

STRUCTURAL STEELWORK CONNECTIONS AND JOINTS

Project report submitted by

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SUMMARY

This project deals with the behaviour and design of structural steelwork connections.

The types of connections under study are the ones with Black bolts and High Strength Friction Grip (HSFG) bolts, fillet and butt welds.

Chapter 1 deals with the manufacture and design specifications and procedures of various cases of joints. Direct shear joints, single shear and double shear, are checked for failure by shear on the bolt shank, bearing on the member or bolt, tension in the member and shear at the end of the member. Direct tension joints are checked on the tensile area of the root of the thread of bolts and when prying forces occur. Eccentric connections are separated into groups of bolts in direct shear and torsion and groups of bolts in direct shear and tension are also considered. HSFG bolts are analysed, and connections are designed for shear, tension and subjected to external tension in addition to shear. In shear connections, bearing capacity and shear in the plies is checked. In tension connections and connections subjected to external tension in addition to shear, design is also described.

Chapter 2 deals with various welding processes, failure modes and ways to inspect and check the joints. It also includes types of connections using welding and their design procedures.

Eccentric connections, torsion joint with load in the plane of welds and bracket connections, are discussed and analysed. Provisions regarding the design of fillet and butt welds are also given, followed by chapter 3 which deals with further considerations connections design.

Structural hollow sections with their various types and design are discussed in chapter 4, a tube with another, a tube with a flat plate, a rectangular hollow section with another or with a flat plate.

Chapter 5 contains design examples based on the literature given in the previous chapter.

Chapter 6 contains an introduction in the Basic computer language, a programme for connections, and the results from the above programme. Finally the conclusions are given.

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