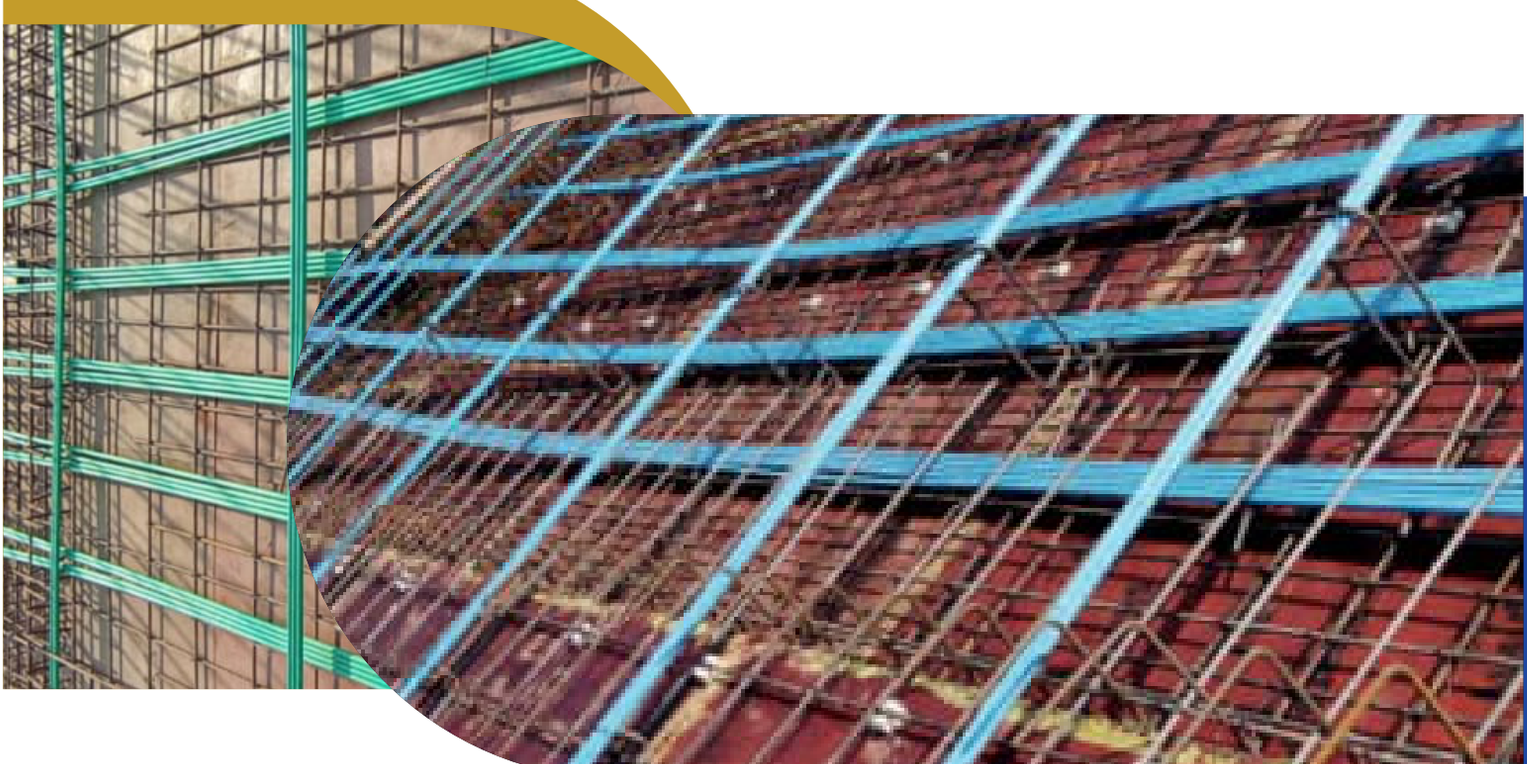
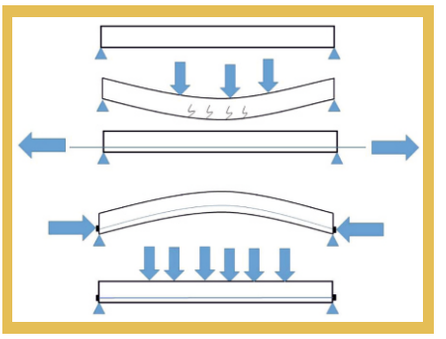
Streben
Technologies

Manufacture and supplier
of P-T system components



What is Pre-stressed Concrete?



Pre-stressed concrete is a form of concrete where initial compression is given in the concrete before applying the external load so that stress from external loads are counteracted in the desired way during the service period.
This initial compression is introduced by high strength steel wire or alloys (called 'tendon') located in the concrete section.

Prestressing Systems

Pre-Tensioning System

Tendons are tensioned before concreting; Transfer of prestressing force by bond over the transmission length; Suitable for precast members in mass production.

Post Tensioning Systems

Tendons are tensioned against hardened concrete; Transfers of prestressing force by the anchorage device; Suitable for heavy Cast In-situ members.

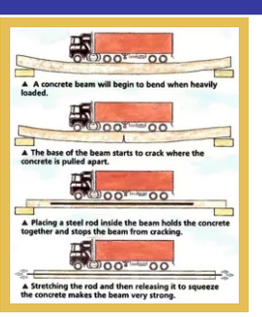
Bonded Post-Tensioning

(Grouted Post-Tensioning) Transfers of prestressing force through anchorage device as well as bond between concrete and the cable, once the tendon was grouted.

Unbonded Post-Tensioning

(Mono Strand Post-Tensioning) Transfer of Prestressing force only through anchorage device.

What is post-tensioning?



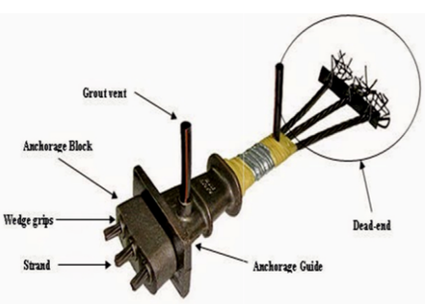
Post-tensioning is a method of reinforcing concrete. High-strength steel tendons are positioned in ducts or sleeves before the concrete is placed. Once the concrete has gained strength, tension is then applied, pulling the tendons and anchoring them against the outer edges of the concrete, before service loads are applied.

Why Post-Tensioning?

- ✓ **Large column free space.**
- ✓ **Allows greater span/depth ratio.**
- ✓ **Reduced floor height with increase in number of floors.**
- ✓ **Heavier loads.**
- ✓ **Earlier removal of form work.**
- ✓ **Reduce dead load of the structure.**
- ✓ **Less deflection & tensile stress**

BONDED SYSTEM

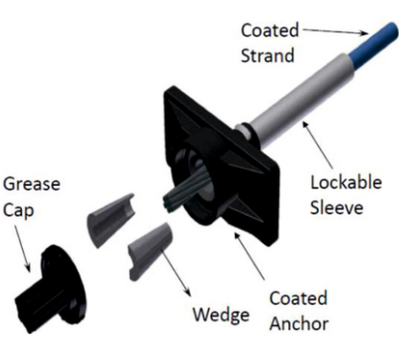
Bonded post-tensioned concrete is the descriptive term for a method of applying compression after pouring concrete and during the curing process. The concrete is cast around a plastic, steel or aluminum duct, to follow the area where otherwise tension would occur in the concrete element. A set of tendons are fished through the duct and the concrete is poured. Once the concrete has hardened, the tendons are tensioned by hydraulic jacks that react (push) against the concrete member itself. When the tendons have stretched sufficiently, according to the design specifications, they are wedged in position and maintain tension after the jacks are removed, transferring pressure to the concrete. The duct is then grouted to protect the tendons from corrosion.



UNBONDED SYSTEM

In this system, tendons which may be located inside the concrete are tensioned after the concrete has hardened. Internal tendons, which are contained within sheaths to prevent them from bonding to the concrete, can be arranged to follow the curvature of the structure and provide the most appropriate profile to suit the applied loading.

After the concrete has attained sufficient strength, the tendons are tensioned using jacks that bear upon the exposed face of cast-in anchorages at the ends of the tendons.



MAJOR CONSTRUCTION DIFFERENCE Bonded slab & Unbonded slab

	Description	Unbonded	Bonded
✓	Fabrication of the tendons in the plant / stare (Extrusion & cutting to specific length)	Necessary	Not Necessary but possible
✓	Placement	Very practical and flexible. Easy to handle and does not need necessary heavy equipment	Very practical and flexible. Depending on application and system used, may require heavy equipment and reduced flexibility.
✓	Grouting	Not Applicable	Necessary
✓	Stressing	Mono strand stressing	Typically multi-strands with high stressing force(Beam). Single strand stressing in slab.
✓	Demolition	Required special care	Similar to regular reinforcement

Advantages of Post-Tensioned Slab system

Architectural aspect	✓ Space can be easily allocated for the service purpose. Wall or walls are not required to be on a flat surface, It will not obstruct pipeline system or work system. ✓ Reduce the height between the floor and the total height of the building, making the height of the building not exceed legal requirement. ✓ Can design buildings with longer interval between each pillar, making the space inside the building spacious and beautiful. ✓ Can adjust utility space interior living space for any occasion
Structural aspect	✓ Post-Tensioned Flat Slab system provides flat and thin floor. The overall weight is less than reinforced concrete floor. As a result, it is possible to reduce the construction cost of foundation work, save the structural wood and construction overhead. ✓ Can be designed to have less deflection of the floor, compared to reinforced concrete Flat Slab. ✓ Fire resistance is taken into account in the designing of Post-Tensioned Flat Slab by selecting number of hours which will resist to fire , according to the instruction of Post Tensioning Institute (PTI). ✓ Can better withstand earthquakes, resistant to cracking, the structure is tough.
Valuable aspect	✓ Construction cost per square meter is cheaper than reinforced concrete floor. For areas with a long pillar interval over 6 meters and large building. ✓ Save construction time. Construction period takes 7-10 days for one floor. ✓ More number of floor at the same height, extending more utility space , can support general force and earthquake less than that of the same number of floor.

On Site Exploration: Photography Of Various Geometries

Technical Specifications

7 Wire Unbonded Mono-strand

Material Specifications

Pre-stressing Steel:

(1) Low-Relaxation 7 wire Strand of Class II (Grade 1860) with 12.7mm nominal diameter used in monostrand unbonded post tensioning tendons should conform to the requirements. of IS-14268:1995
(2) Sectional steel area of Strand: 98.7mm
(3) Yield Load: Not less than 180kN
(4) Ultimate Strength: Not less than 1860N/mm
(5) Minimum Breaking Strength: Not less than 183.7kN
(6) Modulus of Elasticity: At least 196,500N/mm²
(7) Minimum elongation: 3.5% for gage length of 600mm
(8) Relaxation at 1000 hours: Less than 2.5% at 70% Minimum Ultimate Tensile Strength
(9) Weight of Bare Strand: More than 0.775kg/m

Sheathing Specifications:

(1) Sheathing material: polyethylene or polypropylene
(2) Minimum Density: 0.94gram/cm³
(3) Thickness: more than 1 mm
(4) Appearance: Sheathing should provide a smooth circular outer surface
(5) Coverage: Sheathing should be continuous over the entire length to be un-bonded, and should prevent intrusion of cement paste or loss of coating

Grease Coating Specifications:

(1) Grease coating should provide protection against corrosion to the Prestressing steel
(2) it should provide proper lubrication between the strand and sheathing
(3) It should resist flow within anticipated temperature range of exposure
(4) It should provide continuous non-brittle coating at lowest anticipated temperature of exposure
(5) It should be chemically stable and non-reac tive with prestressing steel, reinforcing steel, sheathing material and concrete
(6) It should be a compound with appropriate moisture-displacing and corrosion-inhibiting properties
(7) Minimum weight of the grease coating on the Prestressing strand should not be less than 37.4grams/m for strand of 12.7mm diameter.
(8) The coating material should fill the annular space between the strand and sheathing and should extend over the entire tendon length.

Anchor Plates

Specifications

Microstructure:

(A) Graphite Type (As per ASTM A247 Plate I & III)
- Form I & II (Spheroid or Nodular type)
- Distribution A (Uniform Distribution)
- Size: 6-8

(8) Nodularity: 90-95%
(C) Carbide: Less than 3%
(D) Pearlite: 35-40%

Mechanical Properties:

Hardness Number: 170-2308HN

Material Grade:

ASTM A 536 Grade 80-55-06 OR
IS 1865 Grade SG 500/7

Wedges

Specifications

Hardness:
(A) At Surface: 56-65HRC
(B) At Core: 40-46 HRC

Material Grade:

15:9175 (Part 20)-1986 Grade 20MnCr5

Applications:

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

Typical applications have been:

- ✓ Residential Building
- ✓ Commercial cum residential Building
- ✓ Commercial complex cum shopping mall
- ✓ IT Park, Office Building
- ✓ Multi-level car parking / Car Parking
- ✓ Marriage Hall
- ✓ Auditorium
- ✓ Movie Theatre / Multiplex
- ✓ Hotel Building
- ✓ Hospital Building
- ✓ School Building
- ✓ Industrial buildings
- ✓ Transverse pre-stressing of bridge deck slabs.

Contact Us

Streben Technologies

S.N 11/11, H.N.1050, Nanded Phata, Sinhagad Road, Pune 411041

Email id : strebentech90@gmail.com, Maharashtra - GSTIN:27AMDPJ6194M1ZI Call : 8208034151