### MAKE READY DESIGN SERVICES





GLHN is guided by the principle that our success comes from helping others succeed. The firm's philosophy on success fosters dedication and long-term client relationships.

Established in 1963, we are an employee-owned firm headquartered in Tucson with an expanding office in Phoenix. GLHN provides integrated, multi-discipline services in electrical, mechanical, and civil engineering, as well as architecture.

GLHN has a passion for constructing solutions. We thrive on the energy created when collaborating with the Owner, Developer, Contractor, and Consultants.

## 01 | INTRODUCTION

WE ARE DEVOTED CONSULTANTS, CREATING INTEGRATED SOLUTIONS THAT ADDRESS THE NEEDS OF OUR CLIENTS AND MEET THE TECHNICAL AND BUDGETARY REQUIREMENTS OF THEIR PROJECTS. WE HAVE A BROAD AND DIVERSE PORTFOLIO, DEMONSTRATING THAT OUR TEAM CAN SUCCESSFULLY MANAGE ASSIGNMENTS OF ALL SIZES.

# 02 | PORTFOLIO

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### **BANNER HOSPITAL MAKE READY PACKAGE**

In 2018 Banner Health's University Medical Center added a new 9-story bed tower along with major renovations to the existing University Medical Center facility. UMC was originally constructed in 1969 and has been served by and evolving set of public utilities and University of Arizona central heating and cooling distribution infrastructure. Numerous underground utilities encircled the site along with public and private easements, utility corridors and roadways. Adequacy of storm water drainage has been a major challenge throughout the history of the site. GLHN's civil engineering group prepared documents for a 28-acre zoning overlay, including a Development Package that incorporated 30-year planning. GLHN designed the relocation of major utilities crossing the building site and provided architectural design support for a new central utility plant building. A new underground storm drain system and storm water retention mitigated the historical flooding in the region. The GLHN team's construction assistance included storm water management plans, staging and temporary road plans, estimating, permitting, testing, and reporting.

- Coordination of ownership and ALTA survey.
- Resolving multiple utility coordination issues.
- Drainage included 1.8 million gallons of storm water detention under pavement and within the footprint of a future tower; 2.6 million gallons of storm water retention in landscaped surface ponds; an underground storm drain network including a stormwater lift station.
- Road widening and realignment; new sidewalks; paving, grading, drainage and lighting for over seven acres of surface parking lots.
- Hydronic piping scope re-routed existing heating/cooling services, plus new 14" insulated HDPE underground hot water system and 24" insulated chilled water system. New systems were installed by a combination of horizontal directional drilling and conventional trenching.
- Two new onsite sanitary sewer collection systems including grease interceptor.
- Expanded the public potable water main system, adding fire suppression and landscape irrigation.
- Site design added new secure, 24-hour loading dock and site logistics for Trauma 1 level emergency, to outpatient access and pedestrian circulation.
- High level of collaboration among owner/architect/engineer/contractor team.
- Preparation of an independent "make ready" construction document package to clear the site in advance of construction. Completed during initial design and permitting phases.



### JANUARY 8TH MEMORIAL

The memorial was initiated with a privately funded campaign to recognize the impact of a mass shooting on the Tucson community through construction of a lasting memorial with reflection pond and pensive space. The plaza, in a wellused downtown park, is surrounded by city and county government buildings - Tucson City Hall on the west, the Pima County Superior Courthouse and Administration Building on the south and the historic courthouse with its iconic and recently renovated dome on the east. Construction took just over a year but was challenged by discovery of archaeological artifacts on the site, the remnants of an abandoned roadway, and an underground fuel tank that had to be removed. Tucson Electric Power had to relocate poorly documented legacy power lines that ran under the nearly one-acre site. An aging Tucson water line had to be moved as well.

- Mitigating unexpected archaeological artifacts on the site.
- Removing an underground fuel tank and addressing EPA issues.
- Coordination with Tucson Electric Power to relocate power lines that ran under the nearly one-acre site.
- Relocation of water distribution line.

#### UNIVERSITY OF WYOMING SATELLITE CENTRAL PLANT

GLHN is currently engaged in a project to construct a new natural gas fired heating water plant and buried heating water distribution piping to a set of new buildings at the northwest edge of campus, at the interface between a residential neighborhood and large-scale campus buildings. Extensive survey of existing utilities and interface with both City of Laramie and public utilities was required. Completion of this plant is the first phase of a multi-phase project to move the historic district of campus from its aging coal fired steam heating system to heating water. Transition away from coal in Wyoming represents a major shift in campus utility production philosophy. Engineers from GLHN were involved in the economic analysis which aided in the preparation of presentation materials to secure project funds. The team also participated in discussions of the analysis with high level university administration and state legislative representatives. Architects from GLHN prepared site plans and renderings for use in neighborhood engagement meetings

- Identifying utilities and the ownership of private and public easements.
- Documenting underground utility tunnels and subsurface soil conditions.
- Moving historic district of campus from aging coal fired steam system to heating water.
- Design and installation of new utility production and distribution lines.
- Coordination of multiple jurisdictions.
- Replacement of portions of the deteriorating existing utility tunnel system.





#### PIMA COUNTY RILLITO REGIONAL PARK

Rillito Regional Park is an historic quarter horse racing track in north central Tucson. The aging facility was under utilized and in poor condition when the County funded major capital upgrade improvements. GLHN was selected to develop concepts then prepare plans, specifications and estimates for the project which included soccer fields, an improved horse racing complex, and a Marketplace that hosts farmer's markets and other specialty events. Extensive site analysis was required to identify the nature of existing utilities and necessary improvements. Work included design of three new natural turf fields with sports lighting, new parking, and access road development, hydrologic study and channelization of the Racetrack Wash and river park enhancements. Also included was demolition and rebuilding of the stable complex, development of a horse racing staging area and new restrooms. Public outreach was required prior to final construction plans. Our scope also included post design/construction administration services.

As the entire site is a registered historical property, consultation with the Pima County Cultural Resources office and State Historic Preservation Office was required. The site is also located in a floodplain and 404 issues had to be coordinated. An existing channel onsite had to be maintained. Excessive sand deposits were discovered during construction and GLHN worked closely with the geotechnical and structural engineer to resolve the issue by excavating the area and replacing the sand with engineered fill.

- Floodplain and 404 permitting and coordination.
- Mitigating excessive sand deposits.
- Addressing challenges related to wash bisecting the park.
- Demolition and reconstruction of historic stable complex.

#### UNIVERSITY OF ARIZONA SOUTH STADIUM GARAGE

Pressure to manage traffic circulation and event parking during sporting events lead the The University of Arizona to construct a new 915-space, five-level parking structure south of Arizona Football Stadium, using design-build delivery. The building features a ramping system to allow for complete exiting within thirty minutes. GLHN's civil team was responsible for regional road improvements to accommodate the traffic. This included widening and realigning local roads, designing new pedestrian safety refuges as well as sidewalks, modifications to an existing adjacent surface parking lot, addition of a new surface parking lot, a new signalized intersection, area drainage and site lighting.

- Drainage Warren Avenue is in a City-jurisdictional floodplain. GLHN performed HEC-RAS analyses to design storm water infrastructure and set the floor of the garage above flood elevations. Also provide all-weather pedestrian routes. Designed drainage for the garage itself, including storm water detention to slow the rate of runoff from the building to the streets.
- Road widening and realignment included new signing and striping, new sidewalks, paving, grading, drainage and lighting in four adjacent streets.
- Designed new four-way signalized intersection which was incorporated into the City system while meeting the University's campus needs for multi-modal transportation and special event planning.
- Utility relocation including abandonments as well as new utility easements and re-routing utilities.
- Road and site lighting for improved safety with automatic controls and special-event manual override programming; special emphasis on sensitivity to nearby neighborhoods.





### UNIVERSITY OF ARIZONA NEW FM BUILDING

GLHN is currently involved in design and construction of a new multipurpose building for the University of Arizona Facilities Management Department that will house shops, warehouse, small engine repair and administrative offices. The facility fits on a very tight site, surrounded by University and public utilities. Extensive site survey and underground utility location was necessary to cost effectively position the foundations. Architect/engineering coordination with municipal agencies, public utilities and an active neighborhood association were critical to keeping the project on schedule.

- Coordination of Tucson Water distribution and branch line improvements.
- Coordination with Tucson Electric Power and UArizona medium voltage duct banks in immediate vicinity of site.
- Unique foundation design to address building proximity to large bore campus chilled water distribution lines.
- Extensive architectural and civil modeling to validate truck access to warehouse loading docks, and temporary parking in the high pedestrian university campus environment.
- Preparation of an advance "make ready" construction document package to clear the site as the first phase of construction. Construction work was largely completed as design and permitting phases were underway.



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### 03 | COMMUNICATION



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