

**STRESSTECH ENGINEERS PVT. LTD.**  
*Specialists in Post Tensioning Works*



# Message From Managing Director

M/s Stresstech Engineers Pvt Ltd [SEPL] was established in India in 2005 as a joint venture between M/s Vascon Engineers Ltd. and M/s Presscrete engineers Pte Ltd, Singapore, with an aim to provide value added design and build solutions using the post tensioning technology in the Indian market.

With Slow and steady growth in our first five years, being selective on projects, we have established a reputation for efficient and economical designs using post tensioning, backed by timely delivery of quality works at the project site.

Entering into our ninth year in India, SEPL now endeavors to expand its reach both geographically and in terms of the services provided.

We at SEPL have immense faith in the potential of pre stressing technology and its varied applications in buildings and infrastructure. Pre-stressing offers an additional dimension to design and with a little bit of innovation, often provides easier and more economical solutions to design and construction problems.

Our goal is to be the pre-stressing service provider of your choice.

A handwritten signature in black ink, appearing to be 'Dr. Santosh S.', written over a light blue horizontal line.

**Dr. Santosh S.**  
(PhD. in Structural)  
Managing Director



# Corporate Profile

M/s STRESSTECH ENGINEERS PVT LTD (SEPL) is principally engaged in Post-Tensioning services in India. SEPL is the only license holder of the pre-stressing system from M/s Presscrete Engineering Pte Ltd, Singapore for the Post-Tensioning application in India.

SEPL, based in Pune city since 2005, has established itself as a professional firm, expanding steadily and successfully across India as a reputed Post - Tensioning service provider.

SEPL emphasizes on quality in both design and execution. It also believes in anticipating the needs of our customers and strives to fulfill their needs. SEPL aspires to be a Premier organisation adopting best and transparent management practices in business development ,attracting the best clients to achieve distinct state of pride.

SEPL backed by highly educated and experienced Board of Directors, has qualified key staff in PT design and execution along with the trained Engineers, Supervisors and Workers.

For us every project is unique and we take pride in providing the practical, innovative - but at the same cost-effective structural solutions using Post-Tensioning technique to serve the growing construction Industry.





# Our Strength

SEPL believes in the PT design efficiency to achieve the cost-effectiveness and rapid construction solutions. We take initiative steps in providing the preliminary PT options at conceptual stage as per the structural requirement.

Software programmes used for PT design are ADAPT P T, ADAPT FLOOR PRO, PROKON and RAFT. Investment in softwares is not restricted to design alone, but extends to supply chain management to ensure correct levels of stock at all times so that no projects suffers for want of equipments & materials.

PT execution led by key staffs, having more than 15 yrs experience in post-tensioning field in abroad and India. The team is competent to meet the execution challenges, to meet the client's requirement and attains accuracy in execution. SEPL ensures the quality of materials used on site to meet the requirement of the Post-tensioning technique.

SEPL over 8 years in India has developed its own key team not only for staff, but even for trained labour on own rolls. This again ensures mobilization of effective labour gangs in quick time.

Our strength is that we create required capabilities in house in all departments which then propell our growth rather than the other way round. Out selected by a client, even small delays or not an option of Stresstech.





# Need For Post-Tensioning

Post-Tensioning offers great technical advantage in comparison to other conventional forms of construction, such as reinforced concrete and steel. Post-Tensioning members possess improved resistance to shearing forces, due to the effect of compressive stress in concrete.

Taking the advantage of the Post-Tensioning Technique following benefits can be achieved —

- 1 Increase in Flexibility to locate columns at long spans.
- 2 Decrease in deflection and cracking for PT element.
- 3 Decrease in dead weight, resulting in reduction of design loads and cost of foundation.
- 4 More feasibility to have beamless slabs i.e. flat slab with drop.
- 5 Higher utilization of the floor, making of subdivision of floors easy.
- 6 Lesser de-shuttering time and speedy construction.
- 7 Reducing concrete consumption, due to thinner section.
- 8 Huge reduction in steel quantity and therefore cost of construction.
- 9 Building height lesser than conventional



# What is Bonded Post - Tensioning Technique

Prestressed concrete is basically concrete in which internal stresses of a suitable magnitude and distribution are introduced so that the stresses resulting from external loads are counteracted to a desired degree.

“Post-Tensioning is system which generates the compressive stress in the harden concrete using the HT-Strands”

In Bonded Systems- two or more HT strands are inserted into a metallic duct that is embedded in the concrete. The HT strands are tensioned with the help of Hydraulic Jacks and anchored in anchorage devices. The duct is then filled with the cementitious grout that protects the HT strands from corrosion and bonds the HT strands to the concrete surrounding the duct.

Bonded systems are commonly used in bridges, super and sub-structure of buildings and transfers girders. In this system large number of strand can be used to achieve the economical PT options.

## How does compressive stress occur?

The Tendons are laid out in forms in accordance with installation drawings that indicate how they are to be spaced, what their profile should be. After concrete is placed and has achieved the compressive strength min 25N/mm<sup>2</sup>, the tendons are stressed and anchored.

The Tendons, like rubber bands, tends to return to their original length but they are prevented from doing so by anchorages. The fact that tendons are kept in permanently stressed (elongated) state causes a compressive force on concrete.

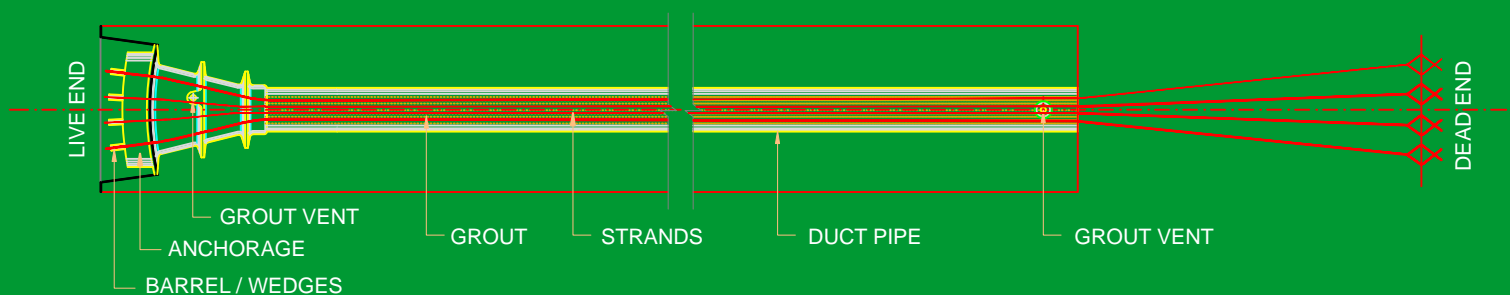


# Materials Engaged in Post-Tensioning Technique

Post-Tensioning system requires concrete which has high compressive strength (Minimum M35 grade) rebar reinforcement and Post-tensioned reinforcement called “HT Strands”.

HT strands shall conform to ASTM 416/90 specification or equivalent. Its ultimate tensile strength of 7wire twisted strands should be 260.7 KN. Strands of 15.2mm diameter with low relaxation having nominal area and Modulus of Elasticity as 140mm<sup>2</sup> and 195 KN/mm<sup>2</sup> respectively.

Anchorage device maintain the applied force in the tendon and transfer it to the surrounding concrete. Assembly of Anchor Head, Barrel and Wedges is named as “Anchorage”. Anchor head, Barrel and Wedges shall be capable of transmitting a force not less than the ultimate tensile strength of the tendon without overstressing the concrete.



**TYPICAL TENDON ASSEMBLY**







# Commercial Projects

Post tensioning has been the obvious choice for most of the IT buildings and office spaces across the country in the last decade. The obvious benefits it offers with respect to speed and economy, both direct and indirect, have been demonstrated time and again and though any change faces its due course of resistance, the industry has indeed accepted this technology in commercial buildings. SEPL has executed a vast number of such buildings as listed below. While flat slabs with drop panels were the most commonly used system, we introduced both the banded and ribbed one way systems which offer better economy in certain cases. The choice of the correct framing system is important and depends on the geometry, and importantly the seismic criteria. SEPL started analyzing each option of framing for each building and helped the client and consultant arrive at the correct option for the specific project.



Adani Corporate House - Ahmedabad



TNLA - Secretariat Building - Chennai



Suzlon Corporate Office - Pune



World Trade Center - Pune



Goldhill IT Park - Bengaluru

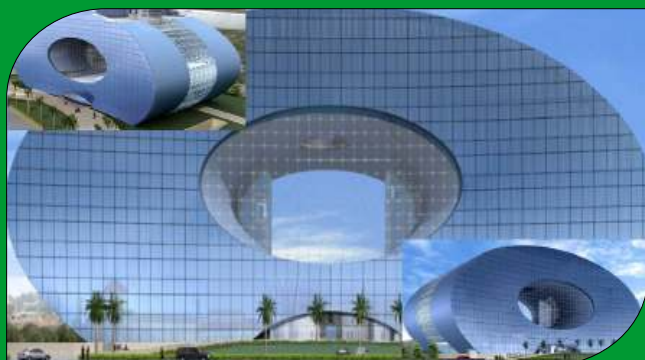




L & T Seawoods - Mumbai



TCS - Hyderabad



ONGC Corporate Office - Mumbai



BPTP - I Park - Gurgaon



V-Tech IT Park - Nashik



EON IT Park (SEZ) - Pune



Royal Heritage Mall, Pune



I-Gate Computer System Ltd. - Pune





# Hospitality Projects

Post tensioning in hotels was not so common but SEPL has offered economical solutions to a vast number of hotels. Floating girders, and large span ball rooms and lobbies are obvious choices for post tensioning. However even for the floor slabs, SEPL has identified many framing systems which ensure best clear heights in corridors for services routing. We have designed flat slabs in hotels incorporating wall loads in the design so that speed and quality of construction are maintained.



Hyatt Regency - Pune



Novatel - Pune



Airport Hotel - Coimbatore



Holiday Inn - Pune



The Park - Pune



Four Points - Pune

# Residential Projects

Use of post tensioning in residential buildings is still not common in India. As most residential constructions cater to mass housing, the column grids are small and post tensioning does not offer a direct economy in design. However SEPL feels that in towers, this technology is bound to catch up as it has done in countries like Dubai and Singapore. The flexibility, quality, speed and reduced dependency on labour that post tensioning offers will soon be recognized and builders will be willing to pay a small price for the same. We have been fortunate to be awarded our first residential tower in India in Pune where we are doing large span slabs in a high end 25 storey building. The design provides for speed and for flexibility in interiors.

However one aspect of the township construction which definitely benefits from post tensioning is the huge basement and podiums. Post tensioned flat slabs are the ideal choice for such areas as they give the benefit of large span spacing to accommodate more efficient parking. They also reduce depths and steel consumptions drastically in these slabs. As they do not normally form a part of the overall seismic analysis of the towers, their design can be easily isolated. We are doing many such podiums.



Omaxe Twin Tower - Noida



Signia Ocean - Mumbai



Crystal Spires - Mumbai



Megopolis - Pune



Windermere - Pune



# Institutional, Industrial & Infrastructure Projects

While post tensioning has been associated with flat slab constructions, the benefits of post tensioning in reducing depths of large span beams in industrial, institutional and infrastructure buildings is often not highlighted. SEPL has designed schools where alternate columns were deleted, thereby increasing span which gave a huge amount of flexibility in architecture. Class rooms could double up as assembly rooms due to the open design. This was possible within the same floor to floor heights by using large span PT beams. Similar work has been done for Infrastructure & Industrial buildings as well.



MLCP (Terminal 3 Project) at IGI Airport - Delhi



Lavasa GDST School - Pune



Reliance DAV School - Mumbai



Cipla - Indore (SEZ)



Victor Reinz - Pune



Multimodel Storage Complex - Mumbai



Saraswati Engg. College - Mumbai



Stellar - Pune



Crescenzo Commercial Capital - Mumbai



Reliance Commercial Complex - Surat



Sunbay Towers - Chennai

# PT Rafts

Post tensioning is effective to counter bending moments. As such its effectiveness in rafts either for uplift or as a foundation system is well established in abroad. SEPL has successfully executed one such raft in Pune in the matrix project with stressing in stages.





# GROUND ENGINEERING

## Ground Anchors

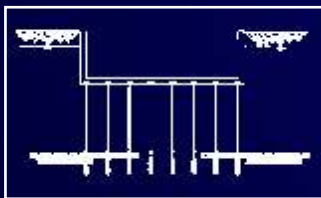
Ground anchors/Rock anchors are essentially steel tendons that are grouted in the ground and can transmit tensile forces from a main structure to the surrounding ground.

## Classification of Ground Anchors

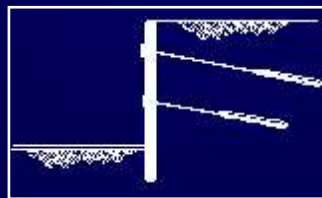
- a. Based on serviceability
  - \* Temporary
  - \* Permanent
- b. Based on Function
  - \* Active
  - \* Passive

## Applications

1. To provide resistance to vertical uplift forces in raft due to Ground water.
2. To provide support for Shore piles and concrete walls for deep excavation in order to avoid landslides.

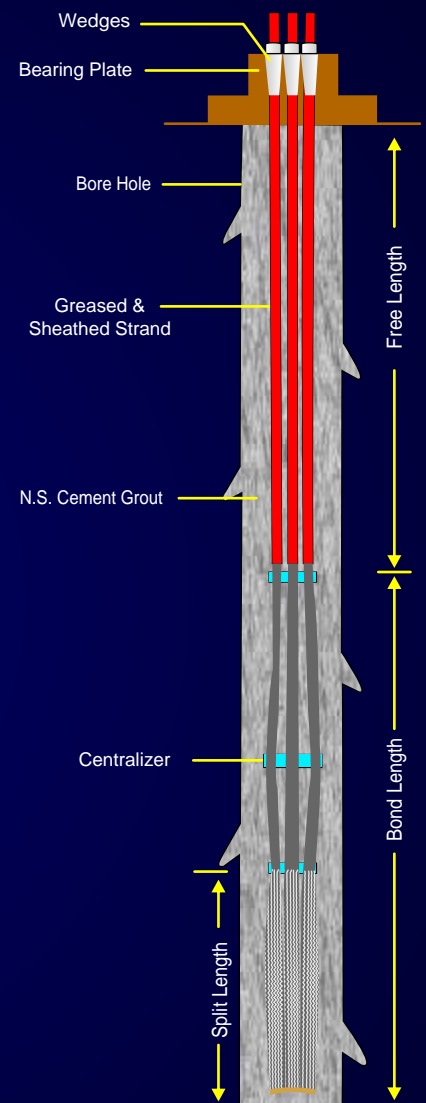


1. Raft uplift



2. Support for Retaining system.

## Anchor components.



## SLOPE STABILISATION

Slope failures can exert tremendous impact on mission success. We in syringa understand these and provide better solutions to tackle the forces exists in undisturbed slopes and the ground water pressure cause slope failure. Ground anchors are often used in combination with walls and horizontal beams to stabilize slopes in order achieve relatively deep cuts to be made for the construction of basements.



## MICROPILES

Micro piles are small diameter piles(125 to 300mm) used for underpinning, which can be installed in almost any type of soil where piles are needed. In areas where conventional methods cannot be used such as restricted access or low headroom areas, micro piles are a good solution and are appropriated for a wide range of ground conditions.



TCS, Pune



HDIL - Mumbai

Palais Royale  
Mumbai



Rustomjee Summit,  
Mumbai



Sofitel Hotel  
Mumbai



Kohinoor Commercial  
Mumbai



Kohinoor Square  
Mumbai



The Address, Mumbai



Orbit Heaven  
Mumbai





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