FOSROC

constructive solutions

CASE STUDY

Happy Valley Underground Stormwater Storage Scheme (2012 – 2018)

Client: Drainage Services Department
Contractor: Chun Wo Construction & Engineering Company Ltd
Customer: Excel Concrete Ltd

Sector: Water Retaining

Date: Nov 2013 –

Stromwater tank construction at Happy Valley Racecourse

THE PROJECT

The Drainage Services Department (DSD) has long planned to solve the drainage problem at Happy Valley region on Hong Kong Island. The Happy Valley area is geographically a natural basin with a very large catchment area, each summer the rain water collected by the drains was not discharged quickly enough after heavy rainstorms causing back flow. Therefore this has always been a top priority on DSD's agenda and this underground stormwater holding facility would solve the flooding issue. The huge underground stormwater tank is situated underneath Hong Kong's most prestige prime location, the Happy Valley Racecourse where many international renowned races had taken place. The design is such that large volume of rain water could be temporarily held in this tank and the pumps inside the tank would be automatically activated when the water level reaches a preset datum. The project design has received the "2012 International Water Association Project Innovation Award"

THE SOLUTION

The design consists of a multiple football pitch size underground concrete rainwater tank with a capacity of 60,000 cubic meters (equivalent to 24 standard swimming pools, which makes this the largest of its kind in Hong Kong) underneath the Happy Valley Racecourse recreation ground. One of the major challenges of the concrete design is to apply Shrinkage Reducing Agent (SRA) admixture and with very low W/C ratio of about 0.38, the cement content being maximum at 400kg. The last time SRA being used in HK was in 1999. In addition, the requirement for internal temperature rise within the concrete (TRET using 1.2mx1.2mx1.2m block) should not exceed 75^{o}C during hydration of the concrete.

Fosroc Hong Kong worked closely with our customer and proposed our high end 4th generation Polycarboxylate superplasticizer together with our high performance SRA admixture Conplast Controller from Spain. We assisted our customer in carrying out trials & demonstration to show to the main contractor and client. Fosroc's SRA displayed better results than the original SRA specified. The SRA enhances the concrete performance and help reducing shrinkage such that the concrete would have waterproofing effect. The Fosroc admixture solution gave our customer an ultimate compressive strength close to 80MPa with high flowability and long retention required at very low cement content. The internal temperature of less than 75^{o}C was also achieved.

THE RESULT

Fosroc admixture solution has proven to be technically advanced offering superb results especially for water retaining structure high performance concrete providing our customer and client great satisfaction and confidence. This project buttressed Fosroc's admixture position as an admixture solution provider in HK.

PRODUCTS

- Auracast 400 and Auracast R (250,000 Litres)
- Conplast Controller (225,000 Litres)

Excavation from Northeast corner of the recreation ground

Section of top slab of the stormwater tank completed

Excavation in progress for next section

T: 852 2882 8662 F: 852 2895 2931 E: hongkong@fosroc.com
Address: 2001-2, Pacific Plaza, 410 Des Voeux Road West, Hong Kong