Welcome to Kingspan, global leaders in the design and manufacture of insulated metal panels and building envelope solutions. Insulated panels serve as an energy efficient, state-of-the-art alternative to traditional construction. This document serves as installation guidelines for the KarrierPanel™ wall panel systems.

Disclaimer
This installation guide is only to be used in conjunction with panel installation drawings and Kingspan recommended details. Details shown in project shop drawings take precedence over any similar information in this manual. Shop drawings may be prepared either by Kingspan or by the panel contractor. Kingspan Technical Service Department is available to assist the panel contractor in the review of shop drawings.

This guide is intended to provide the panel contractor with recommended methods, procedures and guidelines for the installation of the KarrierPanel™ system. Information presented is accurate but may not cover all situations, building conditions and / or details of your specific project. Consult Kingspan Technical Services where this guide does not cover your unique construction requirements. It is the sole responsibility of the project engineer and panel installer to ensure specified air and weather tightness of a building by good design and workmanship in accordance with approved drawings using only the appropriate type of sealants. It is the sole responsibility of the owner’s representative and panel installer to maintain quality workmanship in accordance with approved shop drawings to ensure the best performance of the wall system. Kingspan recommends installers read this document fully before receiving the panels on the job site. Installation classes are available through Kingspan’s Technical Services Department. Please call 1-888-332-5862 for more information.

Follow the architect’s approved shop drawings and engineering calculations for your project specific fastening patterns. The engineer of record is responsible for verifying applicable design loads and panel fastening requirements.

All safety procedures, including adequate fall protection, are the responsibility of the panel contractor.

IMPORTANT!
Please read all information related to your project before receiving materials at the job site and before starting the installation.
## Installation Procedure

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## Material, Tools and Hardware

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1 Introduction

1.1 Features
The KarrierPanel™ product range is suitable for large scale commercial and architectural projects and is available in either horizontal or vertical applications.

1. Single component wall panels provide a robust long lasting weather barrier, insulating core and interior vapor barrier all-in-one.
2. Polyisocyanurate foam core retains original insulating value over time.
3. Unique KarrierRail™ replaces the panel clip system and does not penetrate the air vapor barrier.
4. Panels are lightweight, easy to install under most weather conditions.
5. KarrierPanel™ is adaptable to a wide variety of rainscreen profiles.
6. Panels are available in lengths of up to 52" to minimize the number of stack joints required.
7. Accessory items including metal flashings are available (contact Kingspan for more information).

1.2 Insulation Values
KarrierPanels are available in the following configurations:

- 2” panel thickness
- 2.5” panel thickness
- 3” panel thickness
- 4” panel thickness
- 5” panel thickness
- 6” panel thickness

KarrierPanel™ panels offer the building designer R values of approximately 7.2 per inch, as well as the ability to balance initial cost versus long-term energy savings.

To complete the wall system a full range of integrated accessories including attachment clips, metal trims and aluminum extrusions are available.

1.3 Warranties
Kingspan can furnish various performance warranties as required by project specifications. The items covered by these warranties include weathertightness, corrosion, structural performance and finish performance.

Weathertight warranties require the use of Kingspan Authorized Installers. In addition, these projects require several jobsite inspections, so be sure to schedule inspections in advance.

Kingspan requires that all specifications and shop drawings are reviewed prior to warranty issuance. In addition, warranties are limited to materials supplied by Kingspan, and are not issued until full payment for all services and material provided is received.

Contact Kingspan Customer Service for more information on our warranty programs.

1.4 Installer Qualifications
Kingspan recommends that our panels are installed under the direct supervision of an experienced installation contractor trained in the proper application of our products. Please contact Kingspan at 1-888-332-5862 for information regarding our Authorized Installer training programs.

1.5 disclaimer
All details shown in this installation guide are the standard BENCHMARK By Kingspan details. For project specific details, please refer to your project shop drawings.

For more product information, click here to connect to our website.
2 Technical Information

KarrierPanel™ wall panels have been thoroughly evaluated and tested by independent third party laboratories to determine all aspects of their performance.

The results of these tests, in combination with our comprehensive engineering analysis, enable us to provide design assistance for nearly every project. This includes complete panel analysis of wind, live, seismic and thermal loading as well as allowable spans, deflection and recommended fastening.

2.1 Deflection
Current industry standards for insulated metal wall panels specify a deflection of L/180. The project designer and/or engineer of record should always check the applicable code(s) for deflection limits. For deflection limits other than L/180, please contact Kingspan Technical Services for evaluation.

2.2 Compliance
Kingspan panels are compliant with the relevant codes and requirements for a range of suitable applications.

2.3 Panel Diaphragm
Insulated panels should NOT be relied upon to provide significant diaphragm strength. Instead, cross bracing (cables, rods, angle iron etc.) should be used to provide diaphragm. Insufficient bracing for the walls may result in damage to the panels, and will void the panel warranty.

2.4 Seismic
Kingspan wall panels are mechanically attached on one side only, with the other side free to slide along the tongue and groove joint configuration. In addition to this built-in slip joint design, the panels are very light (approx. 3-4 psf). As a result, they are ideal for use in seismically sensitive projects.

2.5 Fire Performance
Kingspan panels have been thoroughly evaluated by independent third party testing laboratories and are covered under various product approval listings.

2.6 Air and Water Infiltration
Air and Water Infiltration testing has been successfully conducted on the KS Series panels in accordance with ASTM E-283/331.
3 Inspection upon Delivery

3.1 Panels are carefully packaged in large shrink-wrapped bundles, then shipped on flat bed trailers to the construction site. When a shipment is received, check all items against the shipping document for quantities, dimensions, colors, transit damage, etc. Document any shortage of panels and accessories or panel damage on the bill of lading and have it signed by the driver. It is the receiver’s responsibility to make any damage claims immediately.

Please note that although every effort is made to prevent shipping damage, Kingspan is not responsible for damage which may occur during transportation, delivery, storage or on-site handling.
4 Panel Handling

4.1 Panels Handled by Forklift
4.1.1 The recommended loading / unloading method for bundles less than or equal to 30’ is to use a single forklift with widely spaced forks placed under the center of the bundle as shown in Figure 4.1a.

Panel bundles over 30’ in length may be moved by using two forklifts spaced equally along the length of the bundle as shown in Figure 4.1b. Inspect travel route to assure a reasonably level and compacted surface free of ruts and excavations.

4.1.2 To prevent panels from damage while lifting, carefully pick up bundles one at a time.
4 Panel Handling

4.2 Panels Handled by Crane

4.2.1 The recommended crane lifting method is to use nylon straps positioned at a minimum of two points along the length of the bundle. Suitable wood spreaders should be used and located at the top and bottom of the bundles at the strap positions to protect the edges of the upper and lower panels. Extreme care should be taken to avoid bumping and snatching of the bundles when lifting.

4.2.2 Panel bundles with a total length of not more than 30'-0" (9.14m) can be handled with a crane by using nylon straps and wood spreaders as shown in Fig. 4.2. For suggested wood spreader dimensions, see Fig. 4.3.
4 Panel Handling

4.3 Handling Individual Panels

**CAUTION**

4.3.1 Workers must wear appropriate protective gear at all times when handling panels. Failure to do so may cause injury.
4 Panel Handling

Correct and Incorrect Panel Handling

Thermal Bowing

CAUTION
4.3.2 Individual panels should never be moved in a flat position as excessive flexing may result. Excessive flexing ruptures a panel’s core, permanently distorts the facings and may lead to thermal blistering. When moving a panel, it must be turned on its edge first, then supported at each end with as many men as necessary to safely handle.

NOTE
Panels exposed to direct sunlight may exhibit thermal bow, which can hinder panel engagement. This can be corrected by either placing the panels in a shaded area, or by flipping the panels over exposing the cool side of the panel to the sunlight for approximately 15 minutes.

Panels are to be fastened at every support unless otherwise indicated on the shop drawings. Fastener requirements at each clip are based on design loads. Refer to the shop drawings for the correct fastening, or contact Kingspan Technical Services for assistance.
4.4 PanelsHandled by Crane
Panel installation time can often be reduced by using vacuum lifting equipment. The following items need to be verified by the equipment supplier prior to use: lifting equipment must be adequate for panel lengths and weights, and provide sufficient mobility and reach for the project conditions.

Vacuum heads (cups) must be suitable to safely lift panels with profiled and/or embossed surfaces.

Fluted profiles may require specific vacuum heads.

Kingspan recommends using Rotaboy and Cladboy vacuum lifting systems.
5 Panel Storage on Site

5.1 Site must have adequate storage space to receive and store the panel bundles. This space must be level, firm, clean and free from standing water. Bundles should be stored in a dry condition, with one end slightly elevated to facilitate moisture drainage.

5.2 Panels should be inspected upon delivery for presence of moisture. If moisture is present, bundles should be slit open immediately to allow ventilation and drainage.

5.3 If panels are to be used immediately, bundles should be placed at pre-planned strategic locations around the building perimeter, as close as possible to the specific work areas. Review installation shop drawings to determine the best locations.

5.4 Panels in opened bundles should be covered by a plastic sheet or tarp at the end of the working day. The covering and bundles must be securely fastened to prevent wind damage (see Figure 5.1).

5.5 When handling panels and / or panel bundles, ropes, steel cables or chains must not be used.

5.6 Avoid outdoor storing for longer than 60 days. Moisture between panels can cause corrosion or staining. Staining of any kind is not considered to be a cause for rejection.

5.7 If panels are not to be used immediately, then they should be stored under a temporary shelter with the plastic removed from the top and sides of the bundles. Recover the bundles with a protective tarp and adequately secure both tarp and panels to prevent wind damage (see Figure 5.1).
6 Handling and Storage

6.1 Care should be taken during unloading and storage to prevent damage to small items, i.e. trims, fasteners, clips, sealants, etc.

6.2 Cover all pallet crates or boxes to protect materials from weather but allow for ventilation to prevent condensation. Temperature sensitive items such as butyl tapes and sealants should be stored under controlled conditions to maintain suitable application characteristics.
7 Removal of Protective Film

7.1

IMPORTANT!
If panels will not be installed within 60 days of receipt, the bundles should be unstacked and the protective film removed from each panel. Carefully restack the panels and protect from the elements. Failure to remove the film within this time period may result in excessive film adhesion and breakdown of the plastic, making removal extremely difficult. In addition, failure to remove the film as instructed may result in a buildup of adhesive residue. Kingspan is not responsible for either of these conditions. Film removal and panel cleaning is the responsibility of the installation contractor.

7.2

BENCHMARK By Kingspan recommends that the protective film on the exterior of each panel be removed as each elevation is completed.

7.3

Loosen film along male edge and peel it off and down at approximately 45° angle from both sides of panels (see Fig. 7.1).

7.4

If adhesive residue remains on panel surfaces after the protective film is removed, panels may be cleaned with a rag soaked in 409, SFR or equivalent. After cleaning, rinse thoroughly. For safety, provide adequate eye and skin protection, ventilation and follow all other manufacturer’s instructions.

![Peel back film approximately 1 inch along all edges](Fig. 7.1)
8 Structural Alignment

8.1
Review shop drawings prior to installation to verify that structural members are in the correct location.

8.2
Installer must examine the alignment of the structural steel before installation of the wall panels. The walls must be square, and support members to which panels are attached must be in the same plane, flat and free of obstructions such as weld marks, bolts or screw heads.

For vertically installed panels, support members shall be:

a. Plus or minus $\frac{1}{8}$" (3.17 mm) in 5 feet (1524 mm) in any direction along plane of framing

b. Plus or minus $\frac{1}{4}$" (6.35 mm) in 20 feet (6096 mm) cumulative in any direction along plane of framing

c. Plus or minus $\frac{3}{4}$" (19.05 mm) from framing plane on any elevation. Panel supports must extend to the outer extremities at all panel terminations.

8.3
For horizontally installed panels, support members shall be:

a. Plus or minus $\frac{1}{8}$" (3.17 mm) in 5 feet (1524 mm) in any direction along plane of framing

b. Plus or minus $\frac{1}{4}$" (6.35 mm) in 20 feet (6096 mm) cumulative in any direction along plane of framing

c. Plus or minus $\frac{1}{2}$" (12.7 mm) from framing plane on any elevation. Panel supports must extend to the outer extremities at all panel terminations.

Any variance from tolerances can affect performance, installation, and aesthetics and must be reported to the general contractor, and corrected by the responsible party before panel installation begins.

NOTE
The building’s structural steel alignment is extremely important with the KarrierPanel™ system. The rail system will reflect the contours of the underlying wall supports. This in turn will impact the fit and finish of the rainscreen system.
9 Panel Cutting Procedures

9.1 Personnel working with panel cutting equipment should wear respiratory and eye protection at all times.

9.2 Panel cutting should take place prior to panel installation whenever possible.

9.3 Use the appropriate cutting tools with extreme care to avoid panel delamination. Do not use a cutting disk, torch, and other high heat producing methods for cutting. Hot filings may damage the painted surface of the panel. Kingspan recommends use of a circular saw with a fine tooth carbide tip blade. A band saw with a suitable metal cutting blade may also be used.

9.4 For small penetrations, a Dremel type router may be used to cut each face of the panel, and a serrated bread knife may be used to cut the foam core.

9.5 Power snips, nibblers or hand snips may be used to cut trims and flashings.

NOTE
The building’s structural steel alignment is extremely important with the KarrierPanel™ system. The rail system will reflect the contours of the underlying wall supports. This in turn will impact the fit and finish of the rainscreen system.
9.6

Step 1: Mark the cut line on the interior and exterior panel facings.

Step 2: Leave protective film in place during cutting. If film has already been removed, apply masking tape adjacent to the area to be cut.

Step 3: Recheck measurements and proceed with cutting operation.

Step 4: File or sand off any burrs or rough spots at the cut line. Sweep off all metal shavings etc. The panel is now ready to be erected.

Step 5: Use touch up to paint to cover up cut edge. Do not leave any raw steel exposed.

Fig. 9.1
10 Panel Touch-up Paint

10.1 The panel erector is to touch up all exposed field cut edges with touch up paint. Contact Kingspan Customer Service for information on appropriate touch up paint.

11 Panel Cleaning and Maintenance

11.1 Proper installation and maintenance are extremely important in obtaining the very best service and appearance from pre-painted metal insulated panels.

11.2 All dirt, oil, grease, fingerprints, metal filings or other contaminants should be removed to assure proper service life of the paint system. The installer should wipe-down the panels as they are erected.

11.3 Dirt pickup may cause apparent discoloration of the paint after prolonged exposure. Slight chalking from strong sunlight exposure may also cause a change in appearance. A thorough cleaning will usually restore the original appearance of the panels.

11.4 In many cases, a simple low pressure wash of the building with plain water will be adequate. In areas of heavy dirt deposits, a solution of water and detergent (1/3 cup Tide per gallon of water) may be used. Use a rag, sponge, or soft bristle brush to clean. A clean water rinse should follow.

11.5 Mildew may occur in areas subjected to high humidity. To remove mildew, use the following solution followed with a clear water rinse: 1/4 cup of detergent (Tide), 2/3 cup of tri-sodium phosphate (Soilex), 1 quart sodium hypo chlorite 5% solution (Clorox), 3 quarts water.

11.6 Caulking compounds, oil, grease, tars, wax and similar substances can be removed by wiping with a cloth soaked with WD-40 lubricant or mineral spirits. Test on an inconspicuous area first. Do not rub excessively or damage to the finish may result. Wipe only contaminated areas and follow with detergent cleaning and thorough rinsing.

11.7 To remove oxidation and tough stains, use a household cleaner recommended for use on porcelain skins and bathtubs. This should be followed with a thorough rinsing. Wire brushing or any abrasive material may damage the painted surface and should not be used.

11.8 Contact Kingspan Customer Service to receive a copy of the complete Kingspan Panel Maintenance Manual.
12 Panel Touch-up Paint

Pre-Installation Checklist
1. All walls meet contract documents, plumb and square (refer back to page 19).
2. Set benchmarks for panel base supports as per contract documents.
3. Verify that staged panels match the shop drawings based on the specific elevation.
4. Verify clip placement and fastening points based on project specific shop drawings.
5. Verify that sufficient blocking support has been provided behind all vertical joints in horizontal panel applications and behind all horizontal stack joints in vertical applications.
6. BENCHMARK By Kingspan recommends the use of lasers to verify the horizontal and vertical panel lines.
7. BENCHMARK By Kingspan recommends a mixture of dish soap and water to use as lubricant (applied to the gasket) for easier installation of panels (in cold weather environments, use only dish soap).
8. BENCHMARK By Kingspan recommends that equipment, safety gear, and procedures meet and/or exceed the OSHA approved standards.

CAUTION
Ensure that all conditions on the Pre-Installation Checklist are met prior to the installation of panels. If any one of these conditions are not met, BENCHMARK By Kingspan recommends that installation of panels not begin until the issue is rectified.
13 Vertical Panel Installation

Inspect panels to be installed on the elevation to be sheeted. Set aside panels with damaged sidejoints, surface dents or scratches. Remove excess foam (if any) from panel joints to allow proper panel engagement.

A Verify that the structural supports are properly aligned before installing panels (refer to Section 8 Structural Alignment).

B Install base support and associated drip flashings per project details.

C Install inside corner trim and associated structural supports per project details.

NOTE
All structural supports are by others (not by Kingspan) and are shown for illustrative purposes only.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

**NOTE**
One piece sill trims / extrusions to be installed AFTER panel installation, but BEFORE exterior header and jamb trims / extrusions are installed.

**Two Piece Head Detail with Drip Edge**

- Continuous butyl sealant
- Pop rivets
- Drip flashing (not by Kingspan)
- Exposed sealant (not by Kingspan)
- Door / window frame (not by Kingspan)

(Typical framed opening head conditions)

**Disclaimer:** details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

- Install butyl sealant (vapor barrier seals) over base support / flashings, inside corner trims, framed openings, eave strut and rake angle per shop drawing details.

- Install base drip flashing per shop drawings.
Install butyl sealant on head drip trim, jambs and sill framing as shown.
13 Vertical Panel Installation

H Sheeting is typically installed from left to right (sheeting direction may be changed by rotating panels 180° to change direction of joints).

I Cut the joints off trailing edge of the starter panel as shown. Be sure to cut first panel to proper width so that panel joints at framed openings are properly aligned.

**NOTE**
The leading edge is defined as the side of the panel with the hidden KarrierRail™ edge and fasteners.

**IMPORTANT INSTALLATION NOTE!**
Panel layouts on the shop drawings should be drawn so that the vertical joints of the panel DO NOT line up with edges of framed openings. Lining up the vertical joints at penetrations does NOT allow proper weather seals due to the offset joint configuration of the KarrierPanel™.

Framed Opening Locations

- Panel joints offset from jamb (preferred condition for better seal at jamb conditions)
- Panel joints align with jamb

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

**J** Verify liner side joint sealant has been installed (per Section 10). Sealant quantity should be adequate to properly seal male to female joints (approx. 50% to 75% fill in female pocket).

**K** Lift starter panel into place and press firmly into structure to seat panel into butyl sealant placed on the structure and associated trims per step E.

**L** Verify KarrierRail™ is the same length as panel being erected; secure karrier rail to the leading (male) side of panel joint prior to lifting the panel and setting it against the building; place a small bead of sealant between panel and rail at all panel connection points.

Disclaimer: Details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Verify panel is vertical using a level placed on leading (non-cut) edge. Attach KarrierRail™ see notes on previous page and panel with 2 fasteners at EVERY structural support per shop drawings. Attach trailing (cut edge) of panel to corner structure with fasteners as required per shop drawings. Do not overtighten the fasteners as panel damage will result.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Attach trailing edge of KarrierRail™ to panel face with expansion fasteners per shop drawings. Contact Kingspan Technical Services for size, type and spacing of expansion fasteners.

\[ \frac{1}{4} \text{"} - 14 \text{ Hex head fasteners with washer} \]

Set KarrierRail™ in butyl sealant at fastener locations

Horizontal support (not by Kingspan)

Continuous butyl sealant

Male joint

Female joint

Expansion fastener as required 12" to 16" o.c.

Continuous KarrierRail™ (available in 1 - 3" faces)

Wall panel installation direction

Continuous butyl sealant

Horizontal support (not by Kingspan)

Continuous butyl sealant

Male joint

Female joint

Expansion fastener as required 12" to 16" o.c.

Continuous KarrierRail™ (available in 1 - 3" faces)

Wall panel installation direction

Continuous butyl sealant

Façade system connected to KarrierRail™

Please Note:
Through panel fasteners may be required contact Kingspan technical engineer for panel and fastening analysis.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Install marriage bead of sealant from interior joint to supporting structure at EVERY panel termination, i.e. bottom of wall at base support, at framed openings AND at top of wall at eave strut.

NOTE
Marriage beads are critical to ensure proper vapor barriers and are required at all panel terminations.

Eave Condition

Base Condition

NOTE
Verify panels are completely engaged, with proper sealant contact and joint reveals.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

**IMPORTANT INSTALLATION NOTE!**
It is generally easier to cut framed openings from panels prior to installing (refer to Section 9 for panel cutting directions). However, extra care must be taken during panel lifting to prevent kinking pre-cut panels. See Section 9.6 for information on cutting panels at framed opening locations.

*Install marriage bead of sealant from interior joint to supporting structure at EVERY panel termination, i.e. bottom of wall at base support, at framed openings AND at top of wall at eave strut.*

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Repeat steps K through N until wall elevation is completed.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

R Repeat process for other wall elevations. For non-parapet wall conditions, endwall (rake wall) panels must be field cut to match slope of roof.

S Once all walls are sheeted, install exterior corner trims as required. Follow fastening information on project shop drawings.

Outside Corner with Flat Trim Detail

Outside corner trim with pop rivets required

Continuous butyl sealant

Attached clip (by others)

F.I.P. Insulation as required (by others)

1/4” - 14 “low profile” through fastener (as required for wind load)

Pop rivets

Inside corner trim

Continuous butyl sealant

Horizontal support

NOTE
See page 34 for detailed instructions on framed opening trim assembly.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Attach hat channels at jambs of framed openings (gauge and size to match).

Hat Channels at Framed Openings

Framed opening (not by Kingspan)
1/4” - 14 “low profile” through fasteners
1/4” - 14 Hex head fasteners with washer
Hat channel set in butyl sealant at

Hat channels

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings
13 Vertical Panel Installation

Install hat channels at corners as required.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
13 Vertical Panel Installation

Trim Laps at Framed Opening

Trim installation sequence:
1. Head drip flashing with end tabs down
2. Sill trim with tabs up
3. Jamb trims
4. Exterior sealants as required

Disclaimer: details shown are Kingspan standard details and are not project specific.
For project specific information, please refer to your project’s shop drawings
14 Vertical Panel Construction Details

Trim Lap

Trim Lap with Notched Hem

Trim Lap with Lap Strip

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

IMPORTANT INSTALLATION NOTE!
- Minimum width of load-bearing steel exposed behind two horizontal panels at vertical joint is 5” nominal (approx. 127mm) which could be provided by standard double steel stud configuration with steel backer plate. Optional I-beam or HSS steel sections.
- Minimum bearing face for intermediate support is 1.625” (approx. 42mm).
- Where long runs of integrated strip windows are installed, the vertical panel joints should terminate above and continue below the window units.
- Visually check all internal and external tongue-and-groove joints between two adjacent panels to ensure panels are engaged fully and the gaps do not exceed tolerances.
- Details shown in this guide are for reference only. Consult project shop drawings for actual details required.

A. Verify that all structural supports are properly aligned before installing panels (refer to Section 8 Structural Alignment - Horizontal Panels).

B. Install continuous mending plates at all vertical reveal locations. Using a level, mark the centerline of all vertical reveal joints on mending plates to match locations shown on shop drawings.

C. Verify all framed opening locations. Apply butyl sealant to outside face of steel supports / studs around framed openings. Install head drip flashing and tack in place as necessary. Apply butyl sealant to head drip flashing as shown on opposite page. This serves to form both a weather and vapor seal to the back side of the panels.

NOTE
Care must be taken to properly seal all framed openings. Sealant MUST be installed between trims and supporting steel AND between trims and back side of panels.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

**D** Install base trim per project shop drawings. Trim must be level and set in butyl sealant.

**E** Apply beads of butyl sealant on vertical mending plates as shown.

**Disclaimer:** details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Flush Base Detail

- Butyl sealant continuous beads
- Vertical supports (not by Kingspan)
- Single skin panel base flashing
- Continuous butyl sealant both sides of trim
- Min of 1" overlap
- Base channel set in sealant (not by Kingspan)

Overhang Base Detail

- Butyl sealant continuous beads
- Vertical supports (not by Kingspan)
- Single skin panel base flashing
- Continuous butyl sealant both sides of trim
- Min of 1" overlap
- Base channel set in sealant (not by Kingspan)
- Continuous butyl sealant below base flashing

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Panel Installation – Bottom Row

F. Starting from the corner, measure to the centerline of the first vertical mending plate.

G. Cut panel P1 to length. Mitre cut corner as shown in detail.

H. Set panel P1 as shown. Notch top flanges of rail at corner as necessary to accommodate mitre cut panel.

I. Fasten panel and rail into supporting steel with clips and fasteners as indicated on shop drawings.

J. Once panel is secured, apply butyl sealant over the interior male lip at both panel ends to create marriage beads to the inside corner trim (left edge of panel) and vertical mending plate (right edge of panel).

K. Cut panel P2 to length as required, and install panel and rail with fasteners per shop drawings. Gaps between the ends of panels P1 and P2 larger than $\frac{1}{4}$" should be filled with expandable foam insulation.

Verifying karrier rail is the same length as panel being erected; secure karrier rail to the leading (male) side of panel joint prior to lifting the panel and setting it against the building; place a small bead of sealant between panel and rail at all panel connection points.

NOTE
Cut panels in field as necessary for framed openings (see section 9).

Disclaimer: details shown are Kingspan standard details and are not project specific.
For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Vertical Joint Assembly at Corner – Panel P1

- Steel stud at vertical joint
- Mending plate
- Continuous vertical butyl sealant
- Marriage bead of butyl sealant (at vertical joint)
- Panel fastener with KarrierRail™

CAUTION
Do not over-tighten fasteners as damage to the panel core as well as facings will result.

NOTE
Verify panels are completely engaged, with proper sealant contact and joint reveals.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Panel Installation – Vertical Stacking

- Complete installation of bottom row of panels. Then install first column of panels bottom to top using the same process (panels P3-P4, steps G-K).

Horizontal Expanded Panel Joint Section Detail

- Vertical support at 16" O.C. (not by Kingspan)
- Continuous butyl sealant
- Continuous butyl sealant
- Set KarrierRail™ in butyl sealant at fastener locations
- 1/4" - 14 Hex head fasteners with washer
- Continuous KarrierRail™ (available in 1 - 3" faces)
- Exterior facade
- Expansion fastener as required

NOTE
Consult with Kingspan Technical Department for allowable panel loads, spans and fastening patterns.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Assembly Sequence

Once the first building elevation is completed (P1-P7), start around the corner on next elevation using the same sequence and method (P8-12).

NOTE
Numbers indicate order of panel installation.

NOTE
To minimize panel cutting, panel lengths should be pre-determined to align with framed opening jambs.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Outside Corner – Detail

- Install P8 into corner as shown (mitre cut panel and notch KarrierRail™ as required).
- Install butyl sealant marriage beads from interior corner trim to interior male joint (right edge of panel) and door jamb (left edge of panel).
- Install P9 with marriage beads to mending plate (left edge of panel) and door jamb (right edge of panel).
- Install remaining panels, repeating steps N-P as necessary.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project's shop drawings.
15 Horizontal Panel Installation

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Hat Channels at Framed Opening

Install hat channels at window head and sill areas.

Head Detail

- Set hat channel in butyl sealant at fastener locations
- Hat channel as required
- Butyl sealant at fastener location
- 1/8” - 14 Hex head fasteners with washer
- 1/4” - 14 “Low profile” through fastener
- Field cut female joints where required
- Continuous butyl sealant
- Framed opening (not by Kingspan)

Sill Detail

- Continuous butyl sealant
- 1/4” - 14 “Low profile” through fastener
- 1/8” - 14 Hex head fasteners with washer
- Hat channel as required
- Set hat channel in butyl sealant at fastener locations

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
15 Horizontal Panel Installation

Trim Laps at Framed Opening

Trim installation sequence:
1. Head drip flashing with end tabs down
2. Sill trim with tabs up
3. Jamb trims
4. Exterior sealants as required

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
16 Horizontal Panel Construction Details

Vertical Joint

- Vertical support
- Continuous mending plate
- Set KarrierRail™ in butyl sealant at fastener locations
- Continuous butyl sealant with marriage bead to horizontal panel joint
- Expansion fastener at KarrierRail™ (below)
- Fill gaps 1/4” or larger with F.I.P. insulation (not by Kingspan)

Vertical Joint between studs

- Vertical support at 16” O.C.
- Continuous mending plate
- Continuous butyl sealant with marriage bead to horizontal panel joint
- Vertical support
- Expansion fastener at KarrierRail™ (below)
- Fill gaps 1/4” or larger with F.I.P. insulation (not by Kingspan)

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project's shop drawings.
16 Horizontal Panel Construction Details

Base – Flush

Set hat channel in butyl sealant at fastener locations
Hat channel as required
Continuous butyl sealant both sides of trim
1/4” - 14 Hex head fasteners with 11/8” bonded washer
Continuous butyl sealant below base flashing
Base flashing

1/4” - 14 Hex head fasteners with washer
Vertical supports (not by Kingspan)
Base channel set in sealant (not by Kingspan)
Fastener to concrete (not by Kingspan)

Base – Flush with Extrusion

Set hat channel in butyl sealant at fastener locations
Hat channel as required
Set hat channel in butyl sealant at fastener locations
1/4” - 14 Hex head fasteners with washer
Fill void with compressible foam closure
Continuous butyl sealant below base extrusion

1/4” - 14 Hex head fasteners with washer
Vertical supports (not by Kingspan)
Base channel set in sealant (not by Kingspan)
Aluminum base extrusion
Base channel set in sealant (not by Kingspan)
Fastener to concrete (not by Kingspan)
Base channel set in sealant (not by Kingspan)

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
16 Horizontal Panel Construction Details

Panel Termination (High Cell) – Detail

- Structural supports (not by Kingspan)
- Cap trim
- 1/4” - 14 Hex head fasteners with washer
- Backer rod and sealant (not by Kingspan)
- Continuous butyl sealant both sides of trim with marriage bead to horizontal panel joint
- Set KarrierRail™ in butyl sealant at fastener locations
- Continuous KarrierRail™
- Expansion fastener as required

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings
16 Horizontal Panel Construction Details

Mending Plate “Shingle” Lap Detail

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
16 Horizontal Panel Construction Details

Base Extrusion – Optional

NOTE
Lap strips for horizontal extrusions should be set in two rows of butyl sealant at each end. Extrusions should be field drilled with weep holes within 2” of the ends of the lap strips to allow adequate drainage.

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
17 Fastener Information

This chart is based on data from fastener manufacturers test results. Since actual job site conditions will vary, this chart is a basic guideline. If in doubt, field drilling and pull tests are recommended. If #14 type ‘B’ plated fasteners are to be used, pre-drilling is required. Use the drill bit sizes listed below.

Suggested Fastener Driving Speeds
Quarter inch diameter self drilling, self tapping TEK type and B point self tapping type

<table>
<thead>
<tr>
<th>Material</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon and 410 stainless</td>
<td>1,800</td>
</tr>
<tr>
<td>Stainless</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Note: Proper tools are required to produce consistent drilling and minimize potential fastener or application failures due to over or under driven fasteners. A torque control or depth sensing nose piece for the screw gun is recommended for proper installation.

Recommended TEK type for 1/4” diameter (self-drilling, self tapping) fasteners

<table>
<thead>
<tr>
<th>Steel Thickness</th>
<th>TEK</th>
<th>Threads / Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Ga. (.060)</td>
<td>#2, 3</td>
<td>14</td>
</tr>
<tr>
<td>14 Ga. (.075)</td>
<td>#2, 3</td>
<td>14</td>
</tr>
<tr>
<td>12 Ga. (.105)</td>
<td>#3</td>
<td>14</td>
</tr>
<tr>
<td>⅛” (.125)</td>
<td>#3</td>
<td>14</td>
</tr>
<tr>
<td>10 Ga. (.134)</td>
<td>#3</td>
<td>14</td>
</tr>
<tr>
<td>3/16” (.187)</td>
<td>#3</td>
<td>14</td>
</tr>
<tr>
<td>¼” (.250)</td>
<td>#3, 5</td>
<td>14 ( #3) /20 minimum (#5)</td>
</tr>
<tr>
<td>⅜” (.375)</td>
<td>#5</td>
<td>20 minimum</td>
</tr>
<tr>
<td>½” (.500)</td>
<td>#5</td>
<td>20 minimum</td>
</tr>
</tbody>
</table>

Pilot Hole Chart for 1¼” diameter B Point Fasteners (self tapping)

<table>
<thead>
<tr>
<th>Steel Thickness</th>
<th>Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Ga. (.060)</td>
<td>#8 (.199)</td>
</tr>
<tr>
<td>14 Ga. (.075)</td>
<td>#7 (.201)</td>
</tr>
<tr>
<td>12 Ga. (.105)</td>
<td>#7 (.201)</td>
</tr>
<tr>
<td>⅛” (.125)</td>
<td>#2 (.221)</td>
</tr>
<tr>
<td>10 Ga. (.134)</td>
<td>#2 (.221)</td>
</tr>
<tr>
<td>3/16” (.187)</td>
<td>#2 (.221)</td>
</tr>
<tr>
<td>¼” (.250)</td>
<td>#2 (.221)</td>
</tr>
<tr>
<td>⅜” (.375)</td>
<td>#2 (.221)</td>
</tr>
<tr>
<td>½” (.500)</td>
<td>#1 (.228)</td>
</tr>
</tbody>
</table>

Disclaimer: details shown are Kingspan standard details and are not project specific. For project specific information, please refer to your project’s shop drawings.
To install type ‘B’ fastener, pre-drill using the correct drill size from chart on previous page. Insert fastener through KarrierRail™ and tighten down until assembly is snug. Panels are to be fastened at every support. Fastener requirements are based on design loads. Consult Kingspan Technical Services for allowable panel and fastener design loads.

Do not use impact tools. Do not over tighten.

After drilling always remove metal chips that have fallen onto flashings or panels.

**NOTE**
The rail replaces the use of individual panel clips, and should be fastened with two fasteners at every structural location. Expansion fasteners or similar must be used to attached the exposed edge of the KarrierRail™ to the panel face, with spacing determined by Kingspan’s Technical Services department.

**NOTE**
Contact Kingspan’s Technical Services Department for specific project fastening recommendations.

Disclaimer: details shown are Kingspan standard details and are not project specific.

For project specific information, please refer to your project’s shop drawings.
18 Materials, Tools & Hardware

**Tools and Sealants**

- Electric snips
- Circular saw with fine tooth carbide blade
- Power nibbler
- Power drill
- Drive bits and sockets
- Caulking gun
- Laser or gravity levelers
- Grip clamp
- Lazer level

**Fastening Hardware**

- Primary fastener
- Through fastener (primary fastener extended by 1”)
- Low profile fastener
- Secondary fastener
- Rivet fastener
- Hidden fastener wall panel clip
- Knife and Scraper
- Brick Tie (KingTie)
- KarrierRail™
Notes
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