Precast Segmental Aerial Guideway for Honolulu Rail Transit Corridor Project

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Abstract

The Honolulu Rail Transit Project (HRTP) includes the design, construction and operation of a 20-mile grade-separated fixed guideway transit system in Honolulu, Hawaii. The alignment of the project will travel through densely developed areas, over Interstate highways, streams, or existing streets. The majority of the guideway will be elevated to avoid any conflicts with the existing facilities and utilities. Honolulu Authority Regional Transit (HART) retained AECOM to perform the design of the 5.2-mile Airport Segment and 3.9-mile the City Center Segment of HRTP. Precast concrete segmental box girders erected using span-by-span with an overhead launching gantry were proposed to accommodate a 30.6-ft-wide dual track. The paper describes the background and status of the project and provides an insight of key design considerations and approaches, cost-effective structural arrangement for the precast concrete segmental elevated guideway.

Keywords: Precast concrete segmental box; span-by-span; post-tensioning; aerial guideways.

1 Introduction

The Honolulu Rail Transit Project (HRTP) includes the design, construction and operation of an approximately 20-mile grade-separated fixed guideway transit system in Honolulu, Hawaii. Figure 1 displays the guideway alignment of the entire HRTP project. The project consists of four major sections: West Oahu/Farrington Highway, Kamehameha, Airport, and City Center Sections. The West Oahu/ Farrington and Kamehameha Sections have already been awarded as design-build contracts and are currently under construction. Under contract to the City and County of Honolulu, AECOM is providing design review on behalf of the Hawaii Department of Transportation (HDOT) for these two design-build sections that utilize mainly precast concrete segmental guideways. The article will focus on the aerial guideway structures for the Airport and City Center Sections. AECOM was retained by Honolulu Authority Regional Transit (HART) to perform final design for both of these guideway sections. The guideway alignment of the project traverses densely developed urban areas, over Interstate highways, streams, or existing streets, etc. The majority of the guideway is elevated to avoid any potential conflicts with the existing facilities and utilities.

The Airport Section consists of approximately 5-1/2 miles of aerial guideway between the vicinities of Aloha Stadium and the Middle Street Transit Center. The Airport Section follows Kamehameha Highway, H-1 Freeway, Aolele Street through Honolulu International Airport, Ualena Street, and crosses Ke'ehi Lagoon Drive and terminates at the Middle Street Transit Center. The guideway is generally situated within existing public roadways and public properties to minimize impacts to private properties.

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