DEALER STAMP

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STEEL MAIN AIR DUCT INSTALLATION AND ERECTION INSTRUCTIONS

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HARVEST INSTALLATIONS

Steel Main Air Duct

Installation and Erection Instructions

AGRICULTURAL HARVEST STORE INSTALLATIONS LTD

REG. No. 1439743

Health and Safety at work 1974.
Under section 6 of the above act, it is the duty of the manufacturers and suppliers of products for use at work to ensure, so far as is reasonably practical, that such products are safe and without risk to health when properly used and to make available to users of such products adequate information about their safe and proper operation.
Our equipment should only be used in the manner and purpose for which it is intended, and in accordance with the recommendations detailed in this manual. Our equipment has been designed and manufactured with safety in mind, but there are certain basic precautions which should be taken by the user, and in particular, attention is drawn to the safety precautions in this manual and in the operating instructions.
It is imperative therefore that all persons who make use of our equipment have all the information and instruction they require to ensure that they are fully aware of any hazards and they know both the purpose and the correct manner of use of our equipment.

PREFACE

All persons must have read and understood the operation manual before any kind of operating takes place.
All required safety equipment must be in place before starting.
All work must be carried out by a competent person.

HARVEST INSTALLATIONS GUARANTEE

All components which become faulty by reason of defective material or negligent workmanship are covered for a period of 1 year from the date of commissioning; the guarantee covers parts and labour.

The Guarantee is Subject to:
New equipment only.
Use under normal conditions ie. Protected from water or physical damage.
Correct installation by competent person.
No outside damage by impact from vehicles or machinery.
Correct filling, use and maintenance.

Exclusions to guarantee:
Un-licenced use not agreed by Harvest Installations.

Introduction

The Harvest Steel Main Air Duct is for use with a variety of above and under floor drying systems. Designed primarily for use with timber level floor systems, various adaptations can be supplied to suit any crop drying system.

The tunnel, along with foundation and anchoring design, can be used on single or double sided storage installations with depths of up to 4.5m.
Added to this our own track and the Main Air Duct becomes a perfect platform from which to operate the Harvest Maxi-Stirrer crop drying system.

The strength of the Main Air Duct allows fitting of high level internal fan rooms. These self-supported rooms allow fans, burners and main electrical controls to be placed inside the main store, reducing building footprint, and so costs.

Installation / Erection

Parts

As with any larger project, preparation is key. All parts should be on site prior to commencement of works. It is important to take time to thoroughly inspect and count major items. Any shortfall can be reported early and reduce stoppage time during erection.
As parts are delivered from several suppliers, it is important to take time to understand all layout drawings.

Special attention should be paid to main frames and cladding panels. As these parts come in different types and patterns, ensuring the correct number of each reduces delays later in the build.

MAIN DUCT COMPONENTS ARE:

Main frames.
Generally come in two types.
127 x 76 UB hot dipped galvanized frames. These form the main structure of the duct.
127 x 64 UC hot dipped galvanized frames. These are used as end frames and in entrance lobby construction. They are often, though not always, clad in 12mm plywood sheet and form the ends of the tunnel.

Cladding panels.
Bottom panel with air door cut-out. Manufactured to suit the type of drying floor being used.

Plain bottom panels.
For use when the duct extends past the end of the drying floor, such as at an entrance lobby, or into a fan room.

Intermediate side panels.
These come in 610 and 1220 sizes depending on tunnel height.

Top and side panels.
Cover half the tunnel roof width and extend down the side of the duct.

Top side panels.
Only used where a fan or fan duct is connected to the top of the duct.

Plain roof panels.
Only used where a fan or fan duct is connected to the top of the duct.

Spill panel.
Used above the main duct frame to enclose the walkway area of the duct.

Handrail supports.
Fitted on top of the duct to support the spill panels and Maxi-Stirrer track, if fitted.

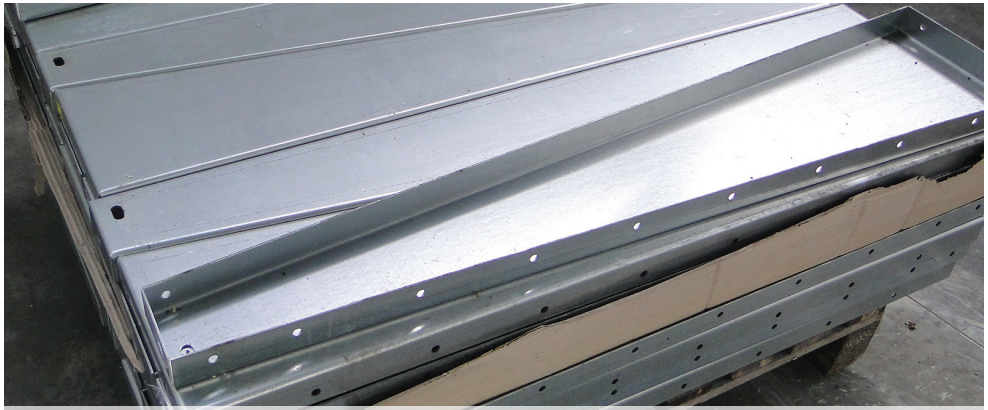
Access ladder kits.
These are supplied for access from floor level to tunnel walkway.
Fixtures and fitting, including flanged nuts and bolts for panel installation, ground anchors and packers for level.

Setting out

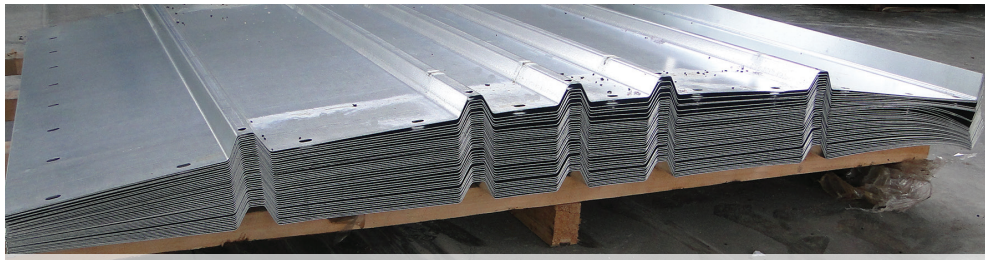
It is important to study all information prior to setting out. As grain store layouts vary, it is not part of this manual to give specific instruction.

DUCT END FRAME AND MAIN FRAMES

DUCT SIDE/ROOF PANELS

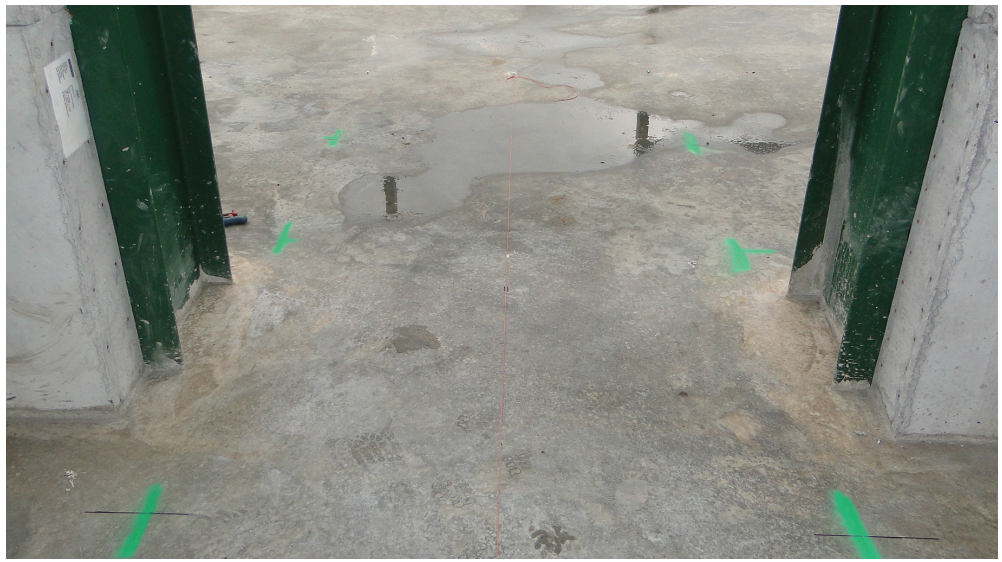


HANDRAIL POSTS, LEFT AND RIGHT HAND



SHEDDER PANELS

The position of the Main Air Duct should be given on a site drawing. Find the centre line of the tunnel and check it runs true to the building (square and parallel).
With a string line in place, determine the start point for the duct frames and mark this on the floor.
Working from the rear wall, the first channel frame should be placed as close to the wall as the building fabric allows. Remember this first frame has a plywood end plate already fitted.
If the duct passes through the wall into a fan room, determine the position for the start of the drying floor, this is usually, but not always, the location of the first frame.



Measure out from the centre line to give the outside line of the duct.
Now it is possible to determine the approximate location of each of the main frames. Working from the first frame location, mark the floor at 4’ intervals along both outside lines.
Now take levels at each of the frame foot locations and arrange suitable packing so the duct will sit level with the highest point of the floor.
Work back into the fan room ensuring that there is sufficient clearance to the building fabric to access all duct fixings. NB. Check frame centres as these can be a mixture of 4’ and 3’ centres.

Check that there is sufficient clearance to all parts of the building fabric for the duct to pass from the fan room, into the main store.

DO NOT ATTEMPT TO MARK OUT AND DRILL ANY HOLDING DOWN BOLTS.

Starting

Install first main frame onto packing. Support the frame or securely tie off. Stand up the second frame which will allow for fitting of the first bottom side sheet. Duct cladding should always be fitted from the rear, or fan house end of duct, moving down the duct towards the front of the building.
Stand up the next frame and fit the bottom sheet

Check drawing layout and duct plan to ensure plain bottom panels are installed in the correct locations and all tunnel frames are at correct centres.

NOTE FRAME ORIENTATION!

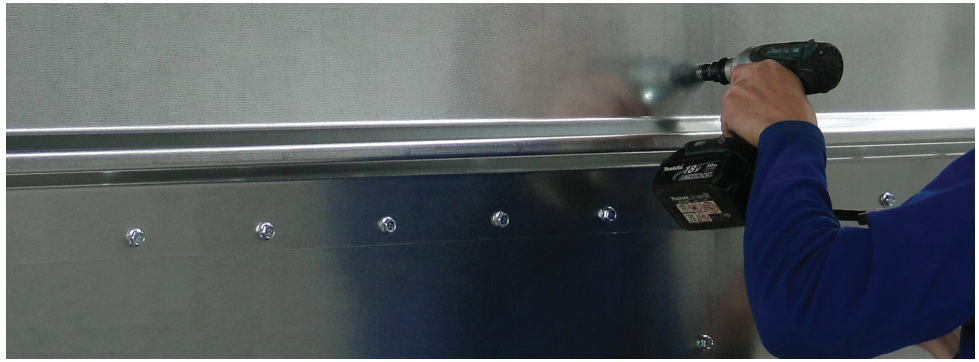
Now it is possible to work along the guide lines on the floor to install the remaining frames and bottom panels on each side of the duct.

Fixing and Tightening

It is important to fix panels in the correct order. This helps to keep the panel line straight, and prevent ripples forming and misalignment of panel corrugations.

Securely spiking panels into place provides first alignment. It is important to spike both ends of the panel and use any overlap holes between panels.

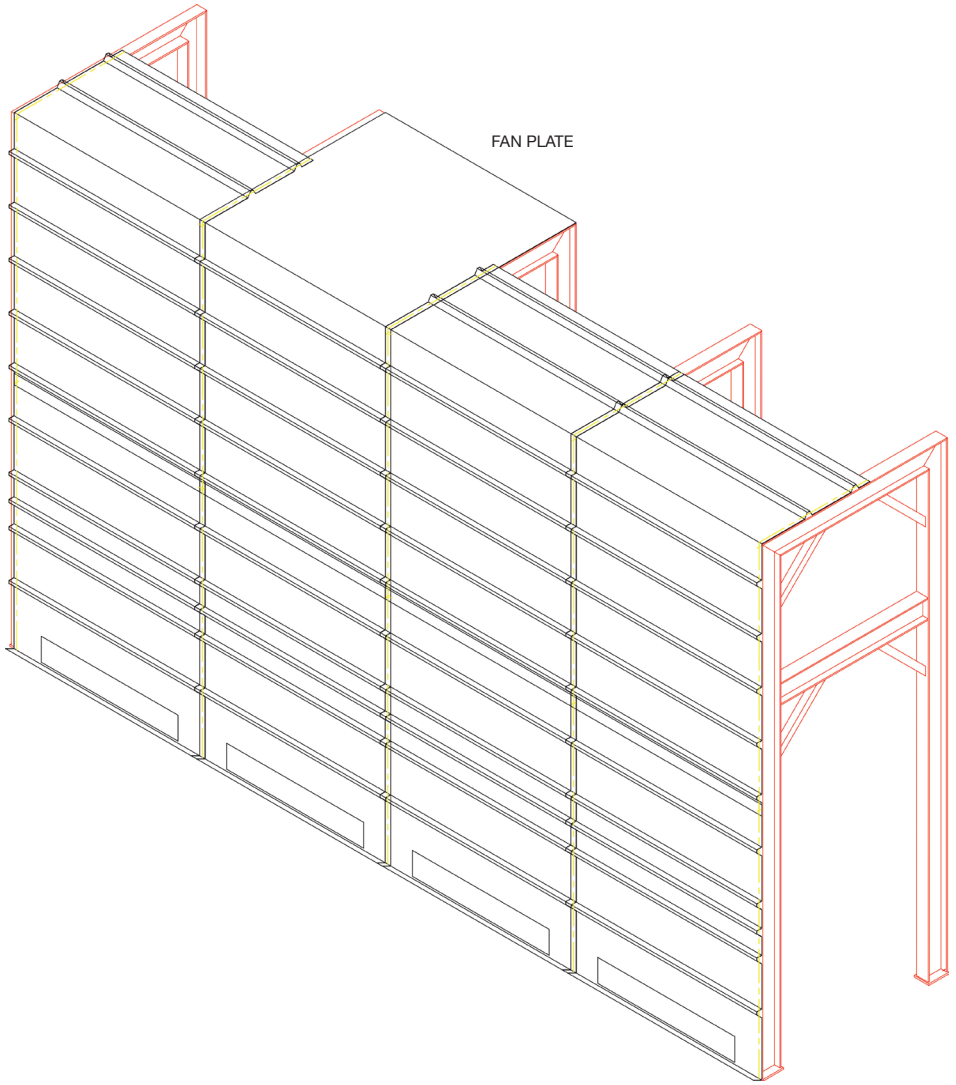
First fix is the top of panel corrugations. This helps panels hold their shape and prevent creep. Once the corrugation holes are filled and tight the remainder of the sheet joints can be filled and tightened.



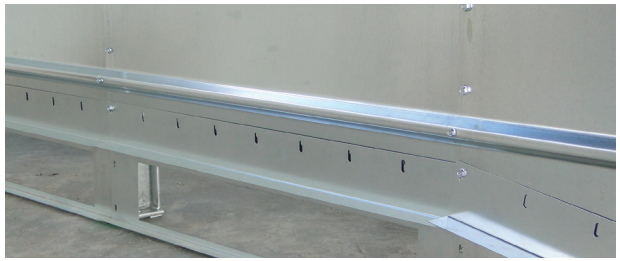
Intermediate side and roof panels

Installation of the side panels follows the same pattern as the bottom panels. Starting from the fan end, or rear of the building, install panels on both sides of duct. It is good practise to spike all corner holes to frames to ensure good location and aid panel alignment.
Roof panels are installed in the same way. Remember not to fill holes used for spill panel seams, and for fixing handrail posts.

Take care to check the main layout drawings for fan positions. If an internal fan room is being installed, some roof panels will not have the roof wrap over section. A plain flat sheet is supplied for fitting of fan ducts.



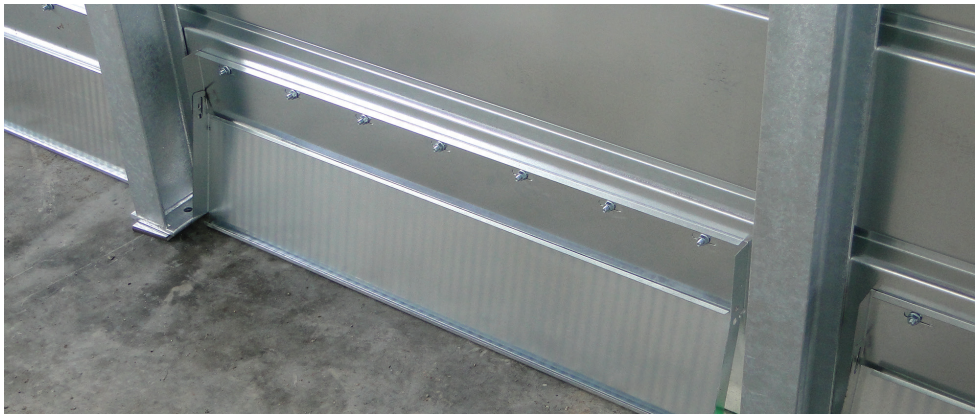
Air doors and flashings



Loose bolt floor flashing at main frame bolt holes only. This will locate the flashing ready for the air door frames.

Install the air door hinge frames inside the tunnel. Again it is important that the bolts are not tightened at this time.

Once the flashing and hinge plate are in place, lift each flashing on its adjusting slots and tighten the fixings to the main frames only. This holds the flashing out of the way whilst the timber floor is installed. Fit the internal air door and loose fill all holes.



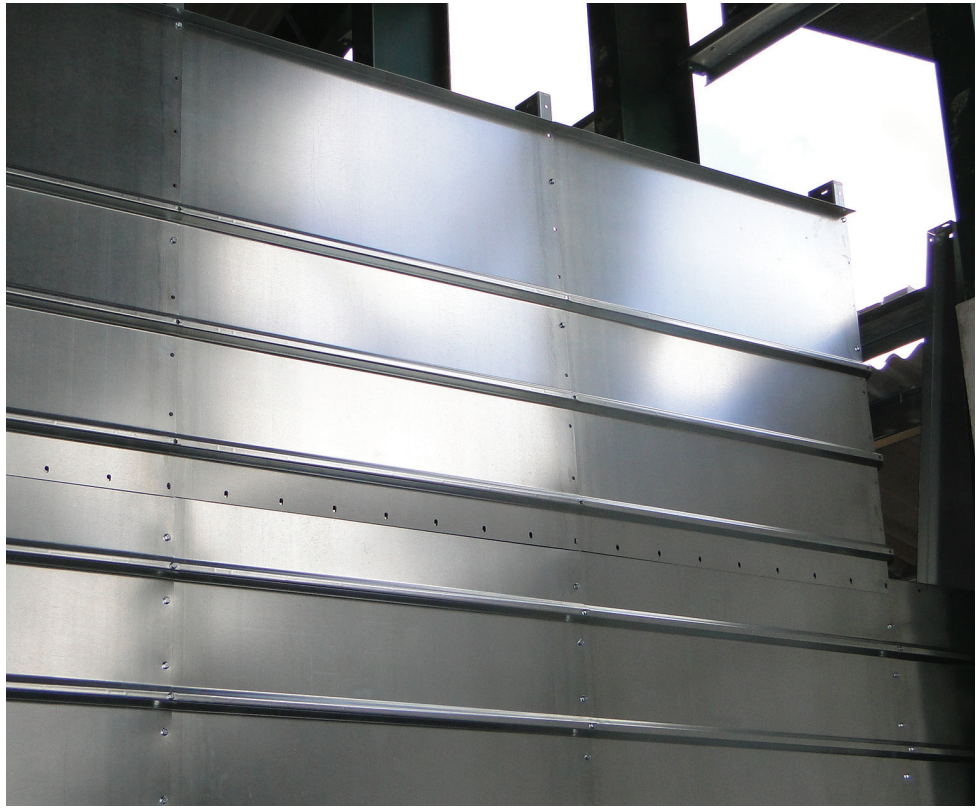
The floor installers will then lower the flashings and tighten all bolts during their installation process.

Handrail uprights and spill panels

Note: Handrail uprights are made in pairs, left and right hand.
Handrail uprights must be placed closed side facing out at the end of the duct. This allows fitting of either end plates, or access ladders.
The remainder of the upright can only be fitted on one direction. They should be fully over the main frame inside the duct. Check orientation is correct before proceeding.

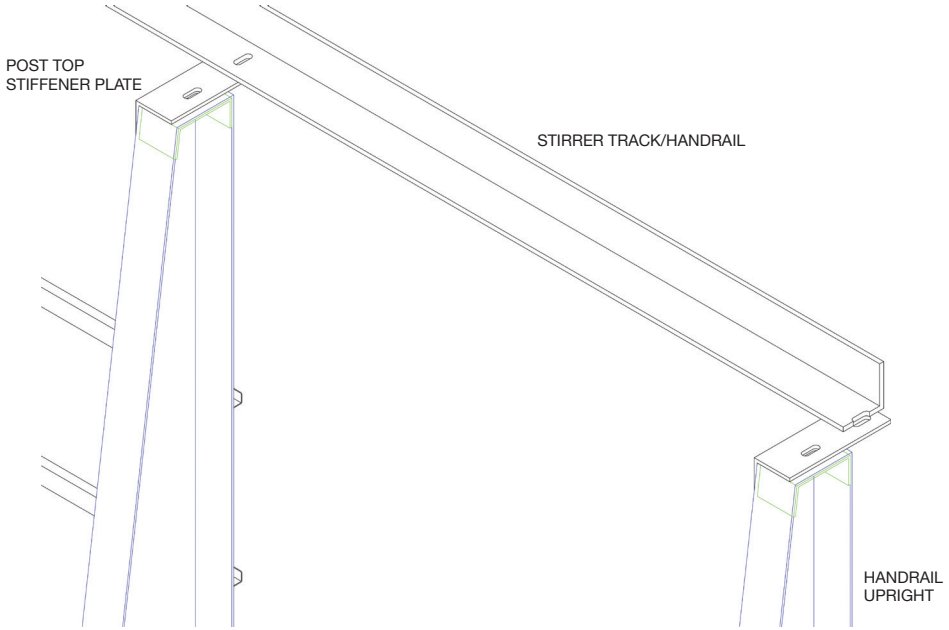
If a raised internal fan room is being installed, check drawing layout for position of special steelwork and install fabricated channels in place of standard handrail uprights.

Spill panels are installed in exactly the same way, and in the same direction, as the other side/roof panels. Loose bolt all seams.



Handrail / Stirrer track

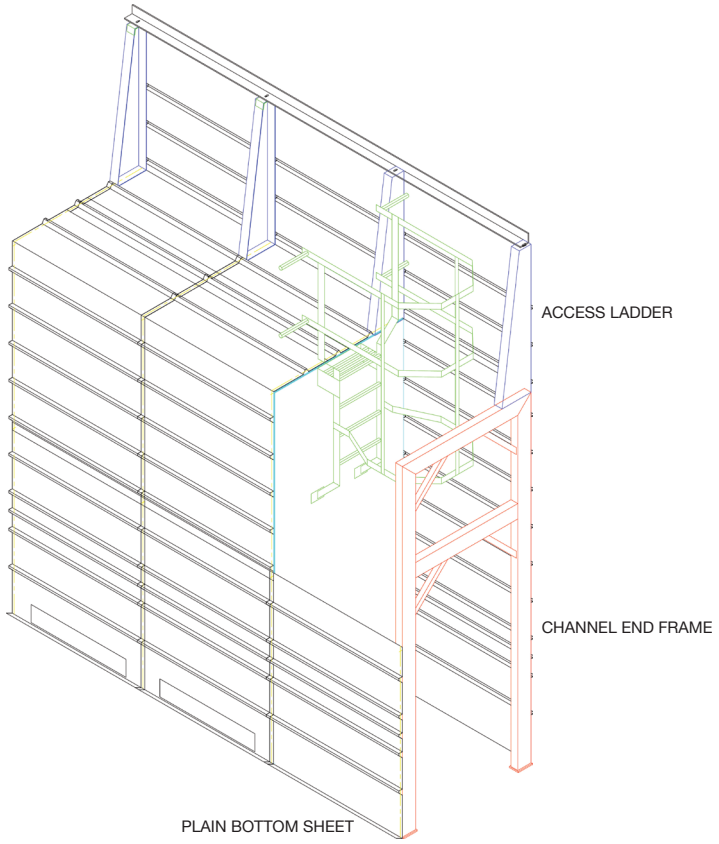
The handrail uprights are topped with a steel angle. This angle can be placed in two locations depending on the building layout.
The standard layout is for the angle to be fitted directly to the top of the upright. The top of the upright, and the angle have slotted holes to allow for alignment of the angle which will be covered later.
If a raised fan room is used, the angle is fitted outboard of the uprights on special brackets. These place the angle 100mm outside the line of the uprights and allow the stirrer to clear all supporting steelwork.
Handrail posts are fitted with an internal stiffener at the top. Fit all stiffeners and brackets (if required), loose fit track at this stage.



Lobby and ladder

It is important to study all plans and understand the correct layout for the tunnel access, and access from outside. An entrance lobby is generally one extra section on the end of the duct, but can be more, depending on layout.
A duct channel end frame and end plate denote the limit of the duct. The lobby is a continuation of the sides only of the duct. The extra main frame needed is always a channel section frame.

The ladder kit comprises: main step, main ladder section, hoops and straps, bottom brackets and removable ladder section. The top step is installed level with the top of the main duct frame, the remainder of the ladder then added. Handrail extensions and Kee-Klamp fittings fix to the handrail upright on the duct.



Fixing down

It is vital at this stage to monitor and align if required the duct main frames with the floor markings placed down at the set-up stage.

Once tunnel line checked, fixing down can start. Ensure all required packers are in place and line and level are maintained during fixing.

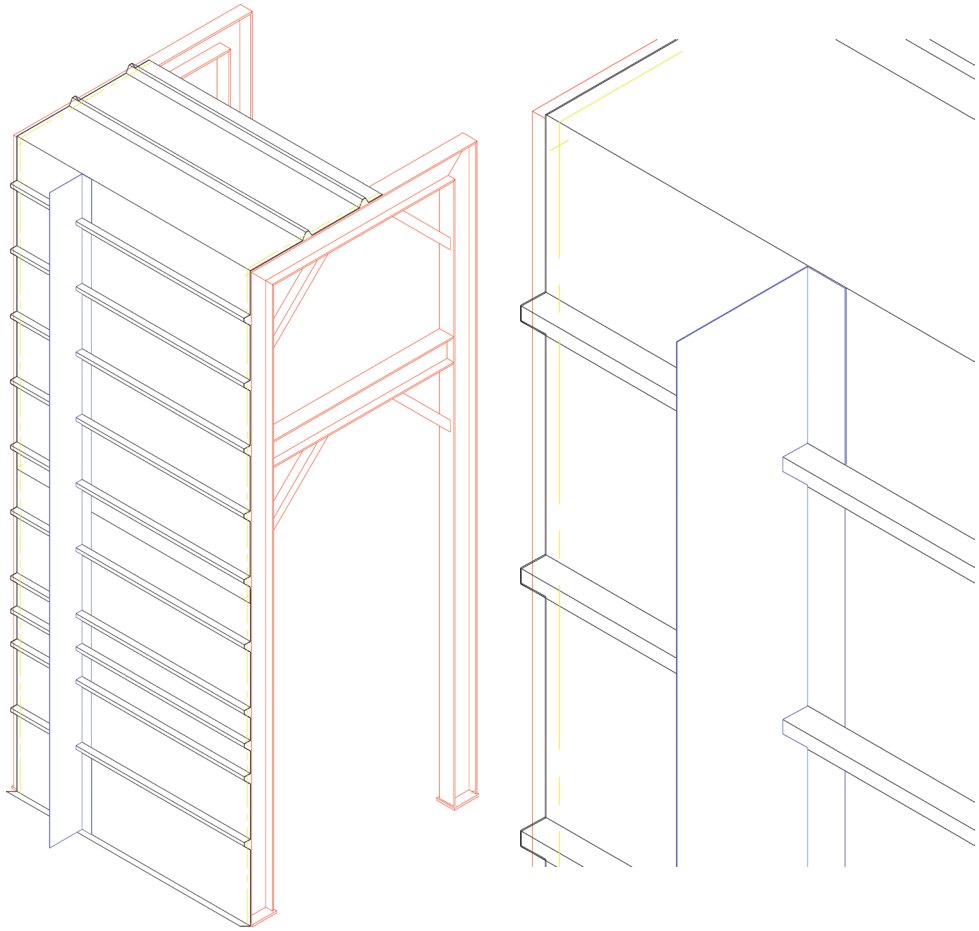
Joint sealing

During assembly, no sealant is used between sheets. This avoids problems of excessive sealant requiring cleaning from the outside of the duct.
A very small bead of sealant is applied to the inside joints after assembly, being smoothed into corrugations with a finger. This method provides sufficient sealing against any major leaks and provides a cleaner build.

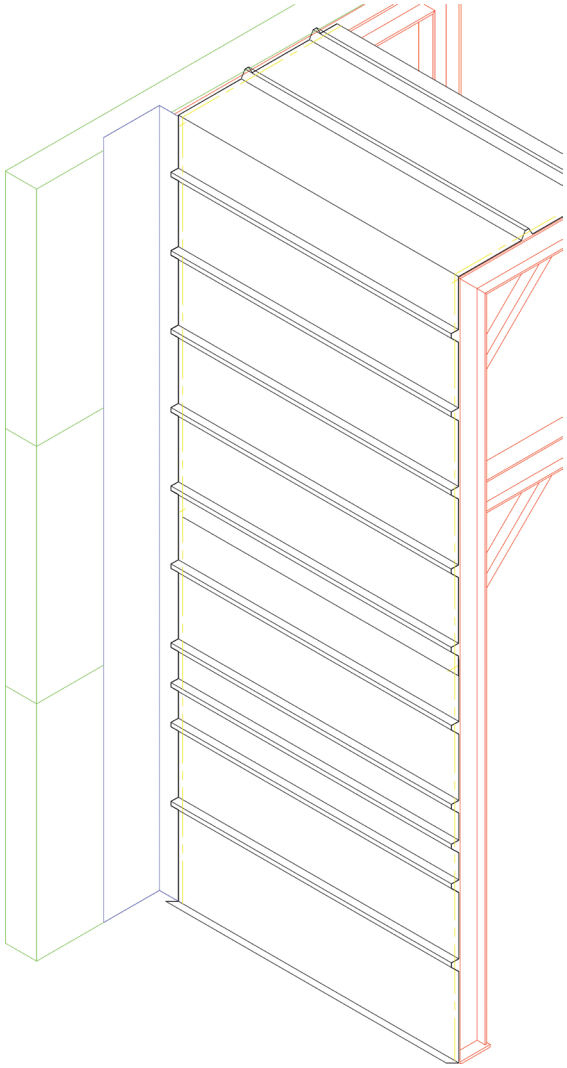
Corrugation sealing blocks are provided for the end of the tunnel. Alternatively, there may be sealing flashings strips which will require a small bead to be placed around the end of the sheet.

Flashings

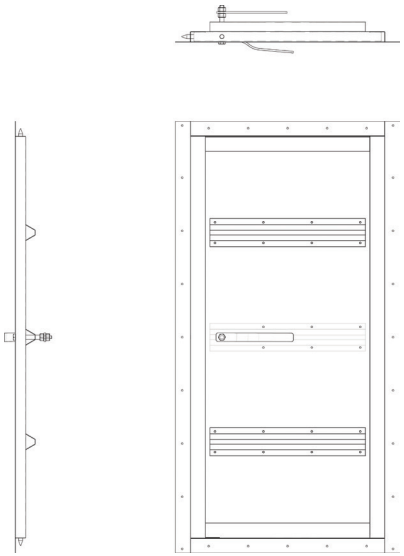
Once the duct is fixed, but before the final completion of the job, it is advisable to order any flashings required to seal the duct to the building. Profiled flashings are used for sealing when a tunnel passed through into a fan room.



Plain flashings are supplied for fixing to adjacent steelwork or concrete panels. These panels are fitted behind the duct side sheets and then to the building fabric.



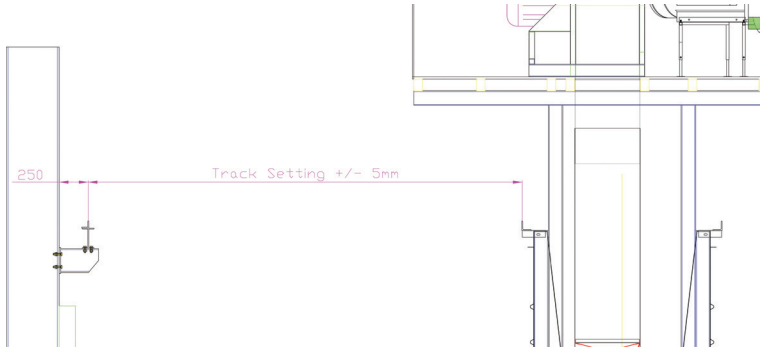
Special components



Duct access doors come complete with their own frame assembly. This can be fitted to the timber end panel in a lobby, or cut into the duct side panel for access from a fan room. Both doors open into the duct in order for air pressure to help with sealing during fan running.

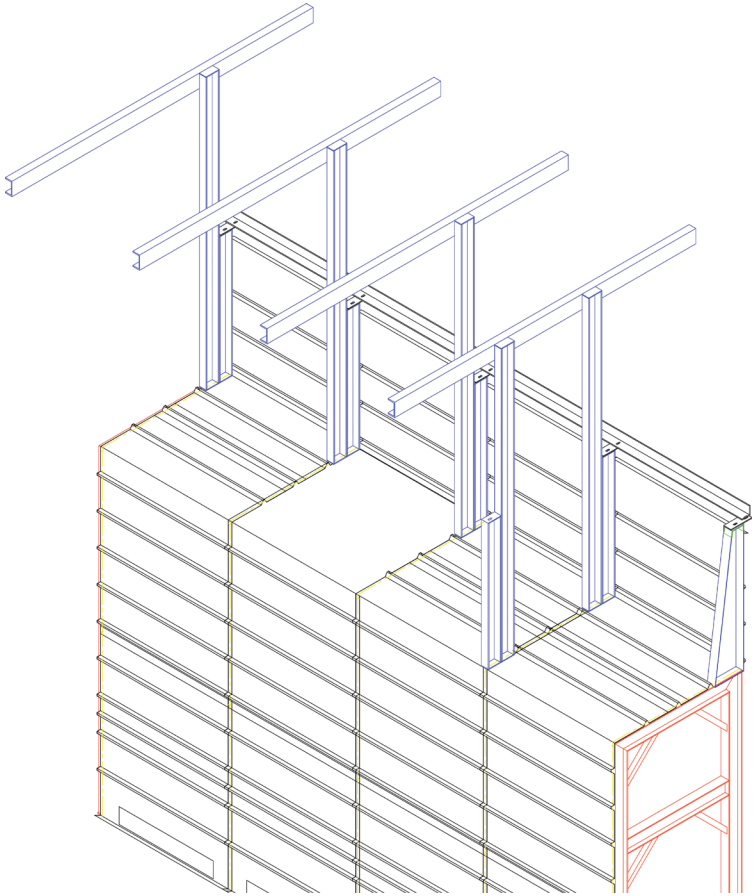
Access ladder kits can be fitted to the duct side either in the fan room or main store. Their assembly is as per end ladders in a lobby.

Stirrer track should be aligned with track mounted onto the store main steelwork. Check required track settings on drawings. Use slotted holes on track to obtain best results. Tolerance of +/-5mm is acceptable. Once track is bolted down and correctly aligned, set joints level and weld. Finish track top edge level to give smooth operation for stirrer.



High level fan room steelwork

High level fan room supporting steelwork is installed on the tunnel in place of handrail uprights.



Study drawings to obtain correct fan room layout. RSC posts are supplied to replace standard handrail posts. RSC posts have extended top plates for mounting stirrer track. Install remainder of fan room steel from these support posts. Fan room floor is supported on timber bearers. Install floor and landing along with access ladder. Lift fans, control panel and / or heaters into place prior to finishing fan room.

Final inspection

Inspect tunnel walkway. Look for good line of track support posts and stirrer track.
Inspect fan connection ducts and all sealing.
Ensure all fixing are in place on spill panels and ladders.

Check inside tunnel for any obvious outside light ingress. This will show up any missed bolts or potential sealing problems. Check all holding down bolts. Check all ventilation doors and their operation ensuring they open fully on overcenter fittings.

Check all flashings are in place and sealed. Leave floor flashing high on bolts for fitting by floor installation team.
Check line and finish on tunnel panels ensuring smooth even surface.

Clear site

Leave site with all rubbish sorted and stacked for the client to dispose of. If one has been supplied then skip all scrap.
Stack any left-over parts or items to one side. Packing panels, usually used for shipping purposes can often be used as patches should this be required at a later date.