Freefoam
Plastic Building Products

Technical & Specification Manual

CI/SFB
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INDEX

INTRODUCTION

Why do so few people actually read their manuals? How come the best video cassette recorders need the simple skills of an illiterate twelve-year old, when the rest of us can't even manage to record EastEnders?
Probably because manuals always manage to make things sound difficult when, of course, they're supposed to make life simple. All you need for roofline and cladding are:

- a lot of common sense;
- some inspiration;
- a hammer and a saw;
- a spirit level;
- a pencil;
- a tape measure and (usually) a ladder;
- the desire to make a decent living.

Oh, and a good manual.

The inspiration comes when you decide to use Freefoam, though, as the manufacturers, we reckon it's just common sense, largely because it comprises a wide range of cost-effective quality products. They're lead-free, and everyone knows that lead is an extremely toxic substance, the use of which is to be avoided wherever possible.
Ask your customers if they'd like their roofline or cladding with or without lead, and you know what they're going to say. Unleaded every time, especially when it doesn't affect the cost. Nor do they contain CFCs or cadmium, both of which are also harmful to the environment. By choosing Freefoam, you and your customers are doing something for the environment.
No lead means immediate benefits, too. It's one thing to value "Green"" issues but it can be more important, in the short term, to be free of "Pink" issues - the colour a lot of PVC-UE can go when lead is used incorrectly in the compound from which it's made. When you want white profile, neither you nor the customer wants pink a few years (or even a few months) down the line. It's bad for business.
Until recently, the only property of lead that anyone knew about was that it's heavy. The absence of lead from Freefoam profiles therefore means a bonus for the installer - it's less weight to carry. It might not sound much, unless you're the guy that has to carry a few 5 metre lengths (or worse still packs) of it around all day.
Instead of just white or brown, the Freefoam range also comes in colours. Because of state-of-the-art manufacturing techniques, using advanced compounds, Freefoam colours have been tested to prove they stay the same, without fading, for years and years.

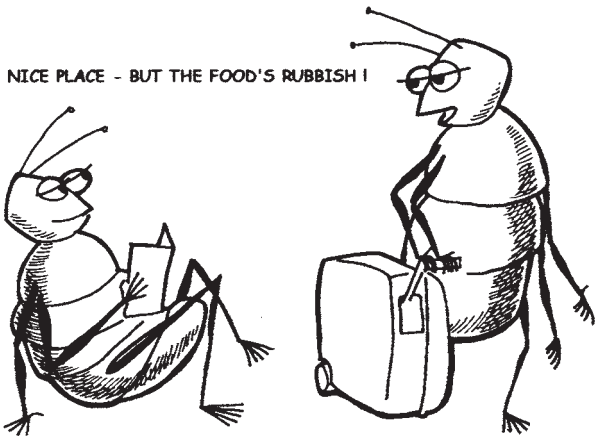
PERFORMANCE and PROPERTIES

Freefoam roofline and cladding products are made from cellular PVC-UE foam, in accordance with British Standard specification BS 7619:1993. They're colour-fast, as defined by BS 1006, (because they're lead-free) so there should be no visible change in twenty years, and they achieve Class 1 surface spread of flame, as defined by BS 476: Part 7:1987.

Quality assurance is something that many take for granted today - to the extent that not having ISO 9001 means a company's products are not acceptable. Needless to say, Freefoam Plastics is a Quality Assured ISO 9001 company. And don't forget, this International Standard DOESN'T apply to products - only to the companies making them.

Whilst Freefoam roofline and cladding products are lightweight, they're also rigid enough to comply with BS 7619: 1993 - tests for impact strength. The material is impermeable to water and an extremely good thermal insulator - about six times better than softwood, in fact. With ever more stringent Building Regulations coming into force, that's becoming an important consideration. All good points, and pretty much what you'd expect. PVC-UE isn't nutritious and it tastes awful, thus ensuring it won't be eaten by termites or woodworm, and it doesn't support fungal growth so, even in the most sheltered areas, it doesn't acquire a green patina.

fig 1



DESIGN CONSIDERATIONS

Condensation

When working with roofs, cladding or windows, it helps to know a bit about condensation. When working with timber-framed buildings, it's *essential.* People generally believe that condensation can be cured by fitting double-glazing. It can't. It just moves the problem somewhere else.

A short explanation. . .
Unless you're in the Mojave Desert, the air usually contains moisture. The warmer the air, the more moisture it can hold, as anyone who's been to Orlando knows. Also, the higher you go, the cooler it gets. So, when your Boeing 757 climbs out of Gatwick or Manchester, you pass through cloud fairly quickly. The bottom edge of the clouds is where the air is too cool to hold moisture without it condensing . . . into cloud.

It's much the same in a house, except that water vapour (what we wrongly call steam) is let out of the bathroom window before it forms into real clouds. The air in warm houses (and roofspaces etc) can hold more moisture than cold ones. If any surface, such as a window, wall or roof, is cold, moisture will condense on it. Fit double-glazing and the moisture goes somewhere else - usually the north-facing wall. Where the temperature falls below the air's ability to hold moisture is called Dew Point. If it occurs within a wall (especially a timber-framed wall) this causes problems.
Damp proof membranes keep rainwater out but they don't stop the build-up of condensation. "Dew Point" can be calculated and, ideally, it should always occur in the middle of the cavity of a wall. If it's in the inner leaf, it leads to mould growth - the first (but not the last) sign of trouble.

Cures? You'll have to read that up somewhere else, because this is a roofline and cladding installation manual, not an encyclopaedia!

Ventilation

Roofs divide into two main categories - pitched and flat. Most of them are made from timber, usually with the ends projecting beyond the walls to ensure they keep the rain out. After that, it starts to get more complicated because there are "warm" roofs and "cold" roofs, and most of them, these days, require ventilation to prevent various forms of decay that might attack the structural timbers and metal components (see fig 2).

Ventilation is provided at the eaves by means of simple purpose-made Iouvred soffit boards but, to be effective, it must be at both sides of the roof and unobstructed. If it isn't, the air can't circulate because, if it's to get in effectively, it must be able to get out somewhere else. The louvred slots are small enough to prevent birds from getting into the void of the eaves, and insect mesh is also available.

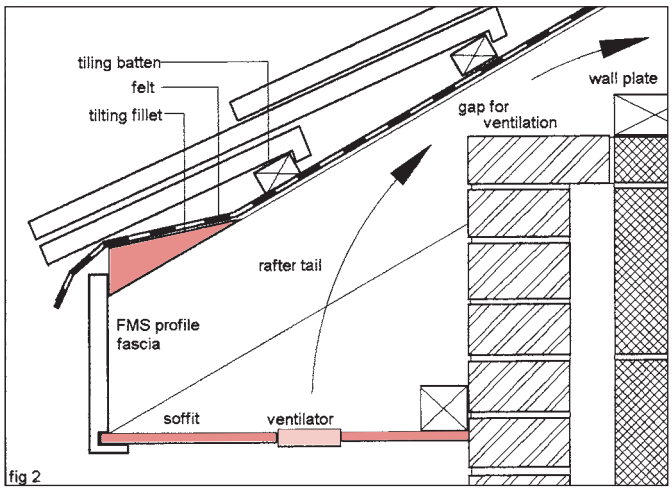


fig 2

Asbestos

Refurbishment work might involve soffits that were made from a range of asbestos-based boards. Chrysotile is a fairly common white asbestos board, whilst Amosite is made from brown asbestos, Crocidolite from blue asbestos *- all **extremely** hazardous substances.*

Before removing, replacing or working with any type of asbestos, it's essential to know the risks and to guard against them. New legislation was introduced in February 1999: ACOP - the Approved Code of Practice, the control of asbestos at work and work with asbestos insulation, asbestos coating and insulating board (Third Edition) gives advice on how to comply with the law.

SAFETY - It's always wise to check for the presence of asbestos and, where it's believed to be present (and since most of us aren't experts on the subject), get it tested.

When working commercially, on jobs where the Construction (Design & Management) - better known as CDM - Regulations apply, you'll need written method statements stating how you deal with these eventualities. The Health & Safety Executive's (HSE) advice is usually quite clear on the matter - if possible, leave asbestos where it is. This means over-boarding, no bad thing when asbestos-based boards aren't liable to rot or decay. By leaving the asbestos where it is, you're also doing your bit for the environment by avoiding the need to dispose of the stuff.

Where asbestos must be removed, it's a specialised (and therefore expensive) job, requiring the right equipment, such as face masks and disposable overalls, the right precautions and strictly-controlled methods of disposal. Whenever asbestos is disturbed, tiny particles are released into the air. They are extremely hazardous to health. This waste must therefore be properly bagged but, even then, it can't just be thrown into a skip because that isn't the end of it. Sooner or later, it will surface on a waste site where it could become someone else's health problem. Before messing with asbestos, the law quite rightly requires that you know what you're doing . . . and can prove it.

Overboarding

Nothing saves money like covering up the existing surfaces. Time is saved because there's no stripping off and therefore no waste to be disposed of. Before quoting for any job, be absolutely certain that overboarding is realistic. If in doubt, take a look at your Code of Practice.

The British Plastics Federation published the first Code of Practice for the installation of Cellular PVC-UE Roofline Products (Document Ref 350/1) in 1994, so everyone in the business should have a copy, even if they don't read it very often. For more information, and/or to obtain a copy, contact the BPF at 6 Bath Place, Rivington Street, London EC2A 3JE (tel: 0207 457 5000).

The Code offers best practice guidance on almost everything that's encountered. In the event of a dispute between a dissatisfied customer and a contractor, this is the document that's usually referred to. If you don't comply with it, you're more likely to be onto a loser. One of the sections is advice AGAINST over-boarding. A case can always be made for doing it, especially where a couple have a reasonably new house (ten years old at the very most) and they're only looking to reduce maintenance.

Anything older, and there's always a chance that rotting timber (or worse) will be discovered. To put it another way, there's the chance that it will be covered. A quote from the Code of Practice, to get your attention:

"To achieve a successful and safe installation, it is essential to create a sound, rigid, working substrate, It is recommended that total replacement rather than capping of existing timbers be adopted where possible. By capping and effectively sealing moist, and perhaps already rotten timber, an environment which is more conducive to fungal attack will be set up and will result in a more rapid deterioration of existing timber. The capping board will tend to "insulate" the rot and promote conditions whereby the fungus can multiply and spread."

In other words, if problems appear after overboarding, and the customer complains or, more likely, makes a claim against you, you're going to be pretty much on your own.

HEALTH & SAFETY

There was a time when, if you wanted to work off a ladder, it was your decision, and there was nothing anyone could do about it. Now they can. . . and do. Even if a ladder is secured to something solid at the top, and properly stabilised at ground level, the Health & Safety Executive say you can only work with one hand, the other being needed to hold the ladder.

This also applies to paid, or so-called self-employed, site personnel too. It is no longer safe (in more sense than one) to assume they know what they're doing and the risks they're taking. Everyone can work out that there are risks involved when working from the top of a ladder. In the event of an accident, an investigation is likely and, if it's found that not enough measures were taken to ensure safe working conditions, money changes hands. A lot of money. You pay the fine.

There are all sorts of alternatives to ladders these days, many of which (such as towers or Easi-Dec roofline access systems) are quite cost-effective and suitable for use even on retail installations. Before assuming that a ladder will do the trick, be very sure indeed that it will.

INSURANCE

Before working on someone else's property, be sure nothing can go wrong that's not covered by an insurance policy. Think about this and you'll come to the conclusion that there's all sorts of things that can go wrong, many of them way beyond your control.

Take it a stage further. What would happen to you, or someone working for your company, if someone alleged theft or, worse still possibly, sexual harassment of some sort. All that's needed, to tie you up in paperwork (at the very least, and that's if you're lucky) for days, if not weeks, is someone to make an allegation.

In other words, ***Public Liability insurance is essential.*** On the basis of the above risks, it's essential, even if someone's going round to a house in the evening to offer a quote. Sit down in their living room, and absolutely *anything* can happen. For this reason, the recommended minimum cover should be £5 million. The cost of cover up to £10 million is also worth a look.

It's not to cover the cost of replacing a couple of plants in the back garden. It's to cover the cost of a team of lawyers, spending weeks, if not months, trying to clear your name. There's enough high-profile people in the news, spending ridiculous amounts of money, just trying to prove they didn't do it or say it. It really could happen to you. Sod's Law says that, if you're not covered, it's more likely to happen to you.

ROOFLINE COMPONENTS

Freefoam offer a comprehensive range of profiles, suitable for virtually every circumstance you'll encounter. This is what you need for replacing roofline:

Fascia codes include:

Ogee Profile

FO - 10mm Ogee profile in various heights plus corners and joiners - FO xxx
FSO - 8mm Slimline Ogee profile for overboarding plus corners and joiners - FSO xxx
FMO - 18mm Magnum Ogee profile plus corners and joiners - FO xxx

Square Edged / Plain Fascia

FW - 10mm Plain Fascia / Reveal Liner plus corners and joiners - FW xxx
FL - 8mm Square Edged Fascia / Reveal Liner plus corners and joiners - FL xxx
FMS - 18mm Magnum Square Leg Fascia plus corners and joiners - FW xxx
FMXS - 25mm Magnum Xtra Square Leg Fascia plus corners and joiners - FW xxx

Round Nose Fascia

FMR - 18mm Magnum Round Nose Fascia plus corners and joiners - FMR xxx
FMD - 15mm Magnum Duo Fascia plus corners and joiners - FMR xxx

Soffit codes include

Solid Soffit:

GPB - 10mm General Purpose Board available in various widths - plus accessories
GPBV - 10mm Pre Vented General Purpose Board available in various widths
GPBDV - 10mm Double Pre Vented General Purpose Board available in various widths

Hollow Soffit

F104, F110, F112 - 10mm Hollow Rigid Profile available in various widths - plus accessories F xxx

Ventilation

F104V - Hollow Ventilator for use with the Hollow soffit
F109 - Ventilator for use with our rigid soffits
F109M - Mesh comes in a 50m roll
FCV - Circular Soffit Ventilator
FVENT10 - 10mm Over Fascia Ventilator
FVENT25 - 25mm Over Fascia Ventilator

These products are available in white, brown and a range of solid colours plus woodgrain finish - for colour availability, please refer to the current Freefoam Plastics Products Catalogue.

Fixed to the eaves are the rainwater goods, with three separate systems available:

Round: Codes FRR xxx; or
Square: Codes FRS xxx; or
Ogee: Codes FRO xxx.

Each rainwater system is a complete range in itself, comprising gutters, angles, stopends, outlets, downpipes, offsets, adaptors, shoes, hoppers, and brackets.

SIZES

The various boards come in several sizes, as shown in the current Freefoam Plastics Products Catalogue. Some of the more popular profiles are wide (either 405, 410, 429 or 454 mm) and double-sided, allowing them to be cut down the middle to yield two working boards.

EAVES REPLACEMENT

Method Statement

A general note: Freefoam's range of roofline products - plain, slimline, ogee and magnum square or roundnose - are all more or less the same when it comes to assembly. There are minor detail differences, but nothing that seriously affects how they're put together. The Protective film on the boards may be lifted and replaced in order to check the quality and finish of the boards.

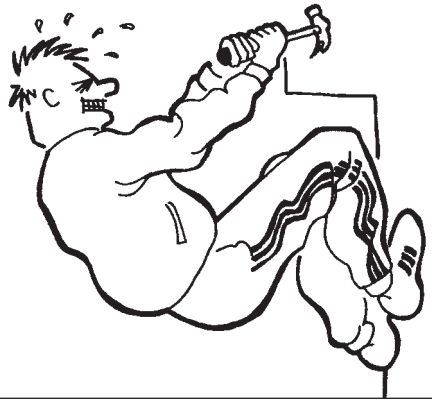
All the components to be used can be cut, sawn, routed, drilled or shaped using everyday carpentry tools. For a good finish, saws should have fine-tooth blades, and power saws should be set at their highest recommended speed, with a carbide-tipped blade fitted.

SAFETY - Always cut - never break - boards. For safety, wearing heavy duty rubber gloves is advisable, since sawn or cut edges can be sharp enough to cause injury. Face masks and eye protection are advisable when cutting, particularly with power tools.

Remove only as much of the existing roofline as it's estimated will be replaced the same shift or day. Pay attention to the day's weather forecast, too!

Remove first the rainwater goods, taking care to ensure that, if salvage is possible, nothing is unnecessarily damaged. When prising existing components apart, remember a few drops of oil can be more useful, and quicker, than a claw hammer. When replacing cast iron guttering, remember at the time of survey that gutters have only been painted on the bottom, so what looks in good condition can often be rotten when seen (and handled) from above.

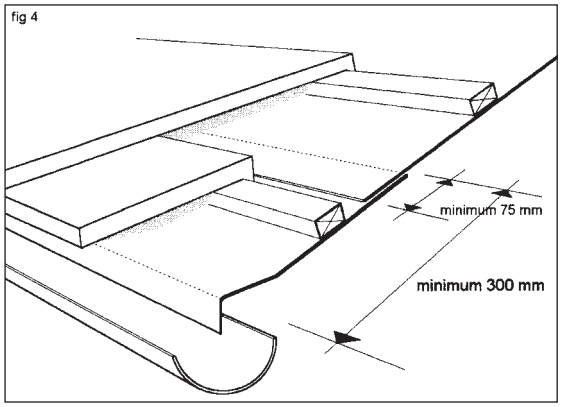
fig 3



Any fascia boards which appear to be in poor condition (the main reason they're being replaced) probably also means the tails of rafters behind might also have decayed. Never try to fix new product to anything that's rotted, or partially rotted, away. (At the time of submitting your quote for the work, always allow a provisional sum for unforeseen problems such as this.)

The tails of any rotten rafters should be cut away, and new preservative-treated timber affixed, to provide a sound base for the new work.

Check the condition of the sarking felt - the underlay to the roof tiles. It should project to discharge any water into the gutter, and nowhere else. If it looks like there's ANYWHERE that it might not do so, renew it, by inserting a width of at least 300 mm, lapped UNDER the existing felt. One of the main causes of call-backs is rainwater running down between the felt and the gutter, and often either discharging from behind the fascia or, worse still, appearing around the head of the windows.
A stitch in time, in other words.



Ensure that the new fascia will be adequately supported. If necessary, where the fascia will project more than 50 mm below the bottom of the rafter tails, nail softwood hangers to the sides of the tails. Trusses or rafters should not be more than 600 mm apart*. There should be full support for the edge of the soffit that abuts the wall, for soffit and fascia ends where they meet at angles (valleys and hips), and a gable ladder - or similar framing - to support the bargeboard.

*Important information: Please note that when using boards with our darker colour range, due to different expansion rates, it is Freefoam's recommendation that the boards be fixed at closer intervals. Our recommended distance is 300mm between fixings.

USEFUL TIP - when removing barge-boards, keep the bits that formed the box end, because they're the most accurate indication you're ever going to get of sizes and angles. Ready-made templates, in other words. Pop them in a plastic bin bag and seal it closed, for future reference.

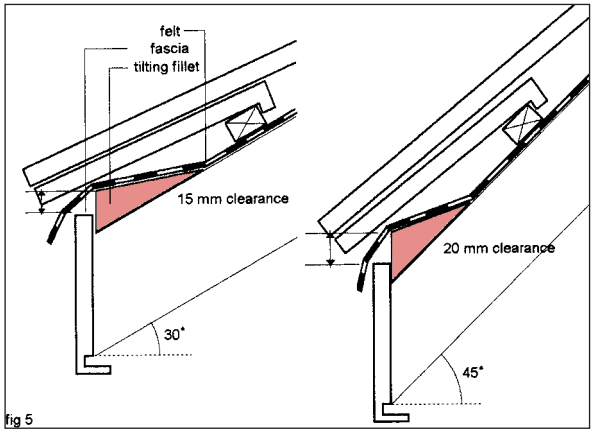
All exposed fixings should only be Plastops® pins or nails, both of which are plastic-headed and ring-shanked, available colour-matched and in a range of lengths from 25 to 65 mm.

Before starting to fix anything, ensure that:

1. the existing timberwork is all plumb and level. Use packers (offcuts will do) to make up any unevenness;
2. you have the right Belt-box™ of Plastops® fixings hanging from your belt before you climb the ladder.

Fascias for pitched roofs should not be load-bearing. In other words, the bottom row of tiles or slates must be supported by a tilting fillet, the presence of which can be verified when work starts. Because the tiles slope at an angle, the top edge of the fascia must be set below the tilting fillet, with suitable allowance made relative to the pitch of the roof: the steeper the angle, the lower the fascia's top edge. Most pitched roofs slope at about 30 degrees, for which a clearance of 15 mm is okay. Where the pitch is steeper, allow at least 20 mm.

USEFUL TIP - when removing the existing eaves, and when sweeping up, ALWAYS be on the look-out for small bits of plywood or other timber. These are often packers that were placed (but not necessarily fixed) into the old construction to ensure straight lines.



NOTE: The above tolerances apply only to replacement. When overboarding, because the fascia is further out, allow an additional 10 mm.

The fascia board is normally the same depth as that it replaces. Freefoam standard sizes range from 100 mm up to 300 mm. When fixing fascia boards, it's **ESSENTIAL** to allow tolerances for thermal movement. To avoid difficulty in removing the protective film, a common practice is to avoid striking the fixing nails fully until after the protective film has been fully removed. Where Fascia Joiners are required, these are nailed into the end of the rafter tails, with the next fascia board being positioned to allow a 4 mm expansion gap.

To prevent breakages, always pre-drill Joiners and similar moulded components. They can't be pre-drilled by the supplier because it's only on site that it becomes known where the holes will be required.

The Joiners are purposely made over-size so all you have to do is cut them to suit your fascia depth on site.

A pitched roof, either side of perpendicular gable walls, has either a bargeboard or a tiled verge at each end. Where it's a barge-board, you'll need Corner trims and where it's tiled verges, you'll need End Caps. Where there are brick corbels, you'll need nothing. Start at the left-hand corner.

Without Bargeboards

It couldn't be much simpler: fix the fascia boards along the front, with joints at rafter tails as necessary. The projecting eaves normally has a small Box-End, which is cut from a single piece of fascia board to match the size and shape of the original. If the original had a separate fillet covering the tilting fillet, this additional triangle can easily be incorporated into the new Box-End.

With fascia and Box-Ends in place, nail or pin End Caps or Corner Trims to both ends. Silicone rarely makes a satisfactory job in these situations - nails or pins always do.

With Bargeboards

Where bargeboards are involved, the procedure is slightly different, because the Box-Ends have to be formed.

Before cutting the Corner Trim, remember its height isn't governed by the depth of the eaves fascia - it's the depth of the bargeboard that matters. A 225 mm deep bargeboard, when cut vertically at its end, has to be deeper because you're not cutting at right angles. If the pitch is 45 degrees, 225 becomes 318 mm and, at 22.5 degrees, it's 242 mm. A tilting fillet can add another 50 mm or so.

Freefoam systems only need an angle Corner Trim, which is always fixed through the face of the fascia. It's easiest to stick this place with a gloop of silicone mastic but it's not the best way. A long way from it, in fact. It's common practice to use silicone when the manual calls for glue or even SuperGlue. That's because manual writers don't spend a lot of their time up ladders, making sure that their recommendations actually work, in everyday practical terms. Corner Trims should always be twice-nailed through (not to) each fascia. The nails should penetrate the timber because it guarantees proper support. On the corner of a house, what you need is proper support! It's all to do with the weather . . .

1 Wind speeds increase, the further you get from the ground. The corners of buildings experience all sorts of wind currents and gusts that don't happen on the ground. Little by little, the wind will dislodge anything that isn't firmly fixed to the corner of a roof, so this Trim MUST be securely fixed. If it works loose, the rest of your installation is going to degrade the same way. A quality job is all about getting it right, first time. That way, quality saves you money because you don't have to go back and put it right at a later date.

2 Everyone knows that cellular PVC-UE expands and contracts all the time. The sun comes out and the fascia lengthens. It goes in and everything gets smaller again. Again and again, day after day, year after year. Three or four millimetres of expansion and contraction means the glue (or, worse still, silicone) is unlikely to cope. Do you know of any glue that's strong enough to stop something coming apart after a couple of years like that? Nails, then!

FASCIA Selection - Lots of roofline manuals show various sorts of idealised eaves construction that bear little or no resemblance to the minimal timber you'll meet on site. All sorts of softwood bracing makes diagrams easy . . . not always helpful.

As often as not, the rafter ends have neither a continuous runner connecting them to each other, nor any softwood brackets between the wall and fascia.

A bit of information about how architects and builders found the cheapest way of creating an eaves. Start with a length of softwood fascia, say 225 x 25 mm with a groove in the back, 12 mm above the bottom edge. Fix a 50 x 38 mm softwood runner to the wall. Take lengths of 12.5 mm external quality ply, offer them into the groove and up against the runner. Bang a few nails in here and there. And that, as often as not, is what you're going to be working with. Not good enough, in a lot of cases, which means preparation work . . . which costs money and should be allowed for when pricing the job.

If you get to work with something better, it's a pleasant surprise and it saves a bit of money.

So, you need to provide, in a lot of cases, cross battens to span between the wall and the rafter tails. Nail them to the sides of the rafters and skew-nail them into the runner, against the wall. This way, you have something like most roofline installation manuals show: supports at 600 mm centres for the soffit.

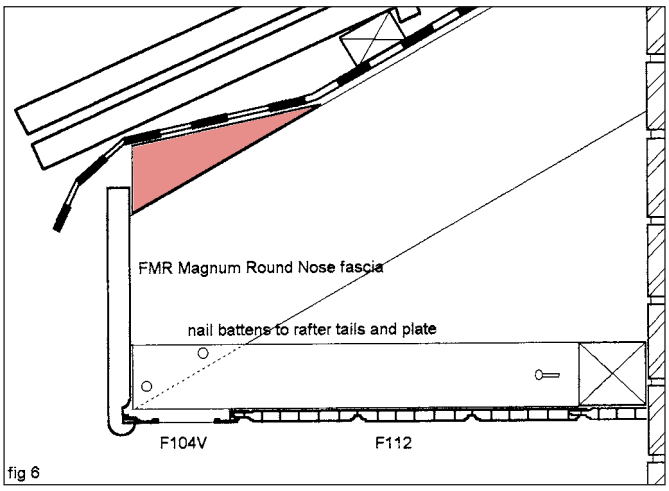


fig 6

In an ideal world, you could nail the soffit into the undersides of the rafter ends. . . but they slope at an angle of somewhere around 30 degrees. This requires the nails to be hammered perfectly, if distortion of the soffit is to be avoided. That's that option out, then.

Either the bottom edge of the fascia has to be positioned EXACTLY 10 mm below the rafter tails or it's best to use a slotted fascia, such as Magnum Square Leg, with its bottom edge 20 mm below the tails.

FASCIA Installation - Nail the first length of fascia into position, starting exactly in line with the end of the corner rafter, then usually at about 600 mm centres into the ends of the rafters. Remember that, when the fascia's in position, the rainwater gutter has to follow, so position your nails so as to be clear of the subsequent screw fixings. This will ensure a) the screws go in without problems and b) the brackets won't rock from side to side because there's the projecting head of a nail behind them.

A note about corners: Magnum Square Leg couldn't be much more user-friendly but there are one or two things to remember. After a while, they come as second nature. The fascia is 18 mm thick nominally but its toe - the bit that projects at the bottom – is 40 mm from front to back.

*Important information: Please note that when using boards with our darker colour range, it is Freefoam's recommendation that the boards be fixed at closer together. Our recommendation for this situation is 300mm.

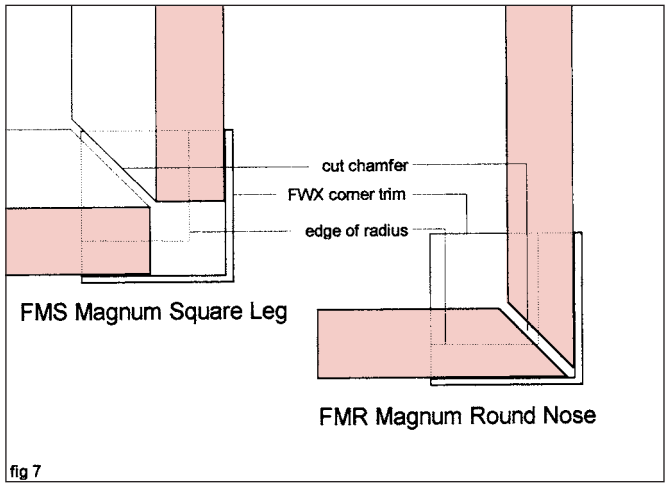


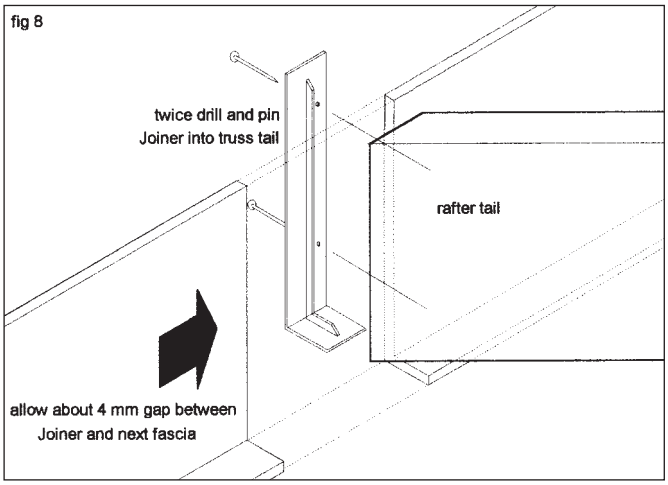
fig 7

Take two pieces of off-cut fascia and put them together, back to back, as if they're going to form a corner. They don't fit! What's more, because the Corner Trim is slightly rounded at its bottom corner, neither fit exactly into it. Here's a general note then . . .

USEFUL TIP - When measuring fascia between Corner Trims, deduct 15 mm for the bottom radius corner of each trim. This still gives you a trim width of 25 mm into which you can fix. When cutting fascia for Box-End corners, the end must be shaped by cutting the toe off at 45 degrees.

At the end of the first length of fascia board, a Joiner is needed. Pre-drill and twice pin it into the fascia.

The first length of fascia does need cutting to length, to ensure that its other end coincides with the end of a rafter. Ideally, the end should be just short of the rafter's centre-line but a millimetre or so either way won't make a lot of difference. Twice nail the fascia into the tail of every rafter, at not more than 600 mm centres.



THERMAL MOVEMENT - a lot's been said about the way PVC building products expand and contract. They do, but it's nothing that can't be handled. If a 5 metre length of white fascia can expand less than 10 mm over its entire length, it could cause problems - but only if it were fixed at just one end. It isn't. It's fixed at 600 mm centres, so any movement takes place between each of the rafters.

You don't have to be brilliant at arithmetic to work out that, if it moves 10 mm over a 5 metre length, then it's going to move less than 1 millimetre between rafters. It might creak a bit on a partly cloudy day, when the sun keeps coming out and going in again, but that's all it will do.

A gap between it and the next length of board doesn't go amiss. Say 4 mm. This is the tolerance. So, offer the next length of fascia up against the Joiner and twice nail it into the rafter tail, about 4 mm away from the spine of the Joiner.

On most houses, the fascia needs no more than two lengths of fascia, so it's important to cut the last one to the right working length.

USEFUL TIP - Take care when cutting the last length of fascia. NEVER cut it too short because it can't be used. Cut it a bit too long and it can be cut again, if necessary.

When nailing a Corner Trim into the last (corner) rafter, make sure the fascia has been cut to the perfect length. 5 mm short is fine, because it allows for thermal movement - expansion and contraction. Dead-on or 5 mm too long is therefore bad news. Fit the fascia into place and use a Corner Trim, nailed through the fascia, into the rafter end.
You can, in theory, either glue or silicone it in place, but . . . .

USEFUL TIP - GLUED End Caps can be dislodged by strong gusts of wind and thermal movement, but NAILED End Caps can't.

SOFFIT Selection - There's a choice of three soffit types, all of which are 10 mm thick:
Plain general purpose solid board;
Hollow board (with separate F104V ventilator strips, if required); ***or***
Pre-vented solid board.

Hollow boards look as if they offer a choice of finish. Always use F104, F110 or F112 on its reverse (to be hidden) side, the board is plain whilst the front/outer is feature-grooved at 100 mm centres.

VENTILATED SOFFIT
A ventilated eaves doesn't do much good if it doesn't get any fresh air into the roof space. Without a gap between the top of the wall (50 mm is more than enough if it's the full length) and the underside of the roof, a ventilated eaves only allows air movement in the eaves itself. This ventilation is usually provided through the soffit, but over fascia ventilation may also be used.

A ventilated soffit can be provided by any of the following options:
- 10 mm thick pre-vented soffit board in widths up to 405 mm;
- 75 mm wide strip ventilator, slotted along both edges, allowing it to be used in conjunction with hollow soffit;
- 80 mm overall diameter circular soffit vents which self-locate into 68 mm diameter holes drilled through general purpose plain solid board;
- 10 mm thick tongue & groove effect hollow soffit boards, F104, F110, and F112, laid in short lengths at right angles to the roofline, with F104V vent strips at intervals between. Alternatively, the Soffit may run in longer lengths parallel to the wall with sufficient F104V to meet the Building requirements also running parallel.

Whilst there are bought-in cost savings when using strip ventilators with hollow boards, it can be cheaper in the long run to use a pre-vented board.

Pre-vented soffit boards are fixed in exactly the same way as plain or hollow soffit boards, being fixed to the timber supports by means of plastic-headed Plastops® pins. Please note that, where boards are to fit behind cover trims, the use of CP30 pins means there's less chance of the heads projecting and therefore ensuring a better fit all round.

SOFFIT Installation - Installers normally prefer to fix the soffit before the fascia because it can be difficult getting a continuous length of soffit into place if the fascia is slotted. This applies to all Magnum profile Boards. i.e. FMR, FMS, FMO, FMXS, and FMD. It doesn't necessarily apply to Ogee or Plain, or square edged fascia which are 10 mm thick, when combined with short lengths of hollow soffit.

Either way, a soffit should be fully supported along both edges by the fascia along the front and by nailing up into a softwood ground against the wall.

Supported isn't the same as fixed. It needs to be fixed, with Plastops® pins, every 600 mm. If there's no softwood runner, or if it's in any way decayed or deficient, you'll need to provide a new one. Treated 50 x 50 is best, though some old hands can make do comfortably with 50 x 38 or even 50 x 25 (but the smallest one's cutting it a bit fine).

If there's to be eaves ventilation, it has to go along the outside edge, because it's unobstructed. Alternatively, circular vents always go slap bang down the middle. Flat soffit can be made from Code GPB flat boards instead of F112 hollow sections.

First, you need to know how wide the soffit's going to be. Take several measurements from the wall to the rafter tails. Write them down if you can!

Choose the smallest dimension and then:
for Plain and Ogee fascia boards, deduct 5 mm; for Magnum Square and Round Nose, add 5 mm.

Where the installation also involves bargeboards, remember to allow for the overhang at each end when cutting and positioning boards. Once fitted, the overhanging pieces of soffit will be supported along their front edge by the fascia. To facilitate a neat joint with the Box-End, cut the appropriate length of F106 H-section Joint trim and slide it into position over the rear edge of the projecting soffit.

USEFUL TIP - Just because hollow boards come in 5 metre lengths doesn't mean the grooves must go lengthwise. By cutting the boards into lots of shorter lengths, the grooves can run at right angles to the wall.

Seemingly more labour-intensive, this system has several advantages, with practice. With the toe of the fascia providing a support along the front/outer edge of the eaves, pin an F108 Edge Trim against the length of the wall, and the soffit now has support at both sides into which it can be fixed.
The soffit can now be cut, extremely quickly, down at ground level, into dozens of short lengths. It's thin enough to grip several thicknesses of board and cut right through the lot. Cut some similar lengths of soffit ventilator, and they can all be offered into place and slid along the soffit, where they're slotted firmly into each other. Quick, efficient, and very attractive.

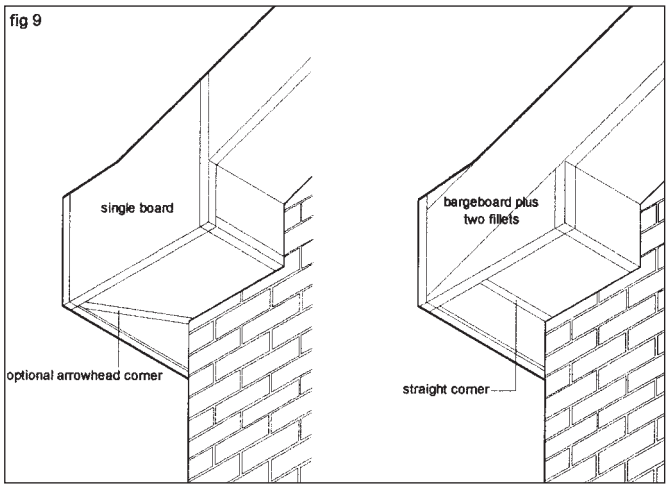
VERGE REPLACEMENT

Method Statement

Verges, in this context, mean bargeboards. They're just fascias, fixed at an angle, instead of level. Some are flush to the brickwork, and others project, but the method statement is the same for both. Either way, it's important to know the angle of the roof pitch to get a neat finish. And either way, they need Box-Ends.

USEFUL TIP - Counting bricks allows you to calculate the roof pitch. Count four full bricks horizontally, then count the number of courses vertically. If it's twelve courses, the angle is 45 degrees. Five courses mean 22.5 degrees. Seven courses is common because that's 30 degrees.

fig 9



There are two types of Box-End: True and Pieced-Up:
Before removing existing installation boards, take note of how the Box-End was made. Replace it with the same, and the odds are nobody can complain. Do it differently and they might not like it.

Where the roof pitch is a fairly standard 30 degrees or less, the Box-End would need a separate piece of fascia, called an Endboard, cut out of 300 mm deep fascia at least (and possibly even a double-sided board), with its horizontal toe along the bottom and profiled to match the shape formed by the eaves fascia, the top edge of the pitch (including the tilting fillet) and the vertical joint that will be formed with the bargeboard.

Now you see why keeping the original comes in so handy!

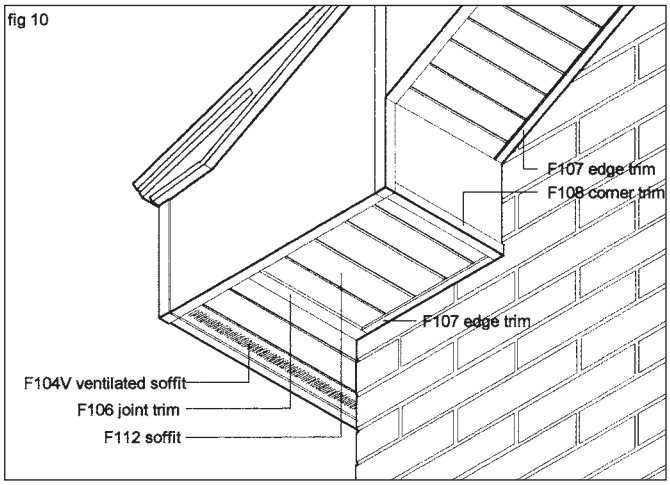
You can't form the bargeboard until you've made the Box-End and you can't make the Box-End until you're certain that all the timber supports are where they're needed. This could be the time to be doing a bit of joinery work.

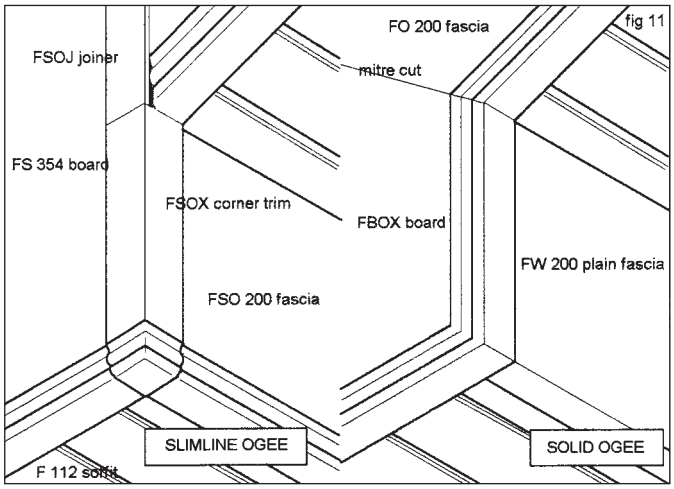
USEFUL TIP - NEVER let a van go out without a few lengths of 50 x 50 mm treated softwood, because they're essential back-up, even if they aren't used.

AND ANOTHER, on the same subject -every van should carry a supply of spare double-sided boards, for use if someone makes a mistake cutting on site. Acknowledging that accidents do happen, and making arrangements beforehand is an essential part of a quality system . . . and the purpose of a quality system is to save money.

Box-Ends can be a pain, and they're probably what makes or breaks a nice-looking job. No matter how well you think this manual explains Box-Ends, don't leave them to inexperienced installers.

Ogee profiles don't lend themselves to any-old construction. The ogee along the bottom edge is a decorative feature and, as such, has to run along every edge. A Box-end is the only place where the edge of the fascia is also vertical.





BOX-END CONSTRUCTION

Method Statement

A proper timber frame support is ***essential*** for a well-made Box-End. You need a bit of imagination. Look at the existing timber, after the old cladding has been removed, and work out if there's framing to fix all your edges into. Wherever there appears to be some missing, cut lengths of 50 x 25 (treated) batten and nail it into place. It has to be a strong frame because you're going to be nailing all sorts into it from different directions. (Like so many things, it gets easier with practice.)

Having made sure that all the supporting timber is there, retrieve the original board from the van, or wherever you put it for safe keeping, so that you can cut another to roughly the same size and shape. As often as not, it's deeper than 250 mm, so you won't be able to replace it with a length of standard fascia board. It's not exactly the same size because tolerances have to be allowed for the rounded corners. A finished width of 450 mm means cutting to 430 mm.

Where the Box-End is deeper than 250 mm, which is quite normal, it's too deep to be made from a single piece of fascia board. A length of FMS410 double-sided board, cut to shape, gets round this problem. Don't forget the 45 degree trimming off the corners, or it won't work. One side is fitted neatly into the FWX Corner Joiner and the other, against which the bargeboard starts, depends on the height of the board. If it's 300 mm or less, simply cut another FWX to size, and nail it into place. If it's taller than 300 mm, you'll need to form it from two trims: an FWX cut to size for the lower (exposed) portion, with an FWJ Joiner above, to match the depth of the bargeboard. A dab of silicone pointing at the horizontal joint between the two helps prevent unnecessary rainwater penetration.

The straight Joiner can be fixed to be vertical, as an extension of the Corner Joiner below it, or it can be angled to match the pitch of the bargeboard.

Much the same process applies for all the Freefoam systems, apart from Ogee which has a separate moulded corner piece, FBOX, from which to cut a Box-End shape with the ogee edge along the bottom edge and the all-important return up the vertical edge.

It's normal for soffit ventilation to continue to the end of the soffit and stop when it gets to the Box-End. It doesn't need to return or continue up the bargeboard. This means all that's needed along the back edge of the soffit is an F106 H Joint Trim.

A bit of site experience from here is worth more than a hundred manuals. With the new Box-End board firmly nailed to the existing timbers, and the Joint Trim slid over the rear edge of the soffit, the remainder of the soffit must be slid into place, to sit on the toe-end of both the fascia and the Box-End board, and ready for nailing into the timber. When cutting the last piece of soffit, its length should be 5 mm less than the distance from the front of the fascia to the back of the timber support. When it's cut, slide it firmly into place and the Corner trim will fit perfectly, as will the fascia that forms the back board of the Box-End.

In some situations, to make a really neat job of it, you might need a Starter Trim against the wall but it isn't always necessary. In ALL situations, there must be a vertical timber support - a hanger - into which the Box-End and back board are nailed.

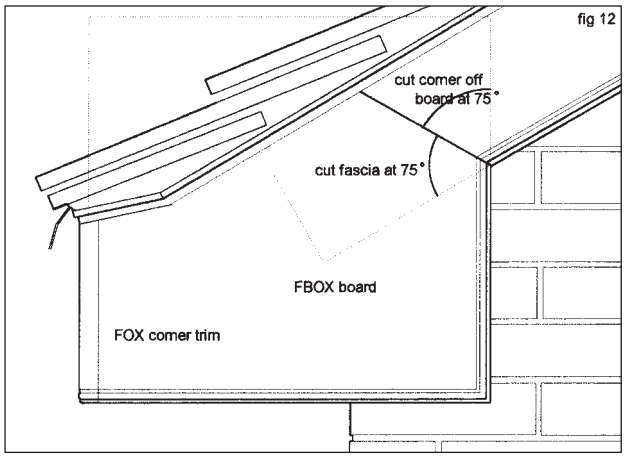
Before climbing down the ladder or tower, measure the size of the back board. Deduct the 15 mm tolerance for fitting it against the Box-End board and the Corner Trim, and cut it. Nail it into place, ideally in at least three corners. That's it. Ready to start the bargeboard, now.

OGEE SOLID SYSTEM (FO, FMO) Box Ends, because they are specially detailed along the lower edge, require more care. For the Ogee feature to continue along the entire edge, Box End included, there are special component parts.

The fascia and soffit are fixed much the same as the other systems, as is the end board, the only difference being that the end board must have the Ogee feature along its bottom edge. Much the same applies to the bargeboard that follows.

Normal Box End boards have four sides - the front, back and bottom edges all being at right angles to each other, with the fourth (upper) edge matching the pitch of the roof. This doesn't work for the Ogee system, whose Box End board must have FIVE sides. The rear upstand, between the soffit and the bargeboard, is vertical as usual, but its top back edge has to be at the correct angle to the bargeboard's end. This is what allows the Ogee detail to work correctly. It sounds complicated.

The Ogee feature is about 36 mm deep (unlike its Slimline brother, which is only 30 mm). Try cutting a length of spare board at, say, 45 degrees - it produces a diagonal Ogee feature along the cut edge about 55 mm deep, which doesn't match anything else, thus proving (before you get up there to try it) that the end board has to be cut at precisely the correct angle. It's called bisecting the angle, and it's simple arithmetic, when you know the formula.



If the roof pitch is 30 degrees, the cut needs to be at 75 degrees because...
180 - 30 = 150, and 150 / 2 = 75

In other words, 180 degrees equals two right angles - equals a straight line. Take the roof pitch (30 degrees) from the straight line, and you get 150 degrees. Halve that - bisect the angle - and you get 75. It really works and, to prove it, if the pitch is 45 degrees...
180 - 45 =135, and 135 / 2 = 67.5

Cut the end off a spare piece of FBOX at 67.5 degrees and do the same to a bit of FO board. Butt them up against each other, and the Ogee feature is about 40 mm deep - a perfect match. But there's one problem, in reality, when you get up there on a ladder. It works, and looks nice, for a 30 degree pitch but less so at 45 degrees, which is too steep an angle. The FBOX moulding is 400 mm long, with the Ogee turning through right angles at both ends. This ensures it can always be cut to suit any situation, whether it be right- or left-handed. Measure the required length, and mark this with the bisected angle onto an FBOX, and cut it to size/shape. When slotted into position, it mirrors the FOX Corner Trim but also carries the Ogee feature up the rear edge of the end board. Place the bargeboard against it and, when this is also cut to the same bisected angle, you get a perfect job. Perfect.

ROOFTRIM (OVERBOARDING)

Freefoam offers an Agrément-approved PVC-UE Rooftrim system, designed for use where the existing fascias are not to be removed, but retained and overboarded. In some cases, soffits might not be replaced, though please note that Agrément certificates (95/0062 in Ireland and 99/3585/C in the UK) apply only when the existing soffit is completely replaced.

The Code of Practice strongly recommends against over-boarding. As mentioned earlier in this manual, the reasons are technical, and clearly expressed:

"To achieve a successful and safe installation, it is essential to create a sound, rigid, working substrate. It is recommended that total replacement rather than capping of existing timbers be adopted where possible. By capping and effectively sealing moist, and perhaps already rotten timber, an environment which is more conducive to fungal attack will be set up and will result in a more rapid deterioration of existing timber. The capping board will tend to "insulate" the rot and promote conditions whereby the fungus can multiply and spread."

In other words, and as stated before, if problems appear after overboarding, and the customer complains or, more likely, makes a claim against you, you're going to be pretty much on your own.

There are situations where overboarding might be possible. If, in the opinion of the contractor, the existing fascia can be overboarded, Slimline fascia systems are available in a choice of Plain or Ogee noses.

ROOFTRIM

Components

Plain

Codes FL xxx are based around an 8 mm thick profile system, in a range of fascia profile depths, plus Joiners, Corners and End Caps. Codes FW xxx are based around a 10 mm thick profile system, in a range of fascia profile depths, plus Joiners, Corners and End Caps. The FW xxx accessories are also designed to accommodate the FMS and FMXS profiles.

Ogee

Codes FSO xxx are based around a 7 mm thick profile system, in a range of fascia profile depths, plus Joiners, Corners and End Caps. Codes FO xxx are based around a 10 mm thick profile system, in a range of fascia profile depths, plus Joiners, Corners and End Caps. The FO xxx accessories are also designed to accommodate the FMO profile. Magnum Round Nose Codes FMR xxx are based on the 18mm thick profile system, in a range of fascia profile depths, plus joiners, Corners and End Caps. The FMR xxx accessories are also designed to accommodate the FMD profile.

ROOFTRIM

Method Statement

Remove only as much of the existing as it's estimated will be replaced the same shift or day. Pay attention to the day's weather forecast, too!

Remove first the rainwater goods, taking care to ensure that, if salvage is possible, nothing is unnecessarily damaged. When prising existing components apart, remember a few drops of oil can be more useful, and quicker, than a claw hammer. When replacing cast iron guttering, remember at the time of survey that gutters have only been painted on the bottom, so what looks in good condition can often be rotten when seen (and handled) from above.

Check the condition of the sarking felt - the underlay to the roof tiles. It should project to discharge any water into the gutter, and nowhere else. If it looks like there's ANYWHERE that it might not do so, renew it, by inserting a width of at least 300 mm, lapped UNDER the existing felt. One of the main causes of call-backs is rainwater running down between the felt and the gutter, and often either discharging from behind the fascia or, worse still, appearing around the head of the windows. A stitch in time, in other words.

Overboarding means that the existing fascia will be at least 8 mm thicker than before. Whilst overboarding is sometimes seen as a way to improve the appearance of a house, without the cost of full replacement, it's unwise to try saving money also by leaving the sarking felt untouched. It MUST discharge into the gutter for the full length. To fail, it only needs a 50 mm length of sarking felt to be short of the gutter. The rest can be perfect but it won't make any difference.

Fascias for pitched roofs should NEVER be load-bearing. In other words, the bottom row of tiles or slates must be supported by a tilting fillet. Because the tiles slope at an angle, the top edge of an overboarded fascia must be set below the tilting fillet, with suitable allowance made relative to the pitch of the roof: the steeper the angle, the lower the top edge. Most pitched roofs slope at about 30 degrees, for which a clearance of 20 mm is needed. In other words, the top edge of the Rooftrim fascia needs to be about 5 mm below the top edge of the existing fascia.

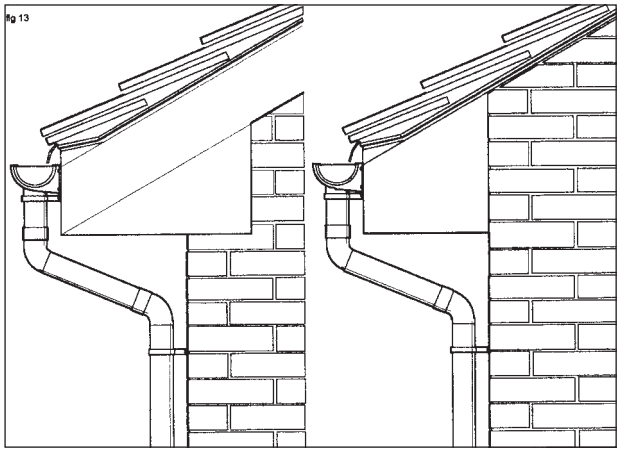
The soffit is replaced before installation of the fascia. Ensure that, once all the existing has been removed and cleared away, the soffit will be adequately supported along both its edges, front and back, and at 600 mm centres along its length. Where timber supports are missing or damaged, they must be added or replaced. Where timber supports are in any way decayed, this is an indication that other timberwork might be similarly affected, so it would be unwise to overboard without at least checking the condition of adjacent rafters etc.

Roof ventilation is advisable but, where there is no air space between the existing eaves and the roof, especially when the eaves is not being replaced in its entirety, the contractor might decide ventilation is either not necessary or cannot be achieved without considerable alteration to the roof construction. A plain soffit is normally applied in these circumstances. This can be made from either General Purpose solid board (GPB xxx) or from Hollow Soffit (F 1xx). The methodology is the same for both.

BOX-END CONSTRUCTION

Method Statement

Unless the gables have corbelled brickwork, the fascia ends with some form of Box End, whether or not there's a bargeboard, so the type of detail must be established before cutting any profiles. If the soffit returns around the gable end, the new soffit must extend beyond the front wall line. If there is no projecting bargeboard at the gable, the soffit can end in line with the outermost edge of existing roof timber.



Cut the soffit, in boards or planks, to the required depth and nail it at no more than 600 mm centres along every edge - front, back and ends. Planks of hollow soffit fit into each other, being tongue-and-groove. Boards require an F106 Joiner and CP30 pins.

Roof corners can be mitred (arrow-head) but it's easier, and no less attractive, to form a horizontal joint along the back edge, parallel to the fascia. Once all the soffit is in place, the fascia is next. Corner detailing is important, if the components are to fit.

Two lengths of fascia, each with a toe on the bottom, cannot meet at a point unless something is cut off to allow a snug fit. The toe is therefore cut off both lengths of fascia, front and end, at 45 degrees, allowing them to meet and form a right angle corner. It's quicker and simpler than notching them.

The board that's fixed to the gable end part of the fascia is either a Box End, because there's a bargeboard, or a fillet which is taller at the back than the front, fitting between the front fascia and the brickwork. Where it's a fillet, more likely when over-cladding, take accurate dimensions and cut the end board from a suitable-sized board. As described above, cut the 45 degree splay off the toe and fit it into place, against the front fascia.

The 45 degree splay starts at the back edge of the fascia board so, when the two boards meet, there's an unfilled gap of at least 8 mm on the corner. *(The Corner Trim covers this, when it's cut to size and pinned into place - normally twice on each side, to ensure that gusts of wind from either side of the building can't dislodge it.)*

Cut and slide into place a rectangle of soffit, and pin it with CP 30s into the timber support. It has to be shorter than the Box End because it fits behind the next piece to go into place - the back board. This is another length of fascia, with another splay-cut toe, to project exactly the same distance, and detailed the same way, as the front fascia. Don't forget to ensure it's deep enough to be covered by the bargeboard soffit, when that's fixed. Pin it into place at every available corner.

Finishing off the Box End requires some sort of Corner Trim, pre-drilled and pinned as usual. A proper Box End - formed of a single full-height board, all the way from the soffit to the undercloak of the roofing, requires a single Corner Trim. Measure its height, remembering that the front edge is lower and therefore shorter than the back, cut it at the correct angle, and place it against the timber support. Mark the area which needs to be cut out, so that it fits around the timberwork. Cut it accordingly, and pin it into place.
You're ready to fit the bargeboard now.

Instead of a vertical rear edge to the Box End, there might be instances where the upper part of the Box End is shaped to the same angle as the bargeboard. In this situation, the Corner Trim is cut shorter, to fit between the bottom corner and the soffit of the bargeboard. An F106 H-shaped Joint Trim is needed to hold the bargeboard and Box End together.

Pieced-up Box Ends, where the bargeboard continues down all the way to the fascia, require a triangular fillet, cut perfectly to size and angle, and a shorter length of Corner Trim. The top edge of the triangular board has to be bedded in silicone (and cleaned off as it's fixed) before the Corner Trim is added to finish off the job. Pieced-up Box Ends look like they should be simpler and quicker but it isn't always the case, unless you're confident of cutting the bits extremely accurately. When in doubt (as mentioned earlier), it can be safest to replicate what was there in the first place.

The difference with Pieced-up Box Ends is that they have to await completion of the bargeboard, because it's the bargeboard itself that comes all the way down to meet the eaves fascia.

OGEE SLIMLINE SYSTEM (FSO xxx) Box Ends, because they are specially detailed along the lower edge, require more care. For the Ogee feature to continue along the entire edge, Box End included, there are special component parts.

The fascia and soffit are fixed much the same as the other systems, as is the end board, the only difference being that the end board must have the Ogee feature along its bottom edge. Much the same applies to the bargeboard that follows.

Normal Box End boards have four sides - the front, back and bottom edges all being at right angles to each other, with the fourth (upper) edge matching the pitch of the roof. This doesn't work for the Ogee system, whose Box End board must have FIVE sides. The rear upstand, between the soffit and the bargeboard, is vertical as usual, but its top back edge has to be at the correct angle to the bargeboard's end. This is what allows the Ogee detail to work correctly. It sounds complicated.

When making a Slimline Box End, the ogee goes all the way round the bottom edge, finishing neatly against the gable wall, instead of returning up the back edge to join up with the bargeboard. The Slimline Ogee feature is about 30 mm deep -noticeably smaller than the Ogee Solid version. The two systems aren't interchangeable, which becomes apparent at the Box End detail.

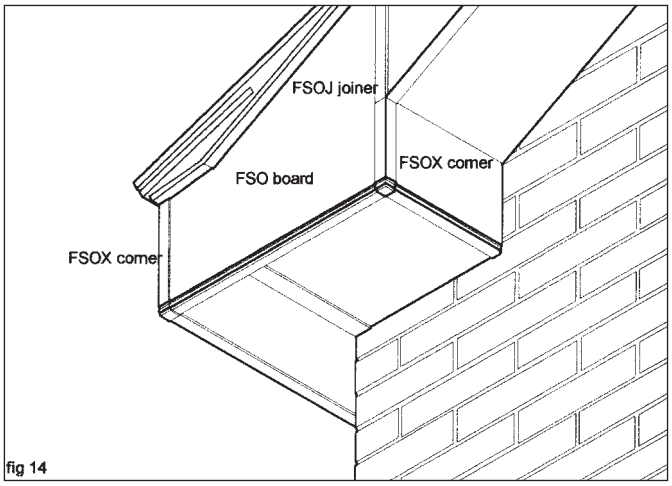


fig 14

In other words, there's nothing particularly different about Ogee, compared with other Rooftrim options, but it can be difficult getting a perfect junction with the bargeboard. It might be worth considering doing the bargeboards in Standard Slimline, where there is any concern at all about how the bargeboard marries up with the Box End.

The bargeboard needs a Corner Trim and, if it's Ogee with an FSOX, it makes a slightly odd joint with the Box End. For this reason, and this reason only, Freefoam Plastics don't recommend using Ogee Slimline for bargeboards - just in case someone gets picky about this detail.

BARGEBOARD CONSTRUCTION

Pitched roofs end along their lengths at the eaves, and along their sides at the verge. Bargeboards are therefore projecting verges. They are fixed in exactly the same way as eaves fascias, the only difference being that they're raked. Some project, so they need soffits, and some are flush to the wall, so they don't.

Measuring the angle of the roof pitch is important, as it's the only way you're going to be able to cut ends to be vertical. Any intermediate joints can be at right angles but they only occur in exceptionally long roof spans.

Before starting bargeboards, Box Ends should be completed -unless they're going to be Pieced-Up, in which case the depth of the bargeboard will be partially determined by the depth of the eaves fascia AND the roof pitch angle. The steeper the pitch, the deeper the board. For example, a 225 mm deep bargeboard, when cut vertically at the end at a 22.5 degree pitch, shows 242 mm depth at the end . . . and, at 45 degrees, 318 mm.

A Reminder

to establish the roof pitch, count the bricks. A width of four bricks rises five courses when the pitch is 22 degrees, seven for 30 degrees, and twelve courses when it's 45 degrees.

USEFUL TIP - When cutting bargeboards, longer is always better than shorter. You can cut another bit off but you can't stick it back on!

If the bargeboard fascia isn't the same thickness as the eaves fascia, you'll need quite a few lengths of packer to make up the difference.
Where the bargeboards meet at the top of a pitched roof, the peak, a trim will be needed to mask the junction of the two boards. Where they are less than 225 mm deep, the FIN 1 Finial mould is purpose-made for a neatly-finished job. There are also instances where a fascia Joiner might be more appropriate - small dormers, in particular.

Fascia Joiners are fine for masking joints, but not always where the fascia is angled, as shown above. Whilst most roof peaks, even on bungalows, are normally high enough for the exposed bottom edge joint to go unnoticed, careful cutting (as shown above) is stongly advised. Purpose-made Finials are mouldings but with a decorative fleur-de-lys to mask the joint behind.
Nail the first bargeboard into place only when satisfied that its peak end is perfectly vertical. It should be about 5 mm short of the exact centreline of the ridge/peak, to allow for thermal movement, and to afford just enough tolerance when fitting everything else.

USEFUL TIP - Unless the roof is pitched asymmetrically, it's worth making a note of the exact pitch, when you know the first board's right. That way, you only have to work it out once.

The other bargeboard can now go up. Nail in into its final resting place when the gap between it and its opposite number is between 8 and 15 mm. Less is too tight, and more could cause a gap. Cut the top of the Finial mould to shape and predrill-then-pin it into place. Where the peak joint is masked by a Joiner, cut an arrowhead to the correct angle and, in the same way, pre-drill-and-pin it into position.

HIPS and VALLEYS

Lots of houses are rectangular boxes, with a pitched roof over, but there are plenty with hipped gables, dormer windows and/or more than one pitched roof. In these situations, hip rafters and valley rafters need consideration.
It's almost certain the rafters will be single lengths of timber (probably something like 200 x 50 mm) with square ends, cut to suit the pitch.
You can't fit fascias to them, unless they have the correct noggins fixed to their sides, so don't try!

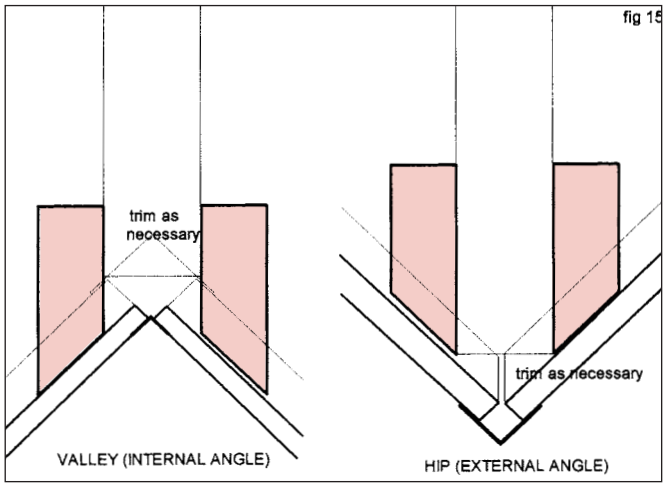


fig 15

Before attempting to renew fascias, blocking pieces (or noggins) are essential at the sides of valley and hip rafters. They might not have been essential when the timber fascia was put up, but they are now. In theory, noggins should be the same depth as the rafters but, in practice, nobody's going to carry a few lengths of eight-by-two in the van, just in case. Two lengths of 50 x 50, nailed into each side, with their ends chamfered at 45 degrees, are perfectly adequate for the job.

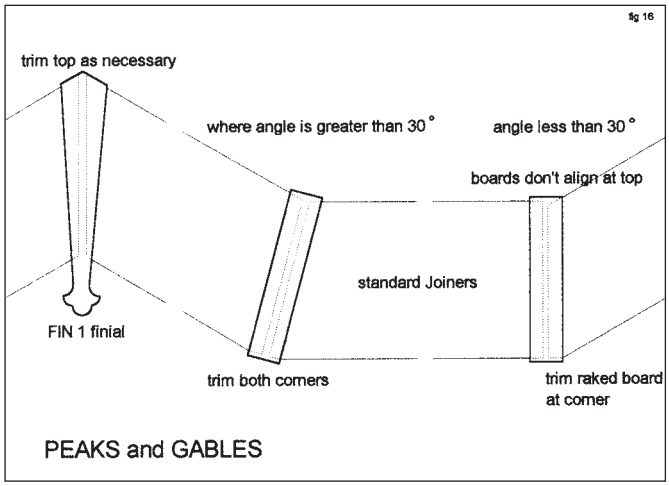
A 300 mm length of 50 x 50, with one end cut at 45 degrees, has a lot of uses. Two, on either side of a hip rafter, splayed backwards, provide a firm fixing for an external angle. Turn them the other way, and they do the same job for an internal angle - a valley. It's well worth pinning a length of former (50 x 50 will do again) into the ends of the rafters at either side before fitting them - that way, you know the blocking pieces are going to project to the correct line. It might seem quicker to do it by eye but, in the long run, it's actually quicker to do this bit right first time.

With blocking pieces in place, fascias are easily fitted into the valley corners, each twice nailed into the blocks, one fascia butt jointed against the other. Not quite as simple for hips, because the two fascias will overlap, necessitating cutting splays off each toe. External angles - hips - need a Corner Trim.

DORMERS

Windows in dormer roofs normally stand above the general eaves line but there are situations where the fascia forms an inverted V upstand. It's this second instance that needs explanation, as the first requires nothing that isn't described elsewhere in this manual.

The angle of pitch determines the correct action. Where it's 45 degrees, one set of rules apply - where it's 22.5 degrees, it's another. At 45 degrees, the Joiner has to sit at 22.5 degrees, bisecting the angle. It cannot be vertical. If the joint were made to be vertical, a significant amount of fascia on the pitched side of the joint would be exposed and, worse, there would be quite a large hole where the toe had been cut off to line through with the eaves.



When bisecting the angle, the toe of both lengths of fascia need cutting, but only about 8 mm, and certainly enough to ensure a neat job when hidden behind the fascia Joiner.

NOTE: Ogee fascias are not recommended where there are in-line dormers, as it's impossible to achieve a satisfactory detail at the joint.

Where the dormer roof pitch is 30 degrees or less, the fascia Joiner is fitted to be vertical. The raked board must be cut (as little as possible) to fit into the Joiner, and it isn't possible to align the top edges of both fascias, so don't try.

RAINWATER GOODS

Components

There are three entirely separate Freefoam systems:

Round: Codes FRR xxx;
Square: Codes FRS xxx;
Ogee : Codes FRO xxx.

The basic, standard system that's been around for years has always been Round. The condition of the existing system is very important. If it's cast iron, the odds are it has to go. Some PVC rainwater goods, if they're not too old (and brittle), can be re-used, if it saves money and if the customer agrees. After all, there's no reason to assume, just because the woodwork is in a poor state of repair, that nothing's been done about the rainwater goods. Before considering re-using existing rainwater goods, especially gutters, be absolutely certain the seals are sound. If you can't guarantee this, you can't guarantee the job.

This manual assumes it's all being replaced. So, before removing the old, take a careful look along the edge of the tiles, to ensure that the sarking felt allows water to discharge into the gutter. **ALL** the way along.

There are so many situations on, say, a fifty-year old house that they can't all be covered in detail, nor do they need to be. There's always the guttering, which always discharges into at least one rainwater pipe. The gutter's supported by brackets, and has stop ends somewhere or other, possibly a few right angle bends and at least one running outlet. Because most (pitched) roofs overhang the walls, the rainwater pipes have double offsets, sometimes referred to as swan-necks, at 22.5 degrees pitch, thus necessitating a couple of 112.5 degree bends. The pipe, clipped to the wall at regular intervals, discharges (usually) at ground level either into the back of a sealed trap gully or by means of another 112.5 degree bend to a shoe, from which the water flows into the top of the gully.

Where one roof is at a lower level than another, its rainwater pipe can discharge into the top of an open hopper, or directly into the main pipe by means of a closed branch. Occasionally, on older buildings, sinks, baths and basins can also discharge into hoppers, into what is generally known as a combined system. Fortunately there are no situations where the WC waste discharges into the rainwater system.

The existing system would normally be screwed to the woodwork, as will its replacement. Remember that, wherever possible, it should always be screwed THROUGH the PVC UE, into the supporting timbers. All this is possible, in the usual manner, with Freefoam rainwater systems.

SHIPLAP CLADDING

Components

Freefoam also offer a comprehensive range of cladding profiles, enough for virtually every circumstance you'll encounter.
This is what you need for cladding:

Boards

Code FC150 is a 175 mm deep shiplap white or Woodgrain-finish board which, when fixed, shows 150 mm nominal depth, known as the pitch. This is fixed with its own suite of trims Codes FC201 to FC209-Starter, Universal/Wall, Joint and Corner Trims.

Trims

universal channels, starters, joints and corners; plus as necessary: architraves, quadrant window trims, cloaking fillets, right angles and flexible angles, bullnose and/or square leg window boards and square edged cappings.

These are entirely separate and different systems, so FC Trims can't be used with F-coded boards and F Trims can't be used with FC150 shiplap.

When ordering, and loading up for delivery to site, it's essential to ensure that everything is suite-matched, as represented by the various suite codes. The system is as simple as possible: the letters indicate the suite and, where numbers follow, they show the size. All extruded board lengths are 5 metres.

The letters that form the second half of codes indicate functions of position-specific components: X and OX for external angle corner pieces, XI for internal angles, J for joiners, EC for end caps. Large or double-ended end caps are shown as DC.

Fixings Plastops® fixings come in two basic types, all made from the very best A4 Marine Grade stainless steel, so they won't rust in the harshest environments:

Pins
plastic-headed ringshank pins in lengths from 25 to 40 mm;

Nails
plastic-headed ringshanked nails in lengths from 40 to 65 mm;

CP30 pins
without PVC-coated heads, and used for mainly shiplap boarding, hollow soffit, or anywhere that requires cover by other profiles.

Pins (but not nails) are supplied in labelled flip-top Belt-boxes™ that can be clipped over the belt and carried hands-free up a ladder. Another of those thoughtful touches that Freefoam come up with. Compared with many other plastic-topped fixings, they're also far less liable to breakage - the heads don't come off at the first sight of a hammer, which means a lot to anyone trying to get the job done without unnecessary hassle or damage.

Wherever the manual refers to fixings, it's best to USE TWO.

Shiplap relies on the overhang of one board over another to keep the weather out, so the boards must always be fixed from the bottom up. Behind the boarding is almost always a softwood framework, fixed into the brickwork (usually nailed) through building paper or a similar damp proof membrane - the last line of defence against water, in much the same way as the sarking felt keeps rainwater out of a tiled roof.

Shiplap isn't made to be fixed vertically. Sooner or later the rain would be blown from the wrong direction, causing considerable rainwater penetration, problems and claims! It can, in some circumstances, be laid diagonally - either at 45 degrees or to run parallel with the pitch of a roof, usually between 22 and 30 degrees and, as likely as not, in a small area on the face of a dormer. Wherever possible, though, horizontal is best.

It's rare, but not unknown, for cladding to be fixed to the outside face of a wall without some form of pre-formed edge/side from which to work. Normally this is projecting brickwork, about 75 mm deep, ensuring that the existing boards and trims are protected, at the side, from driving rain. Freefoam cladding comes with an assortment of trims which, between them, ensure that the finished job is weatherproof (which isn't the same as weathertight*).

* Weatherproof means the cladding sheds most of the rain but the detailing can't stop a certain amount of water getting in at edges or joints. If it could do that, it could be called weathertight.

It's the trims that go on first, because they provide the finished edges within which to work.

SHIPLAP CLADDING

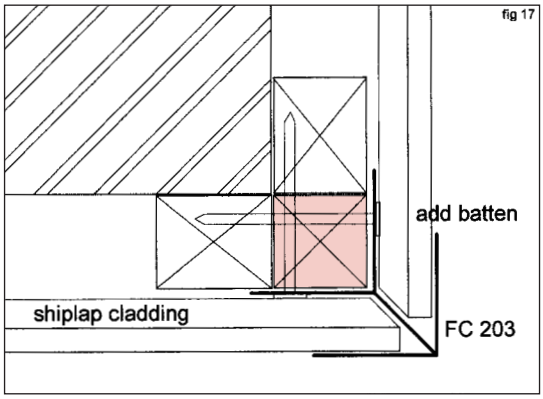
Method Statement

It's essential to be sure the existing structure provides a sound substrate on which to work. If there's any damage or disrepair, now's the time to put it right. Check there are no tears or holes in the damp proof membrane. If there are, they really do have to be made good. Failure to do so will result, almost certainly, in moisture penetration, leading to damp patches on internal walls - for which you'll get the blame. It's always the fault of the last man in! Assuming it's horizontal boarding that's coming off, the softwood battens are vertical, and shouldn't be more than 600 mm apart. There must also be a batten running down each vertical edge as well as across the top and bottom. They're all important and they all have different jobs to do.

Everything that constitutes an edge must have a batten into which to fix the cladding - brickwork at gable ends, eaves, window jambs, sills and heads - everything. What will be described from now on as "the bottom" assumes it will be, literally, at the bottom of the wall, at damp proof course level. In many cases, the actual bottom of the cladding actually occurs along the top of the ground floor windows.

The batten along the bottom will form a dam if it runs from one side to the other without either weepholes or gaps of some description. If the bottom batten is continuous, and without weepholes, drill some. 10 mm diameter at not more than 300 mm centres. That way, you know that any rainwater that gets behind the shiplap can get out again.

External angles (they happen), where both faces are to receive cladding, need at least one of the two edge battens to be 50 x 25 mm, to ensure that you can fix the FC203 Corner Trim.



Where this doesn't happen at a right-angle, or where it's an internal angle, the two battens can be butted as closely as possible to each other.

Any battens that require replacement must, of course, be preservative-treated. Check also that the walling is flat - plumb and without any undulations or unevenness. Occasional bumps and hollows do occur and they aren't always visible until the boards are on . . .when they create a messy-looking job, sometimes necessitating stripping off and starting again, so . . . Start with the trims. It's a bit like doing a jigsaw puzzle because you have to do the edges first. Look on the bright side - there won't be dozens of pieces of sky to fill at the end! Suggestion: start at the bottom, as you do with the boards (and most other things in life).

USEFUL TIP - Keep a stock of packers in the van (plastic ones used in glazing are perfect) for wedging in behind any battens that appear to be out of line. Stick a straight edge on them before fitting and ALWAYS pack behind the battens - and NOT between the battens and boards.

The bottom batten (and therefore the cladding) MUST be at least 150 mm from ground level. This prevents splashing up off hard surfaces and allows this nominal clearance for any build-up of snow.

Cut a length of FC218 the F-shaped Starter Trim with Batten Cover or FC212 Starter trim without Batten Cover, more or less the length of the lowest batten. Less, actually. In fact, it needs to be 30 mm less at each end, to make room for the vertical edge trims, made from FC202 Universal Channel.

THIS IS IMPORTANT

. . . . Weatherboarding, when it's made from timber, is neither as smooth nor impermeable as PVCUE. This means that, when it rains hard on the new stuff, every single drop is going to drain off the surface. Worse still, when it's driving rain, an awful lot of that rain is forced to the sides, as well as downwards. That rainwater has to go somewhere - the channels at the sides, in fact.

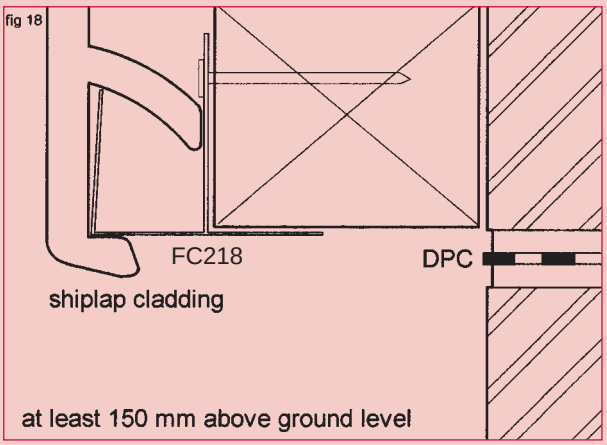
It's therefore obvious, when you think about it, that these channels have to do the job, from time to time, of vertical rainwater gutters. If a lot of rain is being forced in, it has to be able to get out at the bottom as easily as possible. Whilst the boards do obstruct the channel, their shape is such that the water still runs down. In times of driving rain, what matters is that there's nothing at the bottom to stop it pouring out quickly, and as trouble-free as possible. So the channels go all the way down to the bottom edge of the bottom batten, with the Starter Trim fitted between them.

Before fixing anything, take a spirit level and ensure that the bottom batten is perfectly straight and level, If it isn't, pull it off and put it back again so it is. This is where the job starts and it has to start right if it's going to finish right. Push the bottom Starter Trim, with the open angle at the back, up against the batten so that it fits snugly. This leaves a channel facing upwards into which the bottom shiplap board will fit. If the overall width is greater than 5 metres, add the rest of the Starter Trim. Pin it at 600 mm centres with CP30s. The rear upstand is the only part that you can pin into, which is handy because it ensures that heads don't interfere with the heel of the shiplap. Obviously, therefore, these heads have to be as flush as possible.

Desirable, though not essential, along the bottom is an additional FC206 Drip Trim profile. It is essential where the bottom is immediately over an opening (door or window), because it throws rainwater outwards, reducing the danger of premature decay or moisture penetration around the window or door. The Drip Trim has been designed to be shallow enough to clear the top of an outward-opening casement window.
That takes care of the bottom.

"The sides" are usually slightly recessed between the edges of the brickwork, though they also include forming edges around doorways and windows. The same Universal Channel is used in most cases, again nailed at 600 mm maximum centres. Where windows and/or doors are recessed behind the line of the cladding, one of Freefoam's many capping boards can be scribed and cut to fit, and to form a neat (and matching) finished reveal.

The Universal Channel, like the FC205 H-shaped Joint Trim and the FC203 Corner Trim, has unequal sides. The back flange projects at least 10 mm, to give enough room for a secret fixing (again with CP30s pins). This means they can't always be successfully fixed into a 25 mm wide batten. Trying to do so means fixings down one side only, which isn't always desirable, so 50 mm (or at least 38 mm) wide battens are preferred.



Before fixing an FC205 into place, be sure you're happy with its support. If you're not, then replace a narrow batten with either a wider one (bit of a pain, that) or take the easier option and nail another up next to it. As with the Corner Trim, fixings can be staggered, zigzag-style.

The Universal Channel isn't quite as universal as we would all wish. There are places, particularly where dealing with short widths of boarding, that it doesn't do the job. In these situations, an FC201 2-part Edge Trim is needed. Effectively it's two angles that fit into each other.

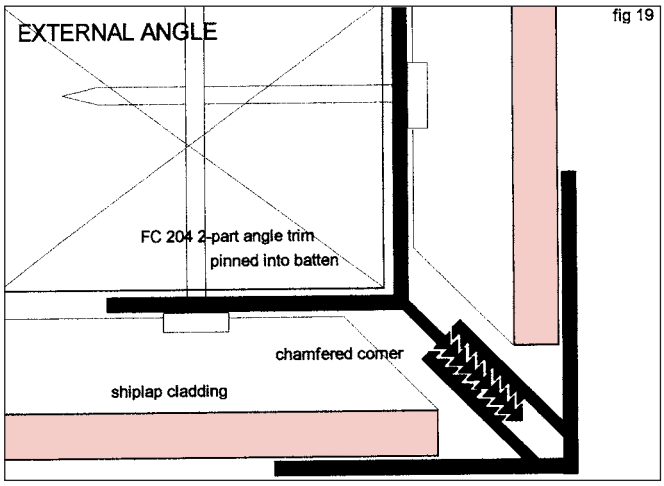
ALWAYS use an FC201 for the TOP edge because it's here that, almost certainly, you're going to be fitting a cut board, and no other trim will do the job.

Pin the female half (no, we don't need to go into details, here) to the batten so that, after the boards are fitted into place, the male half clips into position, and stays there, because of its toothed edging. A continuous vertical edge batten isn't essential, as long as there are horizontal battens at 600 mm max vertical centres - though this is an unusual occurrence for horizontal boarding.

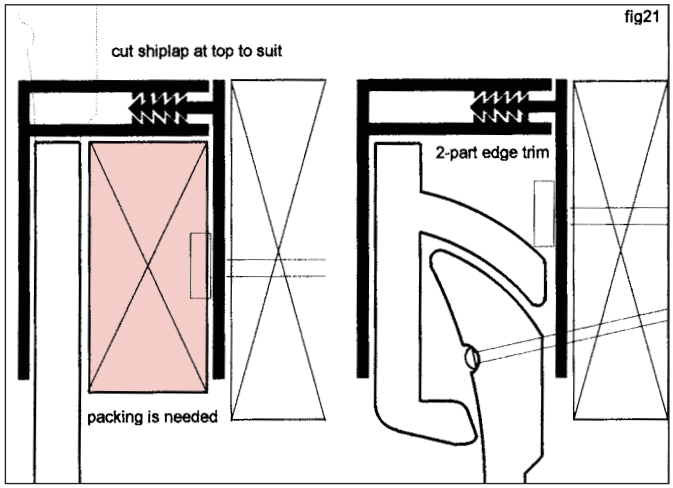
Perimeter trimming of openings should not project more than 5 mm beyond the front face of the battens. This ensures that, at the top, there is an adequate downstand to form a drip, ensuring that rainwater isn't going to seep in behind the cappings.

When fixing Universal Channels as edge trims against the edge of brickwork, the trim must be vertical. It must not follow walling if it's uneven or out of plumb. The sharp, white edge of the cladding is far more noticeable than any brickwork, so flaws really show up.

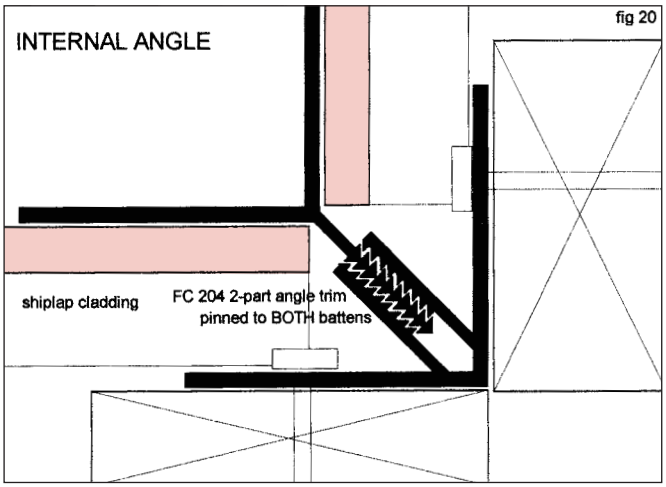
External angles generally need the FC203 Corner Trim. In most cases, it can be fixed (CP30 pinned at 600 mm centres, zigzag-style is fine) before the shiplap is fitted in. Where very short lengths of boarding are involved, it might be necessary to use either two lengths of Universal Angle instead, or an FC204 2-part Angle Trim, owing to the lack of flex in the boards. They're made to be light and strong but they mustn't be too flexible!



The FC203 Corner Trim isn't used for internal angles. It's difficult (very!) to nail through the diagonal web, so the FC204 2-part Angle Trim is used. Before starting any work that involves an internal angle, ensure that there is timber to fix both sides into. One side needs a 50 x 25 to give enough width for nailing, as shown below.



A 2-part Edge Trim is also needed along the top, be it under the eaves or under a window sill. Pin the female half into place.



It's rare for the width of boarding to be less than the 5 metre length of the boards, so a certain amount of cutting and buttjointing is inevitable. Form joints at a vertical batten support, and nail one board into the batten.

Shiplap boards have a groove along the front face, 10 mm or so from the top edge. This is where all CP30 pins have to go. When pins are hammered correctly into place through this groove, their heads should be flush with, not projecting from, the rest of the board. This ensures that the next board above it sits correctly in place.

Fitting boards is the easiest and quickest part of the job, and one of the few that doesn't take any longer to do right.

If the boarded area exceeds 5 metres in length, vertical joints will be needed, and there are two ways of making them, either of which might be suitable for the particular situation.

The boarding might look better (it usually does on houses) if the joints are random but the alternative is to create a single vertical joint all the way down the panel, at some strategic place. Random joints need Butt Joiners, and vertical joints need an FC205 H-shaped Joint Trim. Random joints first . . .

USEFUL TIP - Accurate cutting is always a good idea but, when cutting shiplap boards, it's ESSENTIAL to ensure that edges are perfectly square. It ensures that the Butt Joiners fit neatly.

The FC209 Butt Joiner is merely a cover mould, so it's one of the few trims that can be held in place by silicone mastic. Nail both boards in place before adding the Butt Joiner. The gap between the two boards must be between 10 and 15 mm. Never less, or the Joiner won't fit (and there'll be no room for thermal movement, and not more because it could lead to an unsightly gap appearing on one side or the other. Apply the mastic down the gap between the two boards and press the Butt Joiner firmly into place.

Clean off the excess silicone NOW. It's a job that has to be done sooner or later so, if it's done now, it can't be forgotten.

Butt Joints save wastage, but they do have to be positioned so as not to look unattractive. Excessively short lengths of board (less than 600 mm) should be avoided, if possible. An area to be boarded, say 3.6 metres wide, should have five vertical battens, 600 mm apart. This means a choice of five places at which to form butt joints. It takes a bit of skill to make them look random.

In theory, a 3.6 metre width could be boarded without any butt joints at all, because it's less than the length of a board but, if such an area was fifteen boards high, it would require a 75 metre total length of board. With butt joints, the total length required would be only 60 metres.

If there's to be a single vertical joint, it might be down the centre, or just to the side of a window. Cut and nail in place the appropriate length of FC205 Joint Trim. It's H-shaped and is, in effect, a double channel, into each side of which the shiplap boards slot neatly. The boards are nailed to the battens - not the Trim.

As boarding proceeds up the face of the wall, it becomes apparent, almost always, that the top board will need cutting because it's too tall to fit what's left of the opening. (This may also apply to window openings.) Sooner or later, boards will need cutting horizontally, along their length, for them to fit in place.

Because the boards are profiled to fit neatly over each other, cutting the top 50 mm (or whatever) usually means the loss of some of the shaped profile that helps it keep its shape. For cut boards to fit, and look right, they need packers behind them. Pieces of offcut serve the purpose. They need to be at least 50 mm long, and pinned in place at each vertical batten. Packers must always be pinned in place. Even if it looks like one can be wedged into position, and held there by friction, the boards expand and contract, due to thermal movement, so that sooner or later, the packer falls out.

FLEXI-ANGLES

Almost everything in this manual assumes all the corners of buildings are rectangular. A common exception is a 3-sided bay window, where the angles are normally 135 degrees. Here the edges of the boards are retained by Universal Channels but an FZ50 Flexi-Angle is used to cover the gap between the channels, and keep rainwater out. Flexi-Angles must not be used as the sole means of covering obtuse angles, as they don't restrain the board ends. They can usually be held in place by gun-applied sealant but, in some situations, pins might be needed.

Flexi-Angles are V-notched on one side. The notched side always goes on the inside of the angle.

FLAT ROOFS

First things first - flat roofs aren't flat. Everyone knows that. They are laid to fall, ensuring that rainwater is dispersed in one direction to the guttering. If the fascias need replacement, it's usually because the existing timber has received so little maintenance it's in poor condition. Usually rotten. So let's not go assuming that all the other timber is sound, then! In other words, the LAST thing to contemplate is walking on the roof.

SAFETY TIP - Never walk on a flat roof. Your weight can push small pieces of grit through the surface, causing holes and rainwater penetration for which you get the blame, or your foot can go right through. If you don't go up there, it can't be your fault.

There are so many ways for rainwater to get into a decaying flat roof, and so many cheap and cheerful decking materials, for it to be sheer lunacy to take a stroll across an old flat roof. Imagine that, when it was new, the decking was made from Weetabix. Pour half a pint of milk on Weetabix, and it isn't the world's strongest material. **KEEP OFF.**

It's easy to imagine that working at the edges of flat roofs is much the same as with pitched. To an extent this is so, since there's little difference between bargeboard details and overhanging sides to flat roofs - apart from the angle you're working at.

You don't need years of experience on site to realise that most manuals overlook most of the problems. Standard guidance is all very well, if you're working with a fascia less than a foot deep and an overhang between six and eighteen inches . . . but what happens if the existing fascia covers the ends of ply-webbed roof beams, some of which can be 400 mm deep? Or when there's no overhang, and the fascia's just fixed to the walling?

All the rules about ventilation still apply, except they can be more difficult to put into practice. Two opposing sides should allow ventilation, and these are rarely at the top or bottom of the fall. In other words, always ask yourself if there is provision for CROSS-ventilation. In other words, if the air can get in at one side, can it get out again at the other? If it can't, the roof isn't properly ventilated. Simple as that.

The sides and highest edge of a flat roof are easy to detail, as much the same applies to all three sides. There is (probably) a soffit - to be ventilated on two sides - and a fascia. Nothing new there, then. Instead of the tilting fillet and tiles, there's normally a block along the top edge, over which the roofing felt is dressed, and an edging trim with a drip mould along the bottom. Occasionally, they skip the block at the sides of a roof pitch, allowing rainwater to run over the sides of the roof, causing premature decay to anything made from timber, and some pattern staining (and fungal growth) on the walling. A new fascia won't cure this, and the customer should be shown how the original construction is at fault, to the extent that your work would only delay the same problems recurring. If the customers choose to do nothing about it, at least you warned them.

On the lowest side of the roof, rainwater has to be channeled into the gutter, so the block doesn't sit along the top of the roof but, instead, is fixed to the front of the fascia. This is the detail you need, but rarely see. This is largely because it takes you into the realms of general building work for which your profile supplier (quite rightly) doesn't want to take any responsibility.

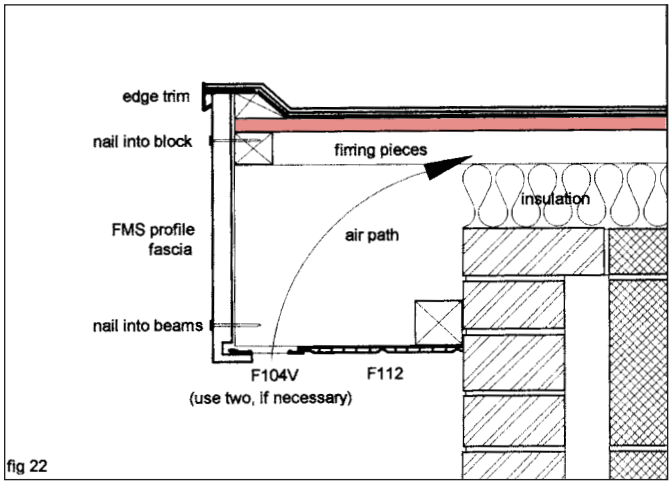


fig 22

Basically, the block has to be prised off the fascia and a new one fixed to the replacement. This involves peeling back old roofing felt, which inevitably leads to cracking and other damage that will, ultimately, lead to either rainwater penetration or renewal of a substantial amount of roofing felt. Bad news, and nobody likes to hear bad news.

When removing the drip block from the front of the fascia, the work has to be done carefully, so as not to cause any damage. If this looks unlikely, the customer MUST be informed of the risk. Someone must take responsibility for any damage that might occur.

At the sides and top of the roof, in other words, everything that doesn't come next to the guttering, is an aluminium drip trim. It's fixed vertically down into the block, and thus can't be removed without disturbing the felt. Diagrams that show the new fascia nailed, through the upper part of the face, into the block are unrealistic. Great for new-build, but not for replacement. If the roofing felt has been properly stuck down, it will be difficult to peel back. Heat is essential. A blow lamp provides enough heat to melt the bitumen and soften the felt. Cold felt breaks easily - hot felt is pliable.

There's nothing especially difficult, or different from pitched roofs, about applying fascias and soffits to the edges of flat roofs, as long as the felt is adequately protected from damage. The details, as shown above, show there's not much difference in the way the parts fit together.

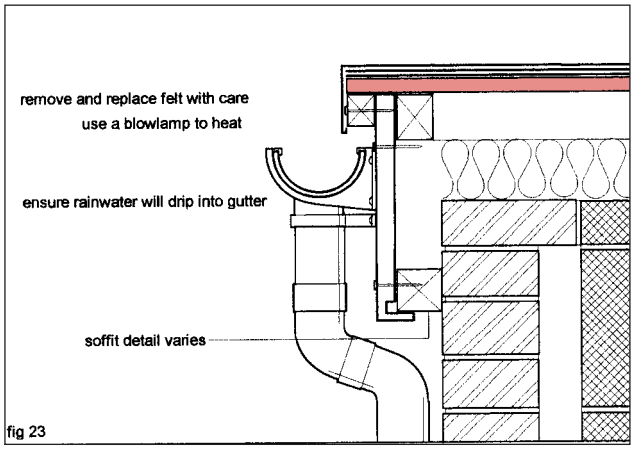


fig 23

Drip trims and blocks must be removed - with care. They must be put back in place with equal care. The rest is easy and straight-forward.

Where fascias exceed 300 mm in depth (sometimes significantly), a single fascia board can be unpractical. In these instances, the fascia should be treated as if it were cladding. Shiplap boarding is easily applied in these situations, and all the rules that apply to cladding apply here also.

NEW BUILD

Architects are often reluctant to design cellular PVC-UE products into their buildings. Not so speculative house-builders. Anything that's more than two storeys high should be the subject of thought because, if timber is involved, there are implications for a) maintenance and b) health & safety. It can be argued that, by allowing treated timber at anything more than two storeys above ground level, an unnecessary and avoidable safety hazard has been designed into the building. Spec builders know this, instinctively, so they eliminate the need for any maintenance.

With the increasing use of cellular profiles in new build housing, all sorts of new design possibilities come into play. Porches over front doors, for example, can have a pitched roof over them. They look better if they have a peak in the middle, inviting creative ideas for solving the problems of joining the various components. There is no right way but there are plenty of wrong ways.

If boards are to be butted against each other, the designer must consider what happens at the edges of each board. The main roof is big enough for all the standard details to apply, just as with replacement. Porches, however, are small in scale, and close to the eye, so care must be taken with the details if they are to look right . . . and work.

"I CAN DO THAT"

One of the joys of roofline and cladding is that, for a reasonably competent joiner, they're both quite easy to do. The capital outlay is so small, that it's also quite easy for someone to set up on his own, get a good reputation, and earn a decent living. The technicalities are predictable, most of the time, and there are only so many strange new situations that crop up. Each one of these, at first glance, looks like it can be sorted out with a bit of common sense.

It's also possible to find your way by car from Nantwich to Chelmsford with a bit of common sense - but directions make life a lot easier. Here, then, are a few random things that are worth bearing in mind because, one day, any one of them might crop up and catch out the unwary.

FLAT ROOFS - If external timberwork is in a sufficiently poor state of repair to need replacement with PVC-UE, it might be that a flat roof (probably on the garage) is also past its first flush of youth.
Major companies have strict Health & Safety policies, preventing their operatives from walking on flat roofs.

1. Before walking on any flat roof, be certain it's safe to do so.
2. Ensure that all employees are aware of the risk.
3. Place walking-boards on the roof before standing or walking over it, in order to spread the load.

EXPOSED SITES - The guidance offered in this manual refers to buildings up to three storeys high, and in typical urban or suburban locations. Rural buildings are generally exposed to stronger winds, as are taller buildings in a town.

1. The reference to fixing centres throughout this manual is 600 mm apart. Where roofline or cladding work is undertaken in coastal, rural, high or any similar location where it's clearly more exposed than would be considered normal, 400 mm centres should apply to cladding, even if this means the provision of additional timber supports.

2. Whilst some mouldings and trims might normally be fixed by means of gun-applied silicone, exposed site conditions (especially at corners of buildings) might well warrant the use of pins or nails instead. In some extreme situations, it makes sense to use both.

TIMBER FRAME BUILDINGS - It isn't always easy to spot timber frame houses, these days. They can be clad in brickwork, and look like traditional construction. Dry lined walls internally don't help identification, either.

Timber framing is designed to breathe. Where timber framing is clad externally with boarding of any description, it is probable that the construction behind the boards features a Breather Membrane affixed to the external face of the plywood sheathing. This only becomes apparent when the external cladding is removed.

To ensure air circulation behind any applied finish, cladding must be fixed to counter battens. Thus horizontal shiplap boards are pinned to vertical counter battens which are nailed to horizontal battens.

VERTICAL SHIPLAP - Wherever possible, this should be avoided. (The same goes for diagonal boarding.) Reason: it's too risky. It might appear sensible - and therefore reasonably safe - to fit vertical shiplap with the "bottom" edges facing away from the prevailing wind.
The prevailing wind (south-westerly for most of us) is what the British Isles get, most of the time. In other words, vertical shiplap should keep the weather out, "most of the time". Customers, and Trading Standards Officers, expect shiplap boarding to keep the weather out all the time.

DIAGONAL BOARDING - This should always be restricted to small areas.

Never attempt diagonal boarding onto horizontal battens . . . they MUST be vertical. This way, even if rainwater does penetrate the shiplap, there's little chance of it doing any harm. To achieve diagonal shiplap board fixings at 600 mm centres, the battens must not be more than 425 mm apart. Generally, it's safest to avoid diagonal boarding on exposed sites or above second floor level.

"A TRAINED EYE" - The same as "years of experience", can be taken as good reason to trust that looks right. Whilst there are plenty of situations where this no doubt holds true, it is unprofessional to believe that a good eye is more accurate than a spirit level.

If something looks right, it's possible it is right. When it's been confirmed by a spirit level, you know it's right, which is always better than believing. There are no situations, in a quality job, where the eye is more reliable than a spirit level.

DAMAGED BOARDS – (It happens) Quality assured companies have a policy of checking goods inwards and outwards.

Goods inward inspections ensure that you don't pay for faulty product, which saves time, money and argument in the long run.

Goods outwards inspection ensures that the van doesn't leave with something that's going to no good - necessitating a return journey (lost time plus costs) or all the various ways site staff find to keep the job going when they don't really have the right kit.

Site operations, if they're to pay, should go according to plan. Accidents do happen, so it's wise to take precautions. Not only should spares be kept in the van, in case of a mistake, but there should also be a repair kit.

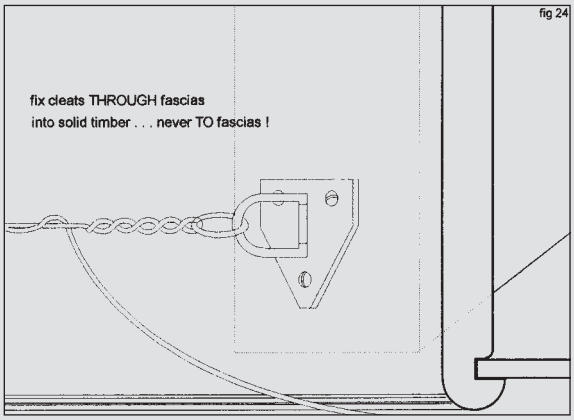
Minor scratches can be polished out of profiles, using wet and dry sandpaper (on a small wood block) though reduction in surface gloss can be expected. Start with 180 grit, keeping the paper wet. Wash the damaged area down, and finish off with 360 grit.

Deeper scratches can also be repaired but, if they're more than 3 mm deep, admit defeat and replace the damaged board, because the outer skin has been fully penetrated. If the scratch is deep, but not too deep, clean off any raised areas, fill the groove with the sort of filler used for car bodywork repairs. When it's dry, sand it flat with 360 grit. Most of the board might need a rub down, to ensure continuity of surface finish. Give it a wash down, to remove any surplus dust or grit.

WIRES - Fascias are wonderfully easy places to nail external wiring. They're used for cabling for electricity, telephones, television aerials, burglar alarms and (surprisingly) even water meters. Most of them can be pinned back into place, as long as the van has a supply of suitable clips.

The exception is the telephone line, which runs from a nearby pole, meaning that the wire is tensioned. This means the fixing into the fascia must be strong enough to support the wire (and the tension in it - which is greater when the weather's cold) and probably a couple of dozen starlings in party mood.

Wherever possible, allow the householder to arrange with the phone company to have the cleat removed and relocated, preferably onto the brickwork (though this usually means lengthening the wire). The line might have to be disconnected for the duration of the roofline work. If dealing with the line yourself, ensure the cleat fixing is strong and goes right into the supporting timberwork behind the fascia. If necessary, mark the position of the rafter end (or similar) with a pencil, to ensure a fixing.



If wiring of any sort is to be disturbed, always check that the system works before doing any removal. And, needless to say, check it again afterwards.

DISHES - Satellite TV dishes, and their wiring, are another source of alleged damage. It doesn't take much of a knock to misalign a satellite dish. Your customer might be interested, for a while, to receive US intelligence relays direct from an AWACS overflying an active war zone but, sooner or later, the kids will want their MTV back. Every time you find a satellite dish, it's worth asking to check reception on the telly before doing any work.

BIRDS - There are times when roofline work coincides with the nesting season. If the timing of work is critical to the customers, ensure they take responsibility for preventing birds nesting. Once the eggs are laid, or the chicks hatch, it's too late. Ignore this advice and you could be liable to a fine

The Countryside & Wildlife Act in Britain makes illegal the removal or disturbance of nesting birds. If they set up home first, the law says you have to wait. This typically applies to starlings and house sparrows, which nest in the eaves, as well as swallows and house martins, who build their little mud huts under the soffit.

Ignore this advice and you could be liable to a fine of up to £1,000 per bird.

BATS - These creatures, who live in some roof spaces, are protected. If there is any possibility that roofline work might adversely affect bats being able to get in and out of their home, it's essential to seek advice. For guidance, either call your local English Nature branch office or, nationally, the BATLINE (care of Cresswell Associates) on 01453 764450.

BALANCED FLUE OUTLETS - Gas-fired boilers generate heat, much of which is expelled as exhaust. The flue outlet, to comply with Corgi regulations, should never be less than 300 mm below the eaves or from a window opening. If you find one that's less, notify the customer and don't attempt to fix any PVC-UE products near it, as they will deteriorate rapidly. If one of these flues is 300 mm or more below the eaves, it's legal but you might need to affix some form of metal deflector to the wall below the eaves. Fix it TO the eaves and it will just transfer the heat direct, through the metal and into the PVC, causing permanent damage.

The simple rule is:
if in doubt, ask someone for advice.

TECHNICAL DATA

Many (but not all) of the performance characteristics that apply to Freefoam roofline and cladding products can be measured, which allows the creation of standards by which to judge those measurements. It should be noted that, in the main, most of these standards can only apply to the components, rather than the completed assembly. Such characteristics include:

Chemical stability Colour fastness
Density Durability
Fire resistance Flame retardance
Strength Thermal insulation
Thermal movement Weather resistance
Workability

GENERAL

Freefoam roofline and cladding profiles are made from cellular PVC-UE (unplasticised expanded cellular polyvinyl chloride) foam, co-extruded as a durable PVC-U skin with a rigid closed cell core. They contain no CFCs (chloro fluo carbons) or lead and are therefore formulated to be completely non-hazardous to health. Freefoam fixings are manufactured from corrosion-resistant stainless steel.

STANDARDS

Freefoam roofline and cladding products are manufactured in accordance with two recognised standards:

The foam profiles -British Standard specification BS 7619: 1993 - Specification for extruded cellular unplasticised PVC profiles

The fasteners -British Standard specification BS 6105: 1981 - Specification for corrosion-resistant stainless steel fastenersthe manufacturing process -the international standard for Quality Assurance BS EN ISO 9002: 1994 (BS 5750: Pt 2).

DENSITY

The thickness of profiles varies, which affects the proportions of outer skin and inner core, so there can be no single value for density but, in general, profiles are between 450 and 600 kg/m3

STABILITY

Stability in this context is resistance to chemical and/or biological reaction. Cellular PVC-UE is not affected by liquids or other substances in everyday use, and is resistant to attack by acids and alkalis. It is generally described as being resistant to attack by wood-boring insects though, in practice, this might also mean it has no nutritional value. It is not attacked by termites or woodworm. It does not support the growth of fungus or bacteria. It is subject to damage by a range of chemicals, generically known as esters, ketones and solvents

COLOUR FASTNESS

The methods of test for colour fastness contained in British Standard specification BS 1006: A03: 1978 include gradings down to a minimum value for colour change of Grade 8 -Freefoam white profiles all achieve either Grade 7 or 8, meaning that there is no significant fading or change in whiteness for a minimum of 20 years. Freefoam white profiles have demonstrated, in test conditions, excellent resistance to discolouration, a degradation known as "pinking", which is generally believed to be related to processes involving Titanium Dioxide and Lead stabilisers. Freefoam co-extrusions use Calcium Zinc instead, which does not suffer discolouration.

Coloured profiles and associated products use organic pigments, chosen for their colour-fast properties. Fading can't be eliminated but it will be gradual and uniform – only detectable when compared with new materials.

DURABILITY

Freefoam cellular profiles are not manufactured from impact-modified PVC-U as used for window frames, so they cannot be as resistant to the impacts experienced in Charpy tests. The denseness of the outer skin ensures adequate resistance to impact, thus ensuring a highly durable surface.

Freefoam fixings are manufactured from Marine Grade stainless steel, the most corrosion-resistant material and thus not prone to rusting or, as a consequence, the staining of cellular profiles.

FIRE RESISTANCE

Resistance to the spread of fire can only apply to a completed assembly but not to its components. Profiles have been tested for compliance with the Flame Retardance requirements of British Standard BS 476:

BS 476: Pt 5: 1979 Ignitability Test - self-extinguishing;
Pt 6: 1989 Resistance to Fire Propagation - Class 1;
Pt 7:1987 Resistance to Spread of Flame - Class 1Y.

STRENGTH

The strength of Freefoam profiles and associated products cannot be measured as such, because strength is a characteristic of an assembly. Thus the resistance to wind loads is entirely dependent on variable factors such as profile configuration/ thickness and the spacing of fixings. When fixed in accordance at the recommended spacings, the roofline and cladding systems have adequate resistance to wind loadings. Up to two storeys height, fixing spacings should not exceed 600 mm centres, and from two storeys to a maximum of five storeys, 400 mm centres.

THERMAL INSULATION

Thermal resistivity is normally referred to in terms of a U-Value. Freefoam profiles, due to the composition of their cellular inner core, offer thermal performance far superior to timber or other natural building products. Due to the varying nature of the profiles in terms of configuration and thickness, thermal performance can only be generalised to between 0.06 and 0.1 W/mK.

THERMAL MOVEMENT

Expressed as the coefficient of linear expansion, Freefoam profiles vary between 5 and 6 x 10-5 per degree Celsius. When fixed in accordance with the manufacturer's recommendations, and in the British Isles, they perform satisfactorily. They should not be installed where ambient temperatures are likely to exceed 40 degrees, such as in close proximity to boiler flues. They should only be installed when the external air temperature is between 0 and 30 degrees. The thermal movement that occurs between day and night, sun and cloud, winter and summer should be allowed for as described in the installation recommendations.

WEATHER RESISTANCE

The external skin of Freefoam profiles is impermeable and cut ends, due to their closed cell structure, are non-absorbent. The weather resistance of installed products (specifically their ability to exclude rainwater) depends on site workmanship. When the recommendations of the manual are followed, rainwater should be excluded up to 5 storeys in height.

WORKABILITY

Freefoam profiles are easily worked with conventional woodworking tools: it can be sawn, shaped, cut, drilled, routed, nailed, screwed and glued. Saws must have fine-toothed blades, and power saws should be set at their highest speed level, with carbide-tipped blades.

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