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PRODUCT MANUAL 2.0 - INSTALLATION

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PRODUCT MANUAL 2.0 - INSTALLATION GUIDE

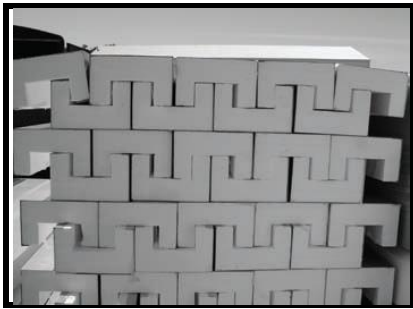
The simple design and efficiency of Eskydeck offers a number of ways that the system can be installed for any type of building. This section outlines recommended basic installation instructions.

Always consult a local licensed engineer to review and approve the design and construction of the Eskydeck system.



- # ESKYDECK INSTALLATION GUIDE





Eskydeck is extremely light weight making it easy to handle and place. The thick Panels and metal clad Beam Forms minimises damage from handling.

Eskydeck components are shipped to the building site directly from the factory, or through your local distributor.

Eskydeck components arrive on site with:

- Drawing layouts showing component placement
- Engineering details for rebar placement
- Shoring requirements and concrete mix design (shoring requirements should be reviewed and approved by a locally licensed engineer)

In addition, the Beam Forms arrive on site stacked, bundled and wrapped for easy handling.

Unloading Eskydeck components can be accomplished by manually lifting or using alternate lifting equipment. The Floor Panels and Beam Forms can be unloaded with 2 people. A 3 person crew is recommended for unloading longer beam lengths of 6m to 8m.



When handling Eskydeck, it is a good idea to also keep the following in mind:

- Lay the Panels and Beam Forms flat when transporting the floor system components.
- Tie the Eskydeck components down during transport to ensure the components are well secured, and avoid damage from scrap materials
- Randomly check the dimensions of a few Panels and beam parts when the components arrive on site. This helps to ensure it meets the required dimensions. However, in the unlikely event that floor components are out of spec, please contact your local Eskydeck representative immediately.

Beam Forms are available in common length increments. Refer to the layout provided as multiple short Beam Forms are often cut from longer lengths. Beam Forms can be trimmed to length on site. The use of a thin cut metal abrasive wheel in a hand held angle grinder, or a gas powered abrasive wheel cut off saw are also commonly used. A small framers square and permanent marker is handy for marking beams to be cut



Installation of Eskydeck follows six basic steps:

STEP 1: Prepare the wall and/or beams that will be supporting the floor.

STEP 2: Erect shoring to support the Beam Form.

STEP 3: Install the Eskydeck Beam Forms.

STEP 4: Install the Eskydeck Panels.

STEP 5: Place reinforcement.

STEP 6: Pour the concrete.

The steps outlined above will vary slightly depending on the structural support system used for Eskydeck (i.e., ICF, CMU, convention concrete wall, etc), which is addressed in the following sections of this guide.



The amount of shoring required will depend on the floor span, floor depth, and loading conditions. In general, the following guidelines should be followed.

- Use shoring supports that extend the full width of the Beam Forms. 150mm x 77mm LVL Beams or wider, are recommended to bear the floor system during the concrete pour.
- When the concrete pour includes both the beam forms and slab, erect shoring at rows not more than 2.0m on centre.
- When the concrete pour consists of only the beam forms, erect shoring at rows not more than 4m on centre.
- Shoring should also be placed where ever Beam Form intersections are located.
- Shoring should remain in place, in most cases, for at least 1 week after concrete curing begins.
- Crews can work on an assembled Eskydeck deck before placing concrete, and without shoring, provided the spans are less than 3m. Longer spans require temporary shoring in place before crews are allowed to work on the deck.

The shoring pattern used to support Eskydeck should be reviewed and approved by a locally licensed engineer.

When only the beams are poured, shoring will normally not be required again when the slabs are placed, provided the beams have cured fully. This allows plumbers, electricians, mechanical contractors and other subtrades the freedom to do all the rough-in work throughout the entire building without conflicting with the pour schedule.



Once subtrades complete rough-ins, the slabs can be placed and finished inside where protected from potential weather complications.

Commercially manufactured shoring is available for purchase or rent from most rental outlets, or temporary framed beams and walls can be constructed and dismantled for each project.



Installation of Beam Forms and Panels along the edge of the floor will vary depending on the wall type supporting Eskydeck, which is discussed in further sections of this manual.

The following guidelines are common to all construction types using Eskydeck:-

- Panel sections less than 600mm should be glued to adjacent Beam Forms and Floor Panels.
- Rain water build-up in Beam Forms can be drained by drilling 5mm holes at 600mm on centre along the underside of Beam Forms.
- Attachments to the underside of the Beam Forms before concrete is placed and set should be avoided to prevent sagging of the beam jackets. Instead, attach to the sides of the Beam Forms if possible, or support the Beam Forms to prevent sagging.



Beams forms typically arrive on the job site in 6m to 8m lengths. In order for Beam Forms to span longer lengths splice connections are required.

STEP 1: Create the splice using the 450mm long splice connector.

STEP 2: Secure the splice connector by fastening screws to the sides of adjoining Beam Form ends. To avoid interference with shoring support and ceiling finishes, avoid fastening screws at the underside of the Beam Forms.





ICF WALLS

Regardless of the ICF system being used, the installation procedure will be the same.

STEP 1: WALL PREPARATION

Preparing the ICF wall will depend on whether the wall terminates or continues above Eskydeck.

- Cut out sections of the ICF wall where the Beam Forms will sit.

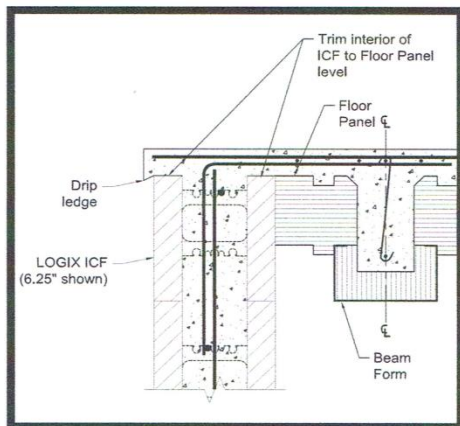
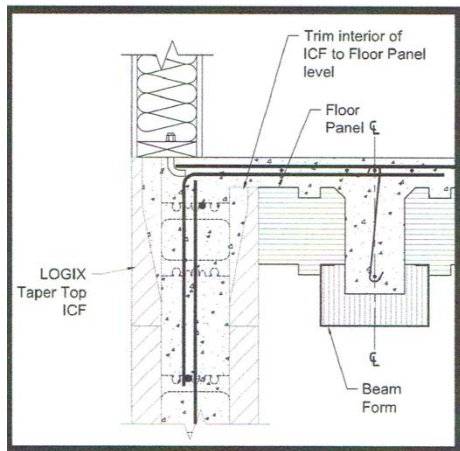
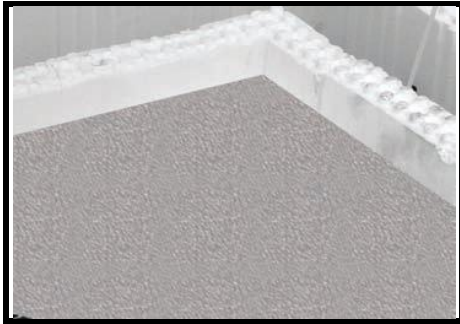
The shape of the removed ICF sections should match the Beam Form to ensure that the Beam Forms fit snugly into the ICF wall. This will help keep the Beam Forms in place, minimize distortion of the ICF, and minimize concrete bleeding between the ICF and Beam Forms during the pour.

Since the beams are spaced at 600mm on centre, it is possible to pre-cut the ICF forms before placing on the wall.

Depending on the building section, additional preparation may be required, as noted below.

ICF Walls Continuous above the Slab Level

- Build the ICF wall to a height just above the top of slab. This will help maintain a continuous top edge of both the inside and outside panels of the ICF wall system, and will facilitate building up the ICF after the slab has been poured.



Transition to Different Wall Type

In applications where the walls continue above the floor system into a different wall type (i.e., framed wall on top of slab)

- Trim the ICF interior wall panels down to the level of the Floor Panels to allow the concrete slab to be integral with the ICF wall.
- Use a Taper Top form for the top course to provide additional bearing support for top plate installation.

Roof Deck

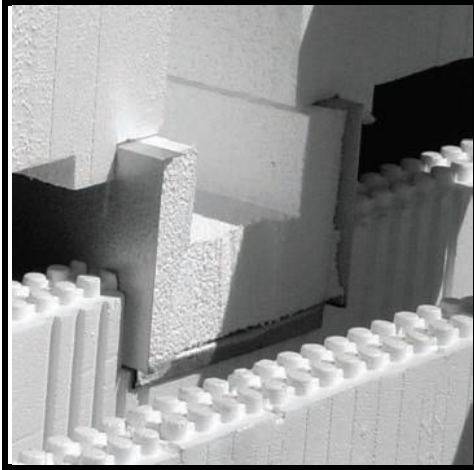
In applications where the Eskydeck will form a roof deck.

- Trim both the interior and exterior ICF panels down to the level of the Floor Panels.

This allows the slab to cover the top of the wall system, and is usually formed with an overhang and drip ledge beyond the finished exterior face of the wall.

STEP 2: BEAM INSTALLATION

- Begin by cutting the beam to length. The total length of the Beam Form is calculated by measuring the clear span from inside face to inside face of concrete wall, and adding an additional 50mm (the ends of the Beam Forms should sit on the full thickness of the ICF form panels and extend an additional 25mm into the concrete wall face).



- After the Beam Forms are cut to length, remove the EPS foam in the Beam Form

ends that will connect to the ICF wall. Remove at least 25mm the EPS from the end of the metal jacket. (The face of the EPS in the Beam Form should be flush with the inside face of the ICF form panels).

- Snip the bottom two corners of the beam jacket back 25mm and bend the cut piece of the metal jacket down, to form a lip that will hook on the inside of the ICF EPS form.

This should result with the EPS foam in the Beam Form being flush with the inside of the ICF form panel, and each side of the metal beam jacket projecting 25mm into the concrete wall cavity.

The bottom of the metal jacket should hook over the ICF form panel, preventing concrete from leaking out under the form as well as keeping the Beam Form stable on the ICF wall.

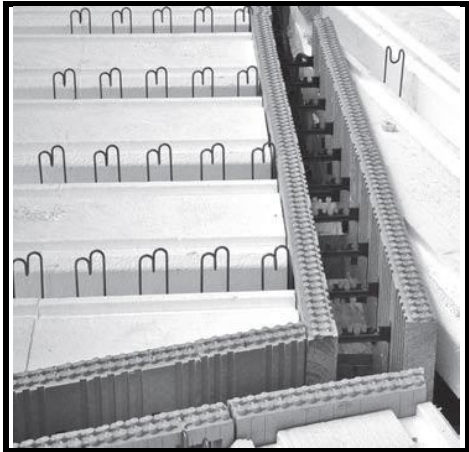
STEP 3: SHORING INSTALLATION

See Section 2.3.1 for shoring installation.

STEP 4: PANEL INSTALLATION

- Place the Panels between the Beam Forms.

This will create the deck on which the concrete will be placed, forming the slab.



STEP 5: REBAR PLACEMENT

- Place the reinforcement for beam and slabs, as required by design.
- Place 90 degree bent bars in the wall system to tie into Eskydeck either by wet-setting, or drill and epoxy if dry-setting.

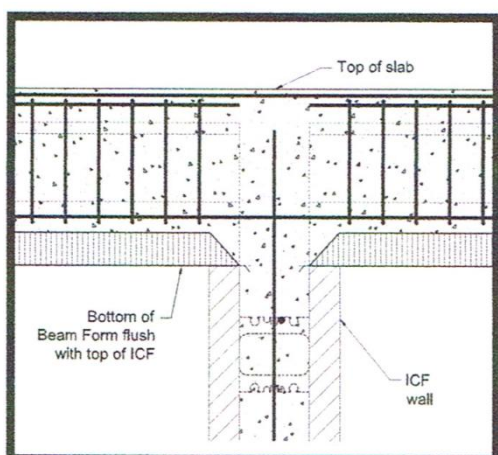
Reinforcement for Eskydeck should be reviewed and approved by a locally licensed engineer.

STEP 6: CONCRETE PLACEMENT

Placing concrete can be done Monolithic with the floor beams and slabs, or done as two separate pours.

Depending on the pour sequence, the amount of shoring and rebar must be checked by a locally licensed engineer to ensure adequate shoring and dowels are used.

Slabs in areas where potential water seepage to the space below is a concern and will need to be water proofed. Several methods of creating a water barrier are discussed in Section 2.3.11.



STEP 1: WALL PREPARATION

Install Eskydeck as described in the previous section.

Interior ICF bearing walls can be built to support Eskydeck from both sides of the wall.

If the bearing wall does not continue above Eskydeck the ICF bearing wall can be formed to the height of the bottom of the Beam Forms. This minimizes the amount of cutting in the ICF wall.

STEP 2: BEAM INSTALLATION

- Cut the beam to length and prepare each end by removing the EPS in the beam back 25mm from the end of the metal jacket.
- Snip the bottom two corners of the beam jacket back 25mm and bend the cut piece of the metal jacket down to form a lip that will hook on the inside of the ICF EPS form.

This should result with the EPS foam in the Beam Form being flush with the inside of the ICF form panel, and each side of the metal beam jacket projecting 25mm into the concrete wall cavity.

The bottom of the metal jacket should hook over the ICF form panel preventing concrete from leaking out under the form as well as keeping the Beam Form stable on the ICF wall.

- Place the Beam Forms such that the Beam Forms will sit in line on both sides of the ICF wall. This will allow the steel and panels to 'run through' over the wall.

STEP 3: SHORING INSTALLATION

See Section 2.3.1 for shoring installation.

STEP 4: FLOOR PANEL INSTALLATION

- Place the Floor Panels between the Beam Forms.

This will create the deck on which the concrete will be placed forming the slab.

If the top of the ICF wall is flush with the underside of the Beam Forms then the Floor Panels can be conveniently installed directly on the ICF bearing wall.

STEP 5: REBAR PLACEMENT

- Place the reinforcement for beam and slabs, as required by design.
- Place 90 degree bent bars in the wall system to tie into Eskydeck either by tying, wet-setting, or drill and epoxy if dry-setting.

Reinforcement for Eskydeck should be reviewed and approved by a locally licensed engineer.

STEP 6: CONCRETE PLACEMENT

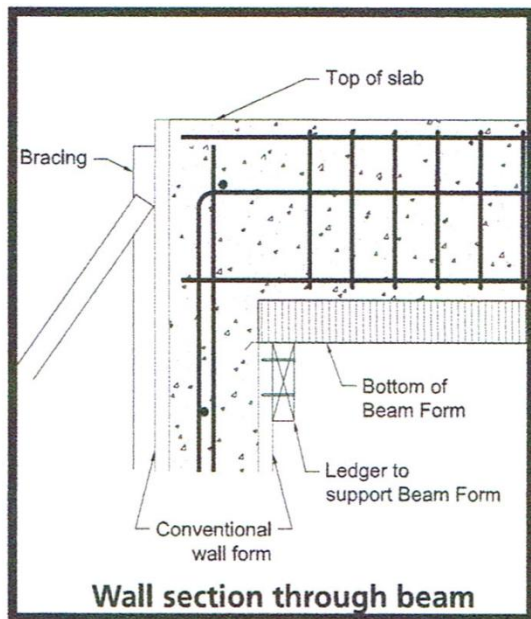
Placing concrete can be done Monolithic with the floor beams and slabs, or done as two separate pours.

Depending on the pour sequence, the amount of shoring and rebar must be checked by a locally licensed engineer to ensure adequate shoring is used.



From the top of the floor deck, the bearing wall will be open through the space between the beam ends for 250mm wide by the core width of the wall. When placing concrete, pour through each space, until concrete is up to the next beam opening and this will eliminate any possible concrete voids between the beams at the top of the ICF bearing wall.

Prior to placing concrete, install sleeves through the ICF wall between the Beam Forms to accommodate mechanical or electrical runs.



Eskydeck can be used with conventional cast-in-place concrete walls. Installation of Eskydeck will depend whether the walls will be poured monolithically with Eskydeck, or as two separate pours, and if the walls will terminate or continue above Eskydeck.

STEP 1: WALL PREPARATION

Walls Poured Monolithically with Eskydeck

Typically, the ends of the Beam Forms are supported on top of one side of the wall form. As a result, the side of the wall form that supports the Beam Forms will be shorter than the opposite side of the wall form by at least the depth of the Eskydeck form work and slab thickness.

- Provide a timber ledge along the top edge of the form work to provide additional bearing support for the Beam Forms.

This is typically required if plywood wall forms are used. Forms with edge frames require no additional bearing support for the Beam Forms to rest on.

The exterior wall form must be rigid enough to prevent excessive deflection during concrete placement. Bracing can be added to prevent this from happening.

Walls Poured Prior to Installation

When cast-in-place walls are completed before Eskydeck is installed, the Eskydeck will need to sit on top of the concrete wall, or into a ledge formed in the concrete wall.

Eskydeck Installed on Ledge Formed in Concrete Wall

- Create a ledge in the concrete wall to support the Eskydeck beam ends.

A minimum 75mm bearing ledge is required, but will depend upon the span and the loads imposed upon the slab. However, a 100mm ledge is easier to work with and will take greater loads from the connected slab.

Eskydeck installed on Top of Wall

- Install temporary forms around the exterior perimeter of the walls. This will act as formwork for the edge of the slab.

Walls Continuous above the Slab Level

In cases where the concrete wall above and below the floor depth is the same width, and Eskydeck is installed into a blocked out ledge, the height of the blockout should be a minimum of 150mm for the Beam Forms to fit without modification, and a maximum height equal to the total depth of the beams, Panels and slab.

Walls Continuous above the Slab Level

If the concrete wall is to continue above the Eskydeck deck, then both sides of the wall form will be in place, as below the Eskydeck forms, minimizing top of wall deflection.

STEP 2: BEAM INSTALLATION

Installing the Beam Forms will depend on whether the walls will be poured monolithically with Eskydeck, or as two separate pours.

Walls Poured Monolithic with Eskydeck

- Install the beams as outlined in Step 2 for ICF wall installation.

Walls Poured Prior to Eskydeck Installation

If the walls are prepared as such that a concrete ledge in the wall is provided to bear the beam ends:

- Cut the beam end to fit snug against walls on top of the ledge.
- Remove the EPS and metal jacket along the bottom of the beam to provide full bearing contact between the ledge and underside of the beam. Be sure to cut back the EPS at a 45 degree angle.

STEP 3: SHORING INSTALLATION

See Section 2.3.1 for shoring installation.

STEP 4: PANEL INSTALLATION

- Place the Panels between the Beam Forms. This will create the deck on which the concrete will be placed forming the slab.
- Install Panel Blockouts or glue in blockouts where the wall meets the floor, if the walls are poured Monolithic with Eskydeck. This will block out the area between the Beam Forms and the underside of the Panels.

Walls Poured Prior to Eskydeck Installation

If the walls are prepared such that a concrete ledge in the wall is provided to bear the beam ends, Panel Blockouts are not required.

STEP 5: REBAR PLACEMENT

- Place the reinforcement for beam and slabs, as required by design.
- Place 90 degree bent bars in the wall system to tie into Eskydeck either by wet-setting, or drill and epoxy if dry-setting.

Reinforcement for Eskydeck should be reviewed and approved by a locally licensed engineer.

STEP 6: CONCRETE PLACEMENT

Placing concrete can be done monolithic with the walls, floor beams and slabs, or done as separate pours.

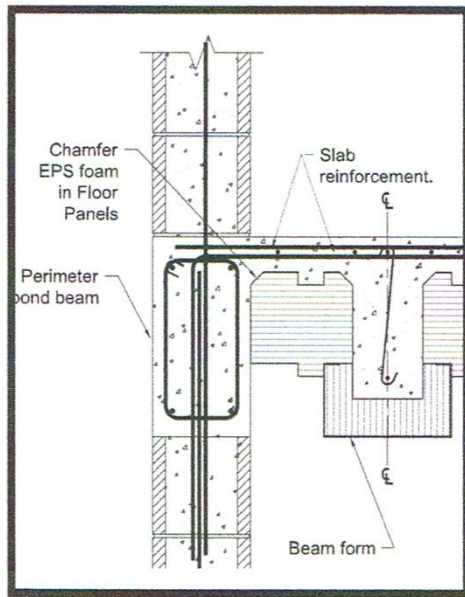
Depending on the pour sequence, the amount of shoring and rebar must be checked by a locally licensed engineer to ensure adequate shoring and dowels are used.

When concrete is placed, the wall forms should be filled to the top first allowing concrete to run into the beam ends before the beams voids are filled. This will minimize the pressure against the wall forms when the beams are poured.

ADDITIONAL NOTES

The following additional notes should be considered during installation:

- Minimum spacing of 100mm between the end of Eskydeck and the exterior wall will help prevent the beam or Panel components from breaking through the exterior wall surface and becoming exposed.
- When Blockout Panels are used chamfer the Panels back at 45 degrees to provide better load distribution from the floor to the wall.
- Vertical rebar dowels placed when the walls were poured, or drilled into the top of the wall, and bent into Eskydeck is required to tie the wall to the floor system.



Eskydeck can be used with concrete block walls. Installation of Eskydeck will depend whether the walls will be poured monolithically with Eskydeck or as two separate pours. And if the walls will terminate or continue above Eskydeck.

STEP 1: WALL PREPARATION

Block Walls Poured Monolithic with Eskydeck

Eskydeck Beam Forms are normally set into pockets cut in the concrete block. This works especially well when the block is to continue above the top of the Eskydeck slab.

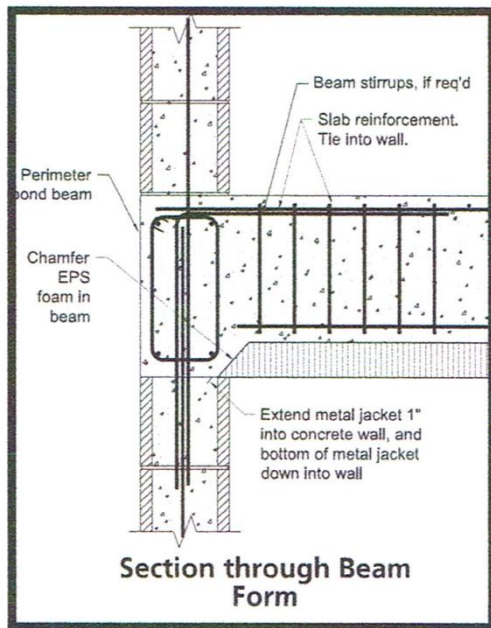
Eskydeck installed on top of Wall

When concrete block walls are completed before Eskydeck is installed, Eskydeck will need to sit on top of the concrete block.

- Place temporary forms around the exterior perimeter of the walls, to increase the wall height to the top of the floor slab and maintain concrete on the exterior face of the wall.

Roof Deck

In applications where Eskydeck will form a roof deck the slab will extend to the outside perimeter of the block walls.

**STEP 2: BEAM INSTALLATION****Eskydeck Installed on Top of Wall**

- Place the Beam Form component on the concrete block wall at least the required bearing width.
- Chamfer the EPS material in the bottom of the beam end at 45 degrees to provide proper bearing on the wall.
- Provide a minimum 100mm between the end of the beams and the exterior face of wall. This will prevent the Beam Forms or Floor Panels from breaking through the exterior wall surface and becoming exposed.

Walls Continuous above the Slab Level

The inside face of the concrete block is only removed where the Beam Forms will connect to the wall.

- Cut the beam to length adding the thickness of the concrete block wall plus 1 inch.
- Snip the bottom two corners of the beam jacket back 25mm and bend the cut piece of the metal jacket down to form a lip that will hook on the inside of the block wall

This should result with the EPS foam in the beam form being flush with the inside face of the block wall, or chamfered, and each side of the metal beam jacket projecting 25mm into the block wall cavity.

The bottom of the metal jacket should hook over the block wall preventing concrete from leaking out under the form, as well as keeping the Beam Form stable on the wall.

STEP 3: SHORING INSTALLATION

Shoring requirements will differ depending if Eskydeck will be poured together with the block walls or after the block walls are poured and set.

- Place additional shoring close to the concrete block walls to prevent the weight of the concrete in the beams from breaking portions of the concrete block.
- The shoring adjacent to the concrete block walls can be removed within 24 hours once the concrete between the block cores and Beam Forms is set.
- Maintain intermediate shoring until sufficient strength has developed.

See Section 2.3.1 for shoring installation.

STEP 4: PANEL INSTALLATION

Place the Panels between the Beam Forms.

This will create the deck on which the concrete will be placed forming the slab.

Walls Continuous above the Slab Level

Place the Panels tight to the inside face of the concrete block when the concrete block wall continues up above the top of the slab.

Eskydeck Installed on Top of Wall

Blockout Panels are best used at the beam ends to close the space between beams below the Panels.

When Blockout Panels are used chamfer the Panels back at 45 degrees to provide better load distribution from the floor to the wall.

STEP 5: REBAR PLACEMENT

- Place the reinforcement for beam and slabs, as required by design.
- Place 90 degree bent bars in the wall system to tie into Eskydeck either by wet-setting, or drill and epoxy if dry-setting.

Reinforcement for Eskydeck should be reviewed and approved by a locally licensed engineer.

STEP 6: CONCRETE PLACEMENT

Placing concrete can be done Monolithic with the walls, floor beams and slabs, or done as separate pours.

Depending on the pour sequence, the amount of shoring and rebar must be checked by a locally licensed engineer to ensure adequate shoring and dowels are used.

- When concrete is placed, the concrete block wall cavities should be filled to the top first, allowing concrete to run into the beams ends before the Beam Form voids are filled.

Slabs in areas where potential water seepage to the space below is a concern, will need to be water proofed. Several methods of creating a water barrier are discussed in Section 2.3.11.



Although, wood and steel stud framed walls can be designed to support a suspended slab, they offer little in way of fire resistance contributing to premature structural failure in the event of a fire.

Wood or steel stud framed walls are best used only as partition walls not required to carry structural loads.

Note - Using Steel Beams is possible but not recommended because we can form and flush beam in reo concrete.

Many different steel sections and connection details can be used with Eskydeck, and will depend on the design and construction.

Steel beam sections should be designed and approved by a locally licensed structural engineer.

ESKYDECK BEARING ON TOP OF STEEL BEAM

When the Eskydeck beams are continuous over the steel beam support shoring and the Eskydeck floor components are installed as normal.

- In the bearing area of the steel beam remove the EPS in the bottom of the Beam Forms to provide a proper bearing surface.

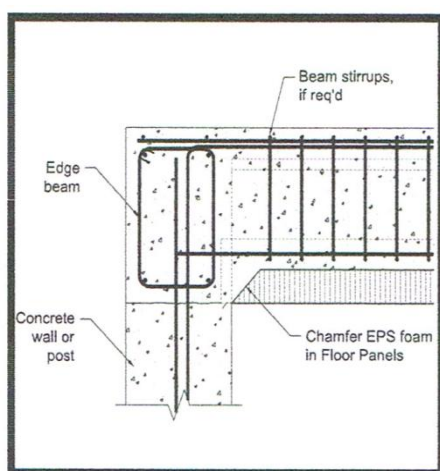
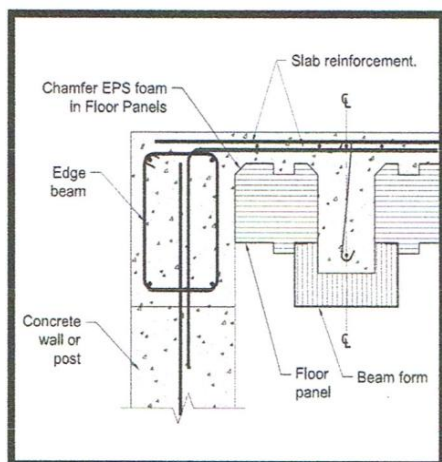
Flush Beams

Where the steel beam is installed as a flush beam at the edge of the slab, around a slab opening, or to eliminate a dropped beam below the slab, steel profiles with a vertical web and flanges are used.

- Install the Eskydeck beams such that the beam end is fit snug and flush against the steel beam.



This flush beam is 200w and can go wider to 1.0+ or go deeper which will go lower than ceiling height.



Using traditional formwork, cast-in-place concrete beams can be built to support Eskydeck floors with long spans, or where edge beams are required.

Cast-in-place beams built flush to the underside of the Beam Forms will maintain a constant ceiling height. In this case, cast-in-place beams will be deeper than the Eskydeck beams 70 or 120mm depending on the thickness of the underside of the Beam Forms. As a result, steel conflict between the floor and edge beams will be minimal.

However, the size of the cast-in-place beam can vary depending on the floor spans, and loading conditions. Below are typical installation methods.

CAST-IN-PLACE EDGE BEAMS

- Form the underside of the edge beam with lengths of 45mm x 240mm or 45mm x 300mm lumber.
- Rest the ends of the Eskydeck Beam Forms on the lumber and screw the lumber to the Eskydeck Beam Form to keep it in place.

This will make the underside of both the edge beam and Eskydeck Beam Forms flush. A screw is installed up through the lumber form into the metal jacket of the Beam Form to hold it in place.

Use a screw at least 65mm long to ensure it penetrates into the Beam Form by at least 20mm.

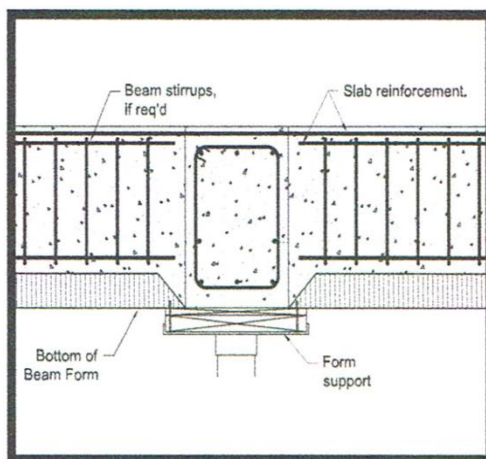
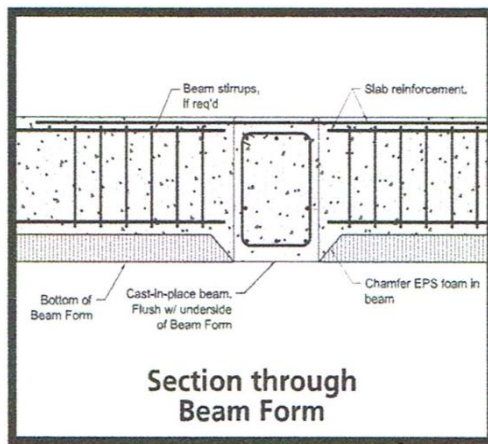
- Use ply form, or Blockout Panels, to fill the space between the Eskydeck Beam Forms.
- Use ply form to form the opposite side of edge beams. The ply form must be braced for added support.



If the slab is placed at the same time as the beams it is easy to form an offset in the outside ply form to create an overhanging slab and drip ledge. This can also be formed onto the concrete edge beam after temporary forms have been removed before the slab is placed. The same temporary form work can be constructed around openings or cantilevers to support and strengthen the suspended slab.

FLUSH BEAMS WITHIN FLOOR SPAN

- Use a 2 x 8, 2 x 10, or 2 x 12 length of lumber (depending on the size of the beam) to form the underside of the flush beam.
- Rest the ends of the Eskydeck Beam Form on opposite sides of the both sides of the lumber, and screw the lumber to the underside of the Eskydeck Beam Forms to hold it in place.
- Install the Floor Panels flush with the Beam Form ends.
- Use ply form, or Blockout Panels, to fill the space between the Eskydeck Beam Form components.
- Install the reinforcement for the edge and floor beams, as required by design.



Sleeves can be installed to allow penetrations through flush beams where mechanical or electrical runs may be required. The sleeves should be located at mid-height of flush beams, and should only be placed based on engineering review and approval.

Service penetrations and attachments can be easily accommodated.

Typically, the foam thickness of the Beam Forms and Floor Panels are thick enough to accommodate service penetrations and attachments that won't run through the concrete itself, or compromise floor to ceiling clearances.

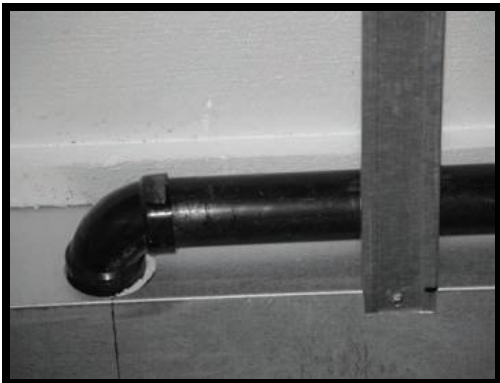




Penetrations can be created using a hole saw to cut through the metal jacket. A plumbing pipe used as a hand drill can be used to cut a hole through the foam material.

- When making a penetration through the Beam Forms, cut a hole slightly larger than the hole cut through the foam material. This will prevent the metal jacket from damaging pipes.
- Beam Forms with thicker form bottoms can be used to accommodate larger service penetrations.





The metal jacket of the Beam Forms provide ample attachment for drywall, lighting and other fixtures.

- The space between the Beam Forms provide ample clearance for service utilities without compromising ceiling height. Shallow light fixtures can also be installed to the underside of the Beam Forms.
- Fixtures can be mounted directly to the Beam Forms.
- Air vents and other service pipes can be strapped directly to the Beam Forms.
- Wiring can be stapled directly to the underside of the Floor Panels with EPS pex staples.
- Metal wall studs cut to size, can bridge across Beam Forms to help support service pipes.

Waterproofing may be required for slabs exposed to potentially wet conditions such as suspended garage slabs

A water proof sealer is a common approach to treating suspended slabs. There are many products that can do the job, and application of the sealer should be based on the manufacturer's instructions.

Generally, the surface of the concrete slab must be clean and free of debris before applying the sealer. In addition, the slab should be sloped, and drainage installed to direct water away.

For more information contact your local Eskydeck representative.