

Due to the fact that canopies needed to be introduced at the 4 car parks. This resulted in huge forces that was missed during the design stage.

Freyssinet was assigned to find a technical solution taking into account all site restraint since all car parks were under handing over stage and limited access where provided.

The solution was through counteracting the forces through anchoring high tension bars (Freyssibar) into sealed cores in the existing drop beams at all car parks.

The range in forces varied from case to case (total 420) ranging between 290 to 575 KN.

Application of the solution through multi-task operation that included:

- Coring into existing RC-Beams;
- Installing Freyssibar into the cores after injecting the special bonding epoxy;
- Stressing of all Freyssibar to the required design forces.

## Repairs

### Strengthening of the RC Beams

Marina District Car Park  
Doha, Qatar



#### Client

Qatari Diar

#### Consultant

ARUP/ACE

#### Contractor

QDVC

#### Construction

Dec 2011 – Feb 2012