BRITISH READY-MIXED CONCRETE ASSOCIATION

Do’s and Don’ts of Ready-mixed Concrete

A document offering practical guidance for all users on the ‘Do’s and Don’ts of Ready-mixed concrete’ covering:

Ordering
Delivery
Placement and vibration
Formwork
Floating and finishing (slabs)
Cold and hot weather working
Cracking
Quality guarantees
Health and safety

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Figure 1 - Concrete testing procedure

Ordering

Enquiry and tender stage:

As much information as possible should be provided to the ready-mixed concrete company at the enquiry/tender stage. The contract specification may contain specific information pertaining to constituent material restrictions, minimum cement contents and/or maximum water cement ratios and it is therefore essential that the ready-mixed concrete supplier has sight of this in order to determine if the locally held materials will be suitable and/or whether alternative materials need to be sourced.

Please note that if you do not supply the full contract specification, this may lead to incorrect concrete being ordered.

Additionally, it is essential that the correct consistence/workability is specified for the job in hand at this stage (Please see page 4 of this document for further information).

An estimate of the volume of concrete required is essential. However, any additional information pertaining to 'placement rates' would also be extremely useful, as forward planning will allow the ready-mixed concrete producer to plan for the use of additional vehicles and/or late working etc.

Placement of order:

To avoid confusion, always make reference to the quotation and concrete reference number/letter when ordering rather than referring to the concrete mix description or part of it, as it is highly likely that a number of concretes will have the same compressive strength class, but may then differ in terms of the specified maximum water cement ratio and/or minimum cement content.

Your order and subsequent delivery of ready-mixed concrete will be based upon the requested consistence/workability, however this may be amended subject to additional cost where necessary. In this respect, additional costs may be incurred if the original consistence/workability of the concrete is increased, as additional cementitious material will be required to maintain the strength and/or maximum water cement ratio requirements.

Please order the correct consistence for the job in hand, rather than adding water on site, as this is bad practice and will adversely affect the quality of the final product. It will also render void any guarantees with regard to the concrete.

Please also allow sufficient lead in time for delivery when placing your order.

Specific advice for DIY customers:

Ready-mixed concrete companies can advise you as to the recommended concrete to be used for a specific purpose (based upon relevant British/European Standards), and will also be able to help with regard to calculating the quantities/volume of concrete required.

Please ask about the use of 'self compacting concrete' as this may be an ideal option with regard to ease of placement, serving to reduce your time and effort and also your overall costs. However, please be aware that this is only suitable for projects where the top surface is approximately level.

Coloured and pattern imprinted concretes are also available (please ask the ready-mixed concrete company for more details).

Ordering continued

Selecting the correct concrete:

The following table has been extracted from BS 8500-1 and provides guidance for typical applications. However, please note that if a contract specification exists, the mixes specified therein take precedent.

Table 1 – BS 8500-1 Extract

Application [A), B)]	Designated concrete	Standardized prescribed concrete	Recommended consistence class
Unreinforced foundations [B)] ***and associated works requiring DC-1 concrete***			
Blinding and mass concrete fill	GEN1	ST2	S3 [C)]
Strip footings	GEN1	ST2	S3 [C)]
Mass concrete foundations	GEN1	ST2	S3 [C)]
Trench fill foundations	GEN1	ST2	S4
Drainage works to give immediate support	GEN1	ST2	S1
Other drainage works	GEN1	ST2	S3 [C)]
Oversite below suspended slabs	GEN1	ST2	S3 [C)]
Unreinforced foundations requiring DC-2 to DC-4 concrete [B)]			
DC-2	FND2	N/A	S3 [C), D)]
DC-2z	FND2Z	N/A	S3 [C), D)]
DC-3	FND3	N/A	S3 [C), D)]
DC-3z	FND3Z	N/A	S3 [C), D)]
DC-4	FND4	N/A	S3 [C), D)]
DC-4z	FND4Z	N/A	S3 [C), D)]
DC-4m	FND4M	N/A	S3 [C), D)]
General applications			
Kerb bedding and backing	GEN0	ST1	S1
Floors			
House floors with no embedded metal (see Note 2 to 4.2.2)			
• Permanent finish to be added, e.g. a screed or floating floor	GEN1	ST2	S2
• No permanent finish to be added, e.g. carpeted	GEN2	ST3	S2
Garage floors with no embedded metal	GEN3	ST4	S2
Wearing surface: light foot and trolley traffic	RC25/30	ST4	S2
Wearing surface: general industrial	RC32/40	N/A	S2
Wearing surface: heavy industrial [E)]	RC40/50	N/A	S2
Paving			
House drives and domestic parking	PAV1	N/A	S2 [C)]
Heavy-duty external paving with rubber tyre vehicles [E)]	PAV2	N/A	S2 [C), F)]

Please refer to the notes overleaf and the following standards for more information:

BS EN 206-1	Concrete. Specification, performance, production and conformity.
BS 8500	Concrete. Complementary British Standard to BS EN 206-1.
BS 8500-1	Method of specifying and guidance for the specifier.
BS 8500-2	Specification for constituent materials and concrete.

Ordering continued

Supporting notes for Table 1:

A) Concrete containing embedded metal should be treated as reinforced.
B) See Table A.3 of BS 8500-1 for designated concretes for reinforced foundations and reinforced concrete (specialist advice should be sought).
C) This is the default slump class for this designated concrete.
D) For trench fill, the recommended slump class is S4.
E) For extreme applications, e.g. foundry floors and busy public roads, specialist advice should be sought.
F) Depends on method of placing.

Note 2 of BS 8500-1, section 4.2.2:

GEN concrete with relatively low cement or combination content might not be suitable for obtaining satisfactory cast and direct finished surfaces, nor for methods of placing, such as pumping. The suitability of such concrete should be discussed with the producer.

Selecting the correct consistence/workability:

The term 'workability' is now referred to as 'consistence'. The most common way of specifying consistence is by slump class. These classes are given below together with the likely target slump:

Slump class	Likely target slump (mm)
S1	20
S2	70
S3	120
S4	180

Slump is now specified and measured to the nearest 10 mm

Delivery

Most ready-mixed concrete companies have a selection of delivery vehicles, which vary in design and size to suit the type of work undertaken.

Generally, delivery vehicles are available from $2m^3$ to $8m^3$, with the typical size being $6m^3$.

Figure 2 – Typical delivery vehicle

The typical dimensions of a $6m^3$ truck are given below:

Size:

Approximately 9m long, 2.5m wide and 3.8m high.

Weight:

Approximately 10 tonnes when empty and 25 tonnes when fully loaded with normal weight ready-mixed concrete.

Placement from chute:

On arrival at site, the ready-mixed concrete is discharged in a controlled manner down a chute that extends approximately 2.7m from the back of the vehicle. The chute can be manoeuvred from side to side, and to a limited extent vertically to assist in discharging the concrete as close as possible to its final position.

Delivery continued

Alternative delivery vehicles:

Some ready-mixed concrete companies can offer specially designed delivery vehicles that incorporate either a 'concrete pump' or 'conveyor'.

Figure 3 – Concrete truck with in built pump

Figure 4 - Concrete truck with in built conveyor system

The ready-mixed concrete company should be consulted with regard to the availability of 'pump and conveyor' trucks as well as their placement distances, heights, weights, dimensions and extension capabilities.

Delivery continued

Safe access and discharge:

Safe access for the delivery vehicle should be provided, taking into consideration the size and weight of the truck when loaded with ready-mixed concrete, and the ground conditions/access.

Please note that the truck will maintain a safe distance from any excavation or area considered dangerous. Hence, please consider how the concrete is to be moved from the point of discharge to its final position prior to placing an order.

Part load charges:

'Part load' charges may apply. The cost of this will be in-built into your quotation at the enquiry stage.

However, please be aware that if you 'under order' and require an additional delivery to complete the job (often quite small in volume terms), this may be relatively expensive due to the application of further 'part load' charges.

Advice should be sought from the ready-mixed concrete company.

Waiting time charges:

Generally, ready-mixed concrete companies will offer a period of time for adequate discharge, which is free of charge. However, please be aware that charges may be incurred following expiry of this period.

Advice should be sought from the ready-mixed concrete company.

Returned concrete:

Please be aware that if you have over-ordered and wish to return any ready-mixed concrete which has not been discharged from the delivery vehicle, a charge may be incurred.

Advice should be sought from the ready-mixed concrete company.

Placement and vibration

Ready-mixed concrete should be placed as close as possible to its final resting position and vibration should only be used to compact the concrete rather than move it. Additionally, it is advisable not to move ready-mixed concrete long distances from a heap as this may lead to segregation, resulting in honeycombing.

Placement by pump:

When utilising a pump to place ready-mixed concrete, it is essential that the pump supplier is informed of the pumping distances involved. Additionally, please ensure that the ready-mixed concrete company is also informed of the placement technique being applied.

Figure 5 – Truck mounted concrete pump

Delays between ready-mixed concrete deliveries should be avoided when pumping, and it is therefore advisable to discuss and agree suitable delivery rates with the ready-mixed concrete supplier prior to placing an order.

Common (squeeze) pumps can transport ready-mixed concrete distances of up to 90m horizontally and 30m vertically, depending on the mix constituents and design, with more specialist (piston) pumps able to transport ready-mixed concrete distances in excess of the this, but again dependent upon the mix constituents and design. However, sharp bends and sudden changes of pipe section size/type should be avoided.

In both cases, the pipe diameter must be at least three times the maximum aggregate size specified for the concrete.

Prior to placing ready-mixed concrete by pump, please ensure that it is primed with sufficient grout to allow the free flow of concrete though the pipes.

Pumping of lightweight aggregate ready-mixed concrete can be achieved by using special admixtures (pumping aids) to overcome loss of consistence/workability due to absorption. However, technical advice should be sought before ordering this type of concrete.

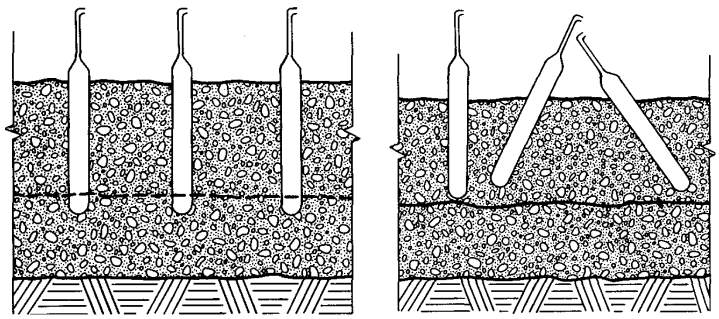
Placement and vibration continued

Placement and vibration into the structure:

It is essential that ready-mixed concrete is placed into the structure with due care and attention and that it is vibrated fully to ensure good compaction.

The following provides guidance on how to achieve this:

- Ready-mixed concrete should be placed in uniform layers, not greater than 500mm and not in large heaps or sloping layers.
- For most applications, slump class S3 should be specified (please see Table 1).
- Ready-mixed concrete should not be allowed to 'free fall' more than 2m.
- The rate of placing and compaction should be equal.
- Walls and columns should be filled at a rate of at least 2-3m (height) per hour, avoiding delays and cold joints.
- Each layer should be fully compacted before placing the next one, and should be placed whilst the underlying one is still plastic.
- A layer of concrete should be placed on the kicker and vibrated before placing any more concrete. This will absorb the energy if concrete is discharged from the top of the form, and thus prevent segregation. This method may be sufficient provided that the concrete does not pass through reinforcement, however in general terms placement by pump hose or tremie is advisable (please see Figure 7).
- In order to remove entrapped air, the poker vibrator should be held vertically in the layer below and brought up slowly whilst placing the additional layer.
- The poker vibrator should be moved around within the wall or column in order that the concrete is vibrated every 0.3 to 0.5m, and for a sufficiently long period of time to visually witness air being expelled.



Correct *Incorrect*

Figure 6 - Use of a poker vibrator

Placement and vibration continued

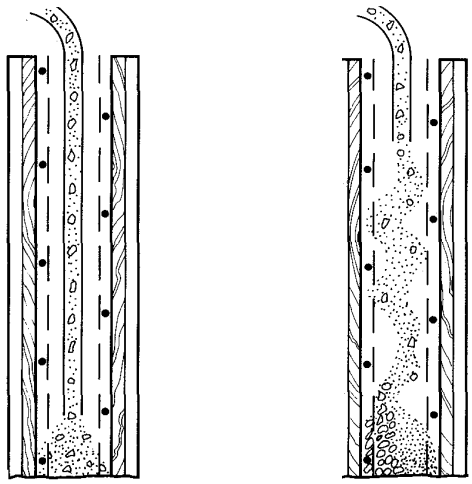
Alternative methods to internal vibration are available and include:

- External vibrators (advice should be sought from formwork manufacturers and/or specialist services contractors).
- The use of self compacting concrete (technical advice should be sought).
- Hand compaction (only to be used in small pours and/or thin sections).

Dropping from height:

As a general rule, to avoid segregation, ready-mixed concrete should not be allowed to 'free fall' from the transfer equipment (e.g. pump or skip) more than 2m.

An over-sanded or pump concrete should be specified when dropping concrete from any height as this will reduce the risk of segregation.



Correct *Incorrect*

Figure 7 - Discharge into a wall via skip/chute

Placement and vibration continued

Placement of concrete on a slope:

When placing ready-mixed concrete on a slope, always specify a low consistence/workability such as slump class S1 and place the concrete from the bottom of the slope, working upwards.

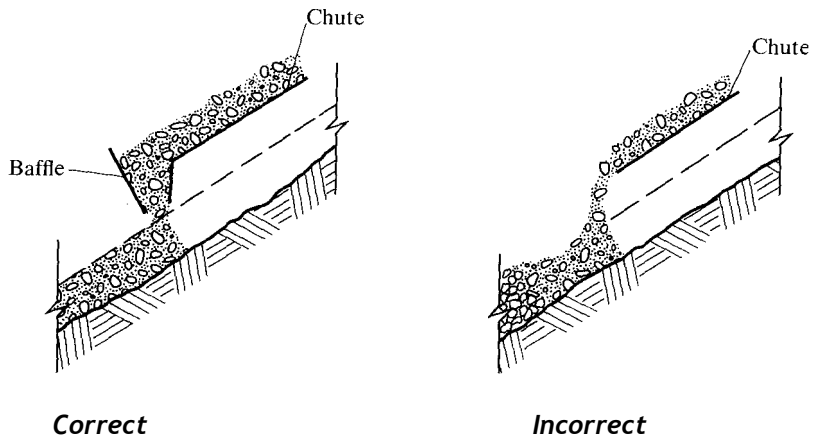


Figure 8 – Placement of concrete on a slope

Use of a tremie:

Placement by tremie is particularly suitable for deep forms where normal placement/compaction methods are not possible. High consistence/workability concrete is fed by gravity through a vertical pipe which is then gradually raised.

The tremie may also be used for placing concrete underwater, but in this case the tremie tube remains immersed in the fresh concrete to minimise wash out of cement.

Use of specialist self compacting concrete (SCC):

SCC is ideal for most types of construction, but specifically where standard methods of placement/compaction are not possible. For instance where heavily reinforced structures are in use or access is difficult.

Slipforming:

Slipforming is a specialist continuous process of placement and compaction, using relatively low consistence/workability concrete. Both horizontal and vertical slipforming can be performed, offering a very high rate of production. However, this should only be undertaken by specialist concrete contractors.

Formwork

Specialist formwork manufacturers/designers should be consulted to ensure that the formwork used is able to withstand the pressures exerted by the ready-mixed concrete in its plastic state.

Only a specialist 'purpose designed proprietary' release agent should be used. It is also essential that the dose or application rate is checked carefully, as different types of formwork material require differing amounts of release agent.

Too little release agent may result in surface defects due to the concrete adhering to the forms, and too much release agent may result in surface defects due to the concrete surface being retarded, causing excess bleeding, resulting in a poor quality finish.

Numerous 'form face' materials are available and it is therefore advisable to carry out a series of trial panels to ascertain the most suitable option prior to commencement of the works.

Precautions:

Sunlight can react with release agents when applied to certain types of formwork material, resulting in colour variation of cast elements. It is therefore advisable to store formwork panels in the shade wherever possible.

SCC requires specific precautions in terms of the formwork and falsework used, and it is therefore advisable to seek specialist technical advice prior to placement.

Striking times:

The contract specification will set out striking times for formwork. However, this will depend upon the ambient temperature, volume of concrete placed and type of cement used.

In cold weather, the concrete may harden more slowly and should be protected from frost. Additional striking and curing time should therefore be allowed. Please refer to the 'Cold and hot weather working' section of this document for further advice.

Floating and finishing concrete (slabs)

Numerous methods of vibration, floating and finishing exist in relation to concrete slab construction, and these are explored in more depth below.

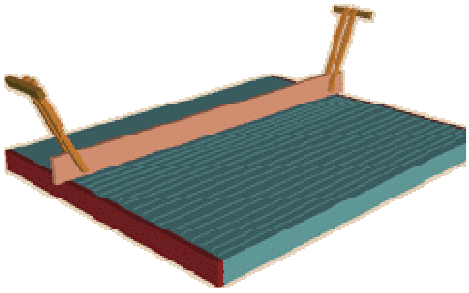
However, it should be noted that irrespective of the method of placement and vibration applied, all ready-mixed concrete for ground slabs should be placed on plastic sheeting to avoid rapid loss of water into the sub base.

Hand float and tamp finish:

A shovel or rake can be used to roughly level the freshly placed ready-mixed concrete. A 'straightedge' tamping beam can then be used to compact the concrete, remove entrapped air and allow smoothing of the surface.

However, it should be noted that a tamping beam will not compact the whole depth of the concrete and additional vibration may be required.

A brushed finish may then be applied to the surface of the concrete following vibration to offer improved 'skid resistance'.



Figures 9 and 10 – Hand tamp and 'brush finish'

Vibrating beam:

A vibrating beam offers more compaction than the 'Hand float' technique described above and should be used for deeper slabs/sections, although a number of passes may still be required in order to obtain a suitable finish.

In addition, please note that additional vibration may be required at the supports to ensure full compaction.

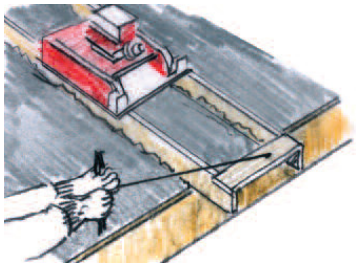


Figure 11 – Vibrating beam

Floating and finishing concrete (slabs) continued

Power finishing:

Power finishing is generally a two stage process as described below:

1. Initially, power floating would be undertaken, whereby the surface is worked/floated, bringing mortar to the surface (sometimes called panning) to produce a level, closed, but not completely smooth finish.

2. Power trowelling is then undertaken, whereby the surface is subsequently densified to produce a polished, smooth and 'case-hardened' finish.

If intending to power finish ready-mixed concrete, it is advisable to contact the ready-mixed concrete company in the first instance to inform them of this, as the concrete design can be adjusted to ensure sufficient cohesiveness for this type of application.

In cold weather, ready-mixed concrete with CEM I or CEM II cement type should also be specified in order to reduce setting times and allow earlier finishing.

Power floating should be performed when the concrete has started to stiffen, but not completely hardened. As a rule of thumb, a 3mm impression with the heal of a boot would signify that the concrete has hardened sufficiently for this process to begin.

Power trowelling may follow several hours later dependent upon the ambient temperature.

Figure 12 – Power float

Note - This type of finish should only be attempted by professionals with experience of power floating and concrete performance.

Floating and finishing concrete (slabs) continued

Precautions:

Finishing too soon

If ready-mixed concrete is 'finished' too early, when it is still bleeding, surface delamination may result.

This occurs when water rising from the concrete is trapped below the surface, thus separating the surface from the main body of concrete.

In this regard, it is advisable not to 'power finish' air entrained concrete, due to the fact that this type of concrete appears to be ready for floating when it is not. This is because of its particularly good cohesive nature/appearance, which can be deceptive (i.e. it may still be bleeding, although it appears not to be).

Curing

All ready-mixed concrete should be cured and protected from the elements. This includes wind, rain and even sunlight, as any of the above can damage the surface.

In this regard, one of the most commonly experienced surface defect, known as plastic cracking, results from a combination of wind and sun. The 'Cracking' section of this document explores this in more depth.

Surface curing agents are extremely beneficial and should be applied in all cases. Please refer to the product data sheet for further advice with regard to dose or application rates.

Cold and hot weather working

Cold weather working:

Care must be taken when ready-mixed concrete is placed in cold weather, as it may be damaged (if unprotected) to such an extent that it is unfit for use.

In this regard, ready-mixed concrete suppliers monitor both ambient and concrete temperatures and will inform you prior to supply if the temperature of the fresh concrete is likely to fall below 5°C, at which point additional precautions are required.

Notwithstanding this, at the specific request of the contractor, ready-mixed concrete may still be supplied. However, it is the contractor's responsibility to protect and insulate the concrete on site in order to avoid any frost damage.

It should be noted that surfaces that will be in contact with the freshly placed concrete, including sub-grade materials, should be at a temperature of at least 2°C. In addition, reinforcing bars (and other embedded metal) must be free of ice and snow.

Some ready-mixed concrete companies are able to produce heated concrete, which can be supplied to site at temperatures above 10°C, even in the coldest weather. However, notwithstanding this, the ready-mixed concrete should still be transported, placed and insulated as quickly as possible to avoid heat loss.

In this regard, timber formwork usually offers sufficient insulation. However, steel formwork is a poor insulator, thus requiring the use of additional insulating material which should be fixed to the back of the forms.

Additionally, once placed, exposed concrete surfaces should also be covered with insulating material.

It should be noted that cold temperatures will lead to slower rates of strength gain, and as a result, curing and striking times will be extended.

Cold and hot weather working continued

Hot weather working:

High ambient temperatures will increase the temperature of the fresh concrete, resulting in more rapid hydration of the cement, leading to accelerated hardening.

Ambient temperatures of 20°C should not cause a significant problem. However, precautions should be taken when temperatures approach 30°C.

Rapid evaporation of moisture from exposed surfaces may cause plastic shrinkage cracking and crazing (reference should be made to the 'Cracking section' within this document). Hence, it is essential that suitable curing techniques are utilised.

The following precautions/preparations should be taken in hot weather:

- Specify alternative cement types to CEM I, as these can offer slower hardening characteristics.
- Do not add water to the fresh concrete – apply more men to the job.
- Order the concrete at a suitable consistence/workability (higher than you would normally, due to workability loss through evaporation).
- Apply a curing membrane or cover once placed in order to avoid a wind/sun combination (resulting in cracking).
- Place, compact and finish as quickly as possible.
- Consider specifying a 'retarding' admixture (technical advice should be sought).

Cracking

Concrete may develop cracks for many reasons. However, most can be avoided by good site practice.

Figure 13 (below) depicts the most commonly experienced cracks, followed by Table 2, indicating how these may be avoided and/or rectified.

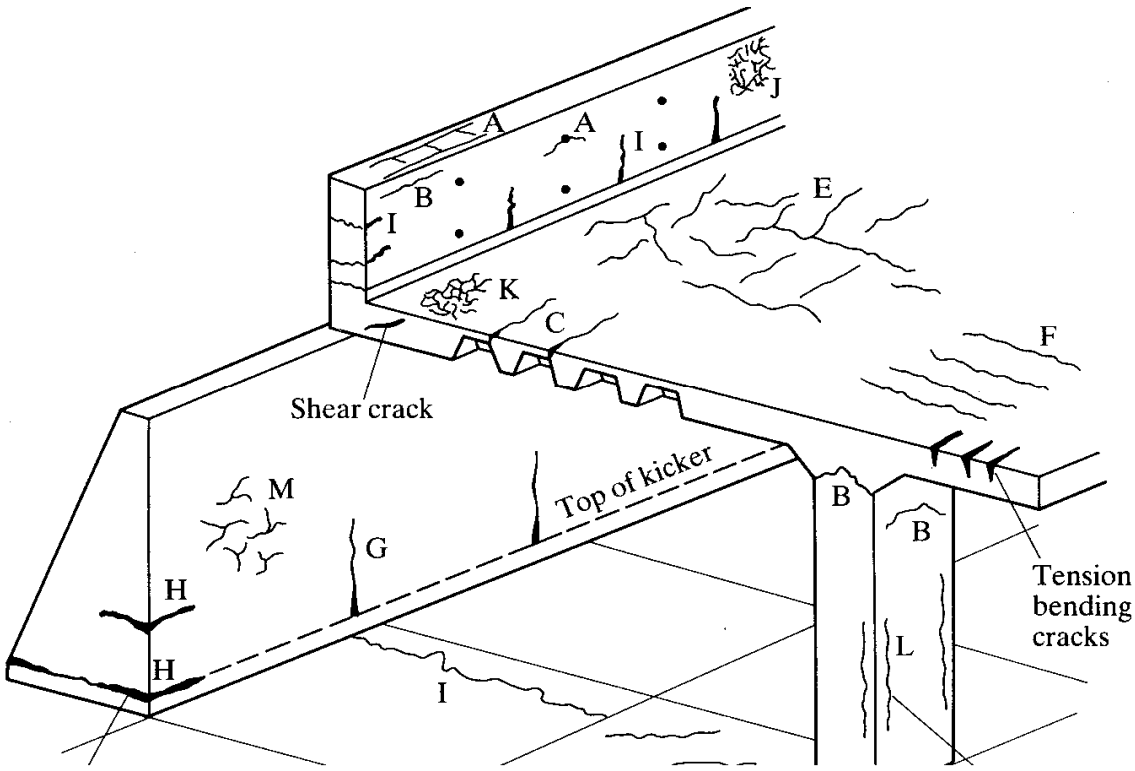


Figure 13 - Commonly experienced cracks

Cracking continued

The following table should be viewed in conjunction with Figure 13, and is designed to offer guidance as to the main causes of cracking, their avoidance and/or rectification.

Table 2 – Summary of commonly experienced cracks

Type of Cracking	Symbol on Schema-tic	Sub Classification	Most common location	Primary Cause (excluding Restraint)	Secondary Causes/ Factors	Remedy	Time of Appear-ance
Plastic Settlement	A	Over Reinforce-ment	Deep Sections	Excess Bleeding	Rapid Early Drying	Reduce Bleeding or Re-vibrate	10 minutes to 3 hours
	B	Arching	Top of Columns	As above	As above	As above	As above
	C	Change in Depth	Trough and Waffle Slabs	As above	As above	As above	As above
Plastic Shrinkage	D	Diagonal	Roads and Slabs	Rapid Early Drying	Low rate of Bleeding	Improve early curing	30 minutes to 6 hours
	E	Random	Reinfor-ced Concrete Slabs	As above	As above	As above	As above
	F	Over Reinforce-ment	Reinfor-ced Concrete Slabs	As above or Steel near to Surface	As above	As above	As above
Thermal Contraction	G	External Restraint	Thick Walls	Excess Heat Generation	Rapid Cooling	Reduce Heat and/or Insulate	1 Day to 2/3 Weeks
	H	Internal Restraint	Thick Slabs	Excess Temp. Gradients	As above	As Above	As above
Long Term Drying Shrinkage	I	Mix Design/ Specification	Thin Slabs and Walls	Inefficient Joints	Excess Shrinkage or Inefficient curing	Reduce Water Content/ Improve Curing	Several Weeks or Months
Crazing	J	Against Formwork	As Struck Concrete	Imperm-eable Formwork	High Cement Content and Poor Curing	Improve Curing and Finishing	1-7 Days or Sometime s much later
	K	Floated Concrete	Slabs	Over Trowelling	As above	As above	As above
Corrosion of Reinfor-cement	L	Natural	Columns and Beams	Lack of Cover	Defective Concrete	Improve Cover/ Concrete Design	More than 2 Years
Alkali Silica Reaction (ASR)	M	Chemical Reaction	Damp Locations	Incorrect Concrete Design for Conditions	-	Ensure correct mix specific-ation	Long Term

Quality guarantees

The technical expertise of BRMCA members is second to none. All BRMCA members undergo independent audits undertaken by UKAS accredited certifying bodies, either:

- QSRMC (The Quality Scheme for Ready Mixed Concrete) – www.qsrmc.co.uk
- BSI (British Standards Institution) – www.bsi-global.com

Both QSRMC and BSI are accredited by the United Kingdom Accreditation Service (UKAS) for product conformity and quality management systems certification. Accreditation provides assurance that QSRMC and BSI operate in accordance with international standards.

The schemes operate independently and provide BS EN ISO 9001:2000 and product conformity certification for the design, production and supply of ready-mixed concrete to BS EN 206-1 and BS 8500.

QSRMC and BSI set the certification standards for ready-mixed concrete and all BRMCA members must be accredited against these requirements in order to maintain their membership of the association.

QSRMC is the specific industry scheme, concentrating solely on the production and control of ready-mixed concrete, with BSI offering a range of services to a wide variety of industries.

Companies awarded QSRMC or BSI certification are licensed to use the certification mark on literature and documentation, including quotations and delivery tickets.

The QSRMC and BSI marks are the best known and most widely specified certification marks for ready-mixed concrete.

The regulation and assessment standards are under the control of a governing board, the members of which are either directly involved in specifying/purchasing concrete or in supplying the product.

Health and safety

BS 8500: Hazard warnings:

Where skin is in contact with fresh concrete, skin irritations are likely to occur owing to the alkaline nature of cement. The abrasive effects of sand and aggregate in the concrete can aggravate the condition.

Potential effects range from dry skin, irritant contact dermatitis, to - in cases of prolonged exposure - severe burns. Take precautions to avoid dry cement entering the eyes, mouth and nose when mixing mortar or concrete by wearing suitable protective clothing.

Take care to prevent fresh concrete from entering boots and use working methods that do not require personnel to kneel in fresh concrete.

Unlike heat burns, cement burns might not be felt until some time after contact with fresh concrete, so there might be no warning of damage occurring.

If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay.

Wash wet concrete off the skin immediately. Barrier creams may be used to supplement protective clothing but are not an alternative means of protection.

Lifting and placing concrete:

Ready-mixed concrete is heavy, with a standard barrow load weighing over 100 kg, so lifting/carrying just a small volume may cause physical injury. It is therefore essential that you follow health and safety regulations in order that you may place, compact and finish the work without straining yourself.

Use of vibrating pokers and equipment:

Certain types of plant create a large amount of vibration during use (e.g. pneumatic hammers, drills, grinders and vibrating pokers). Prolonged exposure to vibration can cause carpal tunnel syndrome and hand arm vibration syndrome (HAVS).

It is possible to reduce the effects of vibration by selecting plant with vibration dampeners, by using anti-vibration gloves, taking regular breaks and/or by keeping your hands warm in cold weather.

Please seek advice from the manufacturer with regard to the use of this type of equipment.

Health and safety continued

Protect yourself when working with concrete:

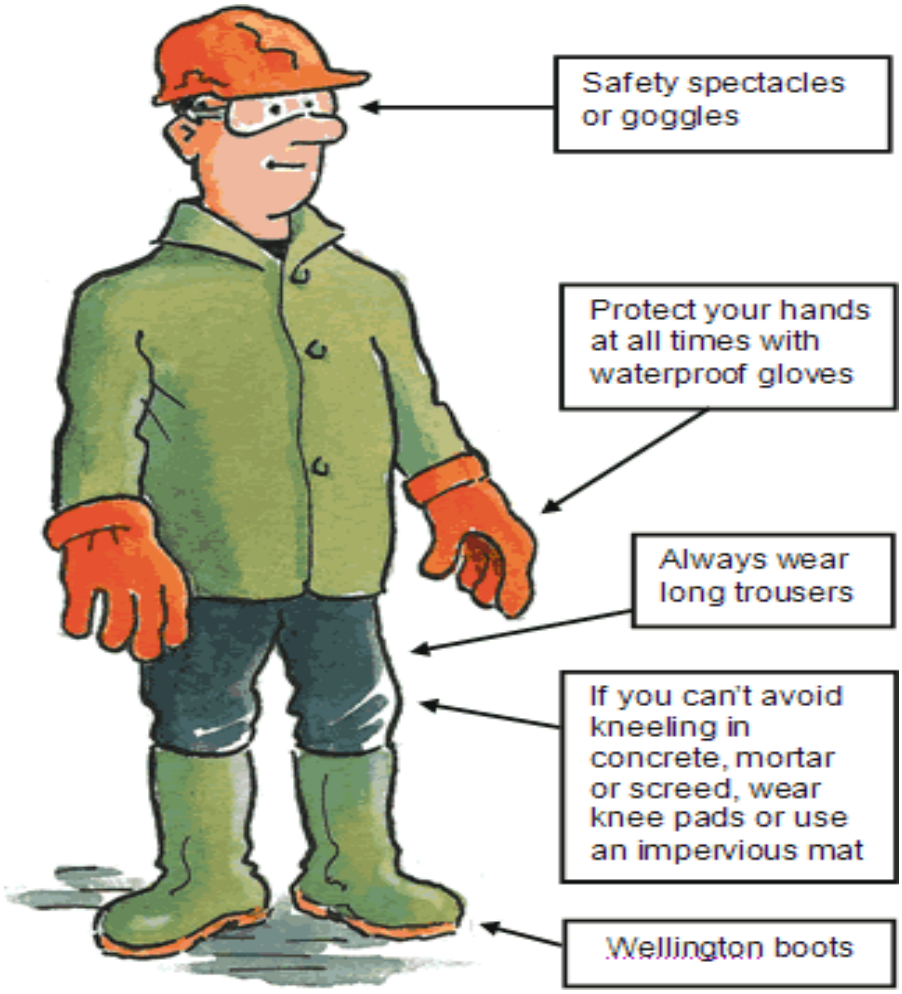


Figure 14 – Personal protective equipment

Appendix A – Glossary of terms/references

Glossary of terms:

Bleeding

Separation of water from fresh concrete.

Consistence/workability:

How workable the concrete is and how easily it can be moved into position.

Curing:

Method of protecting concrete during its early life, ensuring future durability and surface finish.

DC Class

A classification system that takes into account several factors such as the chemical composition of the ground or groundwater, the type of site (natural or brownfield), the pH and mobility of groundwater, the type of concrete element and its working life. Consideration of all these parameters leads to the specification of a suitable concrete to resist chemical attack.

Delamination:

A defect where the hardened surface layer of the concrete (known as laitance) becomes separated from the main body of concrete.

Segregation

This is the separation of the coarse aggregate (larger particles) from the main body of concrete.

Tremie:

A type of pipe used to position concrete more effectively when working at height.

Vibrating poker

An instrument used to vibrate ready-mixed concrete, inserted into the freshly placed concrete and used to remove entrapped air.

Self compacting concrete (SCC)

Ready-mixed concrete that is able to flow and consolidate under its own weight, completely filling the formwork even in the presence of dense reinforcement, whilst maintaining homogeneity and without the need for any additional compaction.

References:

The Concrete Society (Illustrations throughout)
A.M Neville and JJ Brooks – Concrete Technology

BRITISH READY-MIXED
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First Published January 2009