



# ENDURA-FORM

MULTI PURPOSE CONSTRUCTION PANELS

## AVIATION APPLICATIONS

### ENDURA-FORM IS THE PERFECT SOLUTION FOR:

- Runways - temporary or permanent
- Taxiways and Parking Aprons
- Helicopter Pads
- Equipment Pads
- Hanger Floors
- Anywhere ice & snow are a concern



#### Prevent Runway Soil Erosion & Rutting Reduce Runway Maintenance

During the takeoff roll of a B-737 on a gravel runway up to 3 cubic meters of fines can be displaced. This will cause a gravel runway to be eroded in a very short time unless it is maintained which can be very expensive. During heavy rains runways can start to rut - any rutting greater than 1/2" is unacceptable and will shut down a runway until it's been repaired. Rutting greater than 1/2" will begin to affect aircraft takeoff acceleration and performance and can have very serious effects in the event of engine failure during takeoff.

**ENDURA-FORM can help!**

### ENDURA-FORM ADVANTAGES:

- Easy to transport and assemble
- Extremely strong and durable
- A myriad of possible layouts
- Can be assembled and machined with standard tools
- Easy to clean and maintain
- Chemical resistant
- Environmentally friendly
- 100% Recyclable
- Can be pre assembled in sections off site
- Can be easily fitted for radiant heating

*Continuous interlocking sections of ENDURA-FORM panels can be as large or as small as required!*





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## AVIATION APPLICATIONS

### RADIANT HEAT CAPABILITIES



ENDURA-FORM panels have the unique feature of being easily fitted with heating lines to provide heat, ground de-icing and to prevent snow buildup.



**GO TO OUR WEB SITE TO SEE WHAT ELSE ENDURA-FORM PANELS CAN DO FOR YOU!**



### WHAT ARE ENDURA-FORM PANELS?

ENDURA-FORM is an interlocking single form factor panel that can be used in all sorts of applications. ENDURA-FORM panels are extremely strong and durable and have the unique capability to be easily fitted with heating lines for radiant heat applications. They will provide maximum performance in the most extreme conditions.



Panel Size: 32" x 48" (4" thick when interlocked)  
Panel Weight: 32 lbs ea.  
Panels are interlocking and can be overlapped.  
Machinable with standard tools.

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## The Puvirnituq Airport Project

*Recently, Endura-Form travelled to the Inuit community of Puvirnituq on the eastern shore of Hudson Bay in Northern Quebec to build a refueling apron for the local airport and test our panels under the toughest conditions.*



Welcome to Puvirnituq!



Puvirnituq from the Bay



We started site preparation to provide a firm foundation for the Endura-Form Panel installation.



Raking out and compacting the base material to provide a solid, well drained foundation for the Endura-Form installation



The layout of the Endura-Form panels starts over top a layer of material.



Final finishing



Catherine and Chuck give a big thumbs up! They piloted the first plane onto the new apron.



Making good use of their new Endura-Form refueling apron.

**Final finishing of the final 40' x 40' Endura-Form panel installation. The apron is 1600 square feet (360 panels). Ground preparation took 7.5 hours. Panel assembly took 5.5 hours with four workers.**



To demonstrate the strength and toughness of Endura-Form panels, we parked these three fully loaded rock trucks on the apron. These trucks weigh over 300,000 pounds altogether and the Endura-Form panels don't mind at all!



These front wheels are right on the edge of the panels and they show no weakness.



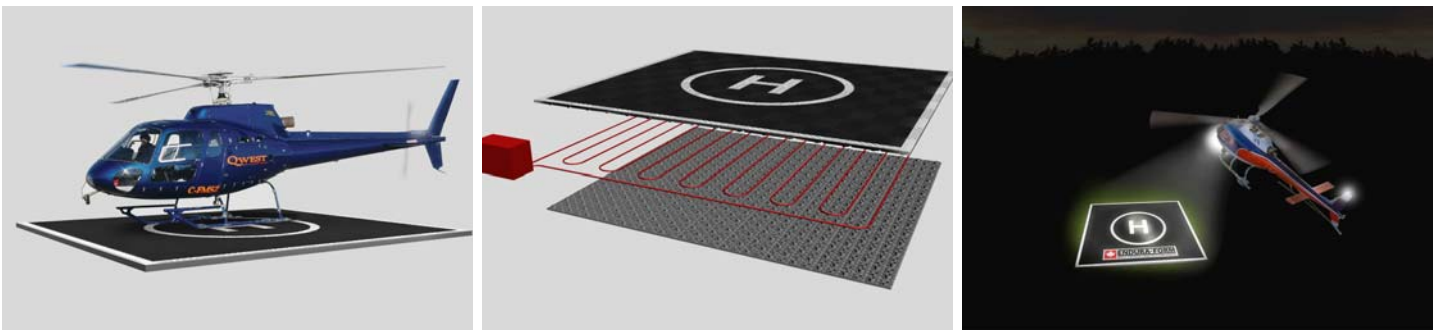
In this close up, notice there's no subsidence at all when the wheels are at the edge of the apron.



Not only does the Endura-Form panel apron provide a clean, safe place to refuel, it's also great for passenger and cargo handling as well.



Compare the Endura-Form apron with the normal gravel runway and how much cleaner and easier it is to maintain. The propellers in the center pictures show the damage running on a bare gravel or dirt runway can cause. Endura-Form panel installations can help prevent this sort of damage.



Endura-Form panels also make great helicopter pads, providing a safe and solid surface for take off and landing. Endura-Form panels are easy to transport and assemble and can easily be disassembled and reused. They can also be painted with reflective markings form maximum visibility in conditions of poor visibility. They are also designed for radiant heating for true all weather operation where snow and ice build up is a concern.

**[www.endura-form.com](http://www.endura-form.com)**  
**[info@endura-form.com](mailto:info@endura-form.com) • 1.604.792.0232**



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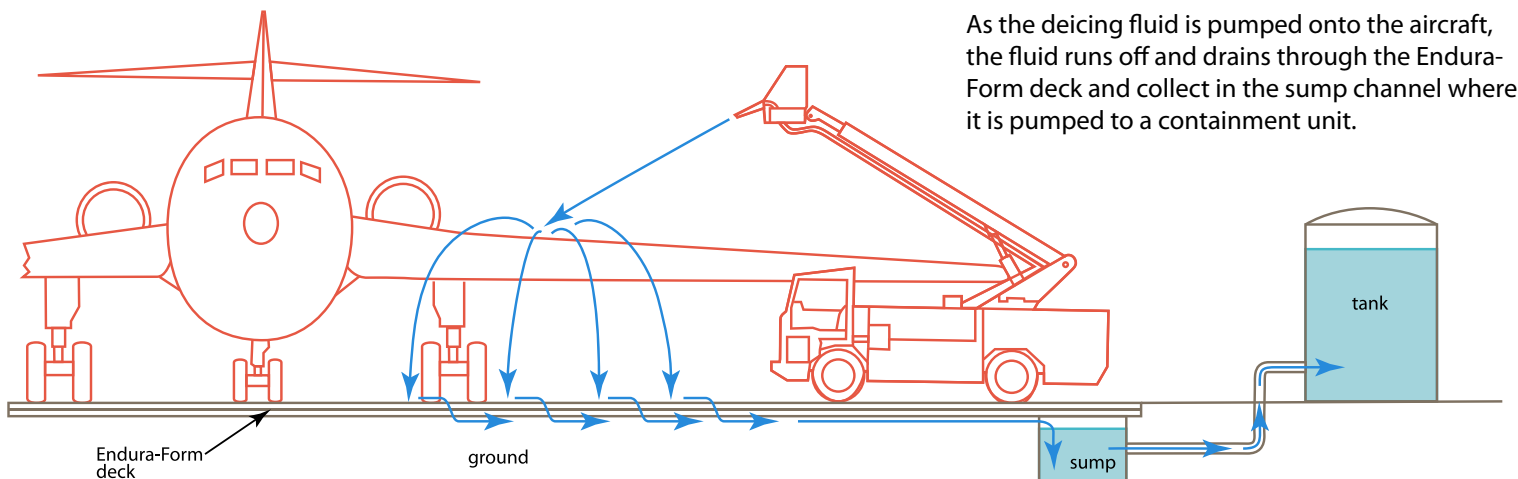
## AIRPORT DEICING DECK

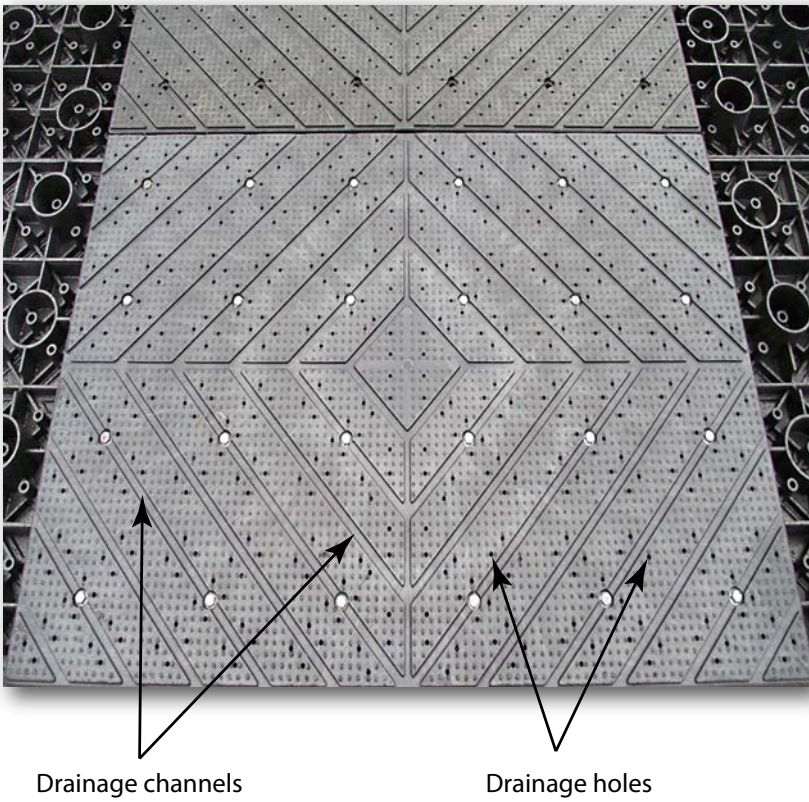
*Collect and recover your deicing fluid safely and easily*

*Collecting and recovering deicer fluid effectively and economically can be a challenge. Let Endura-Form help!*



Endura-Form panels can provide a super strong deicing deck with drain channels and holes to allow the deicing fluid to drain efficiently away and be channelled under the deck to a sump from where it can be pumped to a containment unit - no more puddles of deicer fluid building up and none getting into the storm drains. The decks can easily be made any size to accommodate any aircraft and installed either level to the parking apron or on top of it with a suitable ramp for easy access. Endura-Form panels can also be fitted with radiant heat systems to keep the decks clear in the toughest weather.

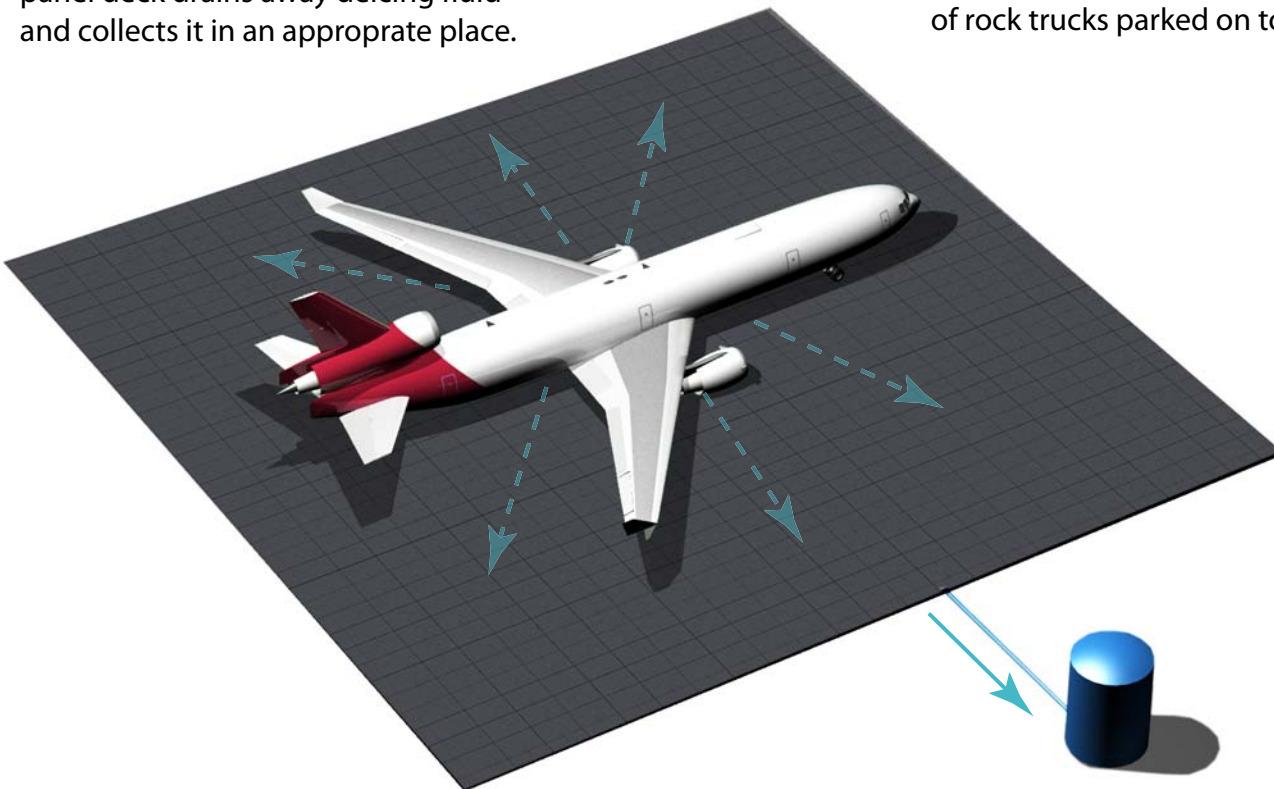




The Endura-Form panels have channels and holes to direct and drain away deicing fluid.



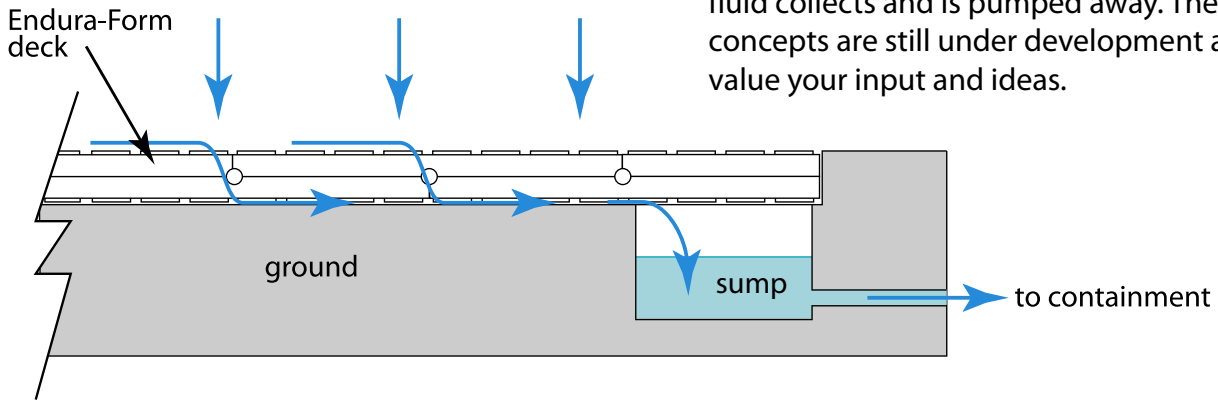
Another view of how the Endura-Form panel deck drains away deicing fluid and collects it in an appropriate place.



Endura-Form panels can resist pressures up to 803 PSI and can take 300,000 lbs of rock trucks parked on top!

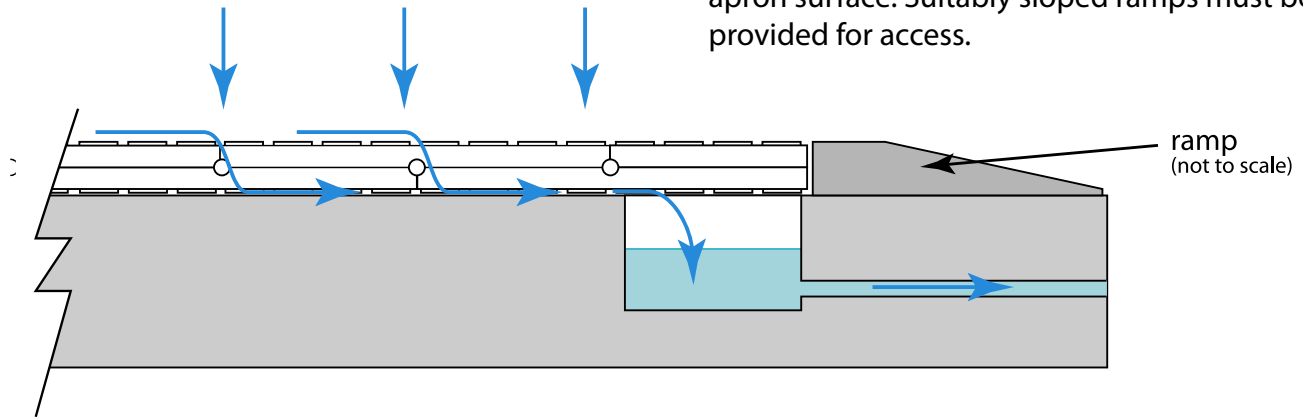


### IN GROUND INSTALLATION



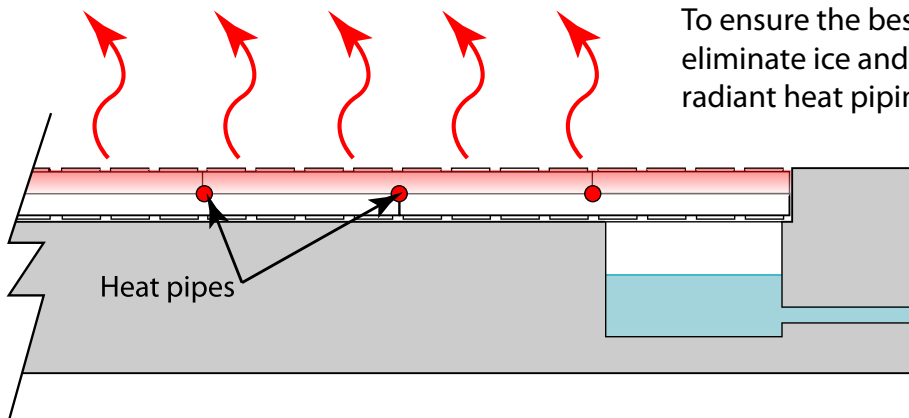
Endura-Form deicing deck installed flush to apron surface. As the deicing fluid runs along the deck, it drains through the panels and runs along beneath the panel deck to a sump where the fluid collects and is pumped away. These design concepts are still under development and we value your input and ideas.

### ABOVE GROUND INSTALLATION



Endura-Form deicing deck installed on top of the apron surface. Suitably sloped ramps must be provided for access.

### RADIANT HEAT INSTALLATION



To ensure the best of all-weather service and eliminate ice and snow build up on the deck, radiant heat piping can easily be installed.





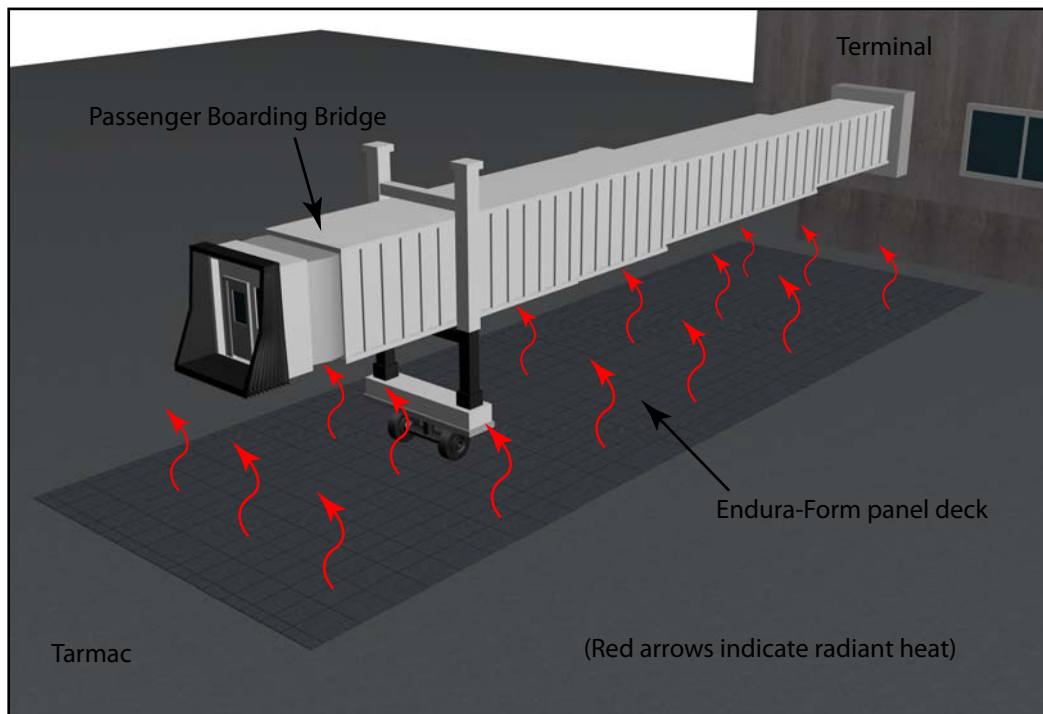


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## *Snow and Ice Control for Airport Passenger Boarding Bridges*

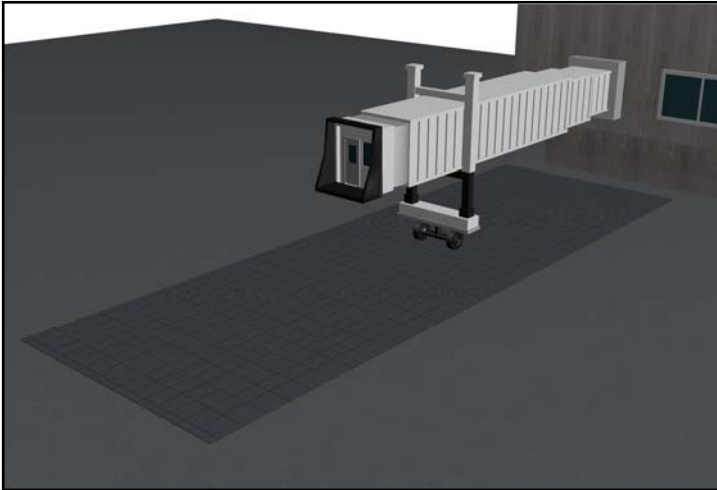
*Ensure Smooth Operation in the Toughest Weather*



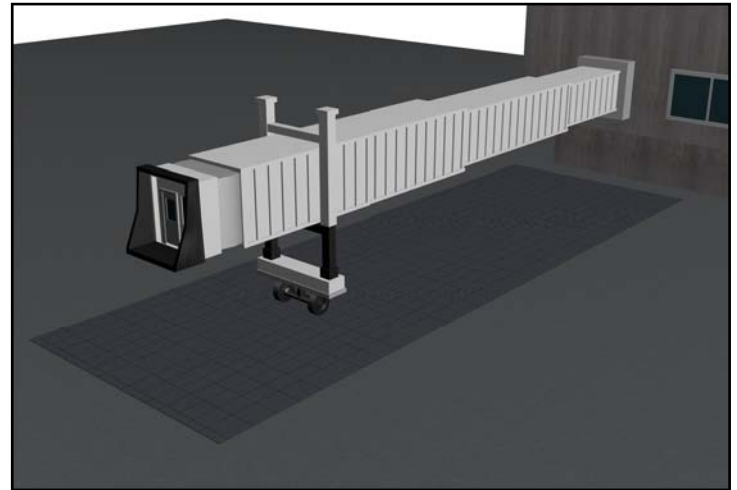
***Make It Easy to Keep Your Passenger Boarding Bridge Tracks Clear for Trouble Free Winter Operation With Endura-Form Panels Equipped with Radiant Heat***

Endura-Form panels can provide a super strong deck that can be easily equipped with radiant heat piping to keep the passenger boarding bridge paths clear in the toughest weather. Endura-Form's individual interlocking panels sandwich and protect the heating pipes while diffusing heat evenly. For best performance, heating pipes can be spaced at 8" intervals. Drainage through and around the panels can be provided if necessary.

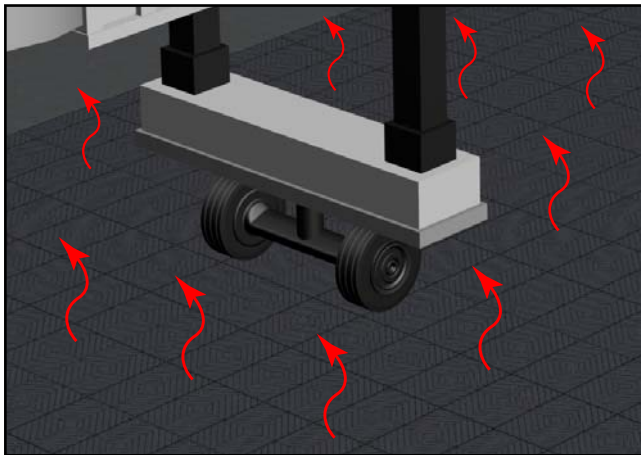




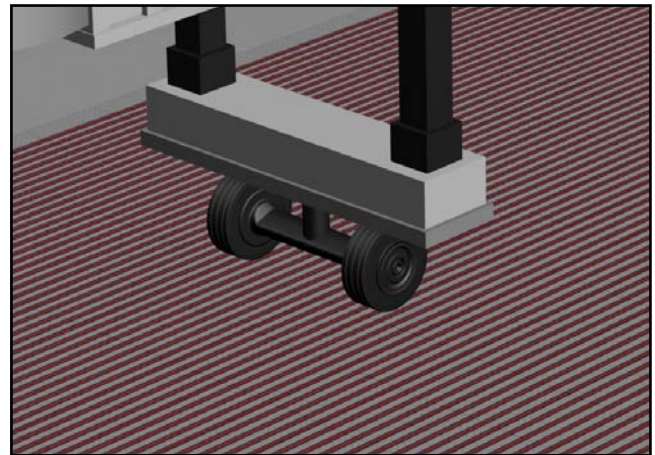
The Endura-Form panel deck provides a path for the full travel of the boarding bridge (seen here retracted). The decks can be made any size required.



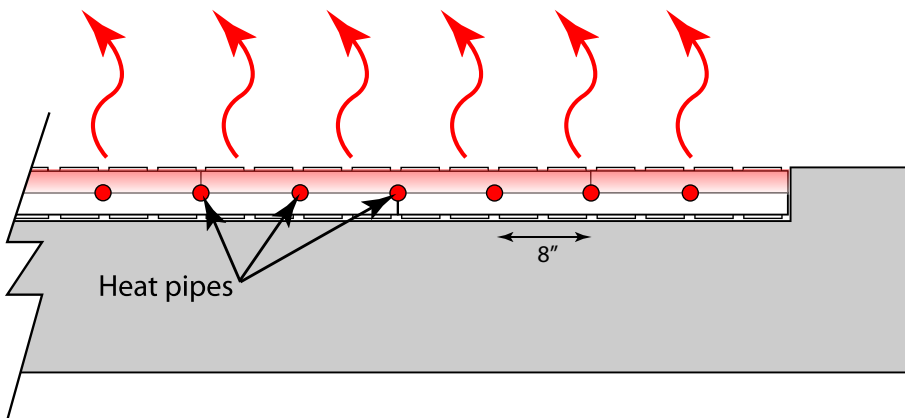
The fully extended passenger bridge travels easily over the Endura-Form deck which stays clear of ice and snow in cold weather.



Close-up of the bridge wheels on the deck. Endura-Form panels are super strong. The red arrows indicate radiant heat.

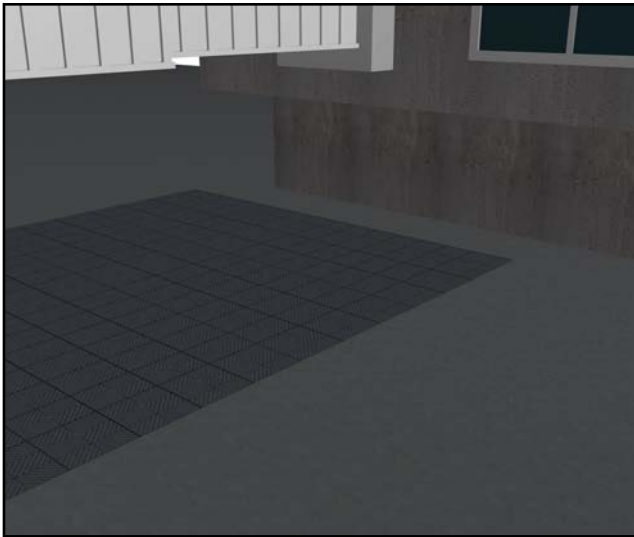


Transparent view of the Endura-Form heating grid installed in the Endura-Form panel deck.

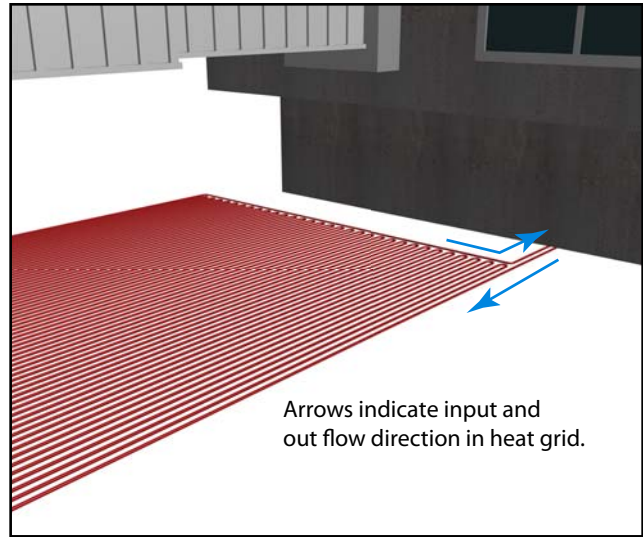


End view diagram of the interlocking panels showing 8" heat pipe spacing. The red arrows indicate radiant heat.





Close-up of the Terminal end of the deck.



This shows the grid at the terminal end with the input and out put lines. The heating fluid is pumped around the grid from the boiler installed in the terminal or out building.



300,000 pounds of rock trucks parked on this Endura-Form deck shows it's strength.



Passenger plane on an Endura-Form panel deck in the Canadian Arctic.



Landing gear on an Endura-Form panel deck.





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## Helicopter Landing Pad



*The Perfect Solution for Your Helicopter Landing Pad Requirements*



Helicopter landing pads constructed with Endura-Form multi-purpose construction panels are a strong, easy-to-construct and durable solution. They can be easily built and placed at airfields, work sites, building roofs, wharves, wilderness sites or anywhere else they might be needed.

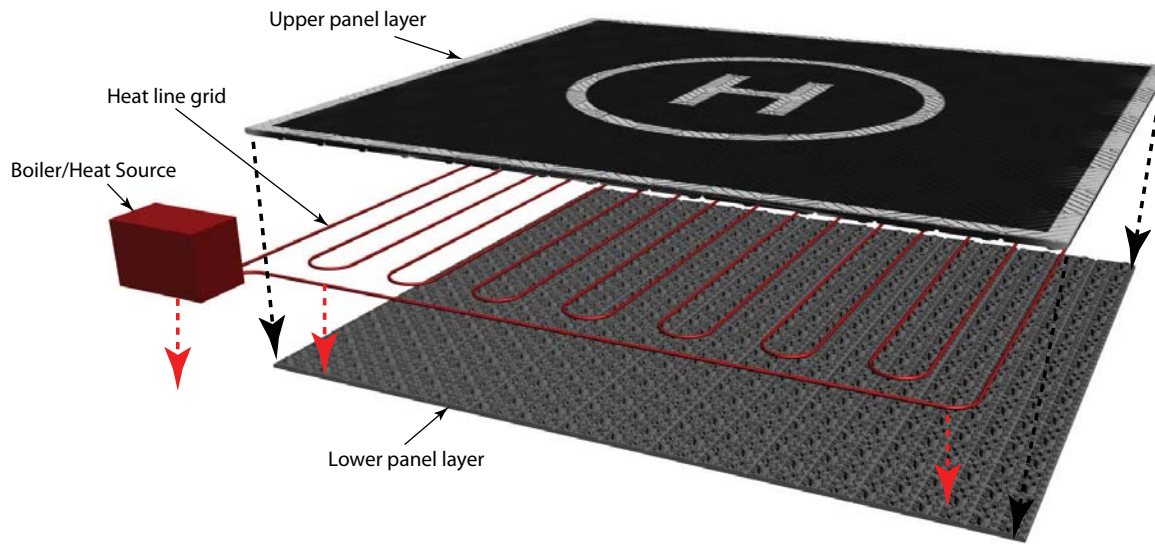
Endura-Form helicopter pads have a low environmental impact, are easy to transport, strong and long lasting and are completely reusable and 100% recyclable. They can be easily dismantled for reuse elsewhere. They eliminate problems with flying debris, provide a solid, stable landing surface and can be marked out with paint and reflective strips for maximum visibility and safety.

In places where snow and ice build-up are a problem, radiant heat systems (see Fig 3 & 4) can be easily fitted to provide a clear, safe landing space in all seasons. The pads can be laid out in a variety of sizes - 12' x 12', 12' x 15', 20' x 20' etc. Endura-Form panel assemblies are interlocking and secured with steel bolts (24 bolts per top panel). **Individual Panel size is 48" x 32" - combined thickness of the two layers is 4". Weight is 6.2 lbs per sq ft (excluding bolts).**

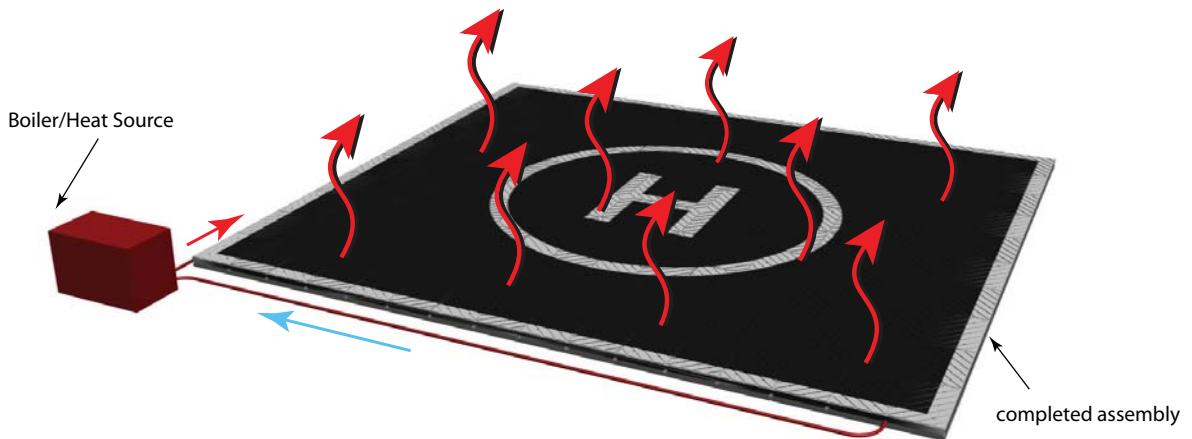


**Figure 02:** This shows the assembled platform with markings. Retro-reflective tapes or paint can be applied either before or after final assembly for maximum visibility and safety. The panels can be made in different colours and painted appropriately. Corporate colours and banners can easily be applied if desired.

## Endura-Form Panels - The Perfect Solution for Your Helicopter Landing Pad Requirements



**Figure 03:** Radiant Heat Option - this exploded view of the upper and lower panel assemblies shows how the heating lines are sandwiched between them. The boiler location is for illustration only - it could be placed in any appropriate spot and be of a hot water or steam type. Heating line spacing could be 8" or 16". Lines outside the pad would be insulated.



**Figure 04:** This illustration shows the assembled pad with the radiant heat option, indicating the radiant heat distribution and the hot output and cold return. The assembly is securely held together with metal bolts.

## Endura-Form Panels - The Perfect Solution for Your Helicopter Landing Pad Requirements



**Figures 05:** In the field, Endura-Form Helicopter pads have a minimal environmental impact and are perfect for temporary or permanent installations at home base, in the field, on building tops or anywhere else you need a strong, easily assembled helicopter pad. They are easy to transport by land, water or air and easy to assemble and disassemble and are reusable.



**Figures 06:** Endura-Form panels can be custom manufactured in a variety of colours and can be marked with retro-reflective tape and paint for maximum visibility at night or in bad weather - especially important in field installations away from light sources. The Endura-Form pads can also be fitted with lights where needed.

*Please contact us if you have any questions about Endura-Form panels, their use and installation.*

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*Learn More at*

## **www.endura-form.com**

*For detailed structural engineering test results from  
the British Columbia Institute of Technology  
go to <http://www.endura-form.com/bcit2/Endura-Form Computer Modelling-Summary.html>*

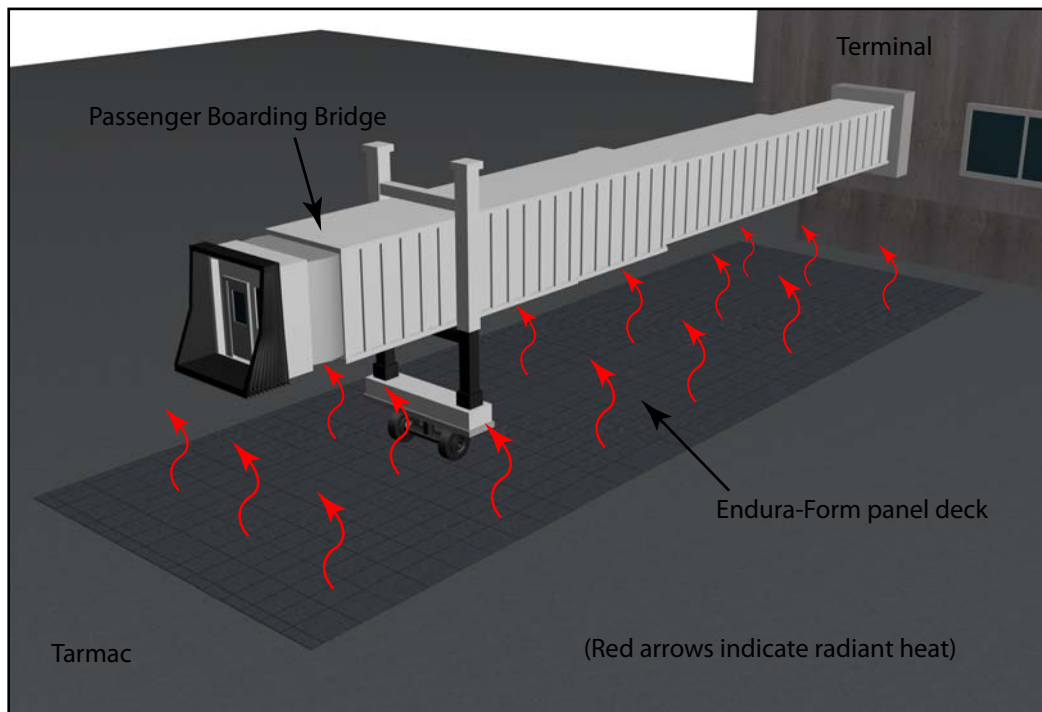


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*Ensure Smooth Operation in the Toughest Weather*

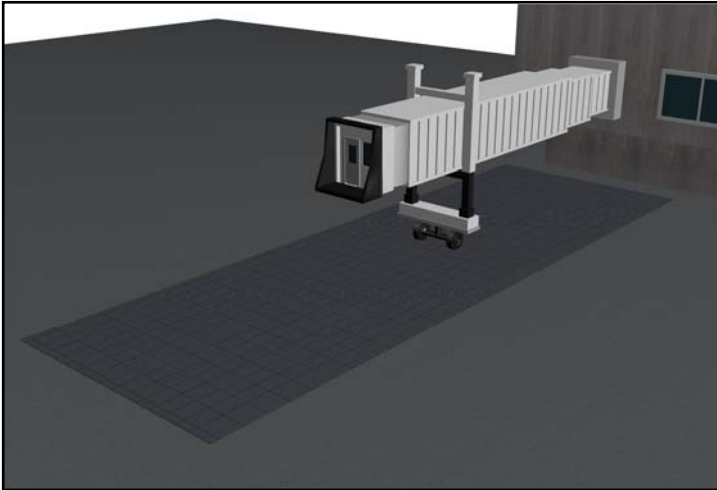


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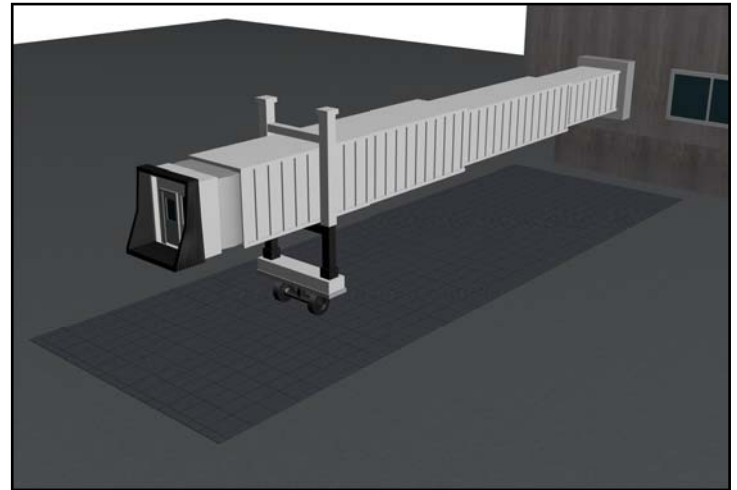
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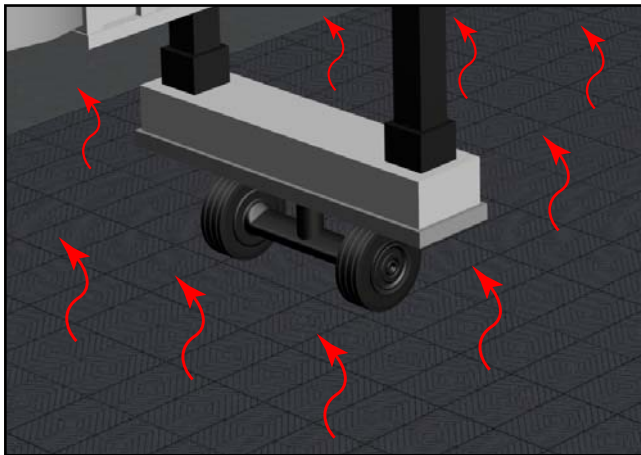




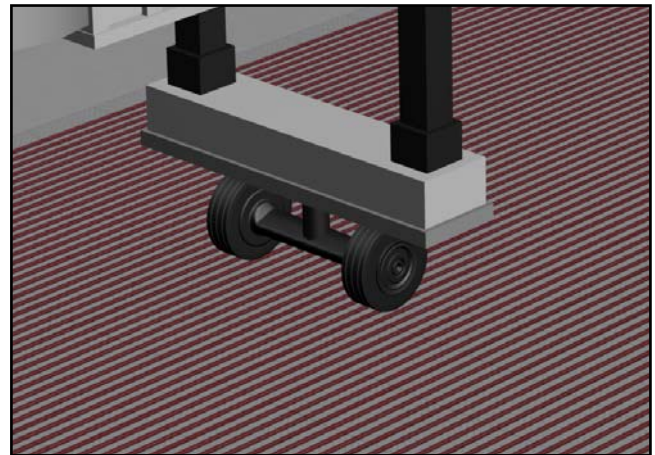
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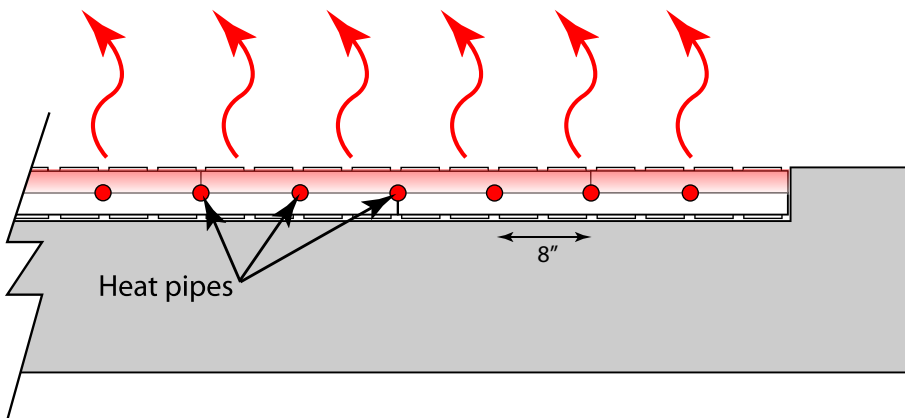
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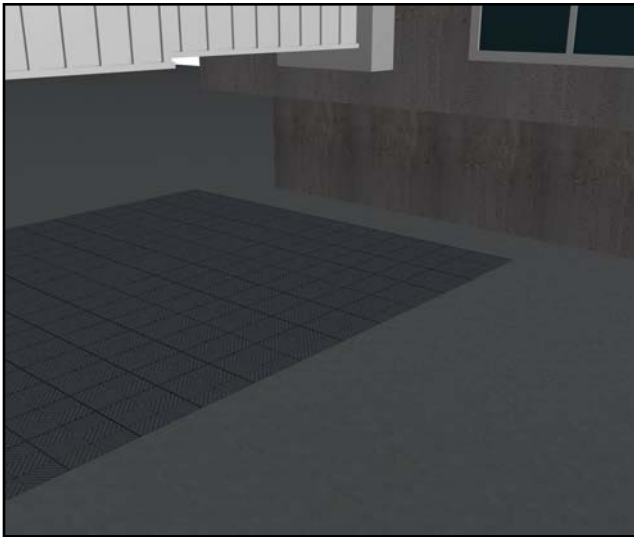


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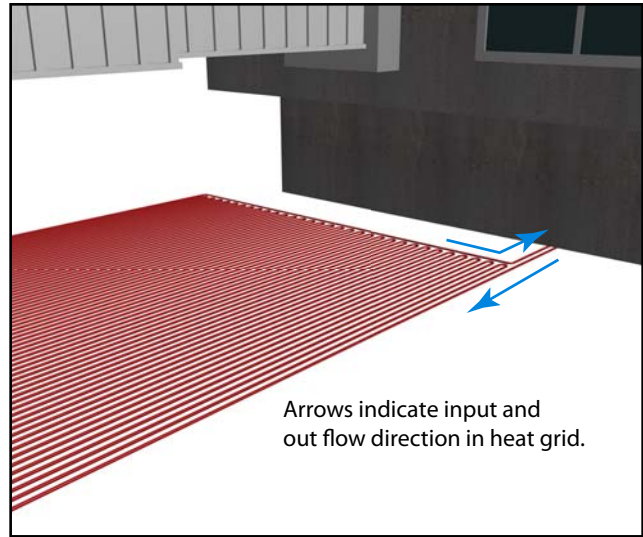


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