PART CC27

GEOPOLYMER CONCRETE

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GENERAL

This Part specifies the requirements for the supply and placement of geopolymer concrete of strength grades 20 MPa, 25MPa and 32 MPa.

Any reinforcing must comply with Part 305 “Steel Reinforcement”.

Documents referenced in this Part are listed below:

AS 1379 The Specification and Supply of Concrete

AS 3582.1 Supplementary cementitious materials for use with portland and blended cement – Part 1: Fly ash

AS 3582.2 Supplementary cementitious materials for use with portland and blended cement – Part 2: Slag ‑ Ground granulated iron blast furnace

AS 3582.3 Supplementary cementitious materials for use with portland and blended cement – Part 3: Amorphous silica

AS 3600 Concrete Structures

AS 9001 Quality management systems – Requirements

HB64 Guide to Concrete Construction (joint publication of the Cement and Concrete Association of Australia and Standards Australia)

**“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 3582.3 respectively, metakaolin and up to 20% alkaline components.

**“Geopolymer Concrete”** means concrete which comprises geopolymer binder, aggregates, water and admixtures.

CONCRETE PRODUCTION

The Contractor must:

ensure that the Geopolymer Concrete supplier has sound experience and demonstrated competence in the supply of Geopolymer Concrete;

provide documented evidence of the supplier’s experience and competency in the manufacture of Geopolymer Concrete; and

provide all relevant details regarding the mix design and its properties.

The mix design for each Geopolymer Concrete strength grade must have a unique identification number.

Geopolymer Concrete and its constituent materials must be supplied and tested in accordance with AS 1379. The concrete plant must operate under a quality system in accordance with AS 9001. Geopolymer concrete must not be mixed when the air temperature is lower than 5°C or greater than 35°C.

Unless specified otherwise:

the Geopolymer Concrete must be subject to production assessment in accordance with Clause 6.3 “Production Assessment” of AS 1379;

the maximum slump at the point of acceptance is 100 mm;

the maximum aggregate size is 20 mm; and

air entrainment is not required.

For each load of Geopolymer Concrete supplied, the Contractor must supply an identification certificate in accordance with Clause 1.7. 3 “Identification Certificate” of AS 1379. The certificate must identify the mix as geopolymer concrete.

The Contractor must ensure that production assessment reports are available in accordance with Clause 6.4.2 “Reports for Production Assessment” of AS 1379. The reports must identify the mix as geopolymer concrete.

CONCRETE PLACEMENT

Geopolymer Concrete must 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.

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.

Water must not be added after commencement of discharge of Geopolymer Concrete, unless expressly approved by the manufacturer.

Prior to the discharge of Geopolymer Concrete at the site, the mixer or agitator must 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 must not be used in the works.

Geopolymer Concrete at the acceptance point must have a temperature not less than 5°C nor greater than 35°C (refer AS 1379, Clause 4.4.2). Concreting in the open must not be carried out during adverse conditions, such as rain, wind, dust or bushfires.

RECORDS

The Contractor must supply the following records:

| **CLAUSE REF.** | **SUBJECT** | **RECORD TO BE PROVIDED** |
| --- | --- | --- |
| 2 | Concrete Delivery Information | Identification certificates in accordance with AS 1379: Clause 1.7. 3 “Identification Certificate”  |

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