BASE*Line*

The quarterly newsletter of Baldridge & Associates Structural Engineering, Inc.

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For those about to park, we salute you!

Over the last 10 years we have designed 20 parking structures including stand-alone structures, basement parking garages, and parking facilities as part of transit centers. Because urban locations often have severe constraints such as tight sites in heavily congested areas, we work collaboratively with the design team to come up with structural schemes that are cost-effective and constructible. A great design can also produce a building configuration that provides more parking stalls than originally planned and adds safety and security by eliminating blind spots and hidden areas. This quarter we feature our most notable parking structures.

Honolulu International Airport Parking Structure

This eight-story, design-build parking garage includes over 1,700 stalls and is connected to the existing interisland terminal garage at the seventh and eighth floors by a two-level, 150-foot bridge designed to accommodate traffic as well as moving walkways for pedestrians. Construction of the 650,000 SF parking structure began in September 2007 and was opened to the public in February 2009.

The team evaluated several building configurations and structural schemes. The selected parking layout includes a double threaded helix ramp design that allows circulation of two levels in one revolution through the parking garage. The final configuration provided 500 more stalls than required by the RFP.

Wave One

Wave One in Noida, India provides parking for over 2,000 vehicles within 700,000 SF of a 2,000,000 SF project. The parking is divided into two areas of the building with 400 parking stalls located in three basement levels and another 1,600 parking stalls located on levels 6 to 12 of the project's podium. Levels 11 and 12 are designed with increased height and loading requirements to accommodate mechanical stacked parking. In order to speed the motorists to the upper level parking there are two circular speed ramps, one at each end of the over 500-foot-long podium.

Walmart & Sam's Club Parking Structure

Design-build of a 1,000,000 SF retail complex that stacks a Sam's Club store above a Walmart store. This project features 350,000 SF of retail and support space plus an adjacent 650,000 SF, four-story, 1,700-stall parking structure designed with exterior speed ramps.

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SALT at Kaka'ako

The project is the redevelopment of Block 'F' bordered by Ala Moana Boulevard, Coral Street, Keawe Street, and Auahi Street in Kaka'ako. The project is a portion of Kamehameha Schools' Kaialulu 'o Kaka'ako Master Plan to revitalize the Kaka'ako district and consists of the renovation of existing structures and construction of new buildings to create commercial and residential spaces. It includes a new seven-story, precast concrete parking structure with approximately 267 stalls.

801 South Street

A new residential development consisting of two 46-story condominium towers (Buildings A and B) and two accompanying stand-alone parking structures. The parking structures are approximately 216,000 SF each and together accommodate a total of 1,763 vehicles. The parking garages utilize post-tensioned beam and floor slabs which allow for a more open floor plan and larger bay spacing in order to accommodate the maximum amount of parking stalls possible.

Country Club Village Six

This residential project is a 17-story tower and a five-story, 87,000 SF stand-alone parking structure that accommodates 534 vehicles. Working with the design-assist team, BASE developed an efficient concrete structure utilizing post-tensioned floors and beams to maximize driving lane widths. The structure also utilized a combination of concrete columns and walls strategically located to work with the optimal parking stall count and avoid blind spots at turning points. The columns and foundations in the parking garage were also designed for future loads from a frame to support potential solar panels to be built over the top parking level.

Hale Pawa'a

Hale Pawa'a consists of a new 10-story medical office building and an adjacent 161,900 SF, eight-story parking structure. The parking structure houses 400 parking stalls for the complex and is supported on a deep foundation system consisting of drilled piers. The parking structure is constructed utilizing a long-span post-tensioned concrete beam and slab. In close coordination with the design-build contractor, BASE utilized a standardized formwork system which dictated the shapes of the post-tensioned support beams at the parking garage. This system proved to be efficient to construct and was a cost-effective structural solution.

Joint Traffic Management Center Parking Structure

A new six-level, design-build parking structure of approximately 160,500 SF. The ground level of the structure is utilized as a city bus staging area for the Alapai Transit Center (ATC) and levels two to six of the parking structure includes 413 stalls for city and emergency management employees. Working with the design-build team, BASE proposed an alternate design using cast-in-place post-tensioned (PT) concrete. The final layout resulted in a savings of over 10% in concrete and reinforcing steel quantities, helping the project to attain LEED Gold certification.

Through the use of PT the formwork was modified to round off, or curve, two corners of the building to soften the structure making for a very aesthetically pleasing design. In 2013 this project was recognized by the Post-Tensioning Institute with its **national Award of Excellence** in the parking structure category of their PTI Awards program.