

# Structures

## Master Specification

### ST-SC-S2 Geopolymer Concrete

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## Contents

Contents	3
ST-SC-S2 Geopolymer Concrete	4
1 General	4
2 Definitions	4
3 Concrete Production	4
4 Concrete Placement	5
5 Records	5
6 Hold Points	5

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## ST-SC-S2 Geopolymer Concrete

### 1 General

- 1.1 This part specifies the requirements for the supply and placement of geopolymer concrete of strength grades 20MPa, 25MPa and 32MPa.
- 1.2 Any reinforcing shall comply with ST-SC-S6 “Steel Reinforcement”.
- 1.3 Unless specified otherwise, all design and / or documentation must comply with the most recent revisions (including published amendments) of the following design standards and / or specifications:
  - a) AS 1379 The Specification and Supply of Concrete
  - b) AS 3582.1 Supplementary Cementitious Materials for use with Portland and Blended Cement – Part 1: Fly Ash
  - c) AS 2582.2 Supplementary Cementitious Materials for use with Portland and Blended Cement – Part 2: Slag – Ground Granulated Iron Blast Furnace
  - d) AS 2582.3 Supplementary Cementitious Materials for use with Portland and Blended Cement – Part 3: Amorphous Silica
  - e) AS 3600 Concrete Structures
  - f) AS 9001 Quality Management Systems – Requirements
  - g) HB64 Guide to Concrete Construction (joint publication of the Cement and Concrete Association of Australia and Standards Australia)

### 2 Definitions

- 2.1 “Geopolymer Binder” means binder containing greater than 80% Fly Ash, Ground Granulated Blast Furnace Slag (GGBF Slag) or Amorphous Silica complying with the requirements of AS 3582.1, AS 3582.2 and AS 2582.3 respectively, metakaolin and up to 20% alkaline components.
- 2.2 “Geopolymer Concrete” means concrete which comprises geopolymer binder, aggregates, water and admixtures.

### 3 Concrete Production

- 3.1 The Contractor shall:
  - a) ensure that the geopolymer concrete supplier has sound experience and demonstrated competence in the supply of geopolymer concrete;
  - b) provide documented evidence of the supplier’s experience and competency in the manufacture of geopolymer concrete; and
  - c) provide all relevant details regarding the mix design and its properties.
- 3.2 The mix design for each geopolymer concrete strength grade shall have a unique identification number.
- 3.3 Geopolymer concrete and its constituent materials shall be supplied and tested in accordance with AS 1379. The concrete plant shall operate under a quality system in accordance with AS 9001. Geopolymer concrete shall not be mixed when the air temperature is lower than 5°C or greater than 35°C.
- 3.4 Unless specified otherwise:
  - a) the geopolymer concrete shall be subject to production assessment in accordance with AS 1379, Clause 6.3 “Production Assessment”;
  - b) the maximum slump at the point of acceptance is 100mm;
  - c) the maximum aggregate size is 20mm; and

- d) air entrainment is not required.
- 3.5 For each load of geopolymer concrete supplied, the Contractor shall supply an identification certificate in accordance with AS 1379, Clause 1.7.3 "Identification Certificate". The certificate shall identify the mix as geopolymer concrete.
- 3.6 The Contractor shall ensure that production assessment reports are available in accordance with AS 1379 Clause 6.4.2 "Reports for Production Assessment". He reports shall identify the mix as geopolymer concrete.

## 4 Concrete Placement

- 4.1 Geopolymer Concrete shall be transported, handled, placed, compacted, finished and cured in accordance with the manufacturer's instructions and Section 17 "Material and Construction Requirements" of AS 3600, using the recommended processes described in HB64. Hand mixing is not permitted.
- 4.2 Subject to the manufacturer's approval and provided a means of accurately measuring the volume of water is available, water may be added to the freshly mixed geopolymer concrete prior to commencement of discharge.
- 4.3 Water shall not be added after commencement of discharge of geopolymer concrete, unless expressly approved by the manufacturer.
- 4.4 Prior to the discharge of geopolymer concrete at the site, the mixer or agitator shall be operated at mixing speed for not less than three minutes, until the geopolymer concrete achieves the required uniformity. Geopolymer Concrete which has begun to stiffen shall not be used in the works.
- 4.5 Geopolymer concrete at the acceptance point shall have a temperature not less than 5°C nor greater than 35°C (refer AS 1379, Clause 4.4.2). Concreting in the open shall not be carried out during adverse conditions, such as rain, wind, dust or bushfires

## 5 Records

**Table ST-SC-S2 5-1 Verification Records**

Document Ref.	Subject	Record to be Provided
3	Concrete Delivery Information	Identification certificates in accordance with AS 1379, Clause 1.7.3 "Identification Certificate"

## 6 Hold Points

- 6.1 There are no Hold Points referenced in this Part.