



Bayou Gardens Extension Through Wetlands



BAYOU GARDENS BOULEVARD EXTENSION



Roadway Construction



Sand Embankment



Bridge & Roadway Construction



Final Construction

Unique transportation design techniques to protect and preserve forested wetlands.

CHALLENGE: Construct highway on new alignment through wetlands and extremely soft soil conditions.

SOLUTION: Utilize embankment surcharge and other methods to provide long-term roadway sustainability.

INNOVATION: Implement high strength woven fabric beneath embankment and monitor settlement.

COMPLEXITY: Coupling roadway embankment and pile-supported bridge elements.

UNIQUE ASPECT: Synergy of geotechnical engineering and structural design elements to match predicted settlement.

RESULT: Completed concrete roadway segment with long-term roadway sustainability.

Location: Terrebonne Parish, LA
 Client: Terrebonne Parish Consolidated Government (Houma, LA)
 Entering Firm: T. Baker Smith, LLC (Houma, LA)



The Bayou Gardens Extension project is a continuation of two previous state DOT projects which initially developed Bayou Gardens Blvd. in Houma, LA as an east/west route that interconnected existing north/south routes in the state network. Bayou Gardens Blvd. is a 4-lane urban highway with a raised median which previously terminated at a 3-legged intersection. The Bayou Gardens Extension project provides a connection between LA Hwy 660 and LA Hwy 316 improving regional mobility, hurricane evacuation, and promoting additional economic development. Prior to the project, motorists detoured approximately six miles on narrow, two-lane roadways with load posted bridges. The overall length of the project is 1.6 miles of two-lane roadway and included a 140-foot-long curve bridge over St. Louis Bayou.

The project's first phase consisted of constructing half of the 4-lane full build. This phase was further divided into two subphases: Phase I, consisting of clearing, grubbing, and embankment surcharge; and Phase II, consisting of the roadway paving and bridge construction.

One main obstacle that prevented the project from being constructed sooner, or as part of the original Bayou Gardens Blvd. construction, was the fact that the Bayou Gardens Blvd. Extension project from LA 660 to LA 316 required that the roadway traverse through forested swamp/wetlands with natural ground elevations ranging from seven feet above sea level to minus five feet below sea level (NAVD 88). The conditions through which the road would be built are not commonly encountered and required unique engineering and construction techniques be utilized to ensure not only constructability, but long-term sustainability of the roadway due to extreme amounts of predicted long-term settlement. To accomplish this, the T. Baker Smith (TBS) design team first developed a construction phase which included clearing, grubbing and placement of up to 12 feet of sand for the roadway embankment, underlaid by a high-strength, woven geotextile fabric. This embankment was then allowed to surcharge the underlying soils for a period of 10 months, during which, settlement on the order of two feet was measured. After the underlying embankment settlement had diminished, a second construction phase was let for bids to construct the roadway paving, turn lanes, intersection improvements, and bridge construction. The project's design began in February 2009 and Phase II was completed and opened to traffic in January 2017.

The roadway paving and bridge phase of the corridor included approximately 4,000 linear feet of left and right turn lanes on LA 316 and LA 660 and a right turn lane along the existing Bayou Gardens Blvd. Intersection design plans included signal upgrades, traffic signal relocations, utility relocations and right of way acquisition. As common in South Louisiana, the Bayou Gardens Blvd. Extension traversed two major underground pipeline corridors, which required extensive coordination for the protection and/or relocation of these facilities.

TBS was responsible for all topographic surveying, subsurface utility engineering (SUE), embankment surcharge monitoring, roadway and drainage design, pavement design, bridge design, project management, environmental permitting, utility design, utility permitting and coordination, construction contract administration, and construction project representation.