INCYE

GROUND SHORING

v. 2.1.3.

www.incye.com

DEFINITION OF THE SYSTEM

- Temporary steel structure, with the function of containing the thrust of the ground on the basement wall until it is taken over by the final concrete structure.

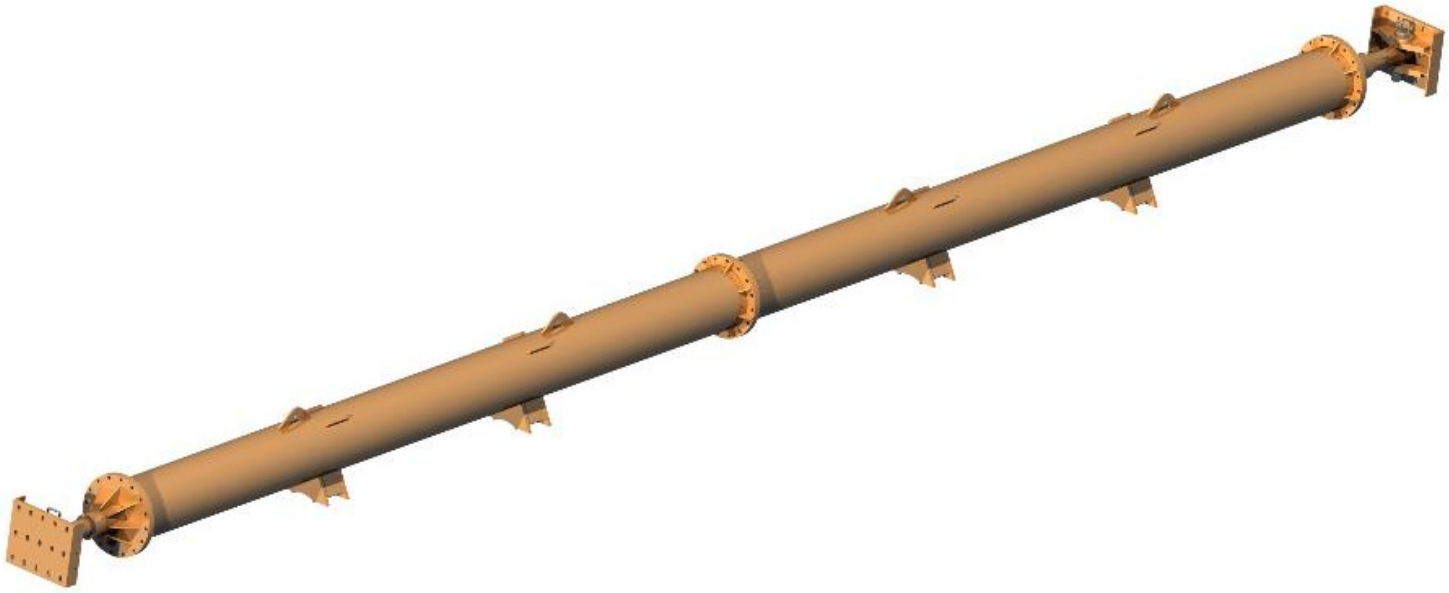
- The **Granshor** truss system is designed to withstand high axial loads of up to 2,600 kN per plane.

- The **Pipeshor** pipe system is designed to carry high axial loads of up to 5,300 kN per prop.

- The **Megaprop** beam system is designed to carry high axial loads up to 1,000 kN per strut.

Basic design criteria

- The diaphragm wall designer defines the shoring levels and the thrusts per linear metre of wall required at each level.
- On the basis of these loads, the maximum tributary width per prop is determined according to the bearing capacity of the **Granshor** truss, **Pipeshor** tube or **Megaprop** beam depending on the span of the brace.
- As there are no specific regulations for the use of elbow fittings, the general indications of the current regulations are followed:
  - Design basis: EN-1990
  - Actions: EN-1991, CTE DB-SE
  - Steel: EN-1993, CTE DB-SE-A
  - Foundations: EN-1997, CTE DB-SE-C



Examples of realised projects

INCYE

GRANSHOR

V. 2.0.2.

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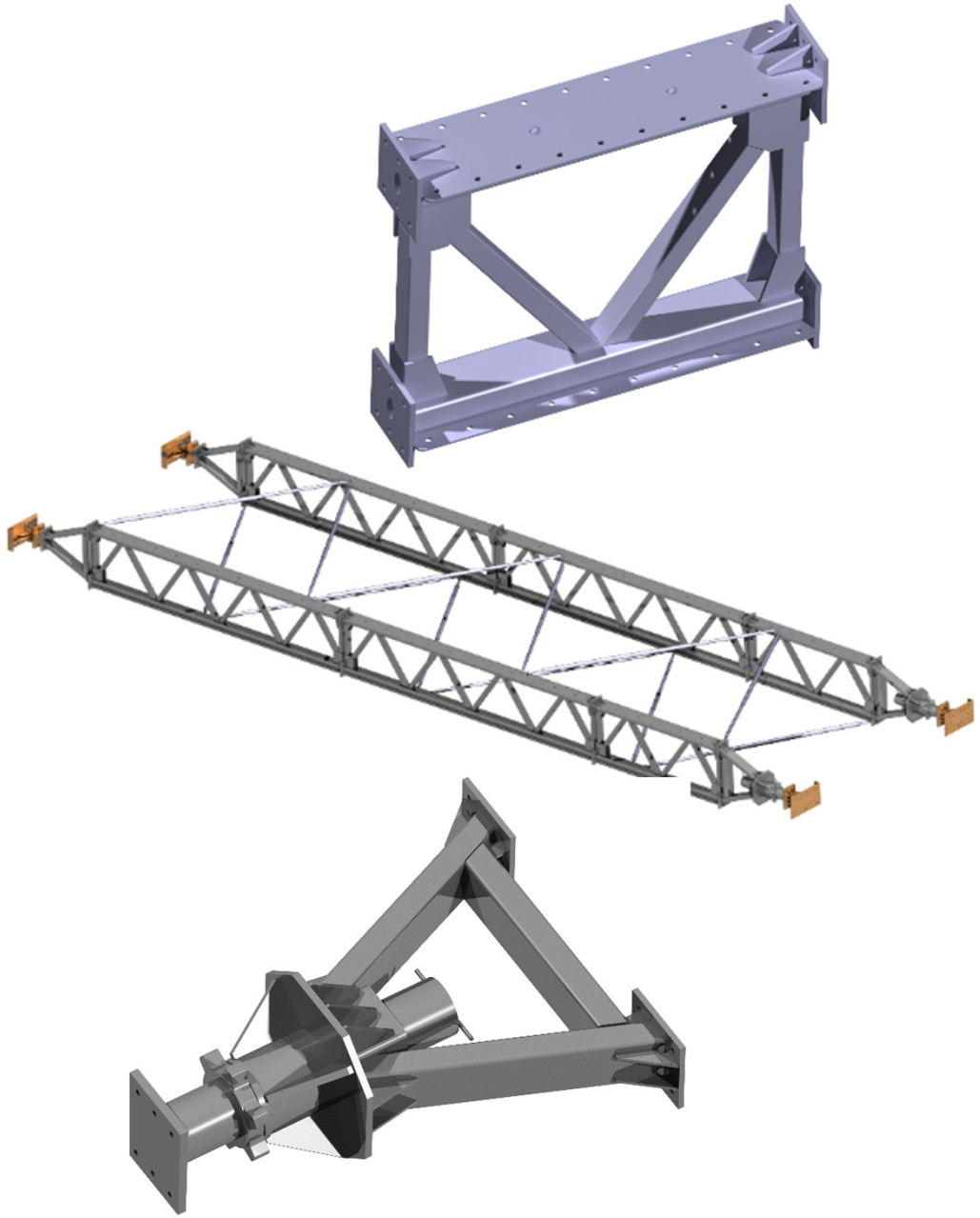
Advantages of the system (1/4)

- **No on-site welding required** (parts with bolted joints).
- Modular design: the use of panels **improves performance** by reducing assembly time on site.
- Mechanical jack to achieve the exact size required, **no cutting of parts** for final adjustment.
- Initial tightening of the jack to eliminate assembly clearances and ensure that the prop is tight to the wall, **reducing deformation** of the screens when they are loaded.
- Adjustable diagonal tensioners **eliminate the need to cut** to size on site.



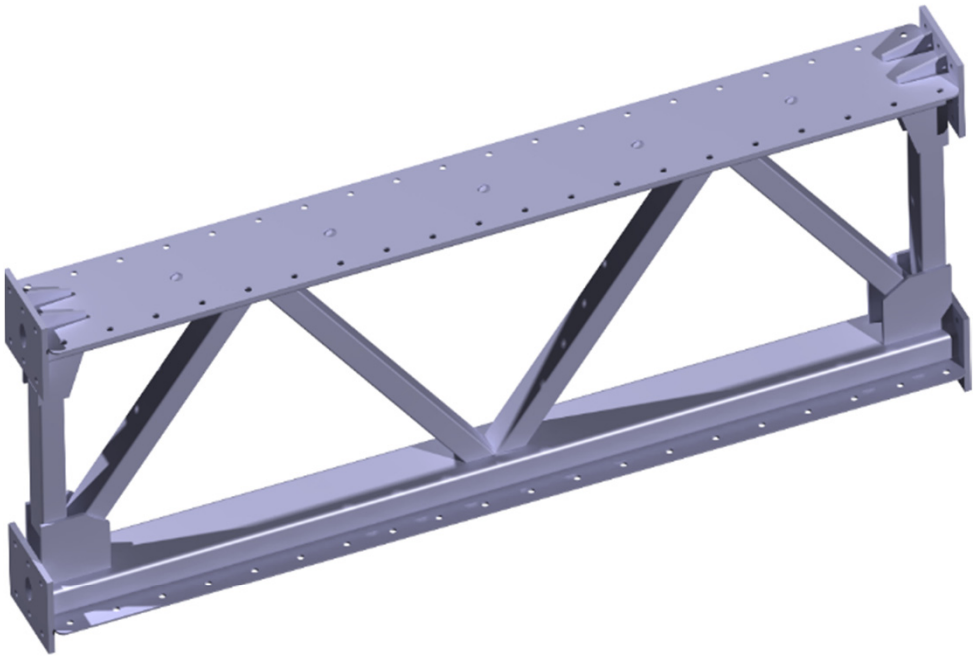
Advantages of the system (2/4)

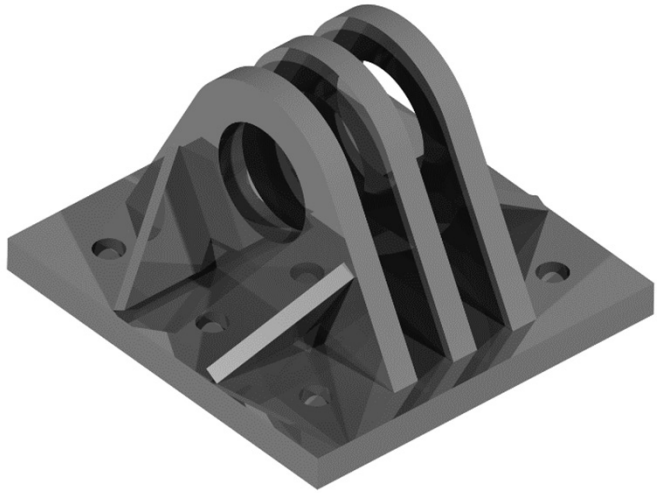
- **High load capacity:** up to 2,600 kN per axial load truss.

- Eurocode-compliant design and use of high-strength steel, making the system **stronger and lighter**.

- Highly rigid lattice panels, with fully welded modules, **reducing the number of joints with possible gaps**.

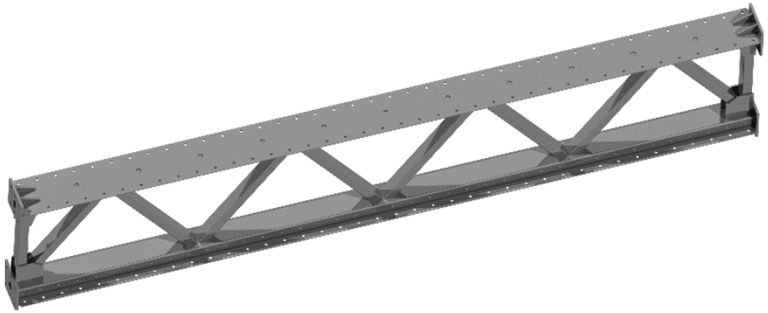
- Fewer components are required, which means a **reduced assembly schedule** and fewer counting errors, **saving time and money.**

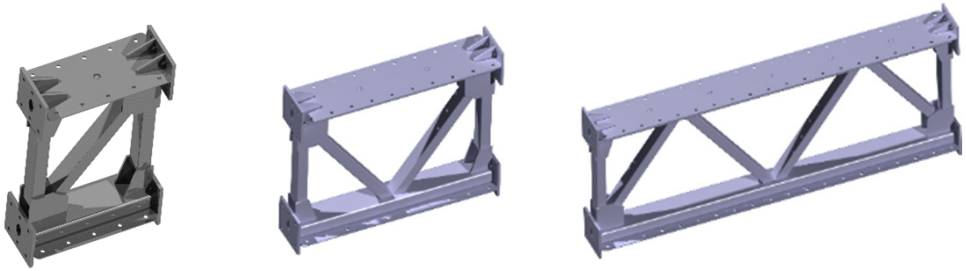


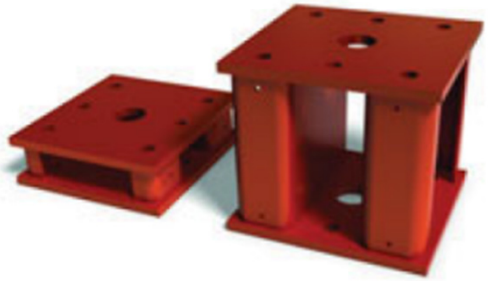


Advantages of the system (3/4)

- **Four panel sizes**: 6,000, 3,000, 1,000 and 750 mm.
- **Long stroke jack**, up to 750 mm, to create a truss of any length.
- Holes every 150 mm in the flanges of the chords, allowing **great flexibility** in fixing the bracing elements.
- Compatibility with INCYE **Megaprop** beams, available in 8 lengths: 5400, 2700, 1800, 900, 450, 270, 90 and 15 mm.
- **Galvanised elements**: high durability and good appearance.



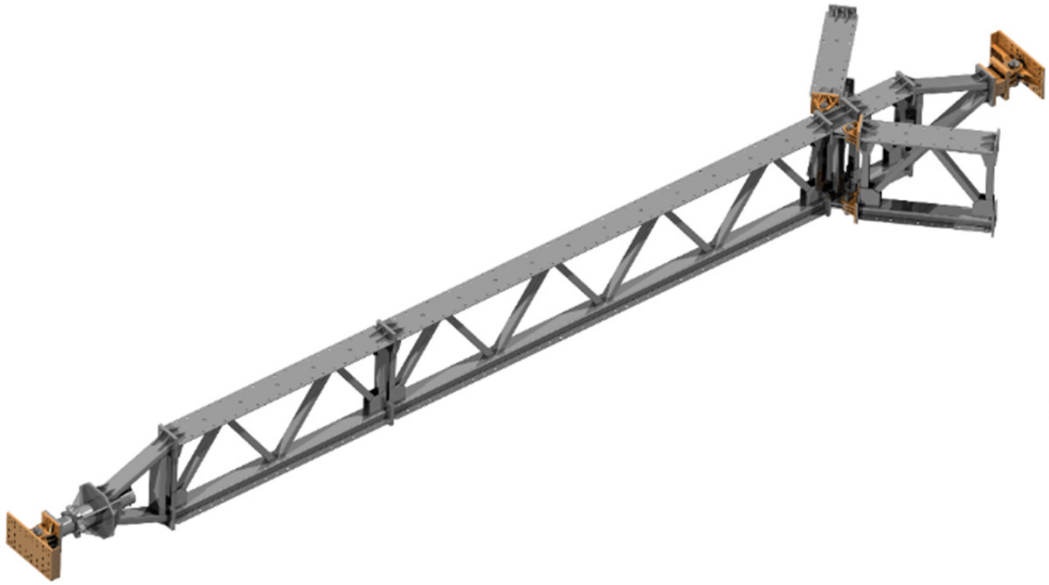


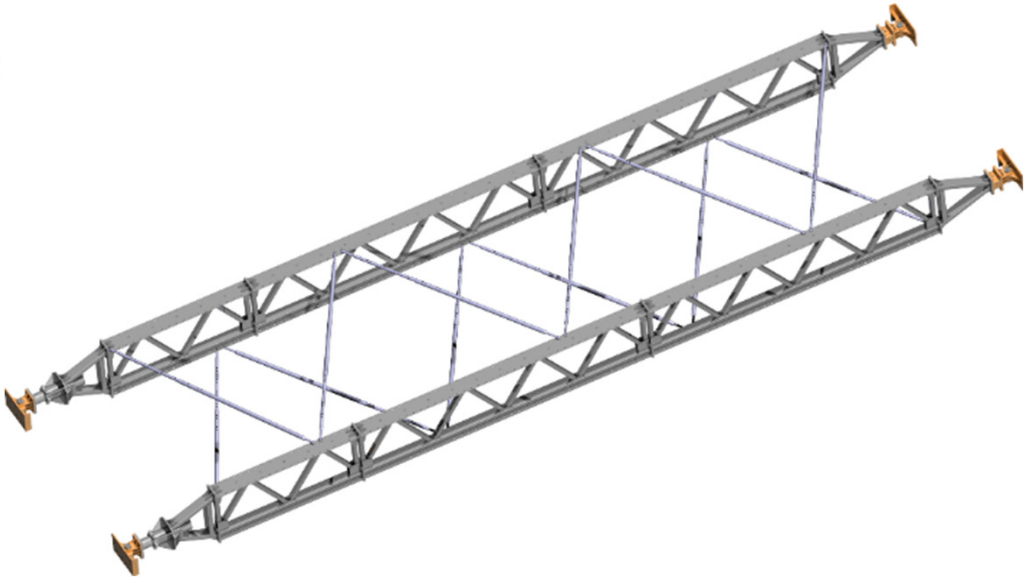


Advantages of the system (4/4)

- **Multiple configurations**, always with standard equipment linked by bolted or bolted joints.

- **Different finishing** options for fixing to screens:
  - On both levels of the truss chords (**Megaprop** jack finish).
  - On a single central level using the triangle termination.
  - Skewed legs can be deployed to reduce wall spans or to fix batten screens.
  - Adaptation to the needs of the screens and the load to be resisted.



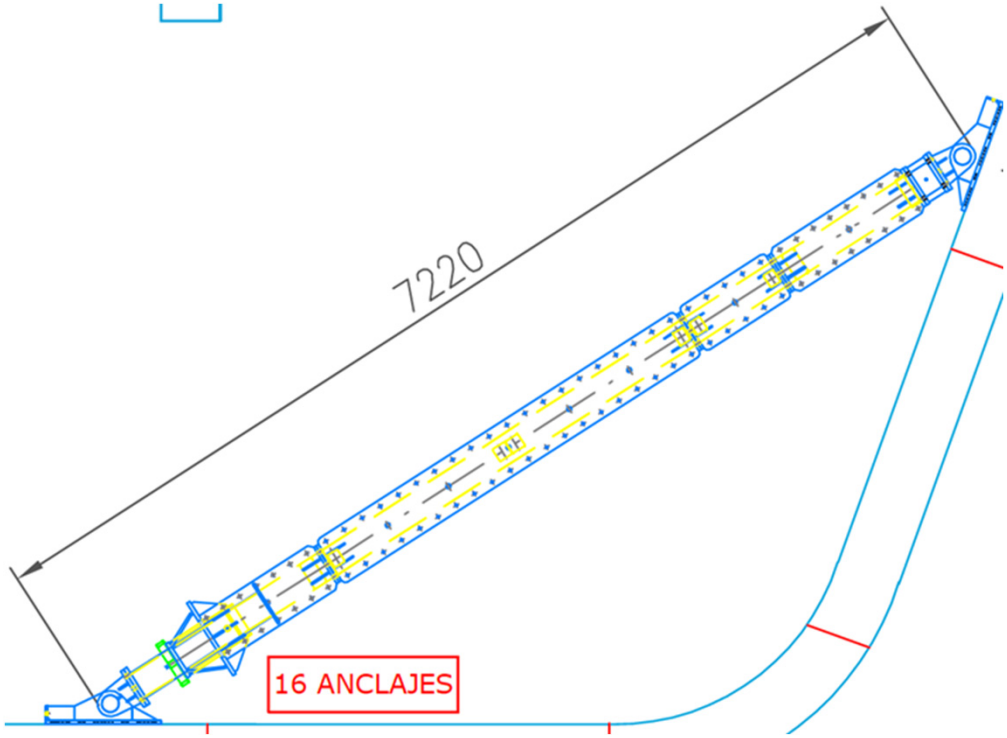


Mallorca 661, Barcelona
TRES NUS

- Two 14.8 m spans for bracing of parallel walls.
- No bracing between the blades; central section of 6.375 m free-standing.
- Oblique legs with 5.4 m Megaprop beams.
- Jack + Megaprop wedge at all ends.
- Ground thrust 36 kN/m; tributary width ~14 m per blade.

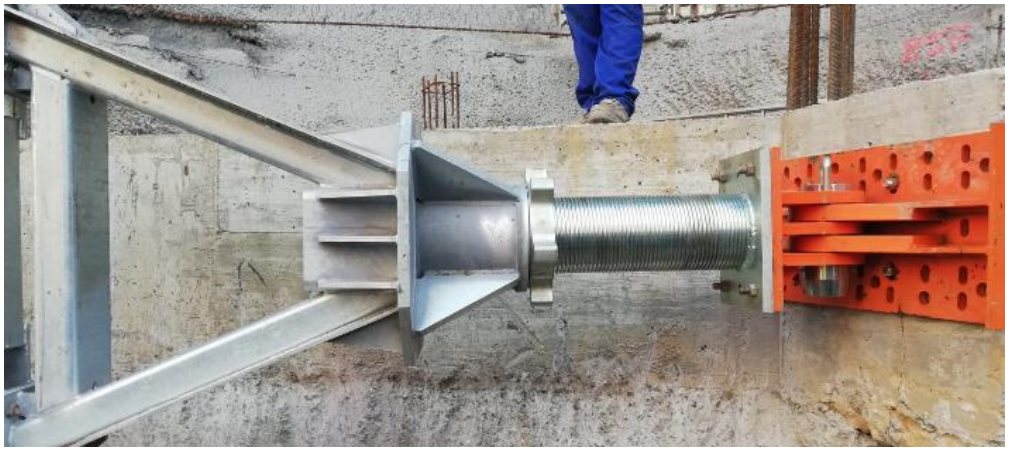
More information

Amílcar 73, Barcelona
BETA CONKRET



- 3 pairs of knives with 7.2 and 13.4 m spans for corner bracing.
- Bracing with tensioners between parallel knives.
- Jack + **Megaprop** wedge at the ends.
- 7.2 m free-standing knife in corner finished in triangles with Granshor jack.
- Ground thrust between 36 and 140 kN/m; tributary width 5-6 m per blade.

Bide Onera Building, Baracaldo
RESIDENCIAL BIDE ONERA



- 2 pairs of braced knives from 9.2 to 18.2 m span for irregular planting.
- 3 wedge-ended knives + **Megaprop** jack.
- Lousy blade: 9.2 m with triangles and **Granshor** jack at ~3,300 kN (ELU).
- Inclination <20º between lousy knife and wall.

More information

Carmen Cobeña,Acacias, Madrid
ESPIREA

More information

Josep Peray 11, Sant Cugat del Vallés
MAHECO

Fuente: Incye

Tanks Saneamiento A Malata, Ferrol Cnes. RAMÓN VÁZQUEZ and REINO

Fuente: Incye

INCYE

PIPESHOR

V. 2.0.3.

www.incye.com

Advantages of the system (1/2)

- **No on-site welding required** (parts with bolted joints).
- **Modular design:** the use of segments improves performance by reducing assembly time on site.
- Mechanical jack to achieve the exact size required, **no cutting of parts** for final adjustment.
- Initial tightening to the jack to **eliminate assembly clearances** and ensure that the prop is tight to the wall, reducing screen deformation under load.
- **No diagonal tensioners** between tubes (clearer construction site).
- **Five tube sizes**: 6,000, 4,500, 3,000, 1,500 and 750 mm.

Advantages of the system (2/2)

- **High load capacity**: up to 4,400 kN for PS4S and up to 5,300kN for PS6 per axial load tube.

- Eurocode-compliant design and use of high-strength steel, making the system **stronger and lighter**.

- Fewer components required, which means a **reduced assembly schedule**, saving time and money.

- 280 mm jack travel at one end; high-pitch spindle for **tightening and loosening** with minimal turning.

- **Compatibility** between different PS4-6s and with Incye **Megaprop** beams and terminations.

- Lifting lugs for lifting complete elbows of large lengths ready for final adjustment.

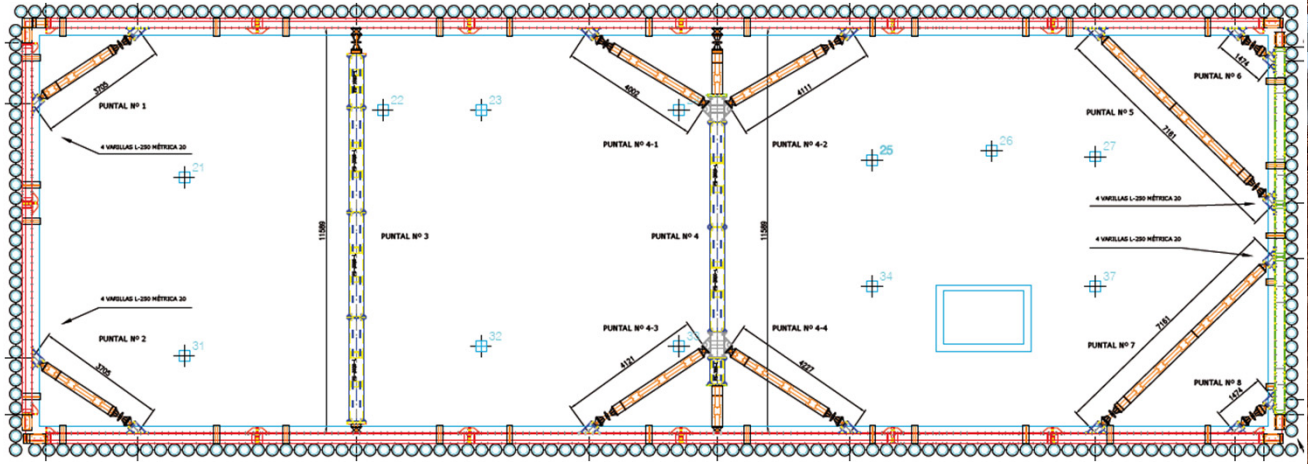
- Legs for stockpiling at various heights.

Carrer Can Oliva 69, Barcelona
ARKSPOT

Tubular bracing to solve problems with ground anchors on site. Pipeshor 6 system that allows a higher load capacity, in this project with loads of 2,300kN per prop and lengths of up to 23m. This leads to the possibility of separating the props up to 8m without the need for bracing between them, which leaves maximum space for excavation and execution of the definitive structure.

C/Sallarès i Marra 77, Sabadell
DECO

The Pipeshor system with its knot option at the ends allows, in this case, to open end arms to multiply the points of contact with the screen, thus reducing the span between supports. With this arrangement, a greater separation between tubes is achieved, generating the maximum free central space to facilitate earthworks and the execution of the final structure, saving pillars, crane shafts, etc.



C/ Provença 309, Barcelona
ARCHS

The aim of this project was to install the props at the same time as the soil was being removed, so a joint plan was drawn up in order to carry out the bracing and the soil removal at the same time. As the Pipeshor tubular system does not require bracing between props, Exariser had sufficient space to remove soil without difficulty.

Más información

C/ Provença 309, Barcelona
ARCHS

Discover in this video how our system facilitates excavation work

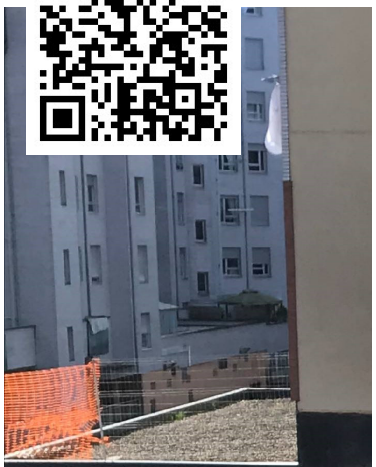
Residencial Andén del Retiro, Madrid
FERROVIAL

More information

C/ Fuenterrabía 9 (San Sebastián)
RYDE

Paseo de la Florida, Oviedo
IGUAR CONS.

More information



Camí del Prat 58-60, Altafulla, Tarragona
ACSA SORIGUÉ

More information

Containment basin, Mollet del Vallés
CONS. DE CALAF

C/ Josep Peray 11, Sant Cugat del Vallés
MAHECO

Ctra Reial 42 48, Sant Just Desvern
TARRACO

Práxedes Mateo Sagasta Secondary School, Logroño
QODA

Refurbishment of a building dating from 1900 in which we supplied both the bracing and the external façade stabiliser.

Carrer Transversal, Terrassa
CDACIP21

C/ Voluntaris Olimpics, Terrassa
AVINTIA

INCYE

MEGAPROP

V. 2.0.1.

www.incye.com

Advantages of the system (1/2)

- No welding is required on site.
- It allows for tensioning or relaxing the braces or props by means of the jacks at the ends, as well as making any changes to the lengths and shapes of the braces or props due to the versatility of the mecano with multiple pieces.
- The shoring system with triangular frames and telescopic turnbuckles improves assembly performance by reducing the number of parts to be assembled and replacing a large number of screws with bolts.

Advantages of the system (2/2)

❑ The mechanical characteristics of **Megaprop** trusses are improved by enhancing:

- the load-bearing capacity of the trusses:

the joints between the main load absorbing elements (**Megaprop**) and the bracing systems in the elevation, are joined together, generating embedments, reducing the deformations (buckling) of the trusses due to self-weight and improving the stiffness of the joints between **Megaprop** and **Superslim**.

In addition, the configuration of this new system allows as many **Megaprop** props as required to be connected to the trusses.

- The load capacity of the bracing systems in the towers thanks to the use of turnbuckles and telescoping devices.

Gorg station, L9 Barcelona Metro
DRAGADOS- ACCIONA- COMSA- SORIGUE

Shoring of diaphragm walls using **Megaprop**, triangular frames and telescopic tensioners.

More information

Tank of storms Sta. Cruz de Oleiros, A Coruña
ARIAS INFRAESTRUCTURAS

Pza. del Buen Pastor 5, S. Sebastián
RYDE

Parking Parrote, A Coruña
COPASA

Port of Cadiz access tunnel
VIAS Y CONSTRUCCIONES

INCYE

More information

COAM Headquarters, Madrid
FCC

Megaprop structure with simple upper and lower chord latticework that allows load support for large spans, thus allowing the emptying for the construction of the current headquarters of the Madrid College of Architects.

More information