

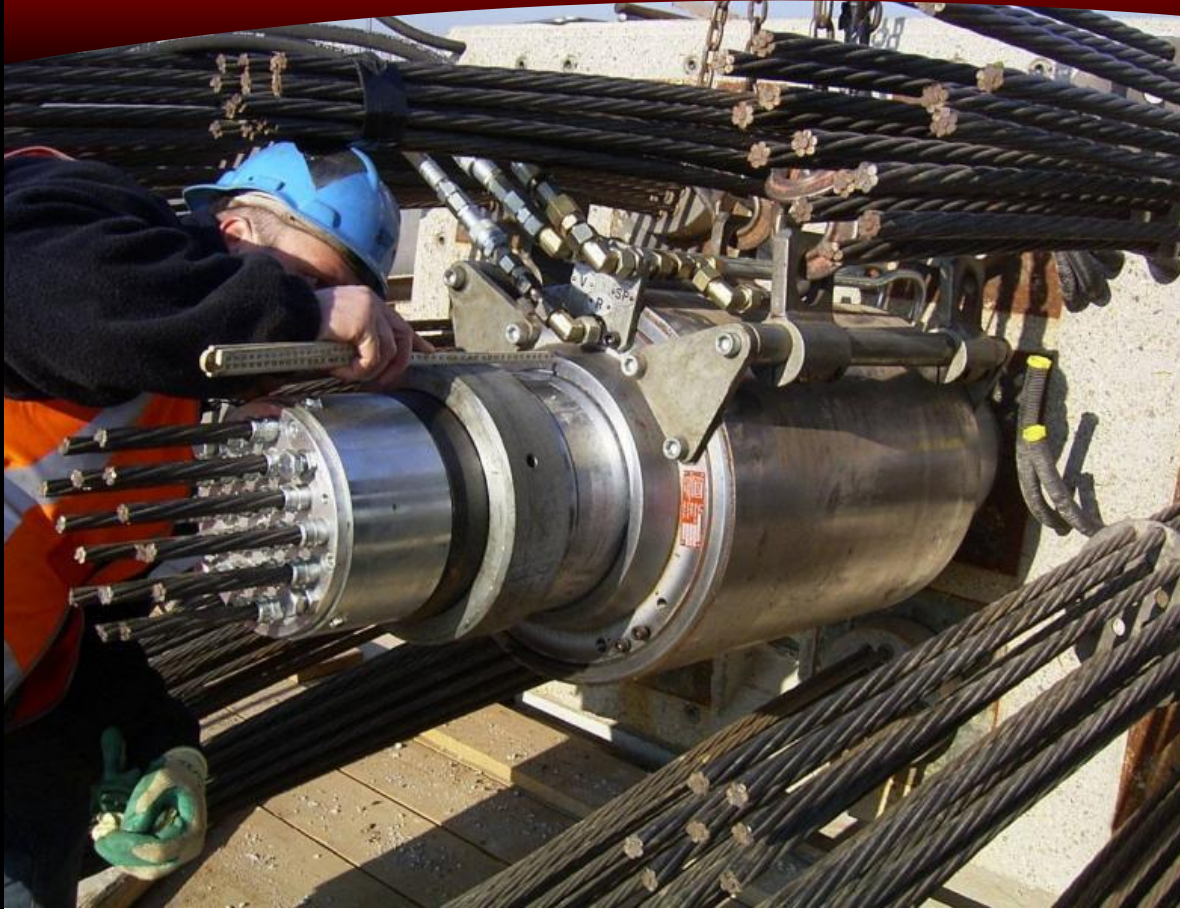


DEVELOPED STRUCTURES ENGINEERING

In Association with



DSE PROJECTS - Lebanon



Pre-Stressing System

Pre-Stressing, results in thinner slabs, which produces valuable extra space, and in turn will be used to create additional floors. This provides valuable extra floor space within the same overall height of the structure. A Pre-Stressing designed slab can contain less concrete (20% to 30%), a minimal quantity of reinforcement and less complicated re-bar shaping, leading to a cost-effective sustainable structure.

Advantages of Pre-Stressing

- Controls Cracks
- Time Savings
- Reinforcing Savings
- Fewer Joints
- Deflection Control
- Improved Modulus of Rupture



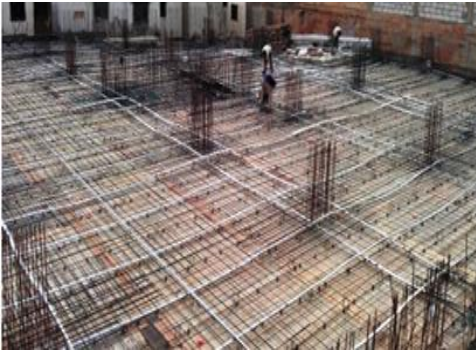
DSE is a complete service provider of post-tensioned concrete. We will design, manufacture, deliver and install our products.

With more than 10 years of experience in the business, we have optimized our structural elements to be efficient, safe and low cost.

The Post-Tensioning accessories are manufactured with the satisfaction of the quality control system and conforming to the requirements of international standards such as PTI and ETA



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What is a Post-tension Slab?

Before a post-tension slab is poured, high-strength steel strands or cables, called tendons, are laid in a tight grid.

These help support and give strength to the slab once the concrete has been cured and they have been tensioned at the proper pressure.

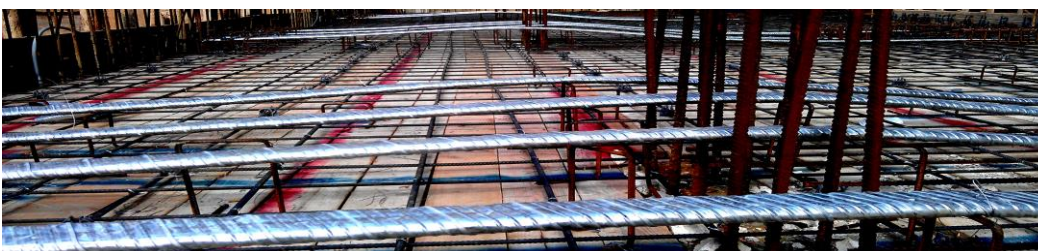


Scope of Services

Based on its extensive and proven experience in the highly specialized area of post-tensioning construction,

DSE offers a comprehensive range of professional services including:

- Consulting services and designs covering all aspects of post-tensioned construction.
- Quality controlled post-tensioning Supply materials, products and equipments.
- Project feasibility study for post-tension application.
- Preliminary design and cost estimation.
- Final Design and shop/working drawings.
- Complete supply and installation of post-tensioning systems.

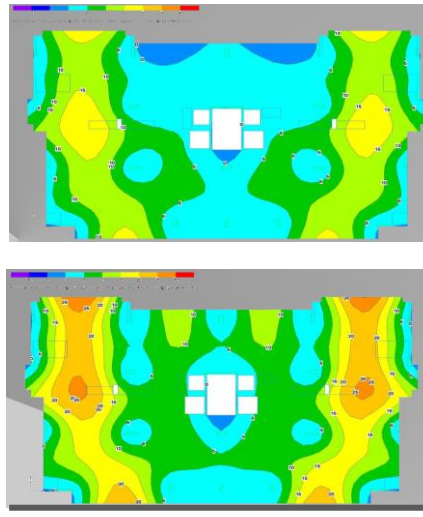




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Advantages of post-tensioned slab systems



DSE slabs bring unique architectural freedom when compared to conventional building methods.

They allow increased spans to be achieved with thinner concrete sections. By reducing the need for columns the structure becomes more efficient and functional.

These advantages can result in significant savings in overall costs.

There are also some situations where the height of the building is limited, in which the reduced story height has allowed additional floors to be constructed within the building envelope.

The following figures 1 and 2 below show the deflection of the slab before the post-tension forces were applied. The finite element analysis is done using Ram Concept.

Applications

The use of post-tensioned slab systems has been consistently growing in the recent years.

Typical applications have been:

1. Private residential housing
2. Offices
3. Car parks
4. Shopping centers
5. Hospitals
6. Hotels and apartments
7. Industrial buildings
8. Transverse pre-stressing of bridge deck slabs.

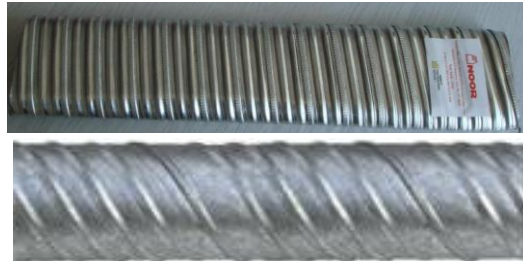


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MATERIALS

Galvanized Metal Corrugated Ducts



DSE Galvanized Spiral Metal Duct or High Density Polyethylene Duct meets all physical and structural recommendations for post tensioning duct as laid down by the Post Tensioning Institute (of the United States). The Duct is available in 2", 3", and 4" diameter with couplings and reducer couplings for all sizes

Bare PC Strand



Post-tension (PT) strands are manufactured in accordance to the standard American Society for Testing and Materials (ASTM) A416. It is composed of seven treated carbon steel wires, six of which are arranged in a helical pattern around a slightly larger center NOOR Strand Anchors utilize a high density extruded polyethylene sheath over corrosion inhibiting compound in the bonded & un bonded zone.



MULTISTRAND BONDED TENDON SYSTEMS

The Multistrand flat duct systems are normally adapted for bonded tendon. The strands are individually gripped in one flat anchor head unit and transmit their pre-stressing forces by mean of flat type anchor plate casting unit. The strands are stressed individually by mean of a mono strand Jack. The strands are contained in one flat duct which is made of corrugated galvanized or non-galvanized metal. To ensure corrosion protection and to give adequate bond strength, the tendons are filled with suitable cement grout mix after complete stressing of the strands

NOOR Bonded Flat Slab S3 Anchors



The same anchorage for stressing anchorage can be used as dead end anchorage in which case the wedges are presented in the anchor head unit by applying nominal force to the strand using the stressing Jack. Alternatively a bulb dead end anchorage can be used with simpler solution and more cost effective.

NOOR Bonded Flat Slab S5 Anchors



In this case each strand is formed into a bulb shape by means of special bulb forming jack. Bursting reinforcement should be provided at the anchorage zone for both stressing anchorage and dead end anchorage type. It can be placed longitudinally or transversally.

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