

**Commercial Buildings****Reference Details:**

Owner Kingdom Holding Company, Riyadh, Saudi Arabia
+++ Design/Consulting Engineer Consortium of Elberbe Becket International B.V., AC Waaire, Netherlands and Omrania&Associates, Riyadh, Saudi Arabia
+++ General Contractor El Seif Engineering Contracting Est., Riyadh, Saudi Arabia

DSI Services Supply of 20,000 DYWIDAG Standard Couplers dia. 40 mm; Supply of 4,000 DYWIDAG Transition Couplers dia. 40 mm to dia. 32 mm; Supply of 40,000 DYWIDAG Standard Couplers dia. 32 mm.

**DYWIDAG Extruded Coupler System for tallest building in the orient****Kingdom Centre Project, Riyadh, Saudi Arabia**

The Kingdom Centre is generally subdivided into the east podium, the west podium and the 300 m tall tower. The west and East podiums are low rise wings with only three levels for wedding chapels, conference rooms, restaurants, bars, shopping areas, social and family facilities and parking garages. The tower is occupied by a bank, a business club, a business centre and a 5 star hotel as well as offices and condominiums.

The lower 180 m section of the tower is composed of a 30 stories tall concrete frame with precast floors. The upper section of the tower is a traditional steel construction with an observatory on the top floor. Due to the very high reinforcement ratio in the frame legs and beams as well as in the stiffening walls, the design called for splicing bars with 40 mm dia. for the foundation and the lower portions of the frame structure. 32 mm dia. bars are spliced in the continued upper parts of the frame. The continuation from bar 40 mm dia. to 32 mm dia. was easily achieved with transition couplers. The extruded couplers offered the best solution due to the congestion in the reinforcement and the extreme demand on the structural joints in respect to slip deformation. The splices had to meet the strict requirements of the US-Nuclear Safety Structures Code (ACI - 349) in respect to static and dynamic loading. The DYWIDAG Extruded Coupler System surpassed the competition in all performance criteria.

DSI's technical as well as commercial competitiveness resulted in an order for a total of 64,000 couplers. This is the largest DYWIDAG Extruded Coupler project ever, only surpassed in quantity (100,000 pieces for bar 28 mm dia.) by the Highway project Adana-Gaziantep, Turkey.