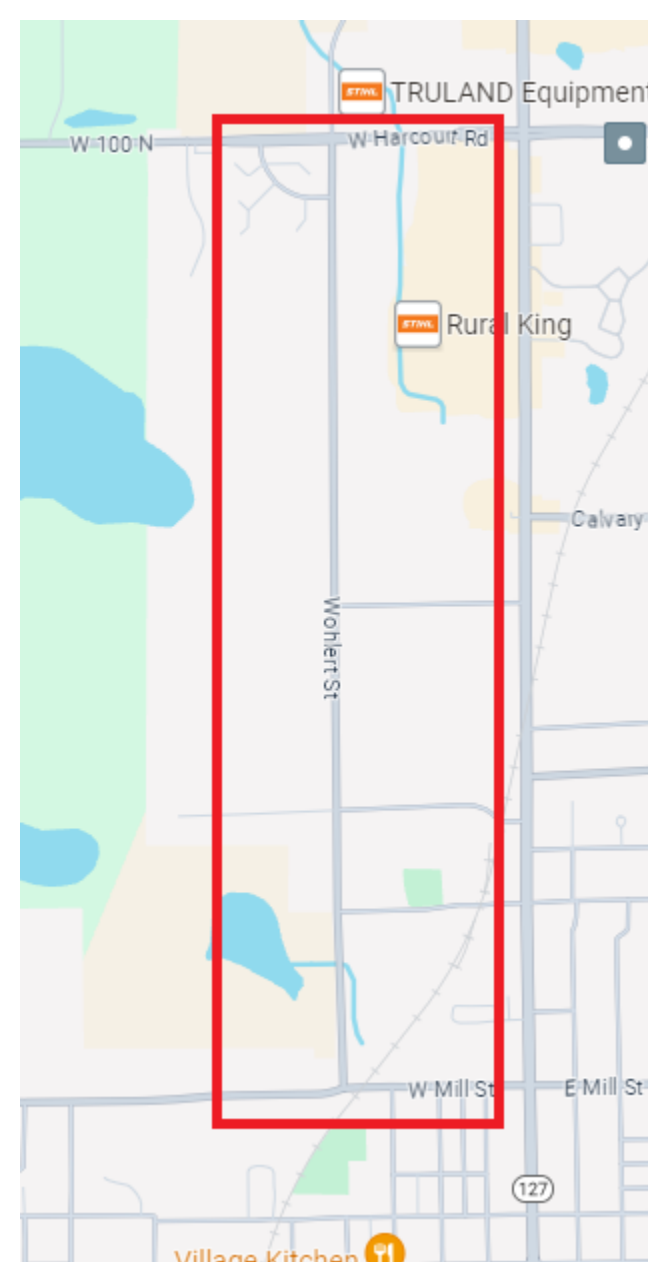


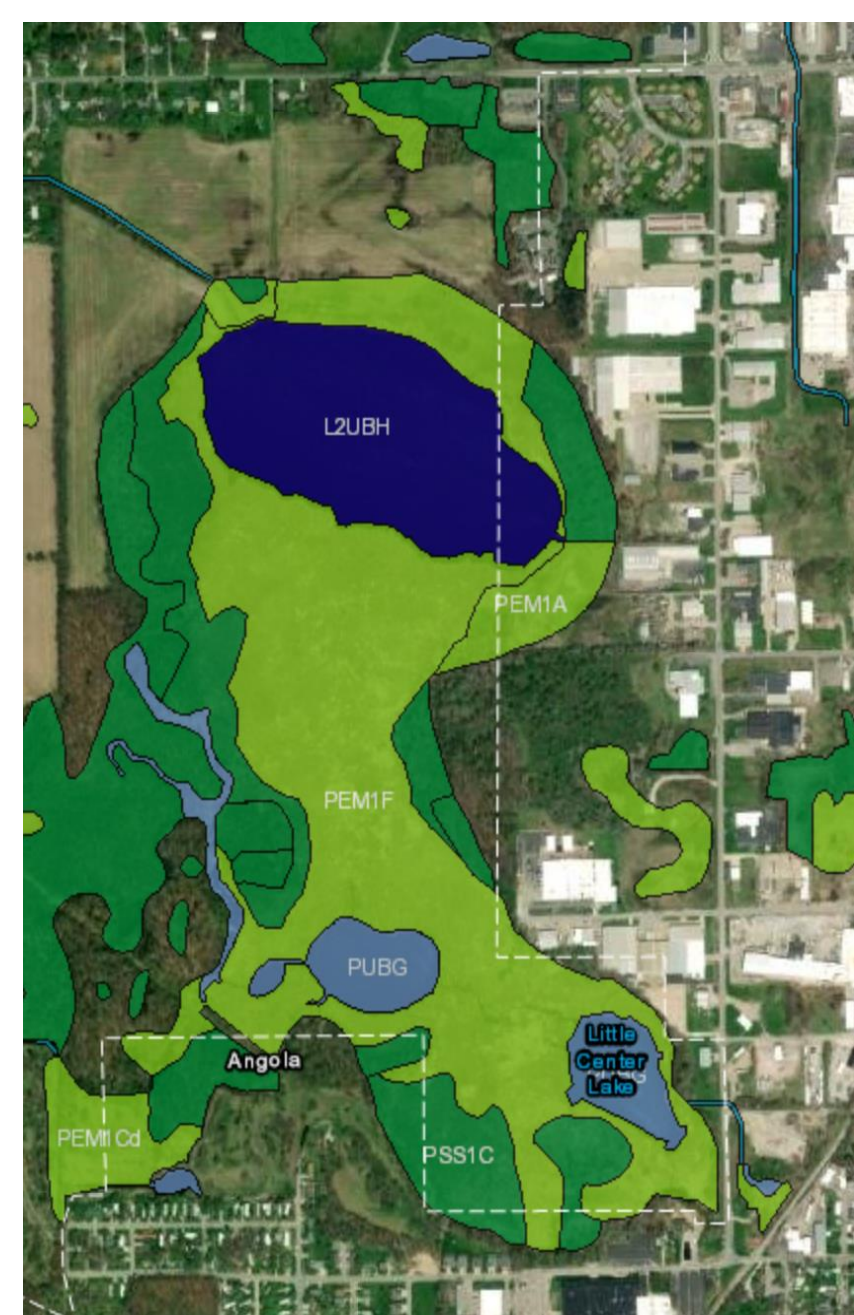
INTRODUCTION

Wohlert Street in Angola, Indiana functions as a major collector road and connects much of the city's industrial park area. Additionally, a residential development on the north end of the roadway segment is underserved with pedestrian connectivity. The City of Angola requested an evaluation of the existing alignment, drainage, pavement, and intersections along the section of Wohlert Street shown in the figure below.



EXISTING CONDITIONS

The existing road is an asphalt paved two-lane road, with one lane in each direction. There is no curb and gutter for this section of Wohlert. The established speed limit for this road is 35 miles per hour. The existing drainage system consists of ditches along both sides of the road which flows generally to the south toward an existing wetland, which is highlighted below in green. The blue area is an existing small lake.



SOIL BORINGS

We performed 5 feet deep soil borings at 4 separate locations and obtained samples for geotechnical lab testing to understand the characteristics and structure of the existing soil. The boring locations are shown below in red circles adjacent to the road. The soils generally consisted of clay soils (A-6).



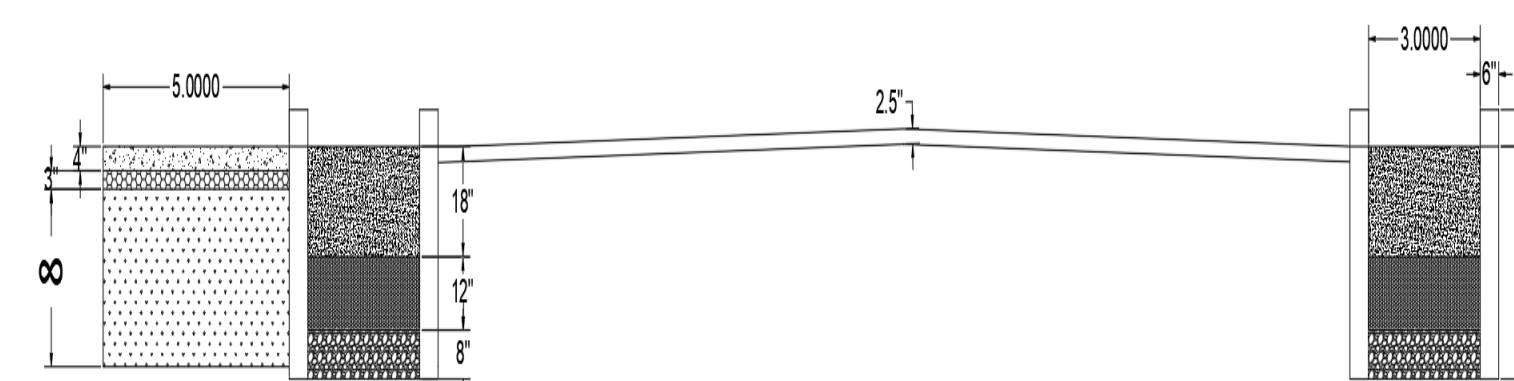
PAVEMENT SURVEY

We evaluated the existing pavement condition using the Pavement Surface Evaluation and Rating (PASER) Manual method. We identified multiple areas with issues including raveling, longitudinal and transverse cracks, and alligator cracking. Additionally, we identified initial longitudinal cracking near the pavement edge and alongside patches. The assessment revealed PASER rating scale of 4. Based on this rating, full-depth reconstruction is not needed. Rather, a 2.5-inch thick non-structural overlay with some full-depth patching and milling near intersections will be required. Photos of some of the pavement damage areas are shown below.



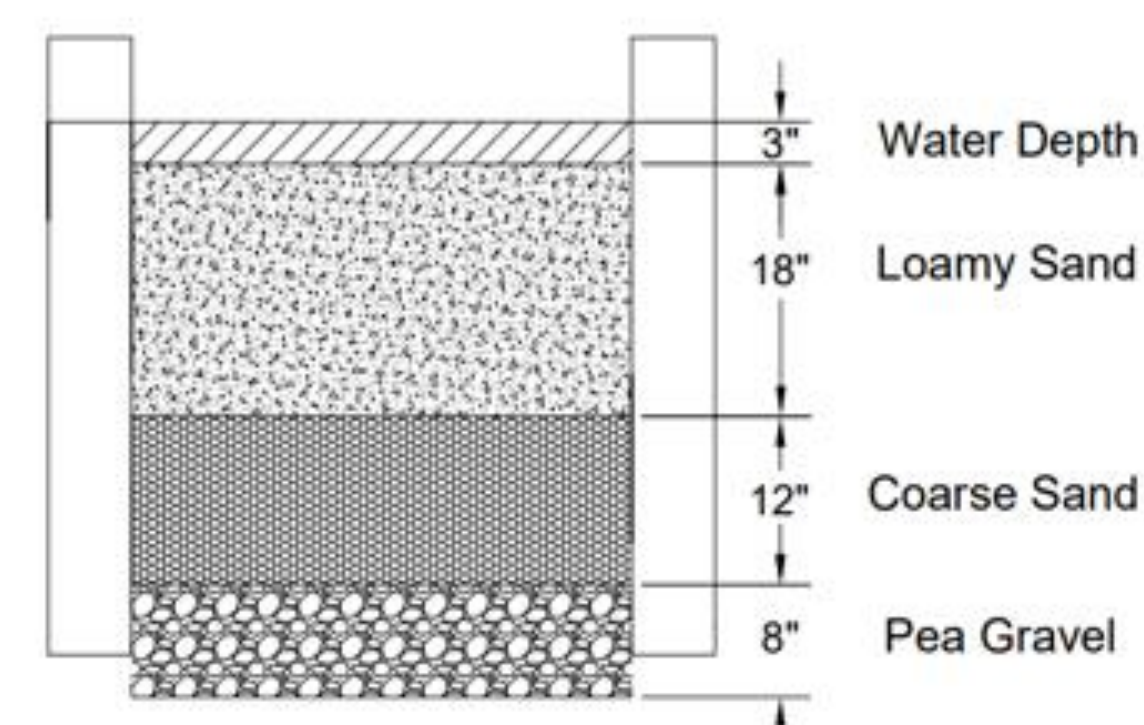
GEOMETRIC DESIGN

The existing roadway geometrics are adequate and no modifications are needed to the vertical or horizontal alignment of the existing roadway. We do recommend the removal of eight driveways along the roadway. Additionally, two on-street parking lots will be relocated away from the roadway, aligning with INDOT standards to minimize potential disruptions and improve overall road safety. A new sidewalk will begin at the intersection of Harcourt and Wohlert Street on the West side of the roadway and run south until Weatherhead Street where it will cross over Wohlert Street to the east side and continue south until it intersects with Mill Street. The crossing at Weatherhead will consist of ramps adhering to ADA regulations as well as pedestrian crosswalk pavement markings and a pedestrian activated rectangular rapid flashing beacon (RRFB). As shown in the figure below, the typical west side cross section consists of a 6-inch vertical curb along the edge of pavement followed by 3 ft of green gutter and another 6 inch vertical curb. The pedestrian sidewalk will be located directly adjacent to the back of the curb.



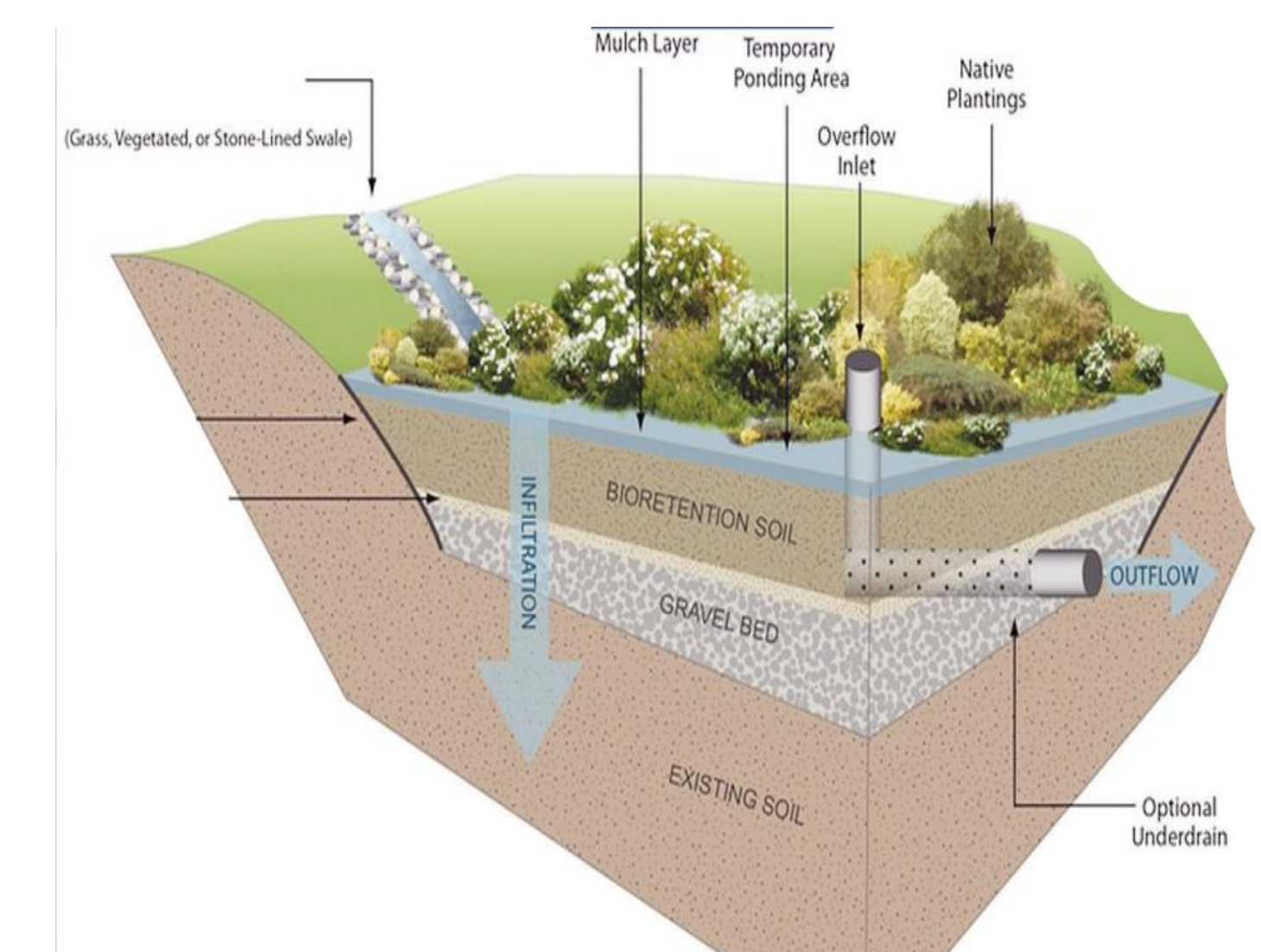
GREEN GUTTER

The current runoff from the road flows into existing grass ditches. Improvement methods such as concrete curb and gutter and a pipe system were initially proposed. However, we recommend that a green gutter system be used for this project. The green gutter design follows the San Mateo Guidebook Chapter 2 "Design Strategies for Green Streets and Parking Lots" specifications. The filtering beds consist of 18 inches of Loamy Sand, 12 inches of Coarse Sand, and 8 inches of Pea Gravel, with an embedded 8 inch perforated pipe.



BIORETENTION SWALES

Runoff which flows into the green gutter only partially infiltrates into the natural subgrade. The remaining water will accumulate in the voids of the media and drain into the two new bioswales on the west side of Wohlert Street. The southwest bioswale, measuring 40 feet by 20 feet, will capture runoff from the southwest half of the project. Simultaneously, the northwest bioswale, spanning 90 feet by 18 feet, receives runoff from the northwest side of the green gutter. The image below shows a typical cross-section of a bioretention swale.



CONSTRUCTION COST ESTIMATE

The INDOT CY2022 Unit Price Summary was referenced to determine the construction cost of the project. The listed weighted average price was used in calculations to estimate the project. However, some items were not on the price list and required additional research. AutoCAD drawings assisted us in determining the quantity of different pay items. We also used Excel to calculate certain values we were able to measure from the Steuben County GIS Beacon. The costs of each material/construction-related item are shown in Appendix E with the total construction cost being \$1,644,633.