

183A Turnpike: A Design-Build Success Story

This Paper presents the planning, design and construction experience of URS Corporation and P.E. Structural Consultants, Inc. on the 183A Turnpike Project in Austin, TX. The purpose of the new toll road project – including social, environmental and economic considerations – is discussed. Unique structural and aesthetic design challenges of the bridges and toll facilities are highlighted. Lessons learned through the Design-Build Delivery Method, as well as specific design solutions of value to future projects, are offered.



PROJECT INTRODUCTION

The Central Texas Regional Mobility Authority (CTRMA) aimed to provide an aesthetically pleasing and economical solution to the congestion problem on US183 in northwest Austin, Cedar Park and Leander. Delivered as a design-build project, the 11.6 mile, \$238 million toll road extends from existing US 183 at RM 620/SH 45 Toll Road to approximately three miles north of the City of Leander. Design efforts began in January 2005 and construction commenced just a few months later in March 2005. The new road was opened to traffic in March 2007. The general contractor was Hill Country Constructors, a joint venture between Granite and J.D. Abrams. The prime design consultant was the URS Corporation. P.E. Structural Consultants, Inc. co-lead the structural design team with URS to provide design and construction support for:

- 23 Bridges spanning roadways and streams
- 40 Mechanically Stabilized Earth (MSE) Walls
- 4 Noise Walls protecting residential areas
- Overhead Sign Supports and Toll Gantries
- Miscellaneous Drainage and Traffic Structures



STRUCTURES HIGHLIGHTS



Typical bridge structures are multiple span prestressed concrete I-beam units spanning lower roadways, creeks and railroads. Project challenges included the presence of karst geologic features; long spans which pushed the limit of TxDOT Type IV and Type VI (Mod) I-beams; and tall, stepped columns.



Aesthetics played a key role in the structural design; the aesthetic concept for all structures in the project is based on the desire to contribute to the visual identity of the growing communities that this toll road serves. The design team, in collaboration with the CTRMA and local communities, developed aesthetic treatments to reflect both the natural and built environment, as well as the historical significance of the region.

Features of key structures within the project are discussed, such as the landmark Park Street Bridge, which incorporates economical standardized construction details combined with special features and innovations to successfully meet the unique challenges and constraints of the project and site.



DESIGN-BUILD DELIVERY METHOD

CTRMA elected to use the design-build delivery method to ensure seamless integration of the design and construction phases of the project. URS assembled a team of engineers with expertise in the design-build delivery method to meet the aggressive schedule of the project. Design-build offered transparency and accountability throughout the process. As a result, a compressed schedule was achieved, enabling the Turnpike to be opened to traffic and collecting tolls ahead of schedule. The success of the project has garnered regional attention, having been awarded the 2008 Texas Council of Engineering Companies (CEC) Gold Award for Engineering Excellence.



APPLICABLE TOPICS: Bridge Design Practice, Innovations in Structural Design, Project Delivery Systems

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