



## Fixings in concrete structures Recommendations for selection of the type of fastener

### Introduction

This standard contains recommendations for the selection of the type of fastener in concrete structures.

### Associated standards

SSG 5715, Fixing plates in concrete structures  
SSG 5716, Holes for fasteners in concrete columns and beams

### 1 General

Fixing in concrete structures are nowadays increasingly made after the structure has been cast. In precast concrete structures, zones free from reinforcement should therefore be specified to facilitate the insertion of fasteners on site.

### 2 Types of fasteners

The types of fasteners which are appropriate from a practical and economic standpoint are recommended for use in the following order of priority:

- 1 Hole for fastener in accordance with SSG 5716
  - Provides high strength and fixings which are most reliable from the standpoint of risk.
  - Can be used to advantage in fixing scaffolds during the construction period.
- 2 Expansion bolt
  - Requires zones free from reinforcement or use of a diamond drill.
  - Is used for structures subject to static loads.
  - Must conform to edge distance and spacing requirements.
- 3 Self grouting fastener
  - Permits large loads at normal temperatures. Permissible loads are considerably reduced at high temperatures. The instructions of the supplier shall therefore be complied with at all times.
  - Depending on depth, can also be used in structures subject to dynamic loads.
  - Requirements for edge distance and spacing less stringent than for self grouting fasteners.
- 4 Embedded fixtures for bolts
  - Normally intended for structures subject to static loads.
  - Should be used for larger loads.
  - If an embedded fixture for a bolt must be mounted near an edge, the type intended for heavier loads must be used for lighter installations also.
- 5 Embedded fixing rails
  - Available in the market in a number of versions.
  - Normally used for moderate loads.
  - Is unsuitable for fixing hoist blocks.
  - In prestressed concrete structures the length of the rail is limited.
  - Can often require special reinforcement.
- 6 Embedded fixing plates in accordance with SSG 5715
  - Intended for structures subject to static loads.
  - Used for moderate loads.
  - Subject to certain restrictions regarding the placing of loads on the fixing plate.

### 3 Comments

The positions of holes and fixings subject to static loads should be determined at an early stage of design so that these can be provided during production of the precast units. It is simplest to make the other holes and fixings on the site.

When drilling and cutting is carried out on site, consideration must be given to the plan position of reinforcement in relation to the ribs on floor slabs and to the lateral positions of holes in relation to supports etc.

Holes can be made easily with diamond drills up to a diameter of 300 mm.

Anchorage shall be designed with respect to the intended load, reinforcement, concrete dimension, concrete strength, fire resistance class and environment.