownership after 5 years of any previous ownership using a mobile device.

The inspection includes the ability to edit and update fields, create violation notices, generate permits, generate certificates, generate affidavits and inspection reports, take photos or video the entire length of lateral and generate fees based on inspection fields entered into the system and equipment used for inspection. The PLI application also tracks the status of any property to notify RCPSD staff when an inspection is required based on time frame and change in ownership.

#### GIS Hosting Services Terminal Railroad Association

Terminal Railroad Association of St. Louis (TRRA) retained our services for developing and implementing a comprehensive Geographic Information System (GIS) with a focus on the management of TRRA's railroad assets and topographic field survey of railroad track and physical features. This project will utilize Cloud-based GIS services, LIDAR and other survey methods, and modern-day scanning technologies converting hand drafted maps that are almost 100 years old.



## Infrastructure Asset Inventory and Data Collection

**Missouri Department of Conservation** Horner & Shifrin was retained by the Missouri Department of Conservation to provide Infrastructure Inventory and Condition Assessment services at 128 Conservation Areas in the State of Missouri. Four conservation zones containing conservation areas were established by the Missouri Department of Conservation to simultaneously coordinate the work between consulting firms. H&S was awarded two of the eastern-most zones encompassing nearly half of the state, containing approximately 300,000+ acres of conservation areas. The two-year

program required strict adherence to a nearly 1,000-page condition assessment methodology and use of MDC provided asset collection software. In addition to asset collection and condition assessment key aspects of the project include population of spatial GIS assets, collection of non-spatial data such as asset agreements, documents, and diagrams, rectification of asset data with historical reports, integration of third party GIS data sets, data governance through the use automated GIS tools, and integration of LiDAR, UAS, and traditional survey methods.



## 3D Scan - 183,000 Sq. Ft. Warehouse Building

## Delta 3 Engineering

H&S was contacted by Delta 3 Engineering to complete a 3D scan of 183,000 sq. ft. building in Marion, Iowa where foundation had been completed and steel support structures erected. Our scanning services were requested to capture as built conditions for Delta 3 in order for their engineers to check plumbness of the support beams and monitor any constructions flaws. Our survey crews were able to deploy our Leica 3D scanner to create a 3D point cloud of the building and foundation. Site control was checked and utilized to tie down the 3D scan. Our crew was able to complete the scan and control survey, post process the 3D scan data, and export it to CAD well under the time frame requested by Delta 3.

## MoDOT Route C Survey and Mapping Missouri Department of Transportation

Kolb Grading requested a Horner & Shifrin survey of an existing rock face with the 3D laser scanner as well as pick up some shots on the top of the hill side just with GPS collector to provide a survey CAD file




that incorporates the whole site. Thinking the 3D scanner will not pick up the top above the rock face H&S intends to use a drone, 3D scanner ,and topo survey in particular areas to create a new plot of the plan cross sections showing the surveyed existing contour line with MoDOT's existing and their design to easily show variances and integrated into MicroStation. The project in Madison County involves blasting and shifting back an existing pre-split wall to widen out a roadway to accommodate a new bridge over the St. Francis river. Kolb Grading needs H&S to survey the existing ground/ rock face in order to get paid at a CY unit price we need to document and survey the existing conditions to calculate the quantity excavated. Part of that will also tell if there are any major flaws in MoDOT's design based on their cross sections hoping to solve any problems prior to construction.



#### NextGen 911 Johnson, Pulaski, and White Counties, Illinois

Horner & Shifrin was retained by (White, Pulaski, Johnson) County 911 to provide the state of Illinois GIS data for Next Generation 911. The Illinois State Police and Next Generation 911 have a specific format, schema and instructions that were required to be followed. The purpose of these large-scale changes is to have a statewide standard for 911 data in a GIS system. Once the Next Generation 911 system is implemented H&S will continue to be data maintainers for (White, Pulaski, Johnson) County 911 and upload additional data to the state of Illinois. Along with maintaining the Next Gen 911, H&S hosts Johnson, Pulaski and White County 911 GIS by providing a GIS solution replacing their outdated single user, single software and single computer system with an online, multi-user

application allowing the staff and public to have real-time access to map data which would be easy to deploy, backed up and cost effective. Once the County 911 Skyview GIS system was structured, County staff and public were able to access map data such as parcel, subdivision, zoning, municipal boundaries, 911, emergency services, fire stations, water districts, schools, etc. from any workstation throughout their offices and from any cellular enabled mobile devices such as Apple iPads. One huge benefit to the Skyview GIS application, was the ease and ability for multiple people to add new addresses via a customized workflow and export/share on a monthly frequency to the 911 dispatching software. This workflow allowed any user with editing rights to follow a standard process to create a new address and meet the requirements for 911 addressing.



### I&I Investigation and Reduction and GIS Hosting

City of Blytheville, Arkansas Pollution Management Inc. and the City of Blytheville, AR retained Horner & Shifrin to complete an extensive smoke testing of the entire sanitary sewer system including I&I investigation involving structure inspection, condition assessment, and video inspection of selected portions of the system. In addition, GIS asset collection and website deployment were included in the scope of work. H&S developed a secure web-based GIS application and database of system attributes (location, sizes, physical condition, etc.) and performed data migration of existing sewer system drawing files into the GIS system. We conducted survey-grade GPS survey of 200+ structures including manholes, pump stations, air release valves, and valve

vaults. Survey data was integrated into the GIS to create a District wide sewer map and integrated with online aerial data. We conducted approximately 200+ detailed manhole inspections utilizing NASSCO standards to collect physical dimensions, structural conditions, and sources of possible I&I. Mobile devices linked to the web-based GIS were used to collect all data, inspection notes, and photographs in real-time providing up to the minute data and status of structures. Utilization of real-time data allowed for additional coordination with PMI and City staff to coordinate additional efforts in the event of extreme I&I situations. We conducted smoke testing on over 500,000 linear feet of gravity sewer lines. Public and private defects and possible I&I locations were documented and entered into the GIS database system. Mobile devices linked to the web-based GIS were used to collect location, data, and photographs of defects in real-time. Specific sewer reaches were identified, a sub-consultant CCTV crew gathered additional detail from visual pipe inspections and the CCTV inspection video and PDF reports were added to the web-based GIS to provide direct access for PMI and the City staff to the data.



Jane Addams Memorial Tollway (I-90) & I-490 Interchange Ramps Illinois State Toll Highway Authority As a subconsultant on CUR/DUR Tollway Project I-18-4698, H&S conducted aerial photogrammetry under FAA Part 107 on the Tollway I-18-4699 construction contract. The aerial photogrammetry was conducted for the purpose of developing 3D modeling, in order to estimate earthwork quantities, and to confirm the accuracy of measurement when compared to the traditional mobile surveying methods that were also utilized on the project. FAA certified drone pilots



and a diverse fleet of aircraft including fixed wing and multi-rotor (four-propeller) UAS systems were utilized to obtain high definition videos or photos. Imagery was obtained by flying drones over the construction site at the beginning and upon conclusion of the construction work. The images recorded were stitched together into 3D models and 2D maps using one of the most advanced software programs for data processing with photogrammetry and point cloud processing. Once the 3D models are completed for both the start and end of the project, analysis will be performed to estimate the earthwork volumes. The intent of this test application is to prove that utilizing aerial / drone surveying will make the collection of data more cost effective when compared to estimating earthwork quantities using traditional surveying methods.



#### Vertical Bridge Clearance LiDAR Scanning

Missouri Department of Transportation MODOT select Horner & Shifrin for a 3-year contract for the location and assessment of bridge vertical clearance measurements from the edge of each travel lane for bridges throughout the State. The initial phase of the project contained 447 MODOT bridges, located along 3500 + miles of highway, throughout the St. Louis City, St. Louis County, St. Charles County, Jefferson County, and Franklin Counties of Missouri, Kev success to the project was the use of mobile LiDAR data acquisition to perform accurate bridge vertical clearance measurements and photographic data at near traffic speeds. Cutting edge software was used to generate accurate clearance measurements and combined with direction of travel photographs to create clearance diagrams that could be delivered to the client electronically via PDF.

#### GIS/CMS Hosting and Services City of Columbia, Illinois

H&S has provided Columbia, Illinois since 2016 with a GIS solution allowing the staff and public to have real-time access to map data which would be easy to deploy and cost effective. Our GIS staff collected digital data from the City and other GIS sources to construct a base map. Using the Internet as a backbone, H&S deployed web-based GIS services to connect in-house City staff with additional field personnel without the need to order additional software or hardware. Columbia. Illinois uses many custom modules such as our Code Violation, Occupancy Rental and Building Permits on the City Management System side, along with our Leaf, Limb, Yard Sales modules on the GIS side.



### GIS Hosting Lake Area Waste Water Association Camdenton, MO

Lake Area Waste Water Association (LAWWA) retained H&S to provide a secure, multi-user, and customizable GIS platform (Skyview GIS) allowing the LAWWA staff and their partner agencies to have real-time access to LAWWA asset features and data that is easy to deploy, backed up, and cost effective by utilizing desktop workstations/ laptop and cellular enabled tablets/ smartphones. The Skyview GIS platform allows LAWWA staff and their partner agencies to view, edit, integrate, migrate, upload, download, share, and analyze a wide range of source data and formats including district-provided paper-based plans, regulatory agency data, non-ESRI databases, shapefiles, geodatabases, tabular data, CAD files, GPS/GNSS survey data, aerial and mobile LiDAR data/photogrammetry, embedded data attachments (photos, videos, and PDF documents) and other third party GIS sources into a homogenous single source SDE geodatabase. Our staff adheres to

the standards provided by LAWWA, so all parties are on the same page when collaborating. Standard forms and drop down menus ensure data integrity by providing preset values for LAWWA staff asset types such as manholes, clean outs, pump stations, pits, gravity and force mains, etc., along with providing the ability to view and/or edit the sanitary system, additional modules and asset data can be added to track the flushing of the sanitary system, smoke testing, basement backups, service request, rehab status, addresses, parcel data from any device. Use of survey-grade GPS units with centimeter accuracy ensures vertical accuracy of assets and the data collected would be reliable when imported into future modeling systems.

#### District Engineering Services Monarch Chesterfield Levee District

Since 2019. Horner and Shifrin has utilized their fixed wing UAS platform to survey 12-miles of earthen levee corridor, along the Missouri River and Bonhomme Creek. The district was able to obtain accurate elevation profiles, contour data, and high-resolution imagery for flood monitoring and assessment and the creation of a GIS database and web hosted application, containing all of the captured information for use by district personnel. In one weeks' time, our UAS team was able to obtain the necessary airspace authorizations, establish ground control, and complete the aerial survey. Our UAS crew members-maintained communication with the FAA. Spirit of St. Louis ATC, and the Chesterfield police department to ensure safe and successful operations in high traffic airspace.







#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### Don Daniel, District Administrator

Rock Creek Public Sewer District (636) 464-3305 dondaniel@rockcreekpsd.com

Andrew Williford, City Engineer City of Mexico, Missouri (573) 581-2100 awilliford@mexicomissouri.org

### Asim Raza, Chief Legal Officer, Director of Corporate Affairs

Terminal Railroad Association of St. Louis (314) 539-4750 araza@terminalrailroad.com

#### Adam Jenkins, Professional Engineer

Kolb Grading (636) 441-0200 a.jenkins@kolbgrading.com

#### Julie Irwin, White County 911 Director White County Illinois 911 (618) 382-8911 whitecountyil911@gmail.com

**Brad Wingfield, Principal, Senior Engineer** Pollution Management, Inc. (501) 221-7122 bwingfield@pmico.com

#### Scott Dunakey, Director of Community Development City of Columbia, Illinois

(618) 281-7144 sdunakey@columbiaillinois.com





#### SERVICES



#### SURVEYING











Horner & Shifrin recognizes that precise and accurate surveys are the foundation of every well-managed project and because surveying requirements vary widely from project to project, we tailor each survey to the specifications of the project type and requirements.

Horner & Shifrin's highly trained field/office staff of licensed professional land surveyors (PLS), land surveyors in training (LSIT), and survey crews utilize the most appropriate and proven state of the art technology with proven field techniques to control project costs and to achieve the highest degree of accuracy, quality, and confidence ranging. Our field equipment includes traditional Total Stations, Global Positioning Systems (GPS), Static and Mobile 3D Scanners, and Unmanned Aerial System (UAS) drones for aerial photogrammetry and LiDAR services. Our staff utilizes the latest CAD / GIS / Mapping platforms to meet the demand of the plethora of formats required for project deliverables.



Our land surveying services include:

- ALTA / NSPS Land Title Survey
- Aerial Drone Photogrammetry
- As Built / Record
- Autodesk Civil 3D / Revit
- Bathymetric
- Bentley Microstation / Open Roads
- Boundary / Topographic
- Bridge / Structural
- Construction Staking
- Corridor / Route / Right-of-Way
- Deeds and Record Research
- Digital Terrain Model Generation
- Easement Exhibits
- Elevation Certificates / LOMA / LOMR
- Engineering Basemaps
  - Environmental / Hydrologic /

- Watershed
- ESRI ArcGIS / PRO
- GPS / Static / Real-Time Kinematic (RTK)
- Horizontal & Vertical Control
- Indoor Mobile Mapping Systems
- Laser 3D Scanning (Exterior & Interior)
- LiDAR (Aerial, Mobile, & Terrestrial)
- Private & Public Utility Locations
- Property (single & multiple lots)
- Property Description Preparation
- Subdivision Plats
- Subsurface Utility Location (Magnetic Resonance)
- Utility Field Inspections









#### LAND SURVEYING

#### **Elm Crossing Court** City of Ballwin, Missouri

Horner & Shifrin prepared a detailed topographic survey of multiple failing tie walls approximately 2,200 feet in length with all affected properties shown in a corridor 200 feet in width for use in design of new retaining walls. Some wooded areas were mapped utilizing a drone capable of penetrating the dense tree cover to accurately show contours in inaccessible areas.



#### **Clarence Cannon National Wildlife Refuge Levee Setback USACE, St. Louis District**

Horner & Shifrin performed topographic survey of existing conditions for approximately 135,000 linear feet of new berms and levees covering over 3,500 acres. Survey crews used a combination of UAS aerial surveys in conjunction with traditional surveying techniques to create a surface model used by the U.S. Army Corps of Engineers and the excavating contractor to generate cut and fill quantities of the proposed levees and berms. Survey crews were able to deploy our fixed wing UAS platform to survey several hundred acres, prior to seasonal flooding. This approach saved time and cut costs to a fraction of what would be expected if using only conventional surveying methods and equipment without sacrificing accuracy.



#### Emmenegger Park Streambank Stabilization

#### City of Kirkwood, Missouri

Horner & Shifrin conducted a topographic survey of approximately 850 feet of eroding Meramec River banks bordering the park grounds. Survey limits were from current waters edge to the driving lane within the park and included all improvements and grades to be utilized in the design of a system to prevent further erosion.



#### Route 181 **MoDOT, Southeast District**

Surveyors conducted a detailed topographic survey of a section of a two-lane asphalt roadway in Douglas County, Missouri approximately 1,000 feet in length at the location of an accident scene. Survey included pavement crown, striping, roadbed breaks, over to fill slope and in slopes and toes and any other pertinent information within the corridor. Surveyor prepared exhibits showing the results of survey to be used as evidence.



#### Discount Tire | R A Smith | Multiple Location in Missouri and Illinois Horner & Shifrin provided an ALTA/NSPS Land Title Survey with topography to be used as base for preparation of site/civil plans for new Discount Tire Stores in Festus, Hazelwood, Manchester, St. Ann,

Glen Carbon, Illinois. Survey included items 1, 2, 3, 4, 5, 7(b1), 7(c), 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20 and Discount Tires special requirements.



#### **Gravois Northwest School** Improvements

**Jefferson County Public Works** 

Horner & Shifrin surveyors researched utilities, properties, and right-of-way for approximately 4,700 lineal feet of existing Gravois Road prior to field survey. Field staff surveyed corridor to 25' off each edge of pavement collecting all improvements including but not limited to pavement center line and edges, striping, drives, fences, storm and sanitary sewers with top elevations, inverts and pipe sizes, utilities (above ground, valves, pedestals, transformers etc. and marks placed by Missouri One Call), walks, buildings and sufficient ground shots to produce a topographic map with 1 foot contour intervals. Property corners along the route were collected and strip map was prepared and inserted into topographic survey to show all properties in the survey corridor for possible future ROW and easement dedication documents. Survey was performed using Trimble total station and was tied to State Plane coordinate system Missouri East Zone, NAD 83.

#### Hermann Stadium Soccer Saint Louis University

Horner & Shifrin provided Civil Engineering design for a new stadium building at the south end of the existing SLU soccer field at Hermann Stadium and as a sub-consultant to Hastings + Chivetta, Horner & Shifrin provided a detail topographic survey in the area of the proposed improvements including extensive public and private utility research, location of all walks, sewers, and St. Peters, Missouri, and O'Fallon and buildings, existing athletic field, fencing,





walls, drives and grades to be utilized in the conceptual design of the project.



### Innsbrook Water Main | PWSD No. 2 of St. Charles County

Horner & Shifrin prepared an 8,200 lineal foot strip topographic survey which included location of the existing improvements to identify the best route for a new water main and other improvements. Survey included location of existing pavement, drives, fences, trees and wooded areas, utilities and 1-foot contours. Existing property corners were located along the route and property lines and right-of-way were added to the topographic survey. Preparation of easement plats for acquisitions will be prepared as needed following design of proposed water line.

### Frankford Elementary FEMA Safe Room

**Bowling Green R-1 School District** Horner & Shifrin provided surveying and civil engineering services for the design of a FEMA Safe Room addition on the back of Frankford Elementary School. Safe Room and connection are approximately 3,000 sf total. Services included assistance with annexation procedures to ensure the entire property was within the City limits instead of being split between the City and Unincorporated Pike County. Topographic and boundary survey were provided for lot recording at the County and for use in design.



### Grand Tower Levee Repairs USACE, , St. Louis District

Horner & Shifrin conducted topographic surveying and surface modeling of Grand Tower Area Levee repairs. On-site topographic surveys and volume calculation drawings of 27 levee slide repairs were completed utilizing Micro-Station surface modeling and GPS survey monumentation along failed levee segments working with the earthwork contractor and the Army Corps of Engineers.



**Big River WWTF Regionalization** Jefferson County Public Sewer District Horner & Shifrin prepared topographic survey for 100' wide corridors on approximately 18,000 lineal feet located in Jefferson County, Missouri in Byrnes Mill and House Springs to be utilized in the design of a new storm sewer system. Survey included deed and plat research on all properties adjoining the corridor. All improvements and utilities including but not limited to curbs, pavement, walks, buildings, sewers, trees, creek channels, and existing grades were located and an existing surface and 1-foot contours which were prepared in AutoCAD format.

#### Plummer Family Park City of Edwardsville, Illinois

Horner & Shifrin verified existing topographic survey using a drone and established multiple control points and site benchmarks on an approximately 50-acre site to be utilized in the construction of all proposed improvements. Surveyors prepared office calculations and field layout of grading, parking lots (paving and curbs), sanitary and storm sewers, light standards, utilities, sidewalks, synthetic turf baseball/softball fields, dugouts, bullpens, batting cages, synthetic turf/ natural grass soccer fields, pickle ball courts, concession stand and pavilion.

Horner & Shifrin employed the use of a traditional Trimble Robotic Total Station, Trimble R10 GPS and a drone to complete this project.



#### Oglesby Park St. Charles County, MO

Horner & Shifrin prepared set multiple horizontal and vertical control points and performed a detailed topographic survey of proposed entrance to new St. Charles County Park which included location of existing pavement, drives, fences, trees and wooded areas, utilities and 1' contours. Existing property corners were located to allow property lines and rightof-way to be added to the topographic survey from existing boundary survey provided by the County Parks Dept. Remainder of the 200 acre park property was mapped utilizing a DJI M300 drone platform equipped with L1 LiDAR sensor. The raw LiDAR data was acquired for the site and then post processed using DJI Terra software and checked for discrepancies prior to survey crews leaving site. Additional processing and point cloud classification was performed using LAS Tools and ArcGIS Pro to remove vegetation and achieve a bare earth surface model.





#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### Todd Mosher, Office Manager

R.A. Smith, Inc (331) 305-6947 todd.mosher@rasmith.com

Jameson Sheley, Sports Division General Manager Byrne and Jones Construction (314) 220-9533 jsheley@byrneandjones.com

#### Sean Martin, PE, Engineering Department Manager

M3 Engineering Group (314) 558-0699 sean.martin@m3eng.com

#### Dan Latham, PE, VP of Sales Bloomsdale Excavating (573) 483-2564 djl@blex.com

Lorraine Ward, Senior Associate, Director of Professional Services Hastings + Chivetta (314) 529-4092 Iward@hcarchitects.com

#### Bronson Bowling, Senior Geotechnical Engineer Shannon & Wilson

(314) 699-9960 blb@shanwil.comw



# TRANSPORTATION

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#### SERVICES

#### TRANSPORTATION







Horner & Shifrin uses creative design techniques and practical measures including a strong quality control program to decrease project costs and provide the highest of quality while maintaining the integrity of our transportation projects.

Our engineers have provided management and design of transportation engineering projects for state and interstate highways as well as county highways and local roadways. Expertise includes project management, budget control, cost estimating, scheduling and public involvement activities, design and construction phase services.

We have extensive experience with Federal Highway Transportation Funding Programs, Surface Transportation Program-Sub allocated (STP-S) funding, Congestion Management and Air Quality Improvement (CMAQ) funding, Highway Safety Improvement Program (HSIP) funding, Bridge Replacement and Rehabilitation Program (BRRP), Illinois Transportation Enhancement Program (ITEP) and other funding programs.

Our transportation engineering services include:

- ADA/PROWAG Curb Ramps & Sidewalks
- Air and Noise Pollution Reduction
  Design
- City Engineer and On-Call Services
- Complete Streets
- Corridor Location Studies
- Design Build
- Environmental Impact Assessment
  Studies
- Feasibility Studies
- Funding Application Preparation
- Great Streets (Streetscapes)
- Highway Planning and Design
- Intermodal Freight Planning and Design

- Internal Roadways and Parking Design
- Local Road and Street Design
- Railroad Engineering
- Pedestrian and Bicycle Facility Design
- Port Design
- Public Involvement / Community Relations
- Safety and Accessibility
- Sidewalks and Curb Ramps
- Site Furnishings and Lighting
- Traffic Calming Design
- Traffic Capacity and Signal Design
- Traffic Studies
- Transportation Funding Alternatives
- Value Engineering







#### TRANSPORTATION

**Progress Parkway Improvements** City of Maryland Heights, Missouri Design improvements to Progress Parkway, a curving central artery for Westport, a busy corporate, commercial and retail district. The pavement, curbs and gutters were in poor condition. Elements included widening of roadway from two to three lanes, drainage improvements, curbs and gutters replacement, shared-use bicycle lanes and ADA/PROWAG-compliant sidewalk additions on both sides. Other components included water quality and detention, erosion control conforming to MDNR requirements, and coordination with utilities, businesses, the City and St. Louis County. STP-funded project.



#### I-255 Rehabilitation IDOT, Region 5, District 8

The Interstate 255 corridor is a 6 lane interstate highway built in the mid-80s with City of Wentzville, Missouri no significant improvements to the pavement structure since initial construction. H&S was contracted by IDOT for the development of a traffic closure report analyzing effects of additional traffic on the ancillary roadway network for the closure of the I-255 from I-64 north to Collinsville Road in St. Clair County. Existing traffic data was gathered for various roadway segments near the I-255 corridor. Using HCS 7, the data was inputted to establish the baseline Level of Service (LOS) for various state and local maintained routes identified from East-West Gateway traffic models. The main detour of the interstate closure utilized the existing interstate highway system. However, it was apparent early in the analysis process multiple routes may be utilized. The model was updated to reflect potential alternate route options for local drivers to navigate the closure. The

increased traffic was then analyzed to determine the difference in LOS. The report identified intersections. freeway ramps, and roadway segments in the study area impacted by the corridor closure. After successfully submitting the closure report H&S was contracted for the development of plans, specifications, and estimates for the resurfacing of the 3.6 miles of I-255 from I-64 north to Collinsville Road in St. Clair County. The project included 3.6 miles of resurfacing, overhead sign structure rehabilitation, repair of two bridges that cross over the interstate, repairs of five mainline bridges, repairs of two ramp bridges, and one mainline bridge that required a deck replacement. 2021 ACEC-Illinois Engineering Excellence Honor Award Winner.



### Downtown Revitalization Plan

Horner & Shifrin provided design of improvements to enhance access to and through downtown Wentzville. Project included alternative development for improved interstate access, signal design of a high volume intersection, future and potential railroad crossings, one-way vs. two-way street feasibility, retrofitting complete streets, improving pedestrian maneuverability, and addressing a parking concern.



#### Hall Street Reconstruction - Phase I St. Louis Board of Public Service

Horner & Shifrin provided engineering design services for the reconstruction of 3,100' of Hall Street from East Grand Avenue to Adelaide Avenue in the City of St. Louis. Improvements involved the complete reconstruction of Hall Street concrete pavement, a new 5' sidewalk on the west side, a 10' shared-use path on the east side from East Grand to Prairie Ave, and a series of bio-retention ditches along the east side of Hall Street to minimize runoff and improve water quality. Traffic lanes were reconfigured to one vehicle lane in each direction and a shared traffic center turn lane. Other design elements included drainage improvements and MSD coordination, new street lighting, and landscaping throughout the bio-retention ditches. Project was partially funded by a grant through MSD's Project Clear Program with the remainder STP-funded through the LPA Local Roads Program. APWA 2021 award winning project.



Jefferson/22nd Traffic Flow and **Corridor Improvements** St. Louis Board of Public Service Horner & Shifrin was the design lead for improvements to the Jefferson / 22nd Street Interchange in the City of St. Louis. The project focuses on improved traffic flow from I-64 to the future National Geospatial-Intelligence Agency (NGA) West Headquarters to the north on Jefferson Avenue. The project reestablished the City grid system of streets and includes roadway, signal and pedestrian improvements to the following streets: Jefferson Avenue, 22nd Street, 21st Street, Scott Avenue, Clark Street, and Market Street. The project also included a bicycle connection from Jefferson/Chouteau to Market/20th. It is





80% STP & CMAQ federal funds and 20% funded by the St. Louis Development Corporation (SLDC).



#### Interstate Drive & South Point Prairie Extension (David Hoekel Parkway) St. Charles County Highway Department

Design of a 1 mile extension of David Hoekel Parkway south of I-70 to connecting South Point Prairie Road and Interstate Drive. The project includes the 0.5 mile extension of Interstate Drive. The project requires a new bridge over Peruque Creek, three new intersections, and sidewalks on David Hoekel Parkway and Interstate Drive. The project was designed for a future 4-lane section with construction documents being developed for the interim 2-lane condition. The extension of David Hoekel Parkway will connect to the new David Hoekel Parkway Interchange at I-70.



#### Maryland Ave. Resurfacing & Bikeway Design

#### City of Clayton, Missouri

Horner & Shifrin designed roadway, bike, and curb ramp improvements to Maryland Avenue in the City of Clayton, MO. Maryland Avenue is a well-traveled roadway on the north edge of the City's business district. The design team led an extensive public engagement process to identify the need and desire for bike lanes along the corridor. The team developed plans for parking-protected bike lanes and

shared lanes to meet the project's goals. Roadway design included pavement resurfacing and curb ramp improvements from Gay Avenue to Hanley Road for approximately 4400'. The project limits included 12 intersections requiring ADA/ PROWAG upgrades, new crosswalks, and pedestrian signal improvements. H&S thoroughly designed the curb ramps to limit impacts to adjacent properties while meeting design standards. The project was federally funded through the STP program.



#### Salt River Road - Route 370 Ramps City of St. Peters, Missouri

Horner & Shifrin studied conceptual improvements to the Salt River Road/ Route 370 interchange in St. Peters. Many alternatives were designed for two new ramps at the interchange including fly-over ramps, loop ramps, and slip ramps to convert an existing partial interchange to full-access. The interchange improvements will provide traffic improvements for the new commercial developments, including Amazon and FedEx, at the Premier 370 Business Park in St. Peters.



#### Prairie Dell Road Improvements Ph. I City of Union, Missouri

Design of improvements to Prairie Dell Road from Audrey Lane to south of Route 50. The college entrance was converted to a roundabout. The existing 2-lane road was reconstructed and widened to 3 lanes to improve safety for left-turn movements

into commercial properties and provide a landscaped median. A trail was constructed along the east side of the roadway, in accordance with ADA accessibility requirements as defined in the Public Right-of-Way Accessibility Guidelines (PROWAG). Street lighting was designed along Prairie Dell Road. H&S was also be responsible for administration, inspection, and oversight of all construction activities. This process followed the requirements of the LPA Manual since the project was federally funded.



#### I-70 Fifth Street Reconstruction St. Charles County Transportation Department

Horner & Shifrin provided conceptual design, extensive public involvement, a Design Report, Access Justification Report (AJR), and final plans, specification and estimates (PS&E) for 1.5 miles along I-70 from Fifth Street to Route 94. The project was completed on an aggressive schedule to meet funding milestones. The project included conversion of a portion of the two-way outer road to a one-way outer road, construction of a new one-way outer road, design of a diverging diamond interchange (DDI) at Fifth Street, addition of a roundabout at Fairgrounds Road, creation of new interstate access points at Fairgrounds Road, and addition of a lane along the interstate corridor at Route 94. Photo courtesy of MoDOT.



HORNER

#### Lincoln Trail Sidewalk Reconstruction City of Fairview Heights, Illinois

Horner & Shifrin was selected to prepare plans, specifications, and estimates for the reconstruction of sidewalk along the south side of Lincoln Trail within the City of Fairview Heights, Illinois. The project, broken into 3 phases, begins at the intersection of Lincoln Trail and Illinois Route 159 and extends westerly to Union Hill Rd. The existing facility had gaps and non-PROWAG-compliant curb ramps and sidewalk sections throughout the corridor. New compliant ramps, driveway entrances, sidewalks, and relocated pedestrian signals were designed. Deliverables included Right-of-Way Exhibits, Plans, Specifications, and Estimates of Cost & Time, Phase 1 (Illinois 159 to Ruby Lane) was completed July 2016; Phase 2 (Ruby Lane to Catherine Drive) was completed November 2018; Phase 3 was constructed summer/fall 2019.



#### North Green Mount Road Improvements City of O'Fallon, Illinois

Horner & Shifrin provided information to assist the city in obtaining an Economic Development Program (EDP) Grant from the Illinois Department of Transportation to improve North Greenmount road prior to the opening of the new St. Elizabeth's Hospital. Services provided for this project included a complete survey, safety evaluation, location drainage, plan & profile development, pavement design, traffic signal design, intersection design studies (at Pierce Blvd, Cambridge Blvd, and Hwy 50), plats & legal descriptions for right-of-way acquisition, utility coordination, final plans, specifications and estimates, and construction inspection. The improvement includes pavement widening for two new lanes with a raised, boulevard-type median, shared-

use path, mid-block pedestrian crossings, ADA compliant sidewalk ramps, bus stop turnout, new curb and gutter, storm sewer, culvert extension, dual left turn lanes and traffic signals at Cambridge Blvd, and traffic signal modification at Pierce Blvd and Hwy 50.



#### Illinois 15 / Illinois 158 Interchange Reconstruction

**IDOT, Region 5, District 8** Horner & Shifrin was selected by IDOT to prepare Phase I and Phase II plans for the reconstruction of the Illinois 15 / Illinois 158 interchange in Belleville, Illinois. including the nearby intersection of Illinois 158 and Illinois 13. The project features the reconstruction of the ramp terminal intersections at the interchange of Illinois 15 and Illinois 158 in Belleville, Illinois. The end result is the replacement of three signalized intersections with two roundabouts. The northern roundabout has six legs of traffic and combines three state routes and eliminates two closely spaced signalized intersections which were the cause of traffic congestion in the area. A complex traffic staging plan, consisting of several stages of construction and an on-site detour, allowed the project area to be open to traffic while the roundabouts were constructed. A concrete barrier wall was designed integral with the adjacent pavement to provide the appropriate level of crash protection for the shared-use path immediately adjacent to the traffic lane and under the Illinois 15 structures.



#### Illinois Route 3, Waterloo IDOT, Region 5, District 8

Illinois Route 3 in Waterloo is the major thoroughfare for traffic commuting to St. Louis from southwestern Illinois in addition to serving the many agricultural facilities in the area. Traffic had grown steadily since the 1990s and congestion was becoming an increasing issue leading to the need to expand the capacity of roadway. Horner & Shifrin was contracted by IDOT to carry out Phase I&II services for this project. Tasks during the Phase I preliminary engineering and environmental study phase consisted of preparing a project report that documented the alternative alignment selection process and environmental and engineering restraints associated with the study area. Tasks also included conducting intersection design studies, a noise analysis, a location drainage study, a crash analysis, and a traffic management analysis. A key part of the study phase was the use of the public involvement Context Sensitive Solutions (CSS) process which included a Community Advisory Group, public meetings, one-on-one stakeholder meetings, and multiple newsletters. As a result of the CSS process, a safety issue at Vandebrook Drive was discovered just outside the original limits of the project. The result was relocating Vandebrook Drive to the existing traffic signal at the south end of the project. Following the approval of the project report, the Phase II contract plans phase consisted of preparing the plans, specifications, and estimates for the construction. This phase involved the design a four-mile-long,10foot-wide shared use path that included a box culvert underpass to address the Complete Streets policy and the design of the first roundabout in Monroe County. 2013 ACEC-Illinois Engineering Excellence Merit Award Winner.







#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### John Greifzu, Assistant Director of Administration

St. Charles County Transportation Department (636) 949-1876 jgreifzu@sccmo.org

#### Matt Malick, Public Works Director

City of Clayton, Missouri (314) 738-2252 mmalick@claytonmo.gov

#### Kirk Brown, Program Development Engineer

IDOT, Region 5, District 8 (314) 290-8547 kirk.brown@Illinois.gov

#### Burt Benesek, Manager

City of St. Peters, Missouri (636) 477-6600 bbenesek@stpetersmo.net

#### Casey Brunke, Assistant Director of Public Works

City of Cape Girardeau, Missouri (573) 339-6351 cbrunke@cityofcapegirardeau.org

#### Dave Pracht, Assistant Director of Public Works City of Manchester, Missouri

(636) 227-1385 dpracht@manchestermo.gov

#### Kevin Trapp, Bridge Engineer

St. Louis Board of Public Service (314) 589-6606 trappk@stlouis-mo.gov



#### STRUCTURAL BRIDGE











Horner & Shifrin provides a complete array of structural engineering services related to the design and construction of bridges. Our structural engineers are experts with the research, planning, design, construction, inspection, monitoring, maintenance, rehabilitation and/or demolition of permanent and temporary structures. They also consider the technical, economic, environmental, aesthetic, historical and social aspects of structures. Our IDOT Complex Highway Structures prequalification is indicative of our bridge capabilities.

Our structural bridge services include:

- Abutments
  - Integral, Semi-Integral, Stub, Open, Closed, Semi-Deep
- Alignments
  - Horizontally Curved, Tapered, Splayed
- Arch Structures
- Precast Concrete, Aluminum Plate
- Bridge Hydraulics
- Bridge Safety Inspections
- Fracture Critical Bridge Inspections
- Bridge Rehabilitations
- Superstructure Replacements, Redecks, Overlays, Concrete and Steel Repairs
- Bridge Studies
- Cofferdams and Temporary Soil Retention
- Culverts
  - Single and Multiple Cells, Three sided
- Emergency and On-call Services
  - Foundations
  - H-Pile, Metal Shell Pile, Drilled Shaft, Spread Footing
- Geosynthetic Reinforced Soil Integrated Bridge System

- Load Ratings
- Pedestrian Structures
- Piers
  - Pile Bents, Encased Pile Bents, Hammerhead, Open Column
- Retaining Walls
  - Concrete T-Type, Concrete L-Type, Sheet Pile, Soldier Pile, Mechanically Stabilized Earth (MSE), Soil Nail
- Scour Analyses
- Seismic Analysis and Design
- Seismic Retrofits
- Sign Structures
- Structure Assessment Reports (SAR)
- Superstructures
  - Precast, Prestressed, Concrete
    Slab, Structural Steel
- Value Engineering
- Signal and Light Pole Foundations



#### **STRUCTURAL BRIDGE**

#### Adelaide over I-70 Collision Damage Repairs | MoDOT Bridge Division

The Adelaide bridge over I-70 was struck with an overheight vehicle, severely damaging two girder lines. The bridge is an Inverset® structure which consists of fabricated bridge segments consisting of two girder lines and concrete slab. Segments were tied together with grouted shear keys, diaphragms and steel plates. The method of constructing this type of structure requires a very specific construction sequence. Repairs included replacing two of the segments. A construction staging analysis was completed to assure structural stability would be maintained.

### Bridge Repair and Replacement Program

#### City of Manchester, Missouri

Horner & Shifrin provided engineering services for the rehabilitation of the City of Manchester's eleven bridges and culverts. The project scope included a condition assessment of each structure based on an in-depth inspection. We also provided repair and/or replacement

recommendations and cost estimates. We then prepared plans and specifications to implement the recommendations.



### Fracture Critical Inspection Program 2005-Ongoing

**MoDOT, Bridge Division, Statewide** Horner & Shifrin has performed fracture critical bridge inspections statewide for the Missouri Department of Transportation that involved inspections for locally or state owned bridges. Suspended scaffolding, swing scaffolding, bucket trucks and manlifts are used to access the areas of the bridges in need of inspection.

#### I-44 Bridges over City Streets MoDOT, Bridge Division

This project included the structural design for the replacement of 6 bridges and

rehabilitation of 6 bridges on I-44 over Kingshighway, Union Pacific Railroad, Vandeventer, Tower Grove, 39th St. and Thurman in St. Louis City. The project included hydrodemolition and concrete overlay over Tower Grove, re-deck of the bridges over Union Pacific Railroad and superstructure replacement over Vandeventer; the other bridges were replaced. Challenges included dealing with soft soil conditions at Kingshighway, 39th St and Thurman and I-44 grade restrictions at Thurman which required close coordination with MoDOT Geotechnical engineers. Galvanized steel girders were used at Vandeventer and Thurman.



#### Railroad Bridge CR 302 Viaduct Butler County, Missouri

Horner & Shifrin provided engineering design, construction observation, materials testing, right-of-way acquisition, and contract administration for improvements to the Industrial Park Bypass Road to build a viaduct over the Union Pacific Railroad. A 135-foot long NU63 girder bridge was designed to span the railroad right-of-way to simplify construction. MSE walls were used at the abutments and were designed as crash walls to withstand train impact. The integral abutments are skewed 35 degrees and founded on 14-inch castplace piles. The roadway approaches featured a 5% grade to minimize length needed to achieve the 23'-6" clearance required over the tracks and was supported by both MSE walls and 3:1 side slopes.

#### Rte. FF over Big Lake Creek MoDOT, Southeast District

Completed value engineering redesign of intermediate bents on MoDOT designed (50'-70'-50') prestressed concrete NU girder bridge. Original design included columns and pile supported footings requiring use of cofferdam construction in the creek. H&S utilized computed pier loadings to design alternative HP14x73 pile bents with web walls. The redesigned piers were expected to save the contractor significant time during construction and reduce the risk of working in the river. Final savings amount was unavailable.

#### Poplar Street Bridge Approach Rehabilitation MoDOT, Bridge Division, St. Louis District

Horner & Shifrin provided engineering services in the form of bridge inspection and design for the rehabilitation of the slab for the double-deck Poplar Street bridge on I-64 from approximately 21st Street to the Mississippi River. The structure is approximately 8,000 feet long and crosses many city streets, rail lines and MetroLink. The project included deck inspection using infrared thermography and ground penetrating radar to determine areas of delamination supplemented with visual inspection of the underside of the deck and expansion joints. A Chain Drag Test was conducted to determine the accuracy of the non-destructive test methods.

#### Hwy 65B over Crooked Creek Arkansas Department of Transportation

Horner & Shifrin is designing a replacement structure carrying Business 65 (Main Street) over Crooked Creek in Harrison, Arkansas. The new 360-ft long multi-span bridge will accommodate five lanes of traffic and dual 6-ft wide sidewalks. Services also include redesign of the intersection with West Central Avenue including new traffic signals, and decorative street lighting along the bridge.

#### US 45 over Branch of Deer Creek IDOT, Region 4, District 7

Horner and Shifrin designed a replacement of US 45 over Branch of Deer Creek. The design consists of a twocell concrete box culvert on a 20-degree left advanced skew. Both cells are 10'-0" wide and 8'-0" tall. The structure is located in Seismic Performance Category B, and utilized stage construction.





#### Route 61 over the Cuivre River | MoDOT Bridge Division Northeast District

Existing twin 700' long structures had a large contraction scour hole in the channel that threatened to undermine one of the intermediate bents. A hydraulic study was prepared including creating a HEC-RAS model of the existing conditions which were calibrated to a USGS gage station which was attached to the bridge. The project included oversight of a geomorphology study completed by MoDOT and evaluation of several options to reduce scour potential at the bridge

### Martin Luther King (MLK) Connector IDOT, Region 5, District 8

Horner & Shifrin developed Phase II construction plans for a new structure over Relocated Illinois 3, and the Union Pacific Railroad (UPRR)/Terminal Railroad Association of St. Louis (TRRA). Also included are Phase II construction plans for the widening of an existing structure carrying Interstates 55, 64, 60 and US 40 over Riverpark Drive, MetroLink, and South Main Street in the City of East St. Louis, Illinois. Horner & Shifrin was responsible for all aspects of the project including administration, progress meetings and final structural design. As the prime consultant, Horner & Shifrin managed eight subconsultants in providing public involvement, agency coordination, railroad coordination, drainage design, traffic management plans and geotechnical engineering services. The new structure is a 1,000 ft long horizontally curved plate girder bridge supported by open column concrete piers and pile supported stub abutments. The substructure units were placed radially to the baseline of the ramp. The structure is located in a high seismic zone, and the design was required to resist seismic forces.



#### Illinois Route 3 Over UPRR and Prairie DuPont Canal IDOT, Region 5, District 8

Horner & Shifrin provided preliminary and final design engineering for replacement of a through truss bridge in Dupo, Illinois. The new structure is a four-span parabollically haunched plate girder bridge with an overall length of 990 feet and a maximum span of 330 feet. The substructure consists of pile supported stub abutments and drilled shaft piers with a crashwall at Pier 3. The structure is located in Seismic Performance Zone 2.



Reagan Memorial Tollway (I-88) Deerpath Bridge Replacement Illinois State Toll Highway Authority Horner & Shifrin performed Phase II design for reconstruction of Deerpath Road Bridge over Reagan Memorial Tollway (I-88). As part of the project, Phase I was resubmitted with a new preferred alternative that included shortened span lengths for the Bridge. The Phase II scope of the project included replacement of the existing Deerpath Road Bridge over I-88 to address structural and functional deficiencies and to provide for a wider opening underneath for potential future I-88 widening, reconstruction of Deerpath Road approach pavement, improvements to Deerpath Road pavement markings, delineators, and signing, modifications and improvements to existing drainage system, road side embankment regrading to improve the Deerpath Road ditch grading profile, and erosion and sediment control and landscaping. Horner & Shifrin was responsible for all structural design aspects and Project Management including administration, progress meetings and final structural design.

#### Mexico Road Multi Use Path Bridge City of St. Peters, Missouri

The project involved design of a multi-use path bridge over Dardenne Creek with trail connectivity in St. Charles County. Its close proximity to the Mexico Road vehicular bridge and numerous utilities in the area made construction a challenge. The vehicular bridge limited hydraulic analysis and led to the use of a similar span arrangement and skew. The bridge consisted of four 75-ft long pre-engineered bowstring trusses made of weathering steel with a concrete deck. Soft soils required substructure to be founded on footings with steel h-piles. The hammerhead interior bents ranged from 11-ft to 25-ft tall. The east wall abutment is 16-ft high to minimize bridge length and accommodate a trail running under the bridge adjacent to the creek. A modular block retaining wall at the east approach allowed connectivity to the trail below. About 400-ft of approach trail was also designed and constructed as part of the project. Trail profile and bridge details were selected to be in compliance with ADA requirements.



Broadway over I-44 MoDOT, St. Louis District

Horner & Shifrin led a team of subconsultants for development of concepts and final PSE to replace the T-shaped, highly skewed bridge carrying Broadway over I-44 in downtown St. Louis. The bridge is located at the end of the express lanes where one lane exits to Broadway and one lane continues through the bridge. The existing ramp was on a bridge and it was determined that a more economical solution was to construct the ramp on MSE walls. Soil improvements in the form of replacement of 5' of fill under the walls was necessary to safely support the wall. Two bridges were designed with an MSE wall island between them where



the ramp intersected the bridge. With skews around 50 degrees and the need to tie-in to approaches and the new ramp, geometry was a very limiting constraint. A 2-span NU girder bridge spanned the EB lanes of I-44 and the express lane ramps and a steel plate girder bridge with flared ends spanned the WB lanes of I-44. Several custom details needed to be developed where the bridges and walls interfaced which required consultation with MoDOT to make sure bridge maintenance staff were supportive of the proposed details.

#### Bootheel Bridge Bundle Design-Build Missouri Department of Transportation

Horner & Shifrin is the Prime Design Consultant for this \$21.3M Design Build Project. The project consists of the replacement or rehabilitation of 17 existing bridges located in nine different counties in southeast Missouri. Additional scope included hydraulic analysis for all structures, roadway design of tie-ins, miscellaneous safety features, and maintenance of traffic. Design schedule anticipated to be less than 2 years.



### Rte. 76 over Table Rock Lake MoDOT, Southwest District

The Rte. 76 over Table Rock Lake Bridge had a saturated deck in need of replacement. A conceptual study evaluated options including replacing the deck under full closure, staged construction, and precast concrete slabs with nightly closures. Also considered in the study was replacing the superstructure. The benefits, risks, and life-cycle costs of each option were evaluated. The decision was made to use full width precast, precast concrete deck panels with rapid setting concrete closure pours to accelerate construction and allow for the structure to remain open during the day. Project included bridge and roadway plans.

## Delta Heritage Trail State Park RailroadH&S completed the preliminaryBridge Inspectionsengineering and environmentalArkansas Parks and Tourismto replace the aging mile-long b

Horner & Shifrin's role on this project is to provide inspection, assessment and potential rehabilitation or replacement of approximately 30 abandoned railroad bridges. The bridges include a 1200-ft long steel truss with lift span over the White River and a 2200-ft long steel truss swing bridge over the Arkansas River. The bridges are through the White River National Wildlife Refuge, which consists of bottom land forest and swamps. Some of the wood trestle approaches are over 2000' long. Drone inspections will be used to improve safety due to advanced deterioration of the structures. The bridges are to be converted to accommodate pedestrian and bicycle traffic as part of the Delta Heritage Trail which runs 85 miles from Lexa to Rohwer, Arkansas. The trail is owned by Arkansas Department of Parks and Tourism.



#### I-270 over Mississippi River Phase II IDOT, Region 5, District 8

Horner & Shifrin was the Prime Design Consultant to deliver Phase I & II documents for the replacement of the 5,450-ft long dual structures carrying I-270 over the Mississippi River. The project includes the structure removal and replacement with two (2) 26-span bridges carrying interstate highway traffic over the Mississippi River between St. Louis. MO and Illinois. Each roadway accommodates four 12-ft lanes of traffic with 10-ft inside and 6-ft outside shoulders. The steel girder framing includes spans as large as 236-ft and features spans of flared girders to accommodate exit and entrance lanes. The bridge is designed as critical and will be designed for seismic performance zone 2 with varying soil site classes.

H&S completed the preliminary engineering and environmental study to replace the aging mile-long bridge carrying I-270 over the Mississippi River which connects Madison County, Illinois to St. Louis, Missouri. Locally known as the Chain of Rocks Bridge, this bridge is a vital link for the Illinois metroeast and St. Louis metro regions which accommodates over 50,000 drivers per day.

The study included preparation of a project report, coordination of bicycle and pedestrian facilities, subsurface utility engineering, surveying, location drainage studies, a major river hydraulic report, bridge condition report, interchange alternative analysis, maintenance of traffic studies, regional traffic modeling, HSM safety study, and a crash report. A key event during the study process was a Design Charrette that brought together key decision makers from both State DOTs and personnel from FHWA's national office. The charrette expedited the study by establishing clear and defined alternatives. In addition, environmental studies were conducted as required by NEPA and multiple Federal and State (IL & MO) environmental regulatory agencies were coordinated with. This coordination included extensive coordination with the U.S Army Corps of Engineers regarding section 404, 10, and 408 permitting. All environmental studies were included and summarized in a federally approved categorical exclusion.

Unit 1 includes dual 383-ft long 3-span steel plate girder bridges with skewed piers founded on drilled shafts. Each roadway accommodates four 12-ft lanes of traffic with 10-ft inside and 6-ft outside shoulders. Unit 2 includes dual 7-span, 1583-ft long bridges over the river also supported by concrete drilled shaft piers socketed into bedrock. The steel girder framing includes spans as large as 236-ft and features spans of flared girders to accommodate exit and entrance lanes for the Riverview Drive interchange. The rest of the structure is being designed by teaming partners. The bridge is designated as critical and will be designed for seismic performance zone 2 with varying soil site classes.



#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

Stacy McMillan, Structural Liaison Engineer Missouri Department of Transportation, Bridge Division (573) 751-0265 stacy.mcmillan@modot.mo.gov

Burt Benesek, Transportation Manager City of St. Peters, Missouri (636) 477-6600

bbenesek@stpetersmo.net

#### David Pracht, Assistant Director of Public Works

City of Manchester, Missouri (636) 227-1385 dpracht@manchestermo.gov

#### Rick Ellis, Division Head, Bridge

Arkansas Department of Transportation (501) 569-2361 rick.ellis@ardot.gov Jason Jonas, Public Works Department Director Jefferson County, Missouri (636) 797-5369

#### Eduardo Flores, Project Manager

Illinois State Toll Highway Authority (630) 241-6800 eflores@getipass.com

#### Benji Philpot, Transportation Project Manager

MoDOT, Southeast District (573) 472-5371 jessie.philpot@modot.mo.gov

#### Travis Slayton, Project Engineer

Robertson Contractors, Inc. (573) 785-0880 traviss@robertsoncontractors.com





#### WASTEWATER







Horner & Shifrin's water engineers use their skills in every project to design processes and infrastructure that minimizes the effect of human activity on the environment. Our objective is to apply these skills by providing clean water supplies, treating wastewater and solid waste, developing technologies to minimize industrial pollution, and managing water resource systems. We offer full-service planning, designing, permitting and construction management of engineering for potable water storage, distribution and treatment; wastewater treatment; sanitary collection systems, and stormwater systems.

We have Certified Floodplain Managers, Certified Inspectors for Sediment and Erosion Control, and Certified Professionals in Sediment and Erosion Control on staff. Our numerous services in water engineering include the following:

- Wastewater Preliminary and Primary Treatment
- Wet Weather Treatment
- Biological Treatment / Sedimentation
- Tertiary Filtration / Chemical Precipitation
- Sludge / Biosolids Handling
- Sanitary Collection Systems
- Sanitary Sewer / Pump Station Plan Review
- Sanitary Pumping Stations
- Infiltration and Inflow Reduction and Analysis
- CMOM Program Development
- Facilities Inventories with GIS
- Sewer and Structure Rehabilitation
- SSO and CSO Elimination
- CSO LTCP Development
- Permitting
- Funding Assistance







#### WASTEWATER

#### Wastewater Treatment Plant Improvements

#### City of Jackson, Missouri

Improvements to the existing sludge handling and disposal system at the City's wastewater treatment facility, including conversion of the existing digester tank to an aerobic digester; conversion of the existing 17,000-gallon tank into a sludge/ lime blending tank; a new polyethylene lime slurry holding tank, two new lime stabilized biosolids storage tanks and appurtenant systems such as piping, valves, blower systems and mixing systems. Horner & Shifrin furnished design, plans and specifications, assistance with bidding, construction administration. on-site construction observation, as-built drawings and operations and maintenance manuals for the improvements.



#### South Wastewater Treatment Plant Improvements

#### City of Jerseyville, Illinois

H&S provided engineering planning and design services for the Jerseyville South Wastewater Treatment Plant. The improvements increase design capacity to 4.0 MGD, and will accommodate the projected population of the City of Jerseyville through 2025.

The existing WWTP was upgraded with continuous-flow SBRs. The SBR's are designed and programmed for biological nutrient removal and are followed by deep bed sand filters for dentrication. Also included the rehabilitation of two existing pump stations, new grit removal equipment, two new fine screens, 75 HP turbo blowers, new tertiary filters, ultraviolet disinfection, reaeration, service water system improvements, chemical feed equipment for phosphorus removal, sludge dewatering unit, five new buildings to house the proposed equipment,

complete new SCADA system and associated electrical and mechanical for the plant. We also provided engineering design services for the conversion of a 250,000-gallon anaerobic digester to a pre-thickened aerobic digester.



#### Wastewater Treatment Plant Improvements

City of Bismarck, Missouri Design of a 250,000-GPD oxidation ditch with two circular clarifiers to replicate a treatment process familiar to the City. The new process improved sludge wasting through the use of center feed clarifiers with submersible pumps. A new office and laboratory was also designed. Existing sludge holding basins were utilized to minimize costs. The plant was designed to nitrify in order to meet MDNR ammonia limitations. This process also prepared the City for future phosphorus limitations. Submersible mixers were designed for an anoxic cycle for biological phosphorus removal and denitrification.

#### Mapping, I&I, SSES and GIS Rock Creek Public Sewer District

Horner & Shifrin provided comprehensive mapping and infiltration and inflow (I&I) investigation for the West Elm Place Watershed, and a district-wide flow monitoring and sewer system evaluation study to prioritize areas for further field investigations. The study analyzed I&I into the system and evaluated and recommended repairs or replacements to reduce infiltration and inflow and restore the sewer system structural integrity. The project consisted of the following phases:

- Flow and Rainfall Monitoring
- GIS/Access Database
- Mapping
- Manhole Inspections
- Smoke Testing
- Dye Water Testing

- CCTV Inspection
- Final I&I Report



Sanitary Sewer I&I Compliance Village of Northbrook, Illinois Horner & Shifrin was retained by the Village of Northbrook for a sanitary sewer system condition assessment and development of a Sanitary Sewer Infiltration and Inflow Compliance Program to comply with the Metropolitan Water Reclamation District of Greater Chicago's Watershed Management Ordinance. The Village encompasses about 13 square miles in area with a population of 33,170. It has approximately 133 miles of sanitary sewer within its jurisdiction.

#### Sewer Use Charge Study City of Jackson, Missouri

Horner & Shifrin provided rate analysis services to the City of Jackson to evaluate rate increases necessary to support planned system improvements necessary to reduce infiltration and inflow and maintain reserves for an equipment replacement fund.

### Wastewater Facility Condition Assessment

#### Yorkville - Bristol Sanitary District

Horner & Shifrin prepared a hydraulic profile for the Yorkville-Bristol Sanitary District's (YBSD) wastewater treatment plant. YBSD operates a single Wastewater Treatment Plant (WWTP), designed to treat 3.62 million gallons per day (MGD), with a peak flow of 6.14 MGD. The facility was originally constructed in 1958, and has been expanded over the years to its present size with significant additions/ upgrades in 1972, 1990, 2001, and 2017.

H&S prepared headloss calculations through the YBSD WWTP and prepared a hydraulic profile from the junction box where the flow splits between the Main Pump Station and Secondary Pump





Station through the outfall into the Fox River.



#### Wastewater Treatment Plant & Collection System Improvements City of Mascoutah, Illinois

Horner & Shifrin is responsible for the design of a new 1.75 MGD SBR treatment facility and improvements to 4 lift stations in the collection system. The treatment facility includes a new headworks utilizing an automatic fine screen with screenings conditioning and a manual bar screen bypass channel, a four basin SBR treatment system with biological nutrient removal, tertiary filtration, chemical feed system for additional phosphorus removal, and sludge transfer and wet weather lagoon lift stations. The three collection system lift stations are proposed for complete replacement to convert from suction lift to submersible pumps ranging in size from 570 gpm to 1750 gpm. Additional improvements include control panel upgrades, valve replacement, a new generator, and rip rap at three lagoons.



#### Saline Creek Wastewater Treatment Facility Upgrades

Northeast Public Sewer District Horner & Shifrin is providing a plant capacity re-rating study, antidegradation review and design, bidding, and construction phase services for upgrades to Saline Creek Regional Wastewater Treatment Facility. The Saline Creek Wastewater Treatment Facility upgrades will consist of the following:

- New aerobic digester system based on Ovivo Two Stage SilC-TAD ceramic membrane thickening system
- New sludge processing building
- Decant pump station
- New secondary clarifier
- Oxidation ditch control improvements
  Additions and modifications to RAS/ WAS pumping system.

The ceramic membrane thickening unit installed in new digester is a new process and will be the second installed in Missouri.

The plant re-rating study will increase plant capacity from 4.0 mgd to 5.25 mgd to avoid a future secondary treatment process expansion. Biowin process model was calibrated from an extensive plant monitoring data base.

Model scenarios were developed for current and future flow and loads. Existing plant is an oxidation ditch biological nutrient removal plant consisting of fine screens, multi-ring Envirex Orbal oxidation ditch secondary process, final clarifiers, UV disinfection, gravity re-aeration, RAS/ WAS pumping, aerobic digestion, and biosolids storage. An anti-degradation study was also be completed to permit the plant at the 5.25 mgd design capacity.



#### Sanitary Sewer Rehabilitation City of Birch Tree, Missouri

Horner & Shifrin provided USDA-Rural Development-funded wastewater treatment plant improvements, smoke testing and infiltration/inflow investigation of the sewer system, as well as geographic information system (GIS) mapping of the City's wastewater facilities. Funds for the \$1.95 million dollar project were secured through USDA-Rural Development and Community Development Block Grant (CDBG). Rehabilitation for the project included plant upgrades to install new lift station

pumps, a new spiral influent screen, clarifier rehab, the installation of a new disc-filter tertiary treatment, DO and control upgrades, and the construction of a new plant office. The collection system improvements included approximately 19,000 linear feet of in-situ lining and the lining of 50 manholes using fiberreinforced-cement.



### Cape Girardeau County Common Sewer District

Horner & Shifrin was responsible for antidegradation evaluation and facility plan development, as well as civil/site, structural and process design of the new centralized wastewater treatment facility. The Sequencing Batch Reactor treatment plant utilizes influent screen, aerobic digestion and UV disinfection before discharging to a losing stream. The facility was designed for a Phase II upgrade to increase the daily average flow from 425,000 gpd to 850,000 gpd. The facility was designed with a SCADA monitoring system to allow remote monitoring and data logging of all critical process parameters, allowing for a swift response to upset situations. Due to geological challenges posed by the site, the influent screen, influent piping/valve gallery, blower house and SBR tanks were designed into a common structure. The only pumping system in the plant site is the terminal lift station, which feeds raw wastewater to the headworks. From there, the downstream processes were all designed to be hydraulically driven by gravity due to the natural topography of the site. The aerobic digestion basins were designed with surface aerators and telescoping valves to stabilize and manually decant to produce Class B biosolids for land application.





#### Sewer District Formation and Expansion – Phases I, II, III, & IV Pike Creek Reorganized Common Sewer District

Horner & Shifrin's staff provided for master planning for the Pike Creek Sewer District, which services the western edge of Poplar Bluff, Missouri. The original phase consisting of a three-cell lagoon and several hundred connections, now serves over 1,300 homes and has become the driving force for home construction in Butler County. The various phases included miles of gravity lines and force mains, over 25 duplex lift stations, grinder installation, and UV disinfection.



#### Wastewater Treatment Facility & Collection System Rehab City of Greenville, Missouri

Greenville has a terrible problem with Inflow & Infiltration (I&I) of stormwater into their sanitary sewer collection system. In addition, their existing aerated lagoon is no longer capable of meeting Missouri Department of Natural Resources standards. Horner & Shifrin has lead the way in studying and seeking funding for a project that is currently in the design stage. Once complete, the project will include cured-in-place gravity main lining, lift station rehabilitation, and a complete overhaul of the town's wastewater treatment facility.



#### Preliminary Engineering Report Pike Creek Reorganized Common Sewer District

The Pike Creek Reorganized Sewer District has been rapidly growing since its creation in 1999. The original design included the construction of a facultative lagoon for its original 500 customers. Since that time, the District has expanded through four project phases and now boasts almost 3,000 customers. Unfortunately, their lagoon can no longer meet the District's permit requirements for effluent quality or flow.

H&S was hired to write a feasibility study that estimated the cost to build a new Wastewater Treatment Facility (WWTF) as well as some gravity main extensions and replacements. Although the system improvements are necessary, the Board required H&S to fully analyze the impact that the project would have on user rates. Therefore the report included review of Operations and Maintenance costs, replacement schedules, reserve schedules, existing debt, and proposed new debt.

### Wastewater Facility Condition Assessment

Yorkville - Bristol Sanitary District Horner & Shifrin provided engineering services for the facility condition assessment for the Yorkville-Bristol Sanitary District's (YBSD) wastewater treatment plant. YBSD operates a single Wastewater Treatment Plant (WWTP), designed to treat 3.62 million gallons per day (MGD), with a peak flow of 6.14 MGD. The facility was originally constructed in 1958, and has been expanded over the years to its present size with significant additions/upgrades in 1972, 1990, 2001, and 2017. YBSD has initiated an assessment to determine the condition wastewater treatment plant which provided a foundation for planning investments in the plant for the next 20 vears.

The evaluation included conformance to the Yorkville Building Code; OSHA; NEC; NFPA 820; and NFPA 70E Signage. We reviewed process safety management plans; emergency response plans; SPCC; Tier II reports; and OSHAs Globally Harmonized System for chemical classification and labeling to determine if gaps are occurring between District Plans/ Procedures and with respect to local and national codes/standards.



Raintree Plantation Wastewater Treatment Facility Plan

**Jefferson County Public Sewer District** Horner & Shifrin provided an engineering facility plan evaluating the District's Raintree Plantation WWTP located in Jefferson County Missouri. The facility serves a private development serving a population of approximately 2,000 residents, a country club and church. The 20-year population projection is 3,000 with a potential full development buildout of 7,000 people. The existing facility is a mechanical plant with wet-weather equalization, extended aeration treatment, final clarifier and UV disinfection. Sludge is stored onsite in aerated tanks and transferred to an offsite District operated biosolids facility for stabilization before ultimate disposal by a contract hauler. The existing facility was evaluated for structural, electrical, process, and equipment conditions as well as overall design and projected hydraulic and organic capacities. Improvements evaluated included expansion of the equalization basin, headworks screening upgrades, conversion of aeration treatment units to SBR's, and replacement of the UV system. In addition to regionalization options to eliminate the plant, construction of a new mechanical plant adjacent to the existing facility were considered due to site restrictions on the existing facility from an adjacent creek floodway. Each of the recommended projects were analyzed to produce a conceptual design and budgetary opinion of cost. The facility plan was completed under a Missouri Department of Natural Resources (MDNR) grant. The District plans to pursue funding for facility improvements through a MDNR SRF loan.





#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

**Cyrus McMains, Executive Director** Yorkville - Bristol Sanitary District (630) 553-7657 Cyrus@YBSD.org

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**Bruce Alton, Director of Engineering** 

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#### Don Daniel, District Administrator

Rock Creek Public Sewer District (636) 464-3305 dondaniel@rockcreekpsd.com

Kent Peetz, Public Works Director City of Jackson, Missouri (573) 243-2300

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# WATER RESOURCES

#### WATER RESOURCES







Horner & Shifrin's water engineers use their skills in every project to design processes and infrastructure that minimizes the effect of human activity on the environment. Our objective is to apply these skills by providing clean water supplies, treating wastewater and solid waste, developing technologies to minimize industrial pollution, and managing water resource systems. We offer full-service planning, designing, permitting and construction management of engineering for potable water storage, distribution and treatment; wastewater treatment; sanitary collection systems, and stormwater systems.

We have Certified Floodplain Managers, Certified Inspectors for Sediment and Erosion Control, and Certified Professionals in Sediment and Erosion Control on staff. Our numerous services in water engineering include the following:

- Stormwater Site and Systems Design and Review
- Flood Control and Water Quality Detention Design
- Site Development Plan Review
- Erosion and Sediment Control
- Stormwater Pollution Prevention Plans
- Stream Stabilization
- Master Planning, Inventory and Map Updating
- Problem Investigation and Prioritization
- Stormwater System Modeling
- Stormwater Utility Development and
- Financing Options
- Permitting and Regulatory Compliance
- Compliance Review for Local Laws
- and Ordinances
- EPA-Phase II Stormwater Regulations
- Compliance
- MS4 Permit Assistance
- Permitting including State and Federal Agencies







#### WATER RESOURCES

#### Flood Mitigation Plan City of Eureka, MO

Horner & Shifrin was contracted to develop short- and long-term flood mitigation plans for flood-prone areas within the City of Eureka. The initial study included a detailed topographical survey and subterranean study that identifies and maps underground structures which may contribute to flood inundation. The topographic study includes Digital Evaluation Modeling containing digital surface modeling and digital terrain modeling. H&S's short-term plan addresses flood fighting needs, as well as needs associated with flood events such as sewer backups and hydrostatic pressure issues. This plan includes the design and placement of temporary structures and pumps. Our long-term plan includes flood reduction structures, long-term management and maintenance programs, repair and replacement recommendations for aging infrastructure, and placement recommendations for new structures. The study is focused on seven key areas identified by the City.

### Stormwater Master Plan Update City of Creve Coeur, MO

Horner & Shifrin assisted the City of Creve Coeur in updating their existing stormwater master plan. Field investigations were conducted on concern areas identified from the previous master plan, problem areas identified in the recent stormwater questionnaire, and other issues brought to the City's attention. Field crews assessed current site conditions and determined if the problem areas still existed.

Remaining problem areas were assigned a project number based on the watershed in which the problem area was located. After site condition evaluation and hydraulic analysis, alternative solutions and cost estimates were developed for each. Where feasible, some problem areas were combined into a single project.

One of the goals of the City's master plan update was to evaluate the existing prioritization methodology and recommend improvements to it. After evaluation of other methods, it was decided that the benefit point system from the Metropolitan St. Louis Sewer District be implemented to provide a means of prioritizing each problem site.

A web-based GIS was created for the City 3. to easily access locations and information of each problem area.



#### Vernon Hills Athletic Complex Village of Vernon Hills, IL

As a sub to Byrne and Jones, Horner & Shifrin provided stormwater engineering services for a project at the Vernon Hills Athletic Complex. The project consists of replacing three natural turf fields with synthetic turf. Among the tasks H&S completed were:

- Detention Analysis Development of an EPA-SWMM model to analyze detention requirements. The Village wanted confirmation that the site's existing detention basin would be able to accommodate any increased runoff associated with the change from natural turf to synthetic turf. Our analysis showed that the existing detention basin had enough capacity to accept the increased runoff.
- 2. Culvert Analysis The original design for the site included a 24" diameter pipe to be located underneath a section of the new fields to replace an existing open channel and collect runoff from the playing surface and offsite drainage The Village was concerned that runoff from larger flow events may flow over the top of the new fields and deposit trash and debris on the fields and cause maintenance issues. H&S used HEC-RAS to examine culvert hydraulics for both the 10-year and 100-year storm events. The HEC-RAS simulation of the 24-inch culvert showed that it adequately conveyed the 10-year event but would be surcharged during a 100-year storm. Therefore, the

culvert was redesigned with a 36" diameter pipe.

 Lake County WDO Permit – Horner & Shifrin assisted the contractor and the Village in obtaining the required Lake County Watershed Development Ordinance (WDO) Permit. H&S was responsible for filling out the permit and providing the necessary documentation for the final application.



#### I-80 Hydraulic Studies IDOT Region 1, District 1

The highlight of this project was a revaluation of the compensatory storage requirements. The original report recommended that compensatory storage be provided in pipes that would be placed perpendicular to the floodway and parallel to Chicago Street. Two pipes were recommended, one for each elevation zone: a 57-foot long, 84-inch pipe and a 119-foot long, 36-inch pipe connected by a 9-foot diameter manhole.Our reevaluation determined that compensatory storage could be provided by excavation at the bridge site because the proposed bridge has a larger cross-section area when compared to the existing channel. The difference between the new concrete channel section and the existing channel counts against the fill and more than offsets the amount of fill due to the new piers.

#### Benton & Transit Storm Sewer City of St. Charles, MO

The City of St. Charles contracted Horner & Shifrin to provide engineering design of a stormwater system to alleviate surcharging in a residential area adjacent to the Missouri River. More than 4,000 feet of sewer, 12-inch to 84-inch, were designed to manage the 15-year,



20-minute design storm and add additional protection during smaller rain events. Horner & Shifrin survey staff conducted boundary, topographic, and utility surveys over a 50-acre area containing 120 parcels throughout the project area. The project also includes replacement of a flood gate near the levee, and reconstruction of the outfall pipe and channel discharging into the Missouri River. The conceptual design provided by the City was revised when a more efficient and cost-effective alignment was analyzed by H&S. Environmental concerns arose when research provided information the existing flood gate was constructed at the site of an old railroad fuel storage location. Design of new water lines were added to the project to incorporate efficiency in design and construction of City-funded projects through the same corridor.



#### Howard Bend Levee District City of Maryland Heights, MO

Consultant District Engineer overseeing engineering-related issues for the 6,000acre levee district. Projects include the following:

#### Levee and Berm System:

Developed construction bid documents for 500-year levee and underseepage berm system. Levee system is 7 miles in length, along the Missouri River.

#### Interior Drainage Stormwater Model:

Development of a stormwater model of 6,000 acres of bottomland. The total size of the tributary watershed is 42 square miles. The stormwater model was used as a tool to obtain a Letter of Map Revision (LOMR) from FEMA.

#### **River Model-Floodway Depiction on DFIRMs:**

Development of a stormwater model to determine the limits of the floodway, using the HEC-RAS. The effort was submitted to flooding at the plant so that operations are

FEMA and SEMA to show the engineered not impeded. location of the river floodway on the preliminary DFIRMs and resulted in FEMA showing the floodways at the locations calculated by the model instead of the policy location at the landside toe of the levee.

#### Flank Levee Improvements - North Creve Coeur Creek:

Development of construction plans for Flank Levees Improvements along Creve Coeur Creek. The one-mile flank levee improvements will protect 1,400 acres from flooding by flank levee overtopping.

Flank Levee Improvements - South Creve Coeur Creek and Fee Fee Creek: Development of construction plans for Flank Levees Improvements along south Creve Coeur Creek and Fee Fee Creek. The 3.5 miles of flank levees will contain the 100-year rainfall event from the 42 square mile tributary area and protect 800 acres from flooding by flank levee overtopping.

#### New River Outlet Design:

Design of new gravity outlet to convey stormwater for large-flow, small returnfrequency storm events. The fourbarrel, 12 x 10 ft., 200-ft long culvert will have two backflow prevention devices incorporated into the design to prevent backflow from the Missouri River during a major river flood. The 500-year river levee will be relocated as part of this work.

#### Flood Protection Alternative Analysis | Yorkville - Bristol Sanitary District Yorkville, IL

The Yorkville-Bristol Sanitary District owns and operates a wastewater treatment facility located at 304 River Street, Yorkville, Illinois. The facility is located at the confluence of Blackberry Creek and the Fox River. As part of a Facility Condition Assessment Project, H&S developed a hydraulic profile for the Fox River at the 25-year flood elevation and determined that the plant's UV system would not be operable during this flood event. Also, large areas of the plant property are inundated during a 100year flood event and most all of the plant property is covered with water during a 500-year event. The purpose of the flood protection alternative analysis was to examine potential solutions to eliminate

The study evaluated five flood-protection alternatives to protect against a 0.2% (500-year) flood event at the District's Water Reclamation Facility. Three of them would protect the existing site: an earthen levee, a concrete floodwall and a combination levee/floodwall system. Two other alternatives were located on the YBSD property on the west side of Blackberry Creek. Those alternatives were: an earthen levee to protect a new plant built at the site and elevating the site on fill to provide protection for a new plant.

All options were evaluated for site constraints, regulatory issues and cost considerations. Specific criteria for levees alternatives were type and ease of construction, maintenance, seepage and slope protection. Specific flood wall design criteria included subsurface conditions, loading conditions, loading effects and potential failure mechanisms.

#### **Ditch & Detention Evaluation** City of St. Peters, MO

The City of St. Peters contracted Horner & Shifrin, Inc. (H&S) to provide professional engineering services for the evaluation and recommendation of a master stormwater drainage ditch system for the area north of Interstate 70 and bound by the Old Town Levee, with Spencer Creek to the east and Dardenne Creek to the west. The City requested the study also contain an evaluation of the existing Regional Detention Basin located on City of St. Peters' property to the north of Recycle City, and the evaluation and recommendation of improvements to Interior Ditch B.



#### Ameren IL Floodplain Dev Permitting Ameren Illinois

H&S was contracted by Ameren Illinois to provide floodplain permitting assistance with St. Clair County for aging tower





replacement in unincorporated portions of their jurisdiction. The utility company is replacing aging infrastructure with more modern mono-poles along various waterways. Ameren required assistance providing a hydraulic analysis of the Mississippi River and a no-rise certification for their proposed work within the floodway to prove a no-rise condition. In addition to County permitting, H&S worked with the City of E. Carondolet and the Illinois Office of Water Resources for permitting compliance and approvals.

Flood analysis included acquiring the existing HEC-2 river models and importing and developing HEC-RAS models for the duplicate effective, corrected effective, existing, and proposed conditions. Because no existing models were available through FEMA, the US Army Corps of Engineers, the County, City, or State, the models were created from scratch to best fir the output files obtained by FEMA for the Mississippi River. Floodplain analysis reports, Floodplain Development Permit Applications, and No-Rise Certificates will be provided upon analysis completion to both the City of East Carondolet, St. Clair County, and the Office of Water Resources.



#### MSRP Floodplain Permitting Ameren Services

The utility company is replacing aging infrastructure with more modern monopoles along various waterways. Ameren required assistance providing a hydraulic analysis of Gravois Creek and a no-rise certification for their proposed work within the floodway to prove a no-rise condition. H&S identified portions of the project that are also within the River Des Peres floodway. H&S staff met with the City's Floodplain Administrator and coordinated with the County's Floodplain Administrator to determine requirements and application procedures.

#### Laurel Lake Estates Pond Drainage Improvements City of Town & Country, MO

The City of Town & Country contracted H&S to provide professional surveying and civil engineering services for evaluation and design of drainage improvements to include the removal of the dam creating Laurel Lake Estates Pond and restoration of the Grand Glaize East Creek channel. The pond captures excessive siltation, making the pond a nuisance and dangerous to neighborhood residents and pets. The new design includes removal of the existing dam, removal of the accumulated siltation. restoration of stream bed and floodplains, placement of cut stone berms to provide detention required by MSD, bank armoring at locations where vegetation will not provide sufficient slope stability, and landscaping improvements for stability and long-term viability of the creek. A hydraulic analysis was completed in accordance with the requirements of the Metropolitan St. Louis Sewer District to provide assurance that storm water runoff from the removal of the dam will not increase flow downstream. Permitting through USACE was also provided by H&S.



#### Hawk Run Storm Sewer City of O'Fallon, MO

H&S provided hydraulic and civil engineering design for a new storm sewer system to collect ponded water in residential back yards. The final design included beehive grates for property owner agreement, and the alignment was chosen by determining the minimum interference with existing landscaping, decks, trees, and public utilities. Design plans, specifications, easement documents, and cost estimates were

#### provided for permitting and construction.



#### Pontoison Drive Stormwater Improvements City of Manchester, MO

Residential yard flooding was impacting the properties of Pontoison Drive. H&S provided conceptual plans and design documents for improvements to capture stormwater from neighboring properties by use of a large berm and new inlets. The pipes were connected to the existing sewer infrastructure and conveyed downstream to a small creek. H&S personnel met with the Aldermen, residents, and City officials to gain support to acquire easements from the residents. H&S provided survey, engineering design, easement documentation, construction administration, public involvement, and sewer district approval for construction permits. The final solution included 376 linear feet of 12- to 18-inch sewer pipe, four new inlets, and almost 3000 linear feet of reinforced-turf covered earthen berm.



Cloverleaf Lane Stormwater Improvements City of Manchester, MO

H&S provided designs for a ditch enclosure through a residential neighborhood that was flooding lower levels of adjacent homes. The project consisted of connecting two public piped storm sewer systems with approximately 300 linear feet of 24-inch sewer pipe. H&S





provided land surveying services, easement documentation, hydraulic analysis, plan creation, resident coordination, bidding assistance, construction administration, and construction inspection..



#### Wentzville DNR Stormwater Grant Assessment City of Wentzville, MO

H&S provided an integrated plan that evaluates current and future 'built-out' stormwater management needs (general type, locations, cost) through hydraulic and hydrologic modeling based on current infrastructure, land use, climate trends and planned growth using current Planning & Zoning standards for four major tributaries wihtin the City of Wentzville. Funding for this analysis is provided in part by a Missouri Department of Natural Resources grant.

#### Good Hope Street Stormwater City of Cape Girardeau, MO

H&S provided engineering services for the replacement of an inadequate storm sewer system through an industrial area, including improvement of an overflow system in the event the system is over capacity. The proposed larger system had to be designed without relocating existing gravity sewers in conflict and at extremely shallow depths; therefore, creative solutions were provided, including 550 linear feet of box culverts, specially designed connection structures, and complete roadway reconstruction. Over 1,400 linear feert of pipe included alternatives for pipe materials to keep project costs low. Project deliverables included project plans for stormwater and roadway improvements, Job Special Provisions / Measurement and Payment Specifications, estimated construction cost estimates, and temporary and permanent easement documents. H&S

provided utility coordination with local utility agencies and shop drawing review during construction.



Stormwater CIP - 11968 Meadow Park Court

City of Maryland Heights, MO H&S provided topographic survey and civil permitting approvals. engineering design for stormwater improvements in a residential neighborhood experiencing yard flooding and erosion. Frequent and excessive runoff has resulted in flooding of basement entry garages, and residential property owner improvements have disrupted drainage across properties. The project includes approximately 150 feet of piped stormwater improvements and inlets to collect stormwater at low points and convey it underground to the existing storm sewer system. Project scope included locating utilities in the back yards to coordinate minimal disruption, locating sewer away from existing retaining wall to prevent bearing on the pipe and disruption during construction, and easement documentation for Metropolitan St. Louis Sewer District approval.



#### Perry Street Storm Sewers City of St. Charles, MO

H&S provided topographic and boundary survey and civil engineering services to the City of St. Charles for the Perry Street Stormwater improvements project for replacement of an undersized storm sewer systems through historical downtown St. Charles. Existing pipes in

unknown locations were investigated for type, size, and connectivity. Recommendations to tunnel beneath historic Main Street provided pedestrian and vehicular traffic circulation during construction to businesses that would be greatly affected by impacts. This also minimized impacts to historic brick streets and monuments. The final design included over 2,000 feet of storm and relocated sanitary sewer, inlet capacity calculations, field research, easement documentation, hydraulic analysis, cost estimating, and creation of project specifications. H&S also coordinated with the City, US Army Corps of Engineers, and the Missouri Department of Natural Resources for



Levee Certification St. Louis Board of Public Service Horner & Shifrin provided certification services, in accordance with Title 44 Code of Federal Regulations (CFR) Section 65.10, for the St. Louis Flood Protection System, which stretches for 11 miles along the Mississippi River. Floodwalls make up 6.75 miles of the flood barrier while earthen levees comprise the other 4.25 miles. In addition, there are thirtynine closure structures and twenty-eight pump stations located along the length of the system.

Available historic supporting data were reviewed, including: as-built and design drawings, operations and maintenance manuals, hydraulic and hydrologic design memoranda, Flood Insurance Study text and maps, and current hydrologic and hydraulic modeling results. Geotechnical investigations were conducted along the flood protection system including the drilling of ninety-six borings. Physical inspections were conducted of the levee, floodwall, closure structures, and pump stations. Selected closure structures were inspected with an ultrasonic thickness gauge to determine deterioration.





H&S reviewed the original design calculations for the structural components of the flood protection system to verify the original loading conditions and to determine if the original design meets current criteria. H&S also developed spreadsheet tools to calculate, analyze and assess the floodwalls and closure structures. Review of the structural components was based on current design manuals (EM) and engineering technical letters (ETL).

An interior drainage study using a onedimensional XP-SWMM model was performed to determine the hydraulic capacity of each twenty-three outfall systems in the leveed area as part of the flood certification study. Three conditions were analyzed, gravity outfalls, pressurized sewers, and areas served by pump stations Areas of inundation greater near site. Completed a flood study and than one foot of depth, whether from either the free discharge or blocked drainage conditions were then mapped as the BFE ...



#### Festus Plant Railroad Culvert Analysis Buzzi Unicem USA

Horner & Shifrin performed a hydraulic and hydrologic (H&H) study for the Buzzi Unicem Quarry located in Festus, Missouri. Buzzi was reconfiguring its existing railroad tracks and expanding the track layout to accommodate increase storage capacity of rail cars that are served by the BNSF Railway. The H&H evaluated drainage impacts of the proposed improvements. Existing and proposed culverts and ditches, both on BNSF and Buzzi property, were evaluated for hydraulic capacity and compliance with BNSF requirements. Project was sequenced in parallel with Buzzi's rail design consultant to confirm any necessary modifications to improvements. Recommendations included a widened track side ditch and continued channeling

of quarry surface runoff to the double culvert outfall ...



#### Emmenegger Park Bank Stabilization City of Kirkwood, Missouri

Horner & Shifrin developed bank stabilization improvements along the Meramec River located at Emmenegger Nature Park to prevent further erosion. Utilized shot rock and concrete rubble material from I-44 Highway project located No-Rise analysis from Sunset Hills required for construction approval. Performed construction observation during installment of bank stabilization improvements. Coordination also required with USACE, MDNR, MSD, and local utilities ...



#### **Deer Creek Flood Mitigation** City of Brentwood, Missouri

Horner & Shifrin is teaming with Jacobs to provide design improvements and flood mitigation along Deer Creek and Black Creek in the City of Brentwood. This project includes \$54 Million in improvements, including buy-outs and demolition to eliminate obstructions in the floodplain, creek restoration and widening, bridge reconstruction to eliminate a choke point, detention facilities and floodplain modifications to lower flood elevations and eliminate flooding along Brentwood Boulevard and adjacent areas. The project also allows for redevelopment and reuse of the site as a City park. Preparation of a utility investigation report and plan drawings to document utility conflicts.

Includes coordination with survey subconsultant to document and record public utilities through survey of all visible utility facilities/structures. Distribution of preliminary plans to utility contacts for review and coordination...



#### Monroe Creek Stream Stabilization **Kirkwood Parks & Recreation** Department

Horner & Shifrin performed the repair and restoration of an open channel upstream and downstream of a new low-water road crossing. The area of stabilization had a total length of approximately 320', of which, 240' was upstream of the new crossing and 80' downstream of the structure. The project utilized a combination of fixes that included Curlex bloc logs and live stakes for toe protection. Curlex III erosion control blankets with a native seed mix for bank protection, and light limestone revetment grade controls to stabilize the stream bed..





#### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### Mr. Cyrus McMains, Executive Director

Yorkville - Bristol Sanitary District 304 River Street Yorkville, IL 60560 (630) 553-7657 Cyrus@YBSD.org

#### Nancy Morgan, PE, Supervising Engineer

Ameren Missouri 1901 Chouteau Avenue Saint Louis, MO 63166 (314) 342-1111 nmorgan@ameren.com

#### Wade Montgomery, PE, City Engineer

City of O'Fallon, Missouri 100 North Main Street O'Fallon, MO 63366 ((636) 240-2000 wmontgomery@ofallon.mo.us

#### Joe Krypciak, PE, Engineer

City of Maryland Heights, Missouri 11911 Dorsett Road Maryland Heights, MO 63043 (314) 291-6550 jkrypciak@marylandheights.com

#### Stan Polivick, Public Works Director

City of Cape Girardeau, Missouri 401 Independence St. Cape Girardeau, MO 63703 (573) 334-8326 spolivick@cityofcapegirardeau.org

#### Kierstyn Lorince, PE, Project Manager

City of St. Charles, Missouri 200 North Second Street St. Charles, MO 63301 (636) 949-3200 Kierstyn.Lorince@stcharlescitymo.gov

#### Dave Pracht, Assistant Director of Public Works

City of Manchester, Missouri 14318 Manchester Rd. Manchester, MO 63011 (636) 227-1385 dpracht@manchestermo.gov

#### Amy Haddock, PE, Assistant Director of Utilities

City of St. Peters, Missouri 1 St. Peters Centre Boulevard St. Peters, MO 63376 (636) 477-6600 ahaddock@stpetersmo.net

#### Tim Randick, Project Manager

Project Manager 1011 Municipal Center Dr. Town & Country, MO 63131 (314) 432-6606 randickt@townandcountry.org



# SUPPLEMENTAL SERVICES

**}** 

#### DESIGN-BUILD







Our familiarity with the way contractors think keeps our engineers on point and streamlines the process required to get to the final solution. In addition to having the engineering expertise, we have the marketing and production capabilities to prepare complex, professional-looking proposals.

Our design-build engineering deliverables and services include:

- Accommodations for bicycles and pedestrians
- Alternate bridge type studies
- Alternate facility design and evaluation
- Compatibility with future facility expansion
- Construction staging
- Design narratives
- Emergency access strategy
- Environmental Impact Assessment Studies
- Recreational and Sport Facility Design

- Future facility inspection accommodations
- Geometric design and capacity analysis
- Incident management plans
- Innovative construction methods
- Long-term maintenance reduction concepts
- Maintenance of traffic schemes
- Partnering agreements
- Proposals
- Public involvement process
- Regional mobility strategies









 Environm Studies
 Recreation



#### **DESIGN-BUILD**

### Bootheel Bridge Bundle Design-Build MoDOT

Horner & Shifrin is the Prime Design Consultant for this \$21.3M Design Build Project. The project consists of the replacement or rehabilitation of 17 existing bridges located in nine different counties in southeast Missouri. Additional scope included hydraulic analysis for all structures, roadway design of tie-ins, miscellaneous safety features, and maintenance of traffic. Design schedule anticipated to be less than 2 years.



#### I-270 North Design-Build MoDOT, St. Louis Area District

Horner & Shifrin provided engineering design services for drainage, roadway, bridge, and hydraulics for MoDOT's \$270M I-270 North Design-Build Project. H&S led all drainage design for the 7-mile corridor along I-270 in St. Louis County from Lindbergh (Route 67) to Bellefontaine Road. The complex design accounted for widening of I-270, interchange improvements, 1-way outer road conversions, and new outer roads. Drainage design was closely coordinated with MoDOT and MSD. Detention basins were provided at many locations to account for increases in runoff. The basin design required coordination and approval by MSD.

#### Safety Design-Build MoDOT, St. Louis District

As the team's lead engineer, Horner & Shifrin used a data-driven approach to target safety improvements at all 31 identified project locations with the combination of improvements expected to reduce 62 fatal and serious injury crashes over a 10- year period.

The project was able to complete quantitative safety modeling analysis by utilizing the tools available in the Highway Safety Manual, as well as Safety Countermeasure Studies listed in the CMF Clearinghouse, to maximize lives saved.

Horner & Shifrin investigated safety improvements used nationwide to determine if any countermeasures could be implemented on the project to maximize lives saved. A total of 13 Additional Applicable Standards (AAS) were identified by the team and submitted to MoDOT for use on the project. These AAS's allowed the design team to use other state's standards and develop project-specific standards which were approved by MoDOT and FHWA.

In summary, Horner & Shifrin was able to use a data-driven analysis to maximize the safety benefit-cost ratio to effectively deliver a systemwide application of 25 distinct safety countermeasures such as High Friction Surface Treatment (HFST), inlaid pavement markers, LED stop signs, intersection conflict warning systems (ICWS), and many others to 31 independent locations in the St. Louis District..



#### Route 364, Phase 3 Design-Build MoDOT, St. Louis District

This large design/build project along Route 364 consisted of 9 miles of new four lane freeway. Horner & Shifrin was responsible for the design of 14 of the 17 bridges required for the project and associated MSE retaining walls. All design work was completed between April and December of 2013. Bridges were designed in conjunction with contractor input and required flexibility and adjustment to meet changing field conditions.

Creek crossing structures for the project included dual 77-ft simple span

prestressed concrete I-girder bridges over Crooked Creek and dual 212-ft two span I-girder bridges over Dardenne Creek. The Dardenne Creek bridges featured drilled shaft foundations for the intermediate bents and special design considerations required to accommodate nearly 30 feet of calculated contraction scour. We also designed new dual 126-ft simple span precast concrete bulb-tee girder bridges crossing Tributary B. The design included straightening and relocation of the Tributary B channel, along with hydraulic analysis to properly size the new bridges.

Grade separation bridges for the project included dual 72-ft concrete l-girder structures carrying Rte. 364 over Hanley Road and 71-ft concrete I-girder structures carrying Rte. 364 over Motherhead Road. Both locations feature MSE wall abutments to minimize span lengths. Other structures included dual 200-ft long simple span steel bridges as part of a new Single Point Urban Interchange (SPUI) at Route K, a two span 200-ft long bridge carrying Gutermuth Road over Rte. 364, and a 212-ft two span concrete bulb-tee bridge for 94 WB Ramp. This structure featured a curved deck and flared girder framing.



#### The New I-64 Design-Build MoDOT, St. Louis District

Horner & Shifrin was responsible for Segment 1 of the \$525 million I-64 designbuild project for MoDOT. We provided roadway and bridge design for a threemile-long segment of I-64 from east of Clayton/Warson Road to west of Spoede Road.

Design for the segment included roadway geometrics, design of three interchanges, roundabouts, hydraulics and drainage, detention analysis, retaining walls, sound walls, grading, fencing, and utility


coordination. We were also responsible for coordination of lighting, signing, striping, traffic signals, and landscaping for the limits of this segment.

The interchange at I-64/Spoede was designed to include entrance and exit ramps from I-64 within roundabouts. Roundabouts were designed to handle off and on traffic from I-64 in addition to outer road connections. The convergence of the roundabout included four legs at each location with the outer roads connecting to Spoede Road. Locations of the roundabouts were designed to allow for adequate acceleration and deceleration lengths from I-64. Since the existing terrain was relatively steep, the roundabouts were tilted at the maximum allowable grade to limit the footprint of the design. Horner & Shifrin designed five bridges for a 3-mile segment of the New I-64 Design/Build Project.



#### **New Water Treatment Plant** City Of Crystal City, Missouri

Horner & Shifrin designed Crystal City's original plant, which went into operation in 1956. In 2015. Horner & Shifrin was hired to design a new 1.2 MGD water treatment plant to replace the aging facility. The project was accomplished through a design-build delivery method, a groundbreaking move on the part of the City. The project featured rehabilitation of the City's collector well, construction of a new softening plant, location of the plant above the Mississippi floodplain, and various upgrades to the distribution system. Two major options were considered for the plant design; conventional lime softening using lime slaking and gravity filtration, and the use of green sand pressure filters prior to nano-filtration membranes. After an exhaustive study, the decision to utilize conventional lime-softening was chosen,

the local aquifer. The design-build team was able to rehabilitate the City's existing collector well and remove it from the Missouri Department of Natural Resources "under the direct influence of surface water"-rule, thereby simplifying the design and reducing project costs.



## Multiport Wastewater Outfall Diffusion System

#### Henry, Illinois

Horner & Shifrin, in association with the design-build team of Massman Construction. Inc. of St. Louis and AquAeTer, Inc. of Brentwood, Tennessee, successfully designed, built and operationally tested a multiport wastewater outfall diffusion system for Noveon chemical manufacturing facility located on the Illinois River in a fast track, D/B project. Services included surveys, modeling and geotechnical investigations, design budgeting, preparation and submittal of permit applications, construction and performance confirmation testing. Diffusion system consists of 8-ft diameter reinforced concrete control/outfall structure located on riverbank with 250 feet of 12-inch diameter steel outfall pipe extending perpendicular into the river and connecting to the diffusion header.

#### Levee Closures and Floodwall Wood River Levee District

The Wood River Levee was initially built in 1910 as an agricultural levee. It was raised to a 500-year urban levee in the 1950s by the U.S. Army Corps of Engineers. The 14,000-acre Wood River Levee District was established to provide residents, businesses and industries protection from overflows of Wood River and the Cahokia Diversion Canal. The levee has never ruptured, even holding strong through the Great Flood of 1993.

due to the extreme concentration of iron in As a member of a design-build team, Horner & Shifrin designed three closure structures and associated floodwall for 500-year urban levee. H&S also provided Quality Control management for this Design-Build project.

#### Training Area 244 Replacement Bridge **Design-Build**

#### **USACE, Kansas City District**

Design and contractor quality control management for the replacement bridge at Training Area 244 over a Tributary to Smith Branch at Ft. Leonard Wood, Missouri. The previous Bailev bridge at this location was washed out by an extremely large storm event. An existing low water crossing exists just downstream of the new bridge location. The project is located on a low traffic volume roadway mainly used for military training. The bridge substructure is steel H-piles and the superstructure consists of precast concrete beams.







### REFERENCES

Horner & Shifrin's rendering of quality professional services often results in repeat clientele. A list of client references is included below; feel free to contact them concerning our experience and capabilities.

#### David Simmons, State Design Build Coordinator

MoDOT, St. Louis Area District (314) 453-1878 david.simmons2@modot.mo.gov

#### **Rob Flotron, Project Manager**

West Contracting (636) 677-1414 rflotron@yahoo.com

#### Travis Slayton, Project Engineer Robertson Contractors, Inc. (573) 785-0880 traviss@robertsoncontractors.com

Bob Leingang, Senior Vice President-Engineering and Estimating Millstone Weber (636) 949-0038 bob.leingang@millstoneweber.com



## ENVIRONMENTAL PLANNING AND PERMITTING











Horner & Shifrin's Environmental Group provides a multitude of services related to planning and permitting for projects ranging from permitting for local entities to complex environmental impact statements and assessments for clients seeking approval for transportation and utility infrastructure projects. With each project, Horner & Shifrin uses state-of-the-art GIS technology to identify the existing environmental conditions and to provide solutions to address engineering, environmental, and development concerns.

Horner & Shifrin's National Environmental Policy Act (NEPA) experience has enabled the staff to work with Federal and State environmental regulatory agencies and provides our clients with a systematic approach for handling all issues and aspects of the human, biological and cultural environment. A role also provided by the environmental staff is to participate in the public involvement process to educate these entities on the environmental resources and concerns within a project study area and in turn, learn from these groups what environmental aspects are important to them.

Our numerous services in environmental planning and permitting include the following:

### NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

- Categorical Exclusions
- Corridor Studies
- Environmental Assessments
- Environmental Impact Statements
- Feasibility Studies

#### **ENVIRONMENTAL STUDIES & REPORTS**

- Bat Tree Habitat Identification
- Conservation Plans
- Cultural Resource Analyses
- Existing Environmental Resources
  Evaluation
- Farmland Analyses
- Noise Analyses
- Phase I Environmental Site
  Assessments
- Section 4(f)
- Section 6(f)
- Section 106

#### **ENVIRONMENTAL PERMITS**

- Floodplain Permits
- IDNR No-Rise Authorization
- Incidental Take Authorization
- Section 9 U.S. Coast Guard Permit

## REGULATORY AGENCIES WE COORDINATE WITH

- Illinois & Missouri Departments of Natural Resources (IDNR & MDNR)
- IDNR Office of Water Resources
- Illinois & Missouri State Historic
- Missouri Department of Conversation (MDC)

## <u>CLIENTS</u>

- IDOT
- MoDOT
- Ameren

- Socioeconomic & Demographic Studies
- Storm Water Pollution Prevention Plans (SWPPP)
- SWPPP Inspections
- Threatened & Endangered Species Assessments (IDNR EcoCAT, MDC Natural Wildlife Heritage Program, USFWS IPaC)
- Wetland Delineations
- Wetland Mitigation Plans
- Section 10 Navigable Waterway
  Permit
- Section 404 Permits
- Section 408 Permit
- Illinois, Missouri, and U.S.
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Fish & Wildlife Service
- MidAmerica St. Louis Airport
- Illinois and Missouri Counties
- Illinois and Missouri Municipalities.



## **ENVIRONMENTAL PLANNING AND PERMITTING**

#### I-270 Bridge Replacement Over the Mississippi River Preliminary Engineering & Environmental Study IDOT, Region 5, District 8

Horner & Shifrin served as the Public Involvement Lead for IDOT and MoDOT for the preliminary engineering, environmental study, and design to replace the bridge carrying I-270 over the Mississippi River which connects Madison County, Illinois to St. Louis, Missouri, locally known as the Chain of Rocks Bridge. Due to the close proximity of the Riverview Drive & I-270 interchange in Missouri to the Chain of Rocks bridge, H&S has and continues to lead the continual coordination with IDOT and MoDOT throughout the study and development of the contract plans.

The study has and continues to use multiple public involvement tools in order to solicit input from the public and keep them informed. Throughout the project, Horner & Shifrin has and continues to work closely with all environmental regulatory agencies, study area communities, property owners, businesses, and residents as the bridge serves as vital link to more than 50,000 travelers per day. Public involvement activities included: developing a Stakeholder Involvement Plan that provided as a guide for which public involvement tools to implement and when during the study; developed and continually updated a mailing and eblast list: created and distributed four newsletters; developed and distributed public meeting postcards; identified key stakeholders and arranged, prepared materials for, and participated in stakeholder meetings; identified members and development of a community advisory group (CAG); arranged, prepared materials for, and gave presentations for the CAG meetings; arranged, prepared materials and displays for two public meetings; documented all public involvement meetings and distributed to the attendees; developed and provided responses to comments received on the project; developed content and updates for the project websites; and developed and implemented a social media campaign during construction. All public

involvement activities and documents were compiled into a Public Involvement Document and included as an appendix in the IDOT Project Report. Working with the local and regional stakeholders, CAG members, and listening to the public led to the completion of a successful study and a bridge replacement alternative that will address the public's key issues and concerns..



#### Mullins Slough WRP Environmental Assessment, Natural Resource Conservation Service & Ameren Illinois Company

H&S prepared an EA for Ameren's proposed reconstruction and realignment of a portion of an electrical transmission line over the Mullins Slough Wetlands Reserve Program (WRP) Easement in St. Clair County, Illinois. The WRP easement is held by the United States Department of Agriculture Natural **Resource Conservation Service** (USDA-NRCS). In reconstructing and realigning the referenced portion of the line, AIC proposes to abandon the existing right-of-way corridor which AIC currently co-occupies with the Mullins Slough WRP easement. In so doing, AIC proposes to occupy a new corridor across the Mullins Slough WRP easement. The encroachment into the WRP easement by the proposed new transmission line ROW easement would be the aerial span of overhead electrical transmission conductor. NEPA requires that NRCS, as a federal agency, consider the environmental consequences of a proposed federal action before making a decision regarding them. H&S environmental staff prepared the EA on behalf of the NRCS and Ameren.

#### Shawnee Parkway Environmental Impact Statement

#### IDOT, Region 5, District 9

Horner & Shifrin was selected by IDOT to complete an Environmental Impact Statement for a new transportation facility improving the east-west travel ways through the Shawnee National Forest in the Illinois counties of Alexander, Pulaski, and Union. This study, referred to as the Shawnee Parkway, required a detailed look at the transportation system within the study area to address the lack of eastwest roadways and provide for economic opportunities.

The study used the public involvement tools of Context Sensitive Solutions (CSS) to work closely with all environmental regulatory agencies, study area communities, property owners, businesses, and residents as the project was within the environmentally significant Shawnee National Forest. Public involvement activities included developing a Stakeholder Involvement Plan that provided as a guide for which public involvement tools to implement and when during the study; identified key stakeholders and arranged, prepared materials for, and participated in approximately 50 stakeholder meetings; identified members and development of a community advisory group (CAG); arranged prepared materials for, gave presentations for the CAG meetings; arranged, prepared materials and displays for a public meeting; prepared and disturbed responses to public comments; developed and continually updated a mailing and eblast list; created and distributed newsletters; developed public participation surveys; and developed a website with an interactive map and a document library in order to be more transparent with the study stakeholders.

#### Phase 1 ESA Village of Mundelein, Illinois

Horner & Shifrin performed this Phase I Environmental Site Assessment for the Village of Mundelein on a property under consideration for purchase for a new Village Park. The subject property consisted of 2.41 acres and included five buildings: four buildings were residential houses and one building that



accommodated three different businesses including a furniture upholstering & refinishing store, insurance business, and stereo system store.

# Illinois 15/Tudor Piggot Feasibility Study

#### St. Clair County, Illinois

Horner & Shifrin served as the Environmental Lead and provided public involvement support for the study which explored the need for an improved roadway connection between the I-64 ramps at Tudor-Piggott Drive and Illinois 15 in East St. Louis. Illinois. The project limits included a mixture of residential. commercial, and industrial land uses. as well as vacant property. The study was conducted to develop alternatives that were supported by the community, provided benefits within the study area. and provided a safer and more efficient roadway connection. The project sought meaningful participation and input from the study area community and affected stakeholders.

#### David Hoekel Parkway Environmental Assessment Re-evaluation St. Charles County Highway Department

Horner & Shifrin provided engineering design and environmental services for a portion of the overall David Hoekel Parkway (DHP) project. This portion involved a one-mile extension of DHP south of I-70 to connect South Point Prairie Road and Interstate Drive in St. Charles County, Missouri. This extension included the design of a new bridge over Peruque Creek and three new intersections.

As a sub-consultant, Bridgett Jacquot of H&S served as technical writer for the portion of the EA Re-evalution that involved the aforementioned portion of the project. The re-evaluation was required in order to address the environmental impacts resulting from the realignment of this portion of the DHP project due to the discovery and avoidance of culturally significant sites. The EA Re-evaluation was approved in August 2018.

The realignment resulted in wetland and stream impacts which necessitated close coordination with the USACE. These impacts required an Individual Section 404 permit from the USACE and Individual

Water Quality Certification (WQC) from MDNR. H&S's coordination to obtain these permits included: project site visits; coordination of the purchase of wetland and stream mitigation credits from approved in-basin wetland and stream mitigation banks; coordination of tree felling restrictions due to endangered bat habitat; and a field survey for the listed Decurrent False Aster and Running Buffalo Clover. Ms. Jacquot prepared, submitted, coordinated, and acquired the Individual Section 404 permit and Individual 401 WQC.



#### Environmental Field Studies & NEPA Documentation

#### MidAmerica St. Louis Airport, St. Clair County, IL

Horner & Shifrin conducted a Waters of the U.S./Wetland Delineation, a Floodplain Determination, and Phase I Environmental Site Assessment for a new site development at MidAmerica St. Louis Airport.

The Wetland and Waterbody Delineation characterized the existing site conditions and determine the extent of wetlands and waterbodies that have the potential to be considered waters of the United States under the jurisdiction of the U.S. H&S performed a Phase I Environmental Site Assessment to identify any recognized environmental conditions. ESA activities consisted of reviewing readily available site history information and assessing the physical condition of the property. H&S' Certified Floodplain Manager reviewed the effective FEMA Flood Insurance Rate Maps and made a Base Floodplain Evaluation determination.

All field studies were summarized in individual detailed memos and included in the NEPA Environmental Assessment document being prepared for the site.

#### Broadway Oyster Bar Phase 1 Environmental Site Assessment SMJM LLC

Horner & Shifrin performed a Phase I Environmental Site Assessment (ESA) for the Broadway Oyster Bar properties located in St. Louis, Missouri. The Phase I ESA was conducted in order to identify any recognized environmental conditions (RECs) using appropriate inquiry into the previous ownership and uses of the site consistent with good commercial or customary practice as defined in CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act; 1980, 42 USC 9601 (35) (B)) The subject property consisted of two parcels totaling approximately 12,824 square feet and included a 3,800 square foot building and a parking lot. The building was constructed in 1910. ESA activities consisted of reviewing readily available site history information and assessing the physical condition of the property at the time of the walkover survey for evidence of possible use, storage, spillage, or dumping of hazardous, toxic or petroleum substances or materials. All information gathered was put into a report and provided to the client for use in the transfer of ownership.



Illinois Route 3, Waterloo, IL IDOT, Region 5, District 8

Horner & Shifrin was contracted by IDOT to first conduct a preliminary engineering and environmental study followed by the development of contract plans for widening Illinois Route 3.

Horner & Shifrin's tasks during the preliminary engineering and environmental study phase consisted of preparing a project report that documented the alternative alignment selection process and environmental and engineering restraints associated with the study area. Tasks also included





conducting intersection design studies, a noise analysis, a location drainage study, a crash analysis, and a traffic management analysis. A key part of the study phase was the use of the public involvement Context Sensitive Solutions (CSS) process which included a Community Advisory Group, public meetings, one-on-one stakeholder meetings, and multiple newsletters. As a result of the CSS process, a safety issue at Vandebrook Drive was discovered just outside the original limits of the project. The result was relocating Vandebrook Drive to the existing traffic signal at the south end of the project.

Following the approval of the project report, the contract plans phase consisted of preparing the plans, specifications, and estimates for the construction. This phase involved the design a four-mile-long,10foot-wide shared use path that included a box culvert underpass to address the Complete Streets policy and the design of the first roundabout in Monroe County. Because this route is such a lifeline for the area, schedule adherence was imperative resulting in Horner & Shifrin completing this phase of the project in a remarkable timeframe of five months. 2013 ACEC-IL Engineering Excellence Merit Award Winner.

# MoDOT - Riverview / I-270 Interchange IDOT, Region 5, District 8

H&S served as the Environmental and Public Involvement Lead for the preliminary engineering, NEPA study, and design for the Riverview Dr. interchange modification. The project limits of the MoDOT Riverview Dr. interchange and the IDOT I-270 bridge replacement project overlap due to the extremely close proximity of the Riverview interchange with the I-270 bridge. Therefore, H&S has been working with IDOT and MoDOT since 2015 to plan and design these projects to ensure the configurations work together and that the projects are let at the same time. H&S aided in the reevaluation of MoDOT's I-270 North EA to ensure these project limits and environmental studies included the Riverview Dr interchange. H&S is continuing to work with MoDOT on the required Section 404 and 408 permitting in addition to holding stakeholder and

public meetings prior to construction. Other environmental studies H&S has conducted for the project include wetland delineations and tree surveys.



#### IDOT D8 IL 3 Trendley to Sauget IDOT, Region 5, District 8

Environmental Lead for the update to the roadway geometrics and the affected environment on a portion of proposed Relocated Illinois 3 from River Park Drive to Trendley Avenue in E. St. Louis. The original EIS was approved in 2001 and included two at-grade railroad crossings and an at-grade intersection at Trendley Avenue. The re-evaluation included new geometry to grade-separate the proposed highway at the two railroad crossings and add a new roadway connection to Trendley Avenue.



### **PUBLIC INVOLVEMENT**





## 270 I-270 OVER THE MISSISSIPPI RIVER STUDY

#### JOIN US FOR A PUBLIC MEETING

Wednesday, January 17, 2018 4:00 - 7:00 pm Southwestern Illinois College (SWIC) GRANITE CITY CAMPUS 4950 Marryille Read, Granite City, IL You may stop by the Open House arytime between 4:00 and 7:000.m.



r more information, please visit the project website: p://www.kdot.illinois.gov/projects/i-270-over-the-mississippi-rive



A role also provided by the public involvement staff is to participate in the public involvement process to educate the public on the planning process and existing resources within a project study area and in turn, learn from these groups what aspects of the project study area are important to them.

Horner & Shifrin has been working the Illinois Department of Transportation (IDOT) for many years implementing their intense public involvement program referred to as Context Sensitive Solutions (CSS) as a way to continually engage stakeholders in a project from planning through design to construction.

Our numerous services in public involvement include the following:

- 3-D Project Creation
- Community Advisory Group Member
- Community Advisory Group Meetings
- Display Creation
- Logo Creation
- Mailing List Development & Mailings
- Newsletters
- Online Mapping Tools
- Postcards
- Presentations
- Press Releases

- Public Hearings
- Public Involvement Materials
- Public Involvement Records
- Public Meetings
- Social Media Outreach
- Stakeholder Identification
- Stakeholder Involvement Plans
- Stakeholder Meetings
- Technical Advisory Groups
- Virtual Public Meetings
- Website Creation





270 OVER THE MISSISSIPPI RIVER | Issue 4, June 2021

CHAIN OF ROCKS BRIDGE NEWSLETTER



#### **PUBLIC INVOLVEMENT**

#### Illinois Route 3, Waterloo, IL IDOT, Region 5, District 8

Horner & Shifrin was contracted by IDOT to first conduct a preliminary engineering and environmental study followed by the development of contract plans for widening Illinois Route 3.

Horner & Shifrin's tasks during the preliminary engineering and environmental study phase consisted of preparing a project report that documented the alternative alignment selection process and environmental and engineering restraints associated with the study area. Tasks also included conducting intersection design studies, a noise analysis, a location drainage study, a crash analysis, and a traffic management analysis. A key part of the study phase was the use of the public involvement Context Sensitive Solutions (CSS) process which included a Community Advisory Group, public meetings, one-on-one stakeholder meetings, and multiple newsletters. As a result of the CSS process, a safety issue at Vandebrook Drive was discovered just outside the original limits of the project. The result was relocating Vandebrook Drive to the existing traffic signal at the south end of the project.

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#### Zumbehl Road Corridor Study City of St. Charles, Missouri

Horner & Shifrin served as the Public Involvement Lead providing the following services: the development of a Public Involvement Plan that provided as a guide for which public involvement tools to implement and when during the study;

identified members and development of a community advisory group (CAG); arranged, prepared materials for, and gave presentations for the CAG meetings; prepared summaries of each CAG meeting for the City's records; held an Alternative Development Workshop with community that involved stakeholders placing comments and colored coded stickers on large aerial maps indicating where they believe crashes occur, an area that is a safety concern, where the congestion exists along the route, where they would like to have a crosswalk and/ or a multi-use trail or other pedestrian facilities added. All of this information was documented and reviewed by the City and H&S for implementation into the alternatives.

# MoDOT - Riverview / I-270 Interchange IDOT, Region 5, District 8

H&S served as the Environmental and Public Involvement Lead for the preliminary engineering, NEPA study, and design for the Riverview Dr. interchange modification. The project limits of the MoDOT Riverview Dr. interchange and the IDOT I-270 bridge replacement project overlap due to the extremely close proximity of the Riverview interchange with the I-270 bridge. Therefore, H&S has been working with IDOT and MoDOT since 2015 to plan and design these projects to ensure the configurations work together and that the projects are let at the same time. H&S aided in the re-evaluation of MoDOT's I-270 North EA to ensure these project limits and environmental studies included the Riverview Dr interchange. H&S is continuing to work with MoDOT on the required Section 404 and 408 permitting in addition to holding stakeholder and public meetings prior to construction. Other environmental studies H&S has conducted for the project include wetland delineations and tree surveys.

#### Shawnee Parkway Environmental Impact Statement

**IDOT, Region 5, District 9** Horner & Shifrin was selected by IDOT to complete an Environmental Impact Statement for a new transportation facility improving the east-west travel ways through the Shawnee National Forest in the Illinois counties of Alexander, Pulaski, and Union. This study, referred to as the Shawnee Parkway, required a detailed look at the transportation system within the study area to address the lack of eastwest roadways and provide for economic opportunities.

The study used the public involvement tools of Context Sensitive Solutions (CSS) to work closely with all environmental regulatory agencies, study area communities, property owners, businesses, and residents as the project was within the environmentally significant Shawnee National Forest. Public involvement activities included developing a Stakeholder Involvement Plan that provided as a guide for which public involvement tools to implement and when during the study; identified key stakeholders and arranged, prepared materials for, and participated in approximately 50 stakeholder meetings; identified members and development of a community advisory group (CAG); arranged prepared materials for, gave presentations for the CAG meetings; arranged, prepared materials and displays for a public meeting; prepared and disturbed responses to public comments; developed and continually updated a mailing and eblast list; created and distributed newsletters; developed public participation surveys; and developed a website with an interactive map and a document library in order to be more transparent with the study stakeholders.

## Illinois 15/Tudor Piggot Study St. Clair County, Illinois

Horner & Shifrin served as the Environmental Lead and provided public involvement support for the study which explored the need for an improved roadway connection between the I-64 ramps at Tudor-Piggott Drive and Illinois 15 in East St. Louis, Illinois. The project limits included a mixture of residential, commercial, and industrial land uses, as well as vacant property. The study was conducted to develop alternatives that were supported by the community, provided benefits within the study area, and provided a safer and more efficient roadway connection. The project sought meaningful participation and input from the study area community and affected stakeholders.



## **PUBLIC FUNDING ASSISTANCE**











Horner & Shifrin has had considerable success in assisting clients in identifying and obtaining financial assistance for the construction of new or rehabilitated projects. We have also aided clients by creatively generating the necessary matching funds required to access certain grant /loan funding sources. In addition, we have extensive experience with Federal Highway Transportation Funding Programs (SAFETEA-LU, TEA-21, ISTEA, and currently MAP-21), Surface Transportation Program-Sub allocated (STP-S) funding, Congestion Management and Air Quality Improvement (CMAQ) funding, Highway Safety Improvement Program (HSIP) funding, Bridge Replacement and Rehabilitation Program (BRRP), and Local Public Agency (LPA). We are experts in acquiring USDA-Rural Development, CDBG, and DNR funding for water and wastewater clients across the mid-west.

Horner & Shifrin has been directly involved in helping past clients secure over \$160 million (combined) in public and private financing. We are on a first name basis with many of the state program and private financing executives. This has given us a distinct advantage in our past engineering selection opportunities because our clients have continually depend on our services for assistance with financing.

Horner & Shifrin also has considerable experience with projects funded through the State Revolving Loan (SRF) Program. Our engineers attend the yearly Federal-Aid Workshop to remain up-to-date with guidelines and expectations and to assure our clients that their projects will be implemented correctly. We understand the importance of accurate submittals for the success of a project. The major challenge of a federally funded project is the extra time required for reviews and approvals.

We have a full understanding of the procedures, requirements and schedule conditions for funded projects. To maintain funding obligations, we enforce strict adherence to schedules and are committed to meeting any deadlines. We have a 100% success rate for TIP (Transportation Improvement Program) applications submitted in the past three years. This success is due to our thorough understanding of the TIP application process, the amount of funding available, and our projection of the cost to benefit ratio the project needs. Recent, successful applications for grants, loans and special financing were funded by local, state and federal agencies, including:

- Illinois Capital Development Board
- Illinois Department of Commerce and Economic Opportunity
- Illinois Department of Natural Resources
- Illinois State Revolving Fund
- River Edge Redevelopment Initiative
- American Recovery & Reinvestment Act
- Delta Regional Authority
- East-West Gateway Council of Governments
- United States Army Corps of Engineers
- U.S. Department of Agriculture Rural Development (RD)
- U.S. Department of Economic Development – Community Development Block Grant (CDBG)
- U.S. Environmental Protection Agency

- U.S. Housing and Urban Development
- U.S. Department of Transportation
- Federal Highway Administration
- Environmental Improvement and Energy Resources Authority
- Farmers Home Administration
- Missouri Department of Agriculture
- Missouri Department of Economic Development
- Missouri Department of Natural Resources
- Missouri State Revolving Fund



## **PUBLIC FUNDING ASSISTANCE**

## Wastewater Regionalization Design -Deer Run Connection

City of Van Buren, Missouri Horner & Shifrin was hired by Van Buren for the first-ever Missouri Department of Natural Resources (MDNR) Regionalization Grant. H&S had previously written a Facility Plan for the Deer Run Reorganized Sewer District that included connection to Van Buren for wastewater treatment. The report reviewed the existing Deer Run wastewater collection system and was submissed to the MoDNR Regionalization Grant (2020 was the first year for the program) for construction funding. Preliminary reporting was completed in late 2019.

The Regionalization project was approved in early 2020 for a \$1.1 Million Dollar MoDNR SRF-Regionalization Grant to resolve a 10+ year non-compliance issue that the District has had with their unpermitted lagoon. Design began in mid-2020. Construction is expected in late-2021.



#### Cape Girardeau County Reorganized Common Sewer District Design Cape Girardeau County Common Sewer District

Horner & Shifrin teamed with Strickland Engineering to assist the District with preliminary engineering and a grant funding search, with a goal of acquiring more than \$12,000,000 in Federal and State funding. A Median Household Income Survey was performed to establish eligibility and determine the grant-to-loan ratio for which the District was eligible. H&S represented the District in discussions with the USDA Rural Development Administration, ultimately securing more than \$32,000,000 in Rural Development Grant and Loan funds.

#### I&I Reduction and Wastewater Treatment Facility Rehabilitation City of Hayti, Missouri

The City of Hayti retained the service of Horner & Shifrin for a City-wide wastewater I&I reduction and wastewater treatment facility rehabilitation project. Hayti's existing system is primarily composed of over 130,000 linear feet of vitrified clay pipe and brick manholes. The I&I is so severe that the town's lift stations can run for weeks during the wet season resulting in the necessity to overhaul 15 of the 17 City's lift stations. The City's aerated lagoon equipment has largely failed and must be replaced to meet the increasingly stringent WWTF effluent limits set by Missouri's Department of Natural Resources.

The \$6.62 Million Dollar project was funded through USDA-Rural Development and CDBG includes the inspection, design, and construction management to reduce the collection system I&I, rehabilitate the City's lift stations, and replace the City's existing aerated lagoon for ammonia reduction. The resulting solution is expected to substantially reduce the amount of I&I entering the system through a series of gravity main In-Situ liners, cementitious manhole lining, sewer wye grouting, and lift station rehabilitation. The WWTF will utilize MBRR technologies.

To facilitate the project, H&S developed a secure web-based ESRI GIS application and database of system attributes and performed data migration of existing sewer system drawing files into the GIS system. Inspection crews conducted survey-grade GPS survey of structures detailed manhole inspections utilizing NASSCO standards to collect physical dimensions, structural conditions, sources of possible I&I, etc., and smoke testing to identify public and private defects. Mobile devices linked to the web-based GIS are used to collect all data, inspection notes, and photographs in real-time providing up to the minute data and status of field operations.

Sub-consultant CCTV crews will provide additional detail data gathered from visual pipe inspections. CCTV inspection video and PDF reports will be added to the webbased GIS to provide direct access for City staff to the data.

The project will culminate in a bid letting that is anticipated in late 2021, which will include two contracts. The first will be for gravity main In-Situ lining, manhole grouting, and lateral wye testing/repairs. The second will include WWTF upgrades, lift station retrofits, and collection system point repairs. The design goal is to reduce system I&I by approximately 65-75%.

#### Water System Design City of Alton, Missouri

Horner & Shifrin provided engineering design services for the Alton, Missouri Drinking Water System Rehabilitation Project which includes the replacement of the City's entire distribution system. Funds for the \$3.6 million dollar project were secured through USDA-Rural **Development and Community** Development Block Grant (CDBG). Horner & Shifrin was able to secure \$2 million in grant funding and the remaining \$1.6 million in low-interest loans. The project was successfully completed in 2018. The project included replacement of all distribution mains, valves, hydrants and meters. It also included tank rehabilitation, coatings and safety improvements, two new well houses with controls, and deep rock well refurbishment.







CLIENT / PROJECT	PROJECT COST	FUNDING DATE	STATUS	RURAL DEVELOPMENT		CDBG	MoDNR	ТАР			%	%
				GRANT	LOAN	GRANT	GRANT	GRANT	LUAN	OTHER	GRANT	LOAN
Jefferson County Reorganized Sewer District - Regionalization Design	\$18,306,282	5/15/2021	In Design		\$18,306,282						0%	100%
Jefferson County Reorganized Sewer District - Raintree Design	\$8,154,000	In Review	Waiting for Funding		\$8,154,000						0%	100%
Lake Area Wastewater Association - Turkey Bend Design	\$12,264,000	In Review	Waiting for Funding	<b>#</b> 00.000	\$12,264,000						0%	100%
Van Buren, Missouri Facility Study (Water) - SEARCH Grant	\$30,000	8/1/2018	Complete	\$30,000	¢0,000,000	¢750.000					100%	0%
Van Buren, Missouri Water Facility Design/Construction	\$4,400,800	5/7/2020	In Design	\$1,268,800	\$2,382,000	\$750,000	¢50.000			¢40.500	46%	54%
Van Buren, Missouri Wastewater Study - SCEAP Grant	\$62,500	5/1/2020	Lomplete				\$50,000			\$12,500	80%	20%
Winona Missouri Wastewater Study SCEAD Grant	\$1,000,000	4/1/2020	Complete				\$1,000,000			\$12,500	100% 80%	20%
Winona, Missouri Wastewater Decign	\$5,753,200		Waiting for Funding	\$3 700 000	\$1 303 200	\$750,000	\$30,000			\$12,500	77%	20 %
Bernie Missouri Facility Study (Water) - SEARCH Grant	\$30,000	11/1/2019		\$30,000	φ1,505,230	\$750,000					100%	0%
Bernie, Missouri Water System Design/Construction	\$7,556,900	In Review	Complete	\$2 156 900	\$5,400,000						29%	71%
Havti, Missouri - Havti Drainage Improvements Design/Construction	\$425.770	9/20/2015	Complete	<i>+2</i> ,,	<i><i><i>ϕ</i>0, 100,000</i></i>	\$402,770				\$23,000	95%	5%
Poplar Bluff. Missouri - McLane Trail Design/Construction	\$522.766	5/29/2015	Complete			+ • • - , • • •		\$371.164		\$151.602	71%	29%
Poplar Bluff, Missouri - PB R-1 & Bacon Park Trail Design/Construction	\$169,700	5/1/2016	Complete				\$117,500			\$52,200	69%	31%
Birch Tree, Missouri Wastewater Design/Construction	\$1,953,025	6/17/2013	Complete	\$726,025	\$727,000	\$500,000					63%	37%
Birch Tree, Missouri Water Design/Construction	\$2,557,100	8/1/2014	Complete				\$1,959,075		\$598,025		77%	23%
Birch Tree, Missouri Sidewalk - SRTS	\$184,070	3/3/2014	Complete							\$184,070	100%	0%
Cape Girardeau County Sewer Design/Construction	\$14,374,000	4/15/2016	In Construction	\$4,976,000	\$9,398,000						35%	65%
Cape Girardeau County Sewer Design/Construction - Additional Funding	\$17,869,000	7/1/2020	In Construction	\$9,871,000	\$7,998,000						55%	45%
Morehouse, Missouri Facility Study (Water) - SEARCH Grant	\$18,000	10/1/2014	Complete	\$18,000							100%	0%
Morehouse, Missouri Facility Study (Sewer) - SEARCH Grant	\$21,000	12/1/2014	Complete	\$21,000							100%	0%
Stoddard County PWSD #3 Facility Study - SEARCH Grant	\$18,000	11/1/2014	Complete	\$18,000							100%	0%
Pike Creek Sewer District Facility Study - SEARCH Grant	\$25,000	2/1/2015	Complete	\$25,000	<u> </u>						100%	0%
Pike Creek Sewer District Design/Construction	\$3,900,000	5/10/2016	Complete	\$1,400,000	\$2,500,000						36%	64%
Pike Greek Phase 5 Design	\$15,737,000		Waiting for Funding	\$10,000,000	\$5,737,000						64%	36%
Alton, Missouri Facility Study (Water) - SEARCH Grant	\$25,000	2/1/2015	Complete	\$25,000	¢4 504 000	¢500.000					100%	0%
Alton, Missouri Vater Design/Construction	\$3,571,200	0/9/2016	Complete	\$1,477,200	\$1,594,000	\$500,000	¢50.000			¢10 500	55%	45%
Alton, Missouri Facility Study (Wastewater) - SCEAP Grant	\$62,500	2/15/2016	Voiting for Euroding	¢2 400 000	¢1 564 400	¢750.000	\$50,000			\$12,500	80% 67%	20%
Arburd Missouri Eacility Study (Sewer) - SCEAP Grant	\$62,500	2/24/2016		φ2,400,000	φ1,504,400	\$750,000	\$50,000			\$12,500	80%	20%
Arbyrd, Missouri Design/Construction	\$1,520,000	5/15/2017			\$1,000,000	\$500.000	\$50,000			\$20,000	33%	66%
Neelvville Missouri Eacility Study (Sewer) - SCEAP Grant	\$55,500	2/24/2016	Complete		φ1,000,000	\$300,000	\$50,000			\$5,500	90%	10%
Neelyville, Missouri Sewer Design/Construction	\$1.304.910	3/1/2019	In Construction	\$482,946	\$321,964	\$500.000	<b>400,000</b>			φ0,000	75%	25%
Neelvville. Missouri Water System PER - SEARCH Grant	\$30.000	In Review	Waiting for Funding	\$30.000	¢02.1,001	<i><i><i></i></i></i>					100%	0%
Wheatland, Missouri Facility Study (Sewer) - SCEAP Grant	\$62.500	4/1/2016	Complete	<i></i>			\$50.000			\$12.500	80%	20%
Weableau, Missouri Facility Study (Sewer) - SCEAP Grant	\$55,555	8/29/2016	Complete				\$50,000			\$5,555	90%	10%
Herculaneum, Missouri Facility Study (Sewer) - SCEAP Grant	\$55,555	8/29/2016	Complete				\$50,000			\$5,555	90%	10%
Corder, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	8/1/2017	Complete				\$50,000			\$12,500	80%	20%
Greenville, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	5/9/2018	Complete				\$50,000			\$12,500	80%	20%
Greenville, Missouri Sewer Design/Construction	\$2,103,620	7/1/2020	In Design	\$925,000	\$428,630	\$750,000					80%	20%
Holcomb, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	3/2/2017	Complete				\$50,000			\$12,500	80%	20%
Holcomb, Missouri - WWTF Design	\$2,081,300	6/17/2020	In Design	\$1,050,300	\$1,031,000						50%	50%
Morrisville, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	7/10/2017	Complete				\$50,000			\$12,500	80%	20%
Fair Play, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	3/30/2017	Complete				\$50,000			\$12,500	80%	20%
Mountain View, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	7/1/2018	Complete				\$50,000			\$12,500	80%	20%
Mountain View Wastewater Project Design	\$5,655,810	In Review	Waiting for Funding	\$2,440,000	\$2,465,810	\$750,000	<b>A</b> =0.000			A ( 0 = 0 0	56%	44%
Deer Run RCSD, Missouri Facility Study (Sewer) - SCEAP Grant	\$62,500	11/1/2018	In Writing	<b>\$004 500</b>	<b>*</b> 222.000		\$50,000			\$12,500	80%	20%
Deer Run Wastewater Phase I Design	\$924,560	In Review	Waiting for Funding	\$624,560	\$300,000		<b>*</b> 4 400 000				68%	32%
Deer Run RCSD, Missouri - WWTF Design - SRF Regionalization Grant	\$1,100,000	2/15/2020	In Design	¢20.000			\$1,100,000				100%	0%
Hayti, Missouri Wastewater Facility Study - SEARCH Grant	\$30,000	5/24/2017		\$30,000	¢0.074.000	¢500.000					100%	0%
Oragon County DWSD#1 Equility Study SEABCH Cront	\$0,197,000	5/15/2019	Complete	\$3,323,000	¢∠,374,000	\$000,000					100%	38%
St Erancic AR Eacility Study (Mater) SEARCH Grant	\$25,000	2/15/2016	Complete	\$25,000							100%	0%
St. Francis, AR Viater System Design/Construction	\$1 341 700	9/1/2016	Complete	\$999 700	\$342.000						75%	25%
Qulin Missouri - Facility Study (Water) - SEARCH Grant	\$25,000	4/15/2016	Complete	\$25,000	ψυτ2,000						100%	0%
Annapolis, Missouri Facility Study (Wastewater) - SCEAP Grant	\$62 500	2/15/2016	Complete	Ψ20,000			\$50,000			\$12,500	80%	20%
Annapolis, Missouri Water System Study - SEARCH Grant	\$30,000	1/1/2019	Complete	\$30,000			φ00,000			ψ12,000	100%	0%
Bonne Terre. Missouri Water System Improvements	\$4,000,000	9/1/2014	Complete	<i>400,000</i>			\$2,000.000		\$2,000,000		50%	50%
Bertrand, Missouri - Street Overlay Improvements	\$476,591	6/19/2019	In Construction			\$459.091	+=,000,000		+_,000,000	\$17,500	96%	4%
Canalou, Missouri - Street Overlay Improvements	\$486,762	6/19/2019	In Construction			\$483,762				\$3,000	99%	1%
Chaffee, Missouri - Wastewater Collection Design/Construction	\$2,800,000	4/15/2017	Complete		\$2,800,000						0%	100%
Chaffee, Missouri - Wastewater Treatment Design/Construction	\$3,200,000	3/1/2018	In Construction		\$3,200,000						0%	100%
Totals	\$157,907,966			\$48,144,731	\$91,591,376	\$7,595,623	\$6,976,575	\$371,164	\$2,598,025	\$630,482		

## EXPERIENCE

-HORNER SHIFRIN



## **CORPORATE HEADQUARTERS**

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