

# ORDERING Premixed Concrete

## INTRODUCTION

With the many different designers' specifications and suppliers' proprietary products, it is important that customers are very specific as to their requirements when ordering concrete.

Australian Standard AS 1379, *Specification and supply of concrete*, sets out minimum requirements for concrete specification. Concrete is specified to be either 'normal class' or 'special class'. The 'class' of concrete and all other requirements of the concrete will need to be set out on the plans and/or in the specification. They should not be varied without the designer's approval.

**Normal-class concrete** is the most commonly used concrete. It requires selection of values for the basic properties (or parameters) of the concrete, within certain limits.

These parameters are set out below, and a check list is also provided. Normal-class concrete is designated by the prefix 'N' before the strength grade. For example, a normal-class concrete having a strength grade of 20 is designated N20.

**Special-class concrete** is concrete whose properties/parameters are different, or whose limits fall outside those of a normal-class concrete. These may include colour, specific drying shrinkage or high-early-strength requirements, concrete containing lightweight aggregates or specialist cements.

## ORDERING NORMAL-CLASS CONCRETE

When ordering normal-class concrete the following parameters need to be communicated to the supplier.

### Quantity

The supplier must be advised of the volume, in cubic metres, of concrete required – including an allowance for any on-site wastage. Possible yield discrepancies will be minimised by carefully estimating the required concrete volume.

Concrete volumes should be carefully estimated from on-site measurements and not from drawings or plans. Factors such as variations in slab thickness, deflection or distortion of forms, over excavation, uneven/irregular subgrade levels, placement over uncompacted sand or fill and use by other trades should be considered to reduce possible discrepancies in the quantity required. Refer to CCAA Data Sheet [Assessing Concrete Volumes](#) for more information on how to minimise volume discrepancies.



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### **Strength Grade**

Strength grade is a basic parameter which must be specified. The standard strength grades are N20, N25, N32, N40 and N50. Standard strength grades greater than 50 (ie 65, 80 and 100) and ordering concrete strengths other than one of the standard strength grades (not recommended) will require a special-class concrete.

### **Slump**

Slump is a basic parameter which must be specified. Slumps that can be specified range from 20 to 120 mm in 10-mm increments. The higher the value, the more workable the concrete is likely to be for ease of placement and compaction.

Slump can not be precisely assessed without carrying out a slump test – nor can it be controlled exactly from batch to batch. AS 1379 provides tolerances within which the supplier must deliver the concrete. For example, a specified slump of 100 mm has an acceptable tolerance of 80 to 120 mm. Tolerances are allowed because of variations of raw materials, batching, mixing equipment etc. The supplier will target the specified slump and should not be asked to supply a slump range.

The slump specified should be fit for the intended purpose. Typically, a 100-mm slump is required to achieve a workable concrete that can be readily placed, compacted and finished. However, current pumping, site practices and placing techniques frequently demand higher slumps. Complicated formwork or congested reinforcement may also require a higher slump to facilitate placement and compaction.

It is necessary to advise the supplier of the required slump, so that the concrete mix can be properly designed to achieve the required strength and other properties. AS 1379 notes that for residential slabs and footings, if the slump is not specified, then a 100-mm slump will be supplied.

Under no circumstances should 80-mm slump be ordered and a higher slump achieved by the on-site addition of water. Water which is added to the concrete without the supplier's approval is called 'excess water'. The addition of excess water at the customer's request may require an authorising signature from the customer's representative and may negate the supplier's warranty as this can seriously affect the ability of the concrete to meet its performance requirements.

### **Maximum Nominal Aggregate Size**

A 20-mm aggregate size will be supplied unless otherwise specified. Alternatively, 10- or 14-mm aggregate sizes may be specified. As with slump, aggregate size may be determined by the method of placement. The designer may specify the aggregate size after considering the element design and method of placement.

### **Method of Placement**

The supplier needs to know how the concrete is going to be placed (eg chute, pump) as this method will influence the concrete mix design. In the case of placing by pump, the type of pump, size and length of line should be specified as these will affect the concrete mix design.

### **Rate of Placement**

The required rate of placing the concrete is important to ensure the supplier can programme production and delivery accordingly. Also, the supplier should be advised of any delays that are likely to occur and of any other special factors such as site access conditions. It should be noted that the AS 1379 requirement for concrete to be discharged within 90 minutes of the commencement of mixing may be waived, or varied depending on weather conditions, by agreement between the customer and the supplier.

### **Testing**

Concrete is tested by the supplier in accordance with the requirements of AS 1379 to ensure that the plant (equipment and processes) delivers a consistent quality product. This is called 'production assessment testing'. To ensure that the customer's project is tested there should be a requirement for additional strength testing on site, called 'project assessment testing'. The details of the test procedures and their frequency need to be considered at the specification stage. Such testing and associated costs need to be agreed upon prior to ordering.

### **Air Entrainment (Optional)**

For the majority of work, air entrainment is not specified. Air entrainment may be specified for particular applications such as freeze-thaw conditions. If required, a maximum air entrainment of 5.0% may be specified.

**CHECKLIST**

The table below provides a useful checklist aimed at ensuring that normal-class concrete ordered from the supplier is both what the customer requires and what the designer specified.

→ Further information on good concreting practices can be downloaded from the Cement Concrete and Aggregates Australia website at [www.concrete.net.au](http://www.concrete.net.au).

**CHECKLIST FOR ORDERING NORMAL-CLASS CONCRETE**

Parameter	Default	Comment
<b>Quantity</b>	None	Allow for wastage.
<b>Strength Grade</b> (N20, N25, N32, N40, N50)	None	One of the standard strength grades must be specified.
<b>Slump</b> (20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120 mm)	None <i>(see comment)</i>	Must be specified. For residential slabs and footings, a slump of 100 mm will be supplied if a value is not specified.
<b>Aggregate Size</b> (10, 14, 20 mm)	20 mm	Need not be specified.
<b>Method of Placement</b> (Chute, pump, spray, tremmie, etc)	None	Must be specified.
<b>Rate of Placement</b>	None	Supplier should be advised of required intervals between deliveries and any special requirements (eg site access).
<b>Testing</b>	Production assessment	Need not be specified.
<b>Air Entrainment</b>	None	Need not be specified. If required, 5.0% maximum.

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