Placing & Compaction

Placing

Concrete should be placed as near to its final position as possible. It can then be roughly levelled off, leaving it a little proud of the forms to allow for compaction.

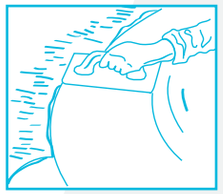
Compaction

Full compaction of concrete is vitally important to remove the entrapped air, leaving it dense and durable. Concrete of medium workability can be readily compacted using a compacting beam in an up-and-down motion. This action should result in a surface where all the voids are 'closed'.

Finish

Slabs can be finished by simply tamping with the compacting beam, by brushing, or by using a wooden or steel float. The timing of the final brushed, tamped or trowelled finish is very important. Premature finishing draws excess water and cement to the surface and this invariably leads to rapid surface deterioration and poor resistance to wear.

Brush finish



Steel float finish

Wood float finish

Curing

Concrete needs to be protected to prevent moisture loss, especially for the first week after placing. The interval between final finishing and the start of curing should be kept to a minimum to avoid damage to the surface. The more usual methods for curing include covering with damp sacking, damp sand or polythene sheet or spraying continuously with water. In cold weather, polythene sheet covered with straw provides protection against frost.

Quantities

Paths around the House

14 x 25kg bags of Irish Cement, together with 2 tonnes of damp gravel will produce just over 1 cubic metre of concrete. This is sufficient material for 10 square metres of 100mm thick slab.

Internal Floors

12 x 25kg bags of Irish Cement, together with approx. 2 tonnes of damp gravel will produce approx. 1 cubic metre of concrete.

Foundations

10 x 25kg bags of Irish Cement, together with approx. 2 tonnes of damp gravel will produce just under 1 cubic metre of concrete.

Storage

Bagged cement should be stored on a raised platform in dry conditions, covered with plastic sheeting. Bags should not be stacked higher than about 1.5m.

Care in use

A health and safety data sheet, giving practical guidance on handling cement, is available from our Technical Marketing department, or on our website.

Irish Cement Series

1	**Mixing & Placing Concrete**	4	Floor Screeds
2	Blockwork & Plastering	5	Concrete on the Farm
3	Precast Concrete Paving	6	Cement Silos

Advice and Information

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Using Irish Cement

Mixing & Placing Concrete

1

Using Irish Cement – Mixing & Placing Concrete

What is Concrete?

Concrete is a versatile and durable material which is ideal for many jobs around the house and garden. It can be used in a variety of interesting and imaginative ways and requires little maintenance. Concrete is made by mixing stone and sand with cement and water in carefully selected proportions and allowing the compacted material to set and harden. As setting and hardening are chemical processes, it is important that concrete is prevented from rapidly drying out after placing otherwise strength development and surface durability may be impaired.

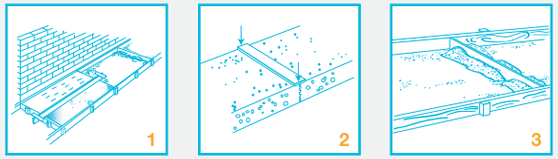
Planning and Design

Foundations

- Strip foundations for garden walls should always be at least three times as wide as the wall being supported.
- Strip foundations should be at least 150mm deep.

Paving

- Plan the job fully before starting the work.
- Following removal of topsoil, prepare a sound base for concrete on firm dry clay or on compacted gravel. 75-100mm of compacted hardcore finished with sand should be placed in areas subject to heavy traffic.
- Fix side forms firmly using timber or metal pegs.
- The minimum thickness of paths should be 75mm and for other paved areas with light vehicle access the thickness should be increased to 100mm. For slabs or driveways, divide the area into bays not greater than 4 metres wide and 6 metres long. For garden paths the length between joints should not exceed 2 metres and joints should be placed at junctions or a change of section.
- Joints can be formed in the wet concrete by using a timber or metal strip to form a groove 20 - 25mm deep, 10mm wide and sealed if necessary. Alternatively a filler strip of hardboard the same depth as the slab can be used to form a joint.

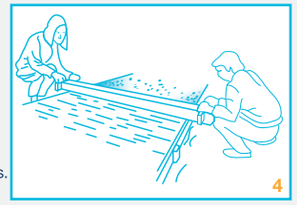


1 Alternate bay construction to keep bays a manageable size.

2 Form a joint by tamping in steel section to form a groove.

3 Place concrete against both sides of hardboard filler strip.

4 Use a timber beam for compacting slabs, paths or drives.



The Right Mix for the Job

Always use a concrete mix suitable for its intended application. Tables I and II give details of mixes appropriate for the more usual types of work.

The following general rules apply to all concrete, whether site mixed or readymixed.

- Concrete must be sufficiently workable to allow full compaction after placing. Air voids left in the concrete reduce its strength and durability.
- As workability starts to decrease shortly after mixing, only the quantity of concrete that can be placed and compacted within one hour should be produced at any one time. This is particularly important in hot dry weather.
- The addition of extra water to either increase workability unnecessarily or to restore workability to concrete left unused for extended periods weakens the cement 'glue' and reduces the overall performance of the concrete.

Where concrete slabs are exposed to significant freeze-thaw cycles:

- An air-entraining admixture should be specified/used.
- Aggregates should be frost resistant.

Table I Volume Batching on the Job

Application	Proportions by Volume Cement: All-in-Aggregate*
Foundations	1 : 7
Internal Floors	1 : 6
Paths, patios etc. around the house	1 : 5
Yard-slabs, roads, driveways	1 : 4.5

*60% coarse aggregate and 40% sand by volume generally gives acceptable results. All aggregates should be washed.

Mixing

Mixing for small jobs is carried out either by hand or using a drum mixer. When mixing by hand, a hard, smooth surface such as plywood or a concrete yard should be used. Care should be taken in assessing quantities of cement, aggregate and water. Quantities given in this leaflet are given by volume rather than by weight.

Readymix concrete producers employ a standard mix designation which should be used when ordering concrete. The initial figure in the Mix Designation column indicates the minimum characteristic strength of a cylinder and the latter figure indicates the minimum characteristic cube strength.

Table II Readymixed Concrete

Application (unreinforced)	Concrete Strength	Mix Designation
Foundations	20N	C16/20
Internal Floors	25N	C20/25
Paths, patios etc. around the house	30N	C25/30
Yard-slabs, roads, driveways	37N	C30/37

Note that: 1. Workability = Medium (slump class S2)
2. Maximum Aggregate Size = 20mm (D20)