

DESIGN-BUILD

Location

- Boulder City, Nevada

Services Provided

- Civil, Structural, Transportation Hydrology Engineering

Cost

- Original Construction Contract Amount: \$273 million (est.)
- Final Construction Contract Amount: \$240 million (est)

Size

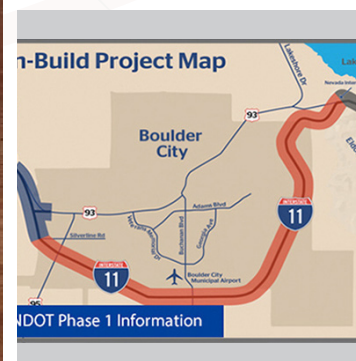
- 5 bridges

Schedule

- Professional Services: December 2015
- Construction: Fall, 2018, estimated completion

Project Team

- Larry Carrol, P.E., Project Director
- Jason M. Calhoun, P.E., Project Manager
- Steve Renck, P.E., S.E., Designer
- Jeff Yoder, P.E., S.E., Designer
- Bernard Ponte, Jr., P.E., S.E., Designer

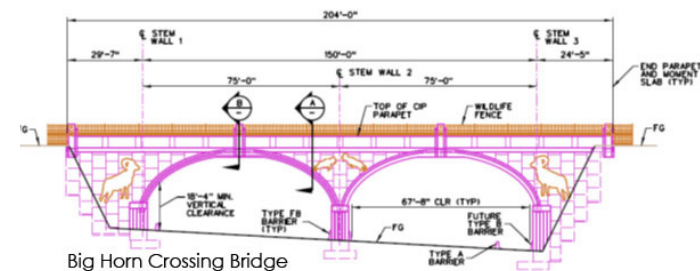


BOULDER CITY BYPASS (I-11)

Design of 5 Bridges, 24'X10' Reinforced Concrete Box Culvert, Retaining Walls, and Utility Design

The I-11 Boulder City Bypass Design-Build Project (the Project) includes the design, construction and installation of a portion of I-11 for a distance of approximately 12.2 miles from north of US-95 to SR 172 at the Nevada Interchange in Boulder City, Clark County, Nevada. The project includes ten (10) overpass and underpass bridge structures for travel over existing roadways and wildlife migration corridors. Poggemeyer Design Group's scope and responsibilities for the project include the structural engineering and design for the WAPA, Boy Scout Canyon, Intertie, and Big Horn Crossing bridges identified in the Project, in addition to the 24'x10' reinforced concrete box culvert and other head and retaining wall design elements defined above. The structural bridge elements, retaining walls, drainage culverts, barriers, sign, signal and lighting are designed in accordance with the requirements of the Contract Documents and Performance Specification.

The WAPA and Boy Scout Canyon bridge structures occur traveling northeast bound on the new I-11 bypass at stations 410+00 and 560+75 respectively. Both the WAPA and Boy Scout bridge crossings have been reprofiled and reconfigured to provide a continuous single long ■ more...



Reference

- Chad Anson (CA Group)
702.338.9454
- Ryan Mendenhall (Las Vegas Paving)
702.251.5800

Boulder City bypass (I-11)



span bridge in each travel direction. The bridge crossings have 17'-1/2" and 20'-6" minimum clearance to road surface below, respectively. Both bridges use conventional cast-in-place post-tensioned box girder concrete construction and are classified as Short Bridges with integral diaphragm abutment.

The Intertie road access crossing Bridge (Bridge #4) structure occurs traveling further northeast on the bypass at station 672+32 and is located just before the scenic drive portion of the roadway. The bridge is to provide for a 16'-10" minimum clearance over the existing Intertie access road and includes one bridge only for both northbound and southbound roadway travel lanes. The Intertie Bridge will also use a conventional cast-in-place post-tensioned box girder concrete construction with either an open seat or integral diaphragm abutment type.

The Big Horn Arched Overcrossing (Bridge #5) at station 712+25 is located at the scenic drive portion before the overlook turnout. The bridge structure is to provide for wildlife overcrossing and includes two (2) 75'-0" precast concrete arched bridge spans over the new roadways. The precast concrete wall panels articulated with big horn sheep aesthetics are fastened to the sides of the overcrossing. End abutments are integrated into the existing topography and terrain, with mechanically stabilized earth (MSE) approach walls. Wildlife migration corridors are to be maintained during construction of the Bypass such that the precast arched bridge will be constructed first to minimize migration interruption.

The WAPA and Boy Scout Canyon bridge structures use a single 142'-0" long span bridge at both locations. The re-profiling adjustments and 142'-0" clear span provide for a full 80'-0" wide road and trim width, plus a 1 to 2 slope finish. Both the WAPA and Boy Scout Canyon bridges will use conventional cast-in-place post-tensioned box girder concrete construction to span the 142'-0" distance, built integrally with the diaphragm abutments.

The Intertie road access crossing bridge also uses a conventional 6'-6" deep cast-in-place post-tensioned box girder concrete construction with an open seat abutment type to span 139'-6" distance.

Architectural aesthetic treatment of the bridges includes built out pilasters at the abutment approaches extending high above the roadway surfaces for dramatic effects, in addition to architectural sconces at the exterior of the bridge mid-spans. Pilasters, pilaster extensions, sconces and other architectural features and details are standardized between the bridges to provide for economies of construction and appearance consistency between the bridges.

Typical details, stressing access, bar coupling, deck overhang, barrier rails, conduit, and deck drainage provisions will also be used for the concrete post-tensioned box girder construction to provide for consistency in the concrete bridge construction and appearances.

The Big Horn Crossing (Bridge #5) bridge structure includes two (2) 75'-0" precast concrete arch spans over the new roadways with articulated aesthetic wall panels, parapet, fence, and earth fill for wildlife migration. The arched bridge spans are constructed using nine (9) 6'-0" wide precast concrete arch segments positioned adjacent to each other atop cast-in-place concrete piers with continuous concrete wall footings. The concrete arches support the structural mechanically stabilized earth (MSE), the MSE wall panels, selected surface material, along with the concrete edge moment slab and wildlife fencing requirement. Total width of the bridge section is 54'-0" with provisions for H-20 vehicle load design.

The utility design and relocation portion of PDG's responsibilities are mainly comprised of the encasement of existing water lines and the relocation and encasement of an existing reclaimed water line. There will also be a new reclaimed water system that will replace the existing infiltration channels that run through the existing Bypass Right-of-Way. PDG will also have to locate and note on the plans that there are two existing Fiber Optic Lines and one existing Southwest Gas main that must be labeled as protect-in-place.

There are three potable water lines that have to be taken into account. The first line is the 14" PVC water main that is running parallel to the US-95 Right-of-Way. The portions of the water line that will cross under the new Bypass as well as the on/off ramps for the US-95 I-11 interchange will be encased with 30-inch steel encasement. This encasement will allow for any maintenance that may need to be done in the future to be done without having to excavate in the drive lanes of the new freeway and ramps. The encasement will also protect the roadways by helping to contain the water should the main burst. The other two lines are within the WAPA/Buchanan Right of Ways and are comprised of an 8-inch and 18-inch water mains. These water mains will be steel encased with 18-inch and 30-inch steel casings respectively the length of the Bypass Right-of-Way (750-LF).

Poggemeyer also designed the electrical conduit runs for the three electrical connections needed for the major interchanges at US-95, WAPA, and US-93. The conduit runs ranged from 1903-LF to 3153 LF.

The City of Boulder City has contracted with Las Vegas Paving to add 5 additional conduits for future utility crossings ranging from 18-inches in diameter to 36-inches in diameter. The additional conduits will be spread from the I-11 / US-95 interchange to the WAPA Bridge.

DESIGN-BUILD

Location

- Ohio

Services Provided

- Bridge Design

Cost

- from \$0-5 million to \$3-7 million

Size

- from 30' to 305'

Schedule

- Professional Services since 2000

Project Team

- Jeffrey T. Yoder, P.E., Project Manager, Bridge Design



DESIGN-BUILD BRIDGES

PDG has completed over 35 design-build bridge projects throughout the State of Ohio. Examples of projects are:

DEL-CR72-8.44 (CHESHIRE ROAD) Delaware County, Ohio

This project was a Design-Build project with R&I construction performed for the Delaware County Engineers Office. The project involved the replacement of an existing single span pony truss bridge with a 100' long single span composite prestressed concrete box beam bridge. The bridge width was increased from an existing width of 24' to a proposed width of 44'. The project involved approximately 500' of approach work which included widening and resurfacing of the existing pavement.

Reference

Delaware County Engineer • 50 Channing Street • Delaware, Ohio 43015 • 740.833.2400



■ more...



■ Design Build Bridges



■ **HAN-37-10.81 BRIDGE REHABILITATION Hancock County, Ohio**
 Design-Build project with Mosser Construction performed for the Ohio Department of Transportation, District One. Project involved the complete deck replacement for an existing 237' three-span continuous rolled steel beam bridge over the Blanchard River. Also, included the reconstruction of the abutment backwalls and wingwalls, installation of new expansion joints and patching of concrete surfaces. The existing structure was analyzed and upgraded with a composite concrete deck to meet current loading standards. Additional work included the upgrading of existing guardrails, new approach slabs and minimal approach paving.

Reference

ODOT - District 1 • 1885 North McCullough St. • Lima, Ohio 45801 419.222.9055

■ **UNI-CR 310-0.70 & UNI-CR307G-4.70 Union County, Ohio**
 Provided design services for the replacement of two bridges within Union County. These were two separate projects that were bid as design-build projects. PDG teamed with the contractor R&I Construction for both bridges. PDG provided preliminary design to assist the contractor with preparing bid costs for the projects. We looked at alternate designs for the structures and contractor chose to construct both of these bridges as cast-in-place continuous concrete slab bridges. Both bridges are three span continuous concrete slabs with one bridge supported on pile foundations and the other supported on drilled shafts foundations. The CR310 has an overall length of 121 feet and the CR307G bridge has an overall length of 92 feet. Both projects were completed on schedule and at budget.

Reference

Union County Engineer • 233 W. 6th Street • Marysville, Ohio 43040 • 937.645.3018

