DGCOS
Ombudsman Scheme

Installer Guide

Building a Conservatory

Contents

Please note:
This guidance document is the product of issues and defects we have seen over the last 10 years. We are providing you with this information as a general guide only to some but not all of the elements of a conservatory build. In all cases the member must satisfy themselves as to the suitability of what they propose to construct, following all of the latest manufacturer's requirements. We hope that this information will help you avoid some of the pitfalls we have seen from the industry.

"It's great being a part of the family representing DGCOS who offer the real deal to the double glazing sector. They are absolutely passionate about improving the industry, protecting customers and providing all-round support for their members with a wide range of benefits, helping to give them the edge in the marketplace."

George Clarke
DGCOS Ambassador

When is a conservatory *actually* a conservatory?

Before considering the actual build process of a conservatory, it is first necessary to establish that the proposed building is in fact a conservatory. This is important because a conservatory is exempt from building regulations. The rules are fairly simple and are recognised by the LABC[1] as:

- **Have at least 50% of its external wall area formed from translucent materials (not including walls within one metre of boundary).**
- **Have at least 75% of its roof area formed from translucent materials.**
- **Be at ground level.**
- **Be effectively thermally separated from the main part of the dwelling[2].**
- **Heating should either be completely independent of the dwelling or be provided with effective controls to operate and isolate the heating from the dwelling[3].**

Providing the building conforms with the aforementioned rules and it is less than 30m^2 in internal floor area, it is exempt from all Building Regulations except that in all cases, electrical and safety glazing regulations must always apply.

It is very important to note that a conservatory can be less than 30m^2 and not be exempt because it does not satisfy the aforementioned rules.

Understanding the above may prevent a situation where it is assumed that a conservatory or orangery less than 30m^2 is being constructed as an exempt building when in fact it may not be, unless it conforms with the aforementioned rules.

This has particular relevance if an installer ceases to trade and has actually built something that is not exempt – the costs to retrospectively make a building compliant can be very expensive.

It is important at this stage to consider if the conservatory requires consideration under the Party Wall Act 1996.

The rules and regulations can be viewed within an explanatory booklet which has been produced by the government.

Find out more →

[1]Local Authority Building Control (LABC) represents all local authority building control teams in England and Wales.
[2]This means that there must be an external quality door or window separating the house from the conservatory. If there is no separation, there is no exemption.
[3]It is generally accepted that TRVs (thermostatic radiator valves) are acceptable as control with a wet system. For underfloor or other electric heating systems providing there is a thermostatic control the requirement will be satisfied.

Assessing the site prior to starting work

The following should apply whether the conservatory is exempt or not.

Before any excavation works are started, the following might prove useful to ensure that the correct foundations are provided at the required depth:-

If no local knowledge of ground conditions is available, local authority Building Control departments sometimes produce guidance to highlight the general ground strata to be found in particular areas. It is particularly useful to know what your excavations are likely to encounter e.g. if an excavation reveals compacted soils mixed with clay, when the local ground condition should be gravel or dry sand, then it is likely that the ground has been filled. Filled ground will require further investigations to determine the best foundation solution.

With filled ground, a trial excavation must be made to assess how much filled ground there is above good load bearing ground. If the good ground is more than 1.50m deep, it is generally accepted that machine excavation in conjunction with trench fill foundation will be required. If the good ground is deeper than approximately 2.50m, a short bored piling solution should be considered for safety and cost considerations.

Note the existence of any trees close to the proposed site. Identify their type and find out if their roots are likely to spread out to affect the foundations by drying out the ground, which if clay, could shrink as the trees grow and their water demand increases. Note also if any trees have been felled recently as this too can affect clay subsoils by decreasing the amount of water being absorbed by the trees, which could cause the clay to expand and cause heave, affecting the foundations.

Photographs of the site and surroundings should be taken if no trees exist. These photographs could prove valuable, if in the future, trees are planted, which affect the foundations and create a structural problem that some may attribute (falsely) to the constructor of the conservatory. The photographs will prove useful in defending any future action.

Existing drains

Existing drain runs must be established before work commences because there have been many changes about who is responsible for drains in and around properties.

The subject of drain responsibility can be complicated and the result of getting it wrong can be very serious. Please research this by using this online tool.

Find out more →

If after researching the above you find that a drain within your site is owned by the sewerage company, you must apply to them for permission to build over or alter any such drain.

Even if none of the drains affected by your work require prior approval, it is never acceptable to build over a manhole, even if a sealed cover is fitted. In all cases, the affected drain must be re-routed.

Excavations

All vegetable soil must be removed from the area of the conservatory. Floor slabs should never be constructed on virgin soil even if well compacted hardcore is used. Floor slabs constructed over veg soil will inevitably sink over time causing gaps under skirtings.

Unless a trial excavation has been carried out before work commences (which is always to be recommended), the actual ground conditions will only be known once excavations have started, so it is vital to be able to assess what is in the ground as work proceeds.

If you don't already know the soil type of your plot, a good starting point is to call your local authority Building Control department. They can give you an idea of the typical soil type in the area you are building and the sort of foundation that is appropriate. Most local authorities produce a fact sheet on typical foundation solutions for different soil types commonly found in the area.

Whatever type of ground is to be found in the actual excavation trench, it is nearly always the case when building onto an existing house, that the area next to the house wall will have been backfilled with anything available to the builder at the time. This needs careful consideration and will usually require the backfill to be removed to expose the house foundation. The area can then be filled and compacted as the work proceeds.

If the ground is clay, there are different types that require different depths, to avoid being affected by expansion or contraction of the clay. Without getting into the various solutions for different types of clay, as a general rule of thumb, providing there are no trees close-by, foundations should be taken to 1000mm deep (as a suggestion, this depth should be quoted for within the fixed price cost of the build, but with the understanding that should the ground conditions dictate, any additional depths or different foundation design will attract additional costs, which must be agreed with the client before any further work is done).

If during excavations tree roots are found, appropriate measures must be taken to ensure that the roots do not affect the foundations. Different measures are required depending on the soil type. It may be necessary to dig the foundation deeper depending on how close the offending tree or trees are to the foundation. This is a complex subject, therefore it is recommended that further advice be sought from a structural engineer, ground investigation company or even your local Building Control Officer (BCO) if you have an established relationship with him or her.

Foundations in all types of ground must be designed according to the load bearing capacity of the ground.

The building regulation Approved Document A – Structure gives useful information on foundation design for different types of ground conditions. You can review this document online.

Find out more →

Within the above, there are very useful practical tests for assessing the load bearing capacity of different types of ground, which could help when designing your own foundations.

To find your local authority building control department click the button below.

Find out more →

Foundations

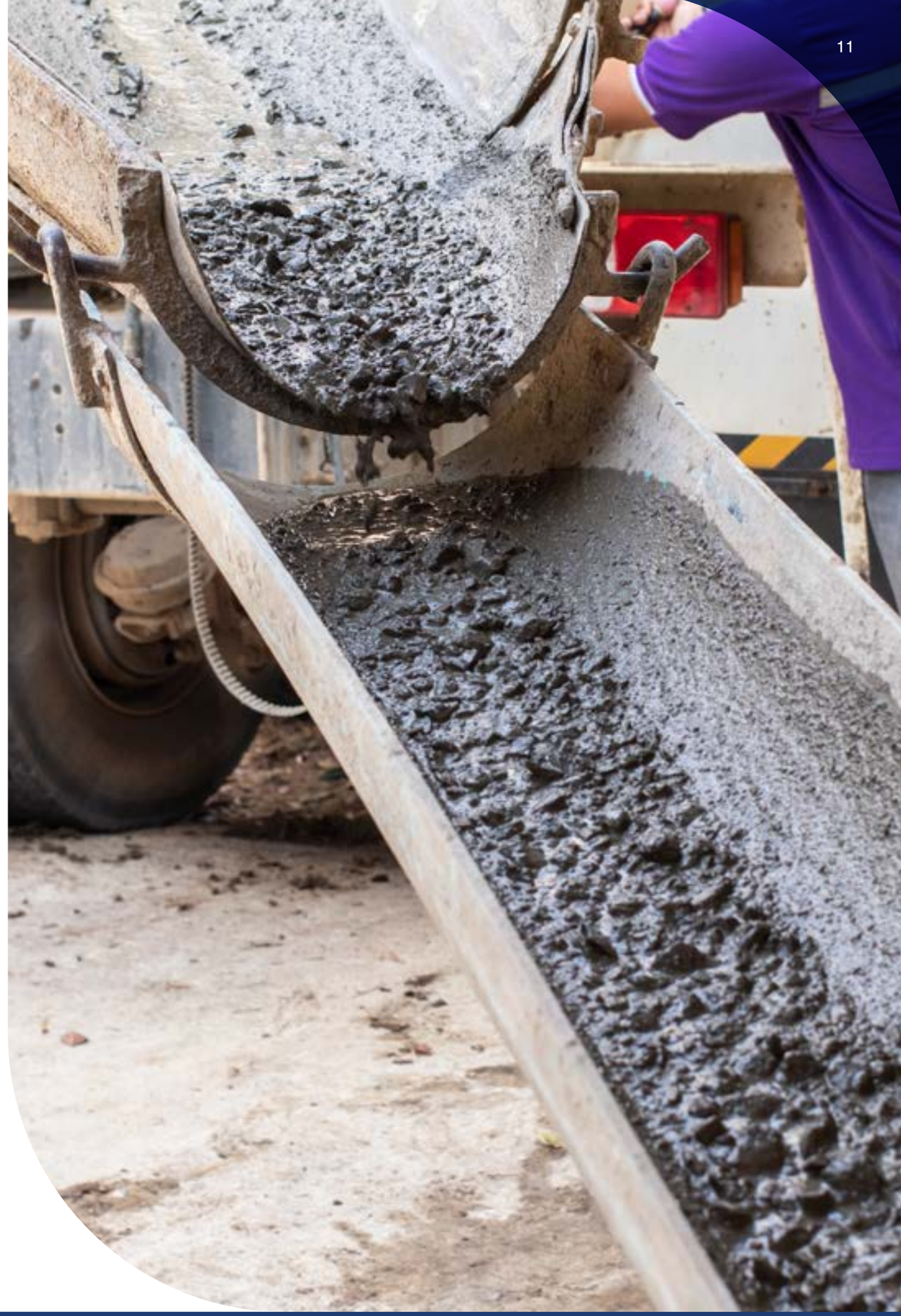
The actual foundation will normally be a strip type which should be a minimum of 150mm thick and the width must be the width of the wall plus twice the thickness i.e. assuming the wall is a standard cavity say 275mm wide, the foundation width must be 275 + 2 x 150 = 575mm but of course 600mm may suit a digger bucket better.

The actual depth will depend on the load bearing capacity of the ground, the proximity of trees and even the water table level.

The foundation must be centred under the wall, to prevent uneven loading on the ground bearing strata, which could cause damage to walls if the foundation tilts.

Do’s and don’ts when pouring concrete foundations

- **Do make sure the foundation trench is clean and dry without any silt lying.**
- **Do ensure that the foundation is not constructed in separate pieces (perhaps to miss existing drains) as this will inevitably lead to differential movement and future foundation issues.**
- **Do make sure any drains are protected and isolated from the foundation.**
- **Don’t start pouring one day and restart on another day without fitting starter bars between old and new pours to ensure that the foundations are properly tied together.**
- **Don’t hand mix concrete, use a consistent source of ready mix.**
- **Do use a suitable strength of concrete for whatever foundation type is being used. Your ready mix concrete supplier will advise.**



Substructure including floor slab

Substructure: assuming ground bearing insulated floor slab

Before commencing with sub-structure brick/blockwork, it is vital to ensure that any underfloor vents from the existing suspended floor (if it exists) are extended through the underfloor area to the outside air to maintain the existing house underfloor ventilation.

Substructure brick/block up to dpc should be built to whatever critical dimensions have been given for the framework. The walls should be centred on the foundation and tied to the existing house wall, normally using a stainless steel wall starter system.

When the substructure brick/blockwork is set and assuming vegsoil has been stripped off to reveal good firm virgin ground, any muck or other debris must be cleaned out of the inside of the foundation trench around the perimeter from foundation concrete level up to formation.

Lay and compact well graded clean hardstone in 100mm layers into the perimeter foundation trench up to formation level.

Lay well compacted hardstone sub-base over the floor area in 100mm layers up to level of floor slab construction. It is very important to use a well graded hardstone with an ideal maximum size of 40mm down to dust, commonly known as MOT Type 1. This specification compacts easily providing it is laid in compacted layers not exceeding 100mm.

It is important to know that the sub-base should not be deeper than 600mm. Any greater depth than that requires a suspended floor design.

Normally a 25 – 50mm sand layer is laid onto the hardstone layer onto which either the damp proof membrane (DPM) or insulation is laid – there is great debate about which should be first however, if insulation is laid first with damp proof membrane (DPM) on top, this prevents concrete from getting under the insulation when the slab is being cast.

The DPM must be of sufficient weight to withstand the normal heavy use it will sustain during site use and in particular if the dpm is laid on top of insulation, it will be exposed to foot traffic during the concrete pour stage, even when care is taken and walking planks are used. Care should also be taken when barrows running in concrete are upended as the front rail can puncture the DPM. The DPM itself, must be carefully laid and if possible should be in one whole piece with corners folded rather than cut to avoid attempting to stick waterproof tape in difficult weather and normal less than pristine site conditions.

Particular attention should be given to the DPM when forming door openings because the concrete slab must run in to the inside of the outside brickwork skin.

Whether or not insulation is being provided beneath the concrete slab, it is vital that the floor edge is insulated against the outside wall to prevent cold bridging. Normally a 25mm insulation strip is laid around the floor perimeter.

Concrete for the floor slab, assuming readymix is being used, should be specified normally by the readymix concrete company. If considering mixing on site, a minimum of 1:2:4 cement, sand & course aggregate should be used. On a practical level, using a half bag mixer, and “all in aggregate” or ballast, the proportions of 1 cement to 5 of all in aggregate should suffice.

Superstructure

From floor slab level upwards, there are many variations in the way that the “walls” up to roof level can be built.

Assuming a fairly common situation where a conservatory is fitted against an existing house wall and there are low level walls approximately 600 - 700mm high around 3 sides, with window sections fitted above to complete the walls up to roof level.

Normally the walls would be built from DPC level using two skins of brick or block. The walls must be connected together with wall ties usually at 900mm horizontal and 450mm vertical centres. Additional ties at 300mm vertical centres must be fitted at door openings even though the cavities will be closed.

Before work starts on building the dwarf walls, a decision needs to be made about whether it is practical or even possible structurally to introduce a vertical DPC into the existing house wall to prevent tracking from outside to inside. If it is practical and structurally acceptable, a full height vertical DPC should always be fitted.

The walls will normally be built to match the existing house as near as possible. If no match is possible alternatives must be discussed with the client.

Both skins of the cavity wall should be connected to the exiting house wall using cranked wall ties or a wall starter kit.

The cavity closure at door openings must include a vertical dpc located against the inside of the outside wall. The DPC should ideally project into the opening by approximately 10mm so that when the door frame is fitted up to the DPC, there will be no possibility of the inside plasterwork touching the outside wall, which is a common cause of dampness in this area.

The erection procedure for the new building will differ dependent on the type of construction material and style of the building and therefore advice should be sought from the system supplier.

In all cases the very latest kit manufacturer’s guidance must be followed because things do change. A very important case in point, is that most kit manufacturers have given additional guidance on the support for box gutters. In most cases, it is no longer acceptable to rely on facia or even rafter fixings. Gallows brackets or some other method of load bearing support must now be used in conjunction with facia or rafter fixings which of course are vital for positioning purposes during construction.

In all installations of the superstructure, work should commence with checking the overall height to the apex of the glazed extension, ensuring that it will fit and not obstruct any high-level windows or the roof soffit line.

The dwarf wall should be checked to ensure that it has been constructed to the correct structural and dimensional specification including door opening positions and sizes.

The next critical stage is to lay out the perimeter sill of the wall-frames on the base or brickwork. If sills are supplied over length, it is essential to check prior to cutting, that the sub-sills fit the brickwork. A check should also be made to ensure it is dimensionally correct to receive the wall-frames. Sills should be located, levelled and fixed in place. A mortar bed may be used to support the sill and any structural member required to transfer the vertical loading to the base should be incorporated and fixed at this stage.

Superstructure (continued)

Assembly of the wall-frames can now take place and all fixings should be in accordance with manufacturers' recommendations. After checking the wall frames are vertical and plumb, the eaves/perimeter ring beam can be fitted. The sequence of erection and glazing of the conservatory roof will be in accordance with the roof system supplier's manual.

Careful consideration should be given to the use of Muntin bars and roof windows/ vents, as issues with leaking are a major source of problems in the industry. The reasons for the high number of failures with these components appears to be related to on-site assembly, in particular, issues of bad weather preventing adequate conditions for applying sealants successfully.

Regarding the eaves beam, it is vital that any corner mitres and the connection of the eaves beam along the top of the wall frames are sealed. This is to prevent any water that drives behind the eaves gutter from entering under the eaves beam, where it can run along the top of the wall frames and migrate downwards, causing dampness or even running water ingress.

The roof kit will commonly include a box gutter to be fitted along the intersection of the new roof with the house roof.

There are many methods of making a watertight connection between the box gutter and the existing roof. Whatever method is used, it is the installer's responsibility to ensure that the connection is watertight, unless of course there are issues with the existing roof. This is a common area of dispute therefore serious thought, in conjunction with some exploratory investigation before work commences on the roof, should be considered.

Drainage in relation to roof run-off

In a common situation where a conservatory roof or box gutter intersects the existing house gutter, usually some adjustments have to be made to ensure that the run-off from the existing roof is not compromised.

Where the existing roof surface that drains into the existing gutter is large, it may not be good enough to add the additional run off from a conservatory into the existing gutter system.

There are many relatively simple methods of calculating the size of gutters and outlet pipes on the internet to assist in deciding the best course of action depending on the exact situation.

Without endorsing any manufacturer in particular, the following may be helpful.

Find out more →

Whatever the actual situation, it is vital that in any case, the existing drainage is not made worse by the introduction of a new conservatory.

If new rainwater pipes are required then if possible they must be connected to an appropriate rainwater drain. An appropriate drain may mean different things depending on the actual situation, for instance, if building on a relatively new housing development, the drainage systems will be separated into foul and surface water. It is illegal to connect any rainwater into the foul drain. On older properties, the drainage systems may be combined therefore, a connection can be made into any suitable drain.

In some cases, a soakaway solution may be considered however, this is not as simple as just digging a hole and filling it will bricks. The clue here is in the name “soakaway” which refers to the ability of the ground to allow some percolation of water.

If a hole is dug in clay and filled with bricks or rubble, no water will drain out of the hole and within a very short time, the drains connected to it will back up. So before considering a soakaway, a percolation test must be done.

The percolation test is simply a hole dug into the ground down to a level approximately 300mm below the proposed drain invert. The hole is filled with water and the levels are checked at regular intervals to see how fast or slow the water level drops. Obviously if the water does not drain away, a soakaway will not work.

Assuming the water does drain away, there are fairly complicated calculations that can be undertaken to interpret the results of the percolation test therefore, to be certain that the right size of soakaway is properly designed, further advice should be sought from a specialist, or research the methods of calculation on the internet.

There are practical solutions assuming the ground percolates using purpose made soakaway crates and manufacturers provide guidance on the size and number of crates required to drain given areas of roof – as an example of many available, please see the table overleaf.

It should be remembered that where a soakaway is being excavated, the depth quoted in most cases refers to the depth below the invert of the incoming drain and not the overall depth from ground level.

Lastly, a soakaway cannot be made within 5.00m of a habitable building or within 2.5m of the property boundary.

Guidance on crate usage

Effective roof area (square metres)	Size of soakaway crates needed (cubic metres)	Number of polystorm crates required
50 m^2	1.0m^3 (1000 litres)	5
60 m^2	1.2m^3 (1200 litres)	6
80 m^2	1.6m^3 (1600 litres)	8
100 m^2	2.0m^3 (2000 litres)	10

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