

「環狀線CF651B標」榮獲結構工程學會 106年度結構工程技術獎

文圖/李家旭 英譯/楊麗華

本局東區工程處負責監造施工之「環狀線CF650區段標之CF651B子施工標」，參加中華民國結構工程學會「106年度結構工程技術獎」評選，獲得該學會出席委員肯定入選得獎，實屬難能可貴。

環狀線CF651B標之施工範圍為中和站(Y11)(含)~板新站(Y14)(含)間之高架橋及車站，計有高架車站4座，高架橋長2430公尺及各站出入口與土開大樓工程。本標施工範圍皆落於地狹人稠之新北市中和區與板橋區，故於各階段施工過程中，皆因路幅狹窄、鄰房緊鄰等許多不利施工條件，使本標工程結構設計複雜及施工困難度高之特性。

因此為安全、如期、如質且降低交通衝擊等因素，本標為臺灣捷運系統首次採用高架疊式車站及高架橋之方式興建並將車站模矩化、月台標準化。本標具有之設計創新及施工挑戰如下：

設計創新：(1)採疊式車站設計。(2)採側式轉疊式轉換區設計。(3)採後拉預力法預力混凝土U型梁。

施工挑戰：(1)於狹窄道路吊裝U型梁，並於夜間封路6小時內施作完成。(2)台64線(中和一)下橋匝道採先拆後建與捷運橋墩共構施工。(3)跨越台64線疊式高架橋，以背拉鋼索吊裝疊式跨距80公尺連續鋼箱梁施工方式吊裝。(4)疊式橋梁跨路口採46公尺曲梁施作。前述施工挑戰經各級長官督導及施工人員通力合作下，相關作業均已如期如質的完成。

環狀線第一階段工程為貫穿新北市新店區、中和區、板橋區及新莊區等精華地段，串連多條捷運系統，建構臺北都會區完整路網，提升運輸服務效益。完工營運後，對改善臺北市與新北市整體交通問題，紓解交通瓶頸極具功效，並可降低私人運具使用比例，以符合低碳城市的精神，提高城市更大的競爭力。



本局東工處陳家昀總工程師(右1)代表領獎

Circular Line Contract CF651B Wins Chinese Society of Structural Engineers 2017 Structural Engineering Technology Award

DORTS is responsible for the supervision of construction on the subcontract CF651B of the Circular line section contract CF650 which was selected for Chinese Society of Structural Engineers 2017 Structural Engineering Technology Awards and was recognized by the members of the association in attendance. The ability to win the approval of association members is truly an outstanding achievement.

The scope of construction on Circular line subcontract CF651B includes a total of four elevated stations and viaducts between (and including) stations Y11 and Y14. The total length of the elevated bridge is 2,430m, and the construction also includes the entrances/exits of each station and land development buildings. The construction for the entire contract was implemented in dense and narrow roads in Zhonghe District and Banqiao District of New Taipei City, and during each stage of the construction process there were many adverse construction conditions due to narrow roads and neighboring buildings. The unfavorable conditions made the structural design of this contract complex and the construction highly difficult to carry out.

Consequently, for the sake of factors of safety, staying on schedule, maintaining quality, and reducing the impact on traffic, building methods for overhead stations and viaducts were utilized on this contract for the first time on any of Taiwan's MRT systems with station modularization and platform standardization. The design innovations and construction challenges of this contract are as follows: New design innovations: 1.) Utilization of staked platform station design. 2.) Utilization of lateral stacking conversion area design. 3.) Utilization of post-tensioning precast concrete and U-shaped girders.

Construction challenges: 1.) For hoisting of U-shaped beams on the narrow roads, at night roads were blocked off, and the tasks were completed within 6 hours. 2.) The off-ramp for Provincial Highway 64 (Zhonghe No.1) was removed first, then co-constructed with MRT bridge pier. For the aforementioned construction tasks, through supervision at all levels and the cooperative working together of all construction personnel, the related tasks were completed according to schedule and quality standards.

Circular line Phase I construction passes through the heart of Xindian District, Zhonghe District, Banqiao District, and Xinzhuang District in New Taipei City and connects with several other MRT lines, establishing a complete transportation network in Taipei Metropolitan Area and increasing the benefits of transportation services. Following the completion of construction, it will alleviate the overall traffic problem in Taipei City and New Taipei City, and effectively mitigate traffic bottlenecks. In addition, it will also reduce the ratio of private transportation vehicle usage in order to conform to the spirit of a low-carbon city and increase competitiveness.