

SECURE SEISMIC DESIGN

# ISO FLOOR SEISMIC

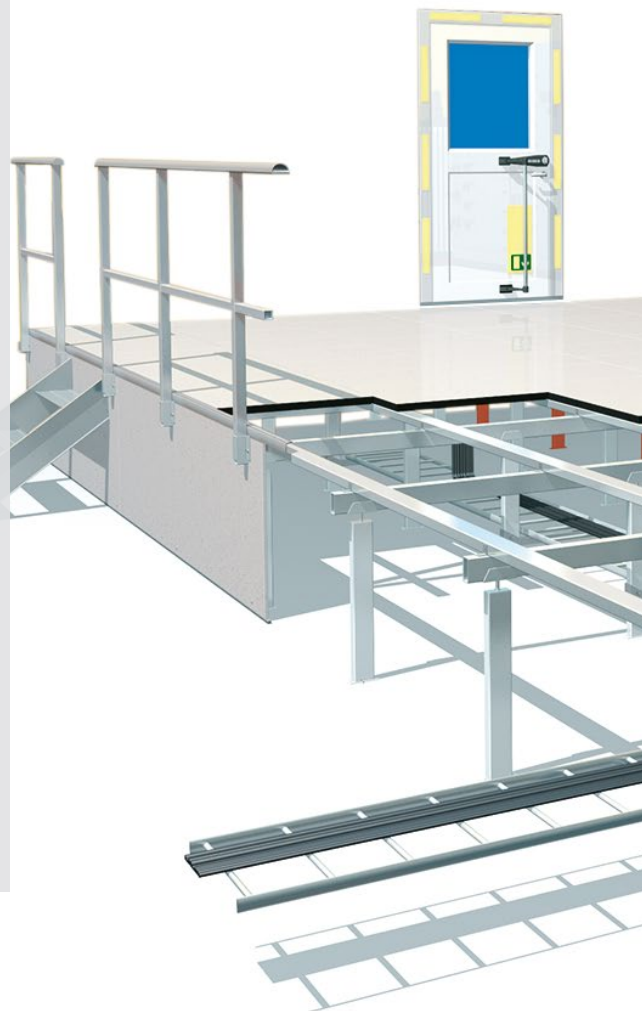
FOR DATA CENTRES AND ELECTRICAL EQUIPMENT ROOMS





*Since 2006, Digicel has used the Bergvik Iso Floor raised floor and seismic zone 4 bracing system. On the 12th of January 2010 Haiti was devastated by a magnitude 7.2 Earthquake. The Switch Rooms equipped with Bergvik Iso Floor remained operational, none of the racks fixed on seismic braces were affected; our network core survived the earthquake and kept the service up when the country most needed it. We can highly recommend Bergvik as a vendor of raised floor and seismic bracing solutions.*

**Bernard Yacoub,**  
CTIO, DIGICEL HAITI



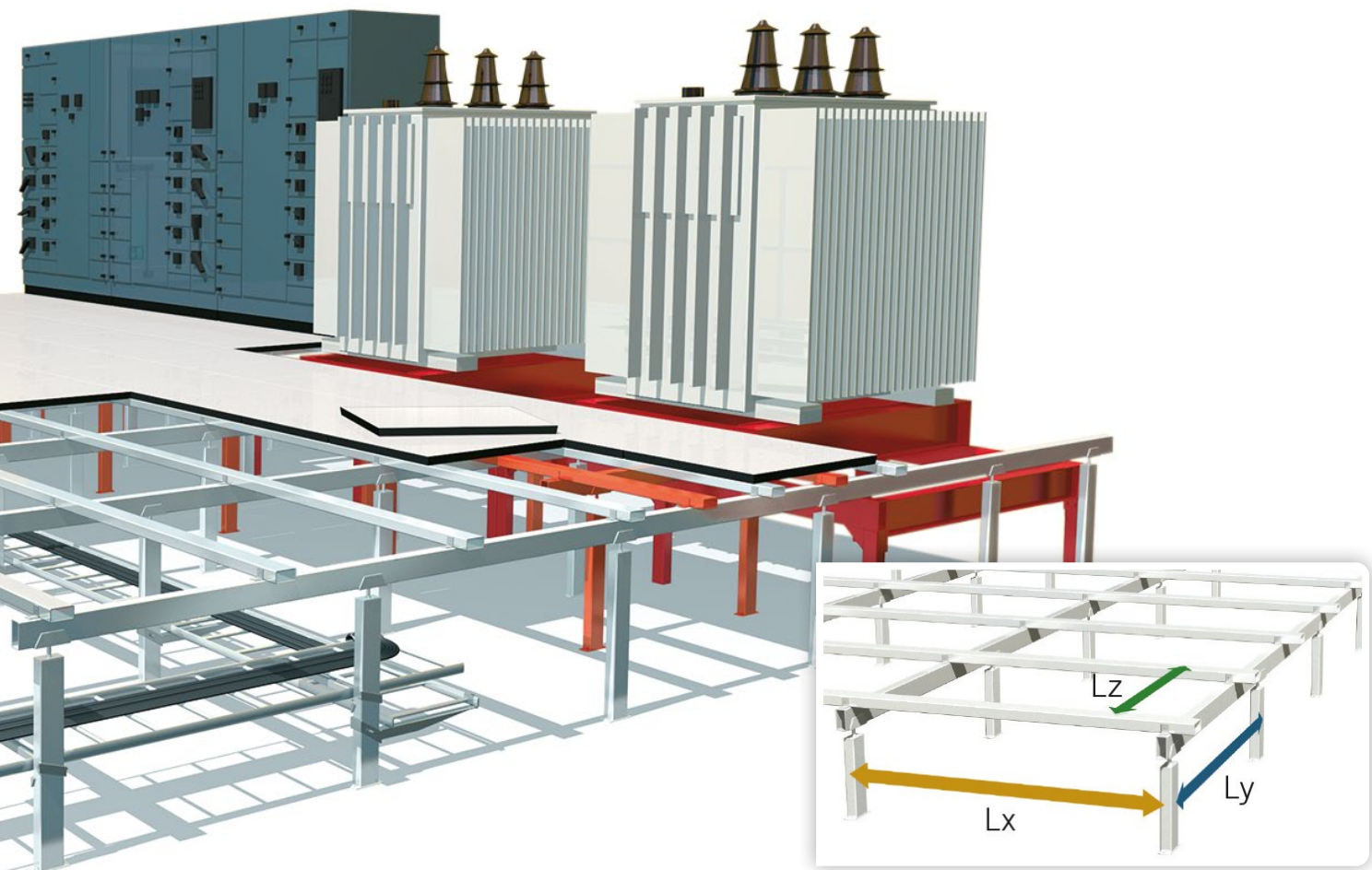
## THE SECURE SOLUTION

Bergvik provides a seismic restraint raised floor in compliance with the US Federal Government and international building code. Bergvik also has the expertise to determine seismic demand due to both horizontal and vertical ground motions at a given facility location worldwide and to design a raised seismic restraint support frame, if needed, for extreme ground motion forces.

Bergvik also has the ability to determine the shaking due to an earthquake, to help with the seismic demands for the fragility of the electrical equipment, data/server rack or other equipment mounted on Bergvik's Iso Floor Seismic design.

Every project is designed by Bergvik in 3D using Revit. Layouts are provided for client's approval prior to commencing with installation. Due to the flexibility of the Bergvik Iso Floor Seismic design, layout and equipment changes can be accommodated.

- Allows for optimized equipment layout and full access to electrical, data, plumbing and ventilation under floor in service aisles.
- Bergvik offers panel sizes from 315-1200x600 mm under equipment rows, as well as for service aisles.
- Quick and easy installation due to the fully modular design.
- Fulfills all requirements according to ASTM E-84 / UL 723 / NFPA 266.
- Tested and approved according to NEBS GR 2930.
- Static and Seismic load calculations are provided as standard.
- No need for pre-welded support stands for heavy equipment. This allows the end user additional time to negotiate the purchase of high cost equipment such as switchgears, UPS and transformers.



# HEAVY EQUIPMENT IS NOT A PROBLEM

During the initial design stage, the modular Iso Floor Seismic substructure and floor panels can easily be adapted to suit various equipment types and density layouts. This leaves all floor panels accessible in aisles, pathways, providing full and continuous access for changes or additions to the under-floor area. There is no need for separate floor stands as all Electrical Equipment sits directly on top of the Iso Floor Seismic substructure.

The modular design of the Iso Floor Seismic system allows for static loads of up to 40 kN/m<sup>2</sup> or 4,000 kg/m<sup>2</sup>. The distance between the primary beam sections (Lx) and pedestal placement on each primary beam (Ly) are the factors that decide the uniform distributed design load.

The distance between the secondary beam sections (Lz) are normally 600 mm, or based on the floor panel size needed in each specific area.

Floor layouts can easily be designed around large and bulky cable runs, as well as mechanical piping or ductwork. This creates a strong, flexible, easy to design, easy to install, cost effective and aesthetically pleasing solution for both below and above the floor level.

For extremely heavy load areas that may require support for up to 14,000 kg, a separate modular transformer support stand can be integrated into the floor system.

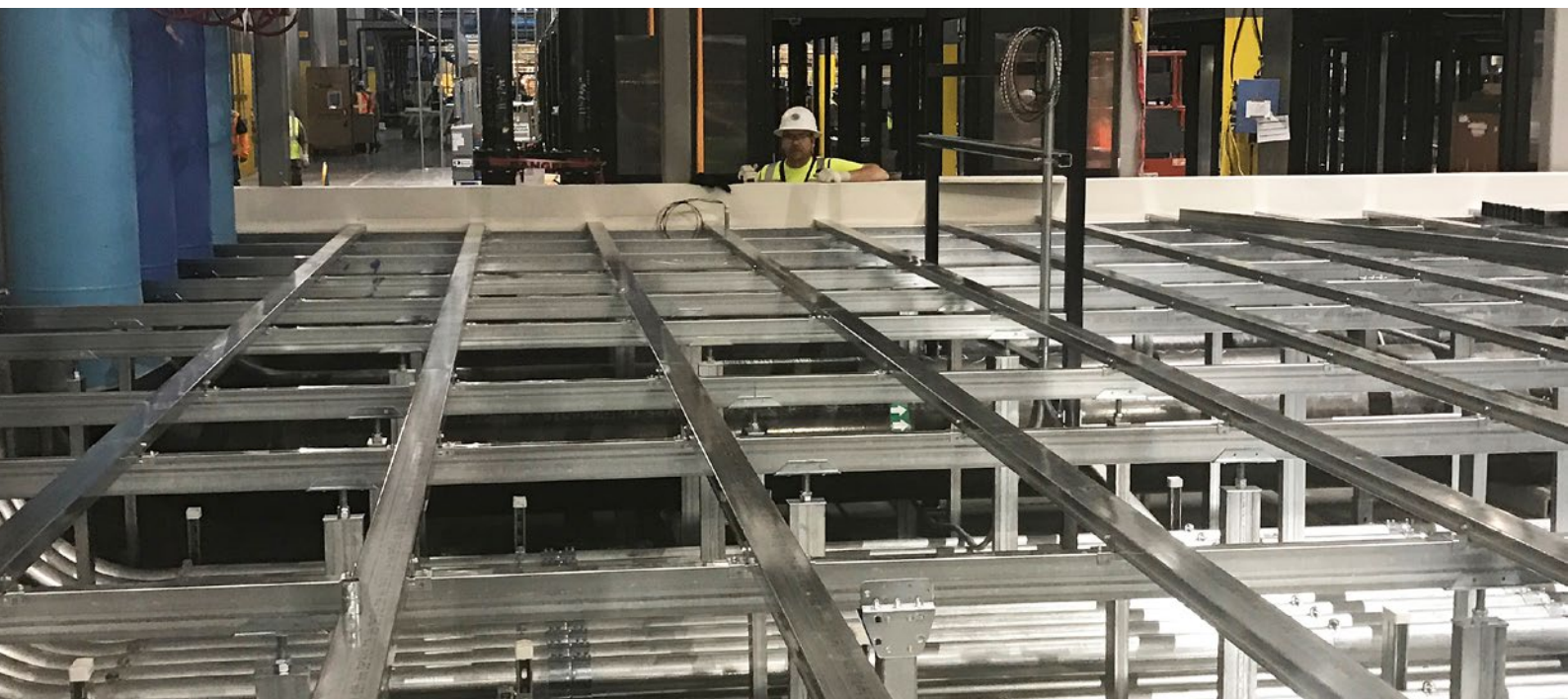
# QUICK AND EASY INSTALLATION

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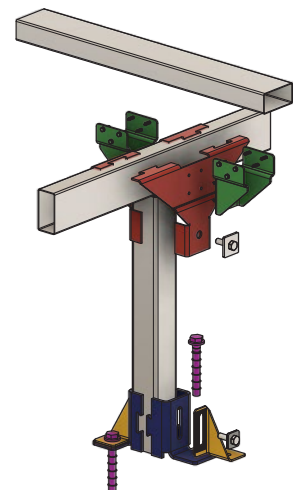
**Typical floor heights range from 300-1,200 mm, and the floor design levelling capacity +/- 25 mm), to allow for the precise levelling of the finished floor.**

Cable ladders, chiller piping, conduits, fire suppressant piping, etc. can be mounted directly to the Iso Floor Seismic pedestals using Bergvik's Holder Clamp (pictured on page 7). This can make a significant reduction in the time and cost required to install these services.

- Electrically isolated for high personal safety.
- Custom panel sizes available to offer maximized optimization and access to service aisles.
- High mechanical strength, with the wood core offering negligible permanent deflection under load.
- Easy to handle due to its light weight, only 10 kg for a 600x600 mm panel.
- Easy to clean, durable and resistant to harsh chemicals and battery acid.
- Fulfills all requirements according to ASTM E-84 / UL 723 / NFPA 266.



Iso Floor supporting 36.5 kN/m<sup>2</sup> of electrical equipment for a major technology company in Arizona.



# THE FLOOR PANEL FOR TOUGH ENVIRONMENTS

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The standard laminated floor panel is 1.5 inch (38 mm) thick, using a core of high density, moisture resistant and flame spread retardant particle board. To maximize the usage of the floor space and to allow for full access to all service aisles, floor panels are available in custom sizes.

Bergvik's laminate is applied with a direct lamination process, which prevents the panels from de-lamination. No glue is used in our lamination process. Bergvik laminate is antistatic, extremely durable and easy to clean.

The three standard laminate finishes are M335 Granite, H818 Alder and A0040 Oak.



Transformer Room at Karolinska Hospital with reinforced Iso Floor Substructure supporting 16 Transformers with a total weight of 120 ton.

# TAKE THE WORRY OUT OF THE DESIGN PROCESS!

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## Bergvik takes the worry out of the design process.

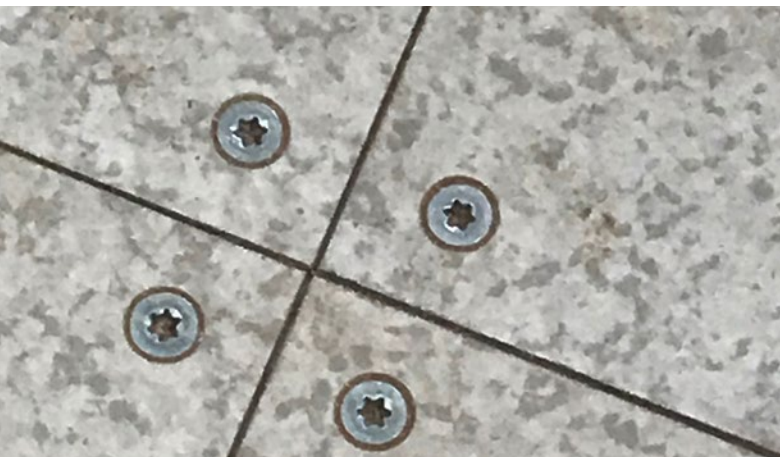
We custom design the floor for every project to provide our customers with the quality they expect and deserve. Your equipment layout can be decided at the design stage and the floor is designed to adapt to your optimized equipment layout.

Through Iso Floor's flexibility and ability to use custom sized panels, Bergvik can provide the Iso Floor with your dream layout without adapting to a 600x600 mm floor grid.

By using Iso Floor, the hot and cold aisles can be adjustable to get up to 25% more Server Racks on the same floor space, in comparison to traditional 600x600 mm grid floors.



Simply build any electrical equipment support frame by bolting 40x40 tube steel directly on top of the standard Iso Floor substructure. Years later when you upgrade e.g. PDU's, CRAH's or Battery Racks and they have a different footprint, you just adapt the 40x40 tube frame and you are done at a minimal cost. Major time and cost savings!



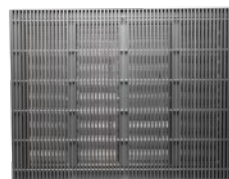
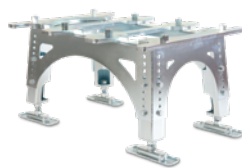
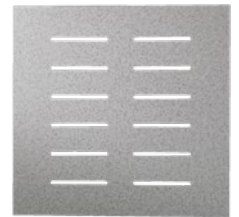
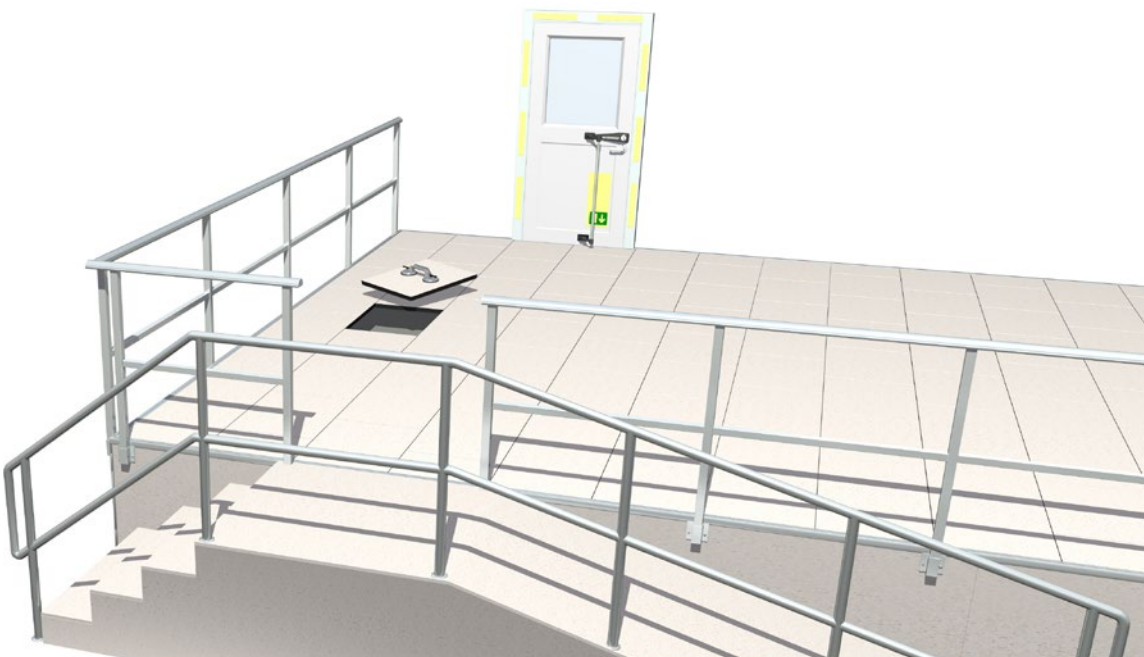
Floor panels can be securely bolted down to the substructure when the floor is specified for high traffic egress areas such as corridors.

# COMPLETE RANGE OF ACCESSORIES

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Bergvik offers a complete range of accessories and options for our raised floor systems. These typically include panel lifters, stairs, handrails, ramps, border fascia panels, cable seals and grommets. Our popular Holder Clamp, which can be quickly mounted to a floor pedestal, provides simple and varied options for installation of cable ladders, cable trays, chiller piping, fire suppressant piping, smoke detectors, etc.

As part of our accessory range, we also offer various forms of airflow panels and grilles, as well as panels made of different materials and sizes. We can also provide cover kick plates for protection of vertically mounted cable ladders, threshold transition plates, vertically mounted emergency door openers and earthing bars. Contact us for specific data cut sheets on the listed accessories.



## BERGVIK SEISMIC BRACING FRAMES

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In studies of earthquakes between 2000-2013, it was shown that the vertical ground motion has created significant damage to non-structural components in buildings. In mission critical data centres, electrical and telecom environments, standard raised floors are commonly used and will not amplify the vertical ground motions. If a system is sensitive to shaking, it is likely to be sensitive in all three orthogonal directions.

Companies are presently investing in lateral base isolation systems and will be shocked at the damage due to the vertical ground motions. The Seismic Bracing frame does not depend on any support from a raised floor but is instead securely anchored directly from the equipment rack or electrical cabinet down to the concrete sub floor with seismic anchors.



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## CUSTOM MADE SOLUTIONS WITH THE HIGHEST QUALITY

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Coordinating with Bergvik is worry free. We custom design the floor for every project if needed, in our CAD software, to provide customers with the quality they expect and deserve. This means that your equipment layout can be decided at the design stage and the floor is designed to adapt around your optimized project design. Additionally, a standard 5-year warranty on the floor is priceless.

Bergvik was founded in 1970. Through all the years, we have exported our floors to more than 100 countries around the world.

Today we design and deliver fully modular and technical floors like Iso Floor, HiFlex Floor, Tech Floor and our proven secure Seismic Bracing Frames. As well as the structural ceiling system - Iso Flex-Grid.

### Our products

ISO FLOOR



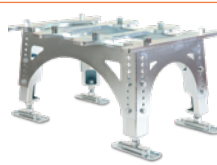
Raised floor for data centres and power distribution rooms with unique flexibility.

HIFLEX FLOOR



High-built power distribution floor as an alternative to concrete beams.

SEISMIC BRACING



Bergvik's seismically secure raised floor that protects critical electrical equipment.

ISO FLEX-GRID



A load-bearing ceiling system that is both a dropped ceiling and a support grid in one cost effective solution.

TECH FLOOR



An economical standard grid floor system for installation in offices and communication centres.

