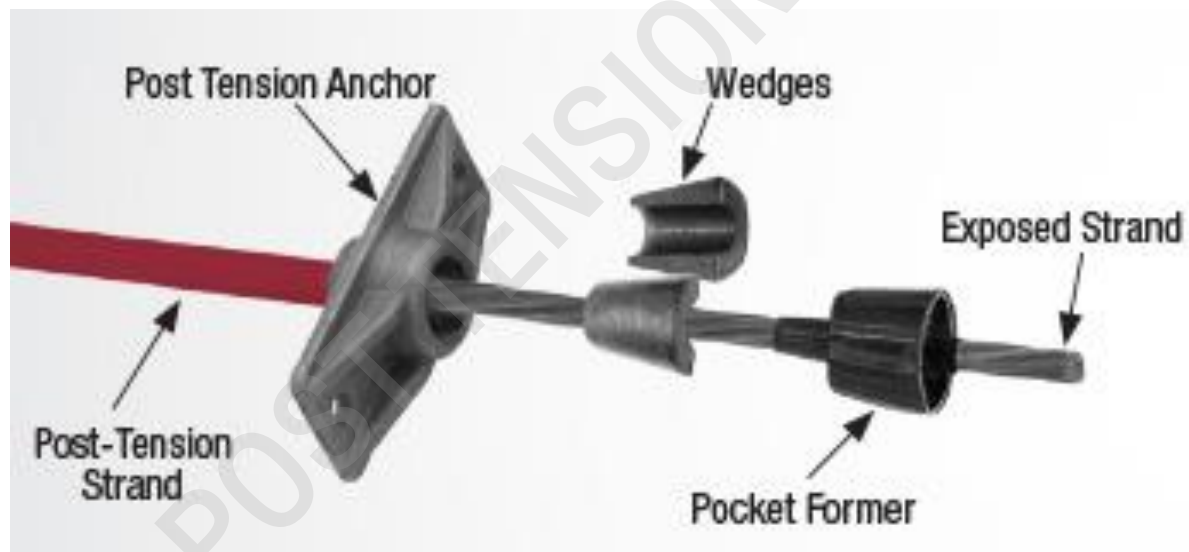


Cutting unbonded post-tensioned slab

Currently some building need to improve structural deterioration or change function in some area. Some case need to repair, increase live load, make new opening for new stair or escalator or etc. For unbonded post-tensioned slab, when we need to cut slab for making new opening. First, we must have post-tensioned construction drawing that shown tendon position, if not we should scan for looking for existing position. We try to avoid cutting strand or cut strands in minimum. When strand was cut, that strand is loss its strength in whole length that make slab strength around that area was reduced.

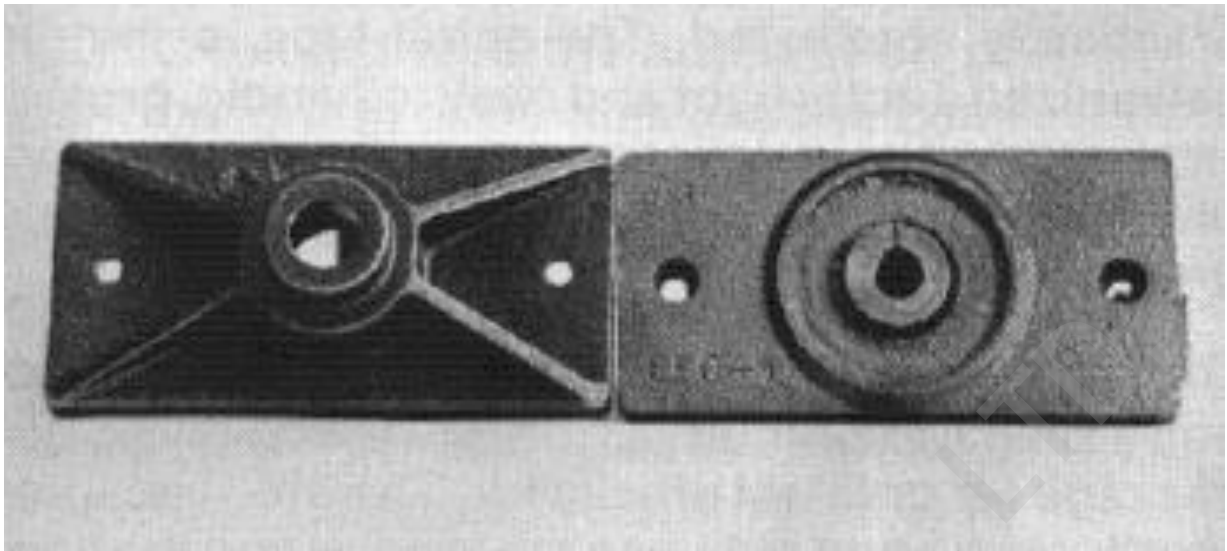
Unbonded post-tensioned slab

This system is not currently used but some more than 30 years buildings use this system. This system consist of one strand in one tendon and strand was coated by grease in PE sheath.

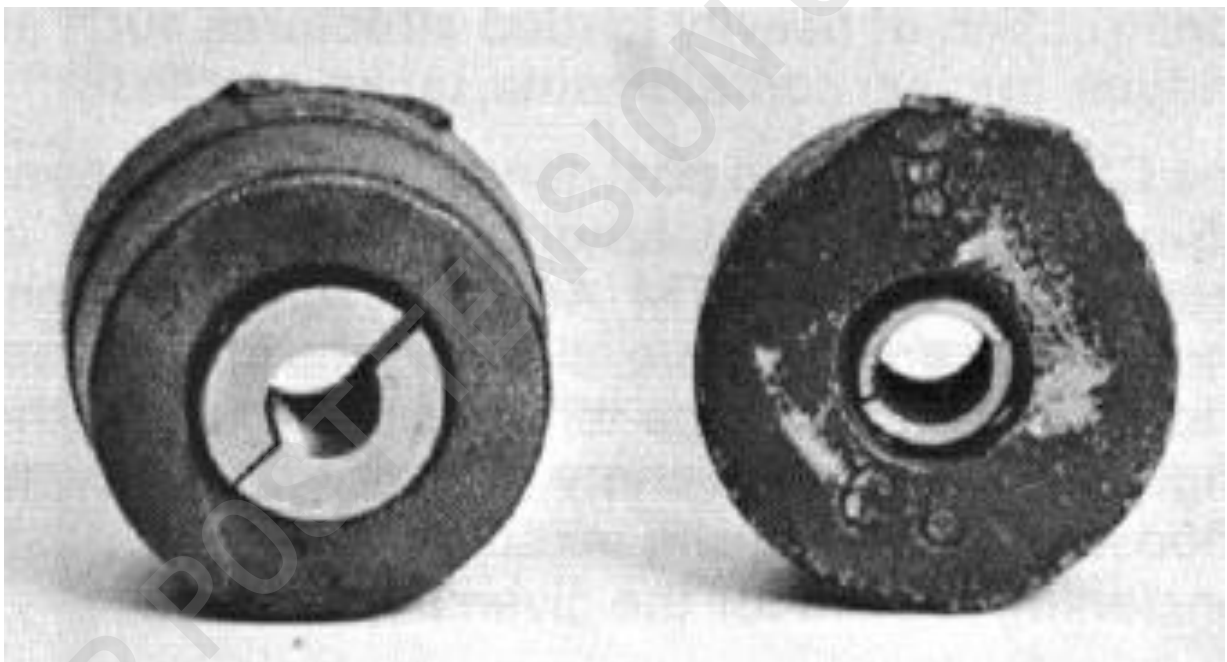


There are 2 types of anchorages for this system

1. Anchorage Plate



2. Barrel



Tendon layout of unbonded post-tensioned slab

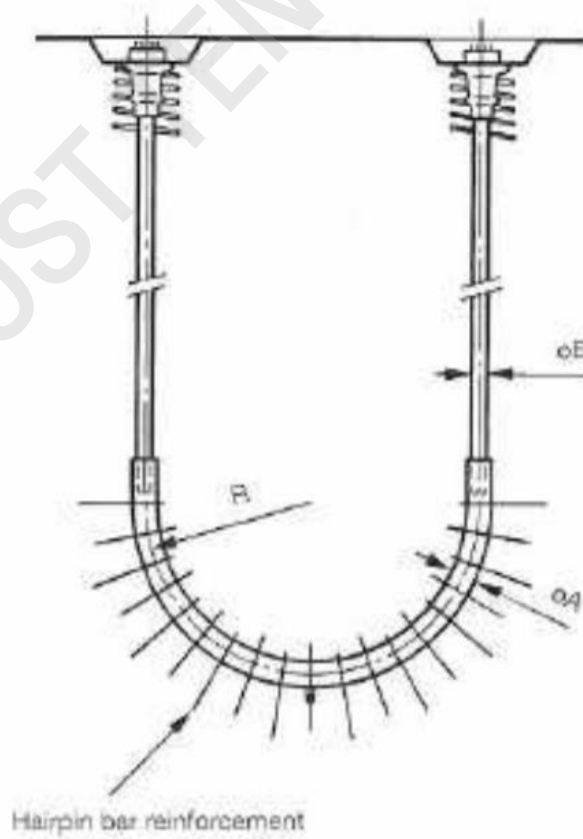
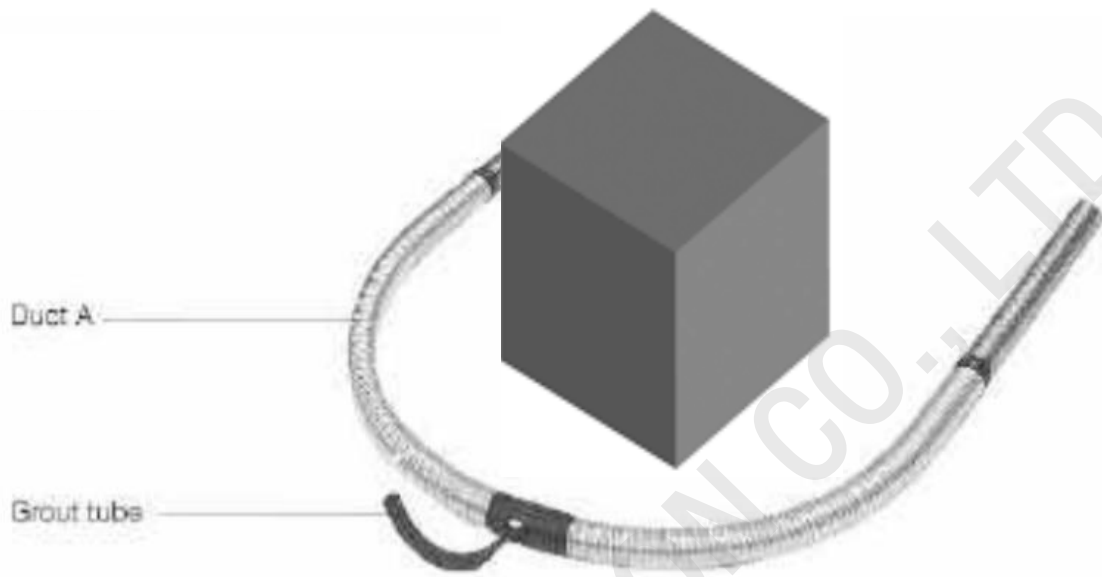
Normally, we use band-distributed layout in this system, one direction tendon located near column and one direction tendon were distributed.



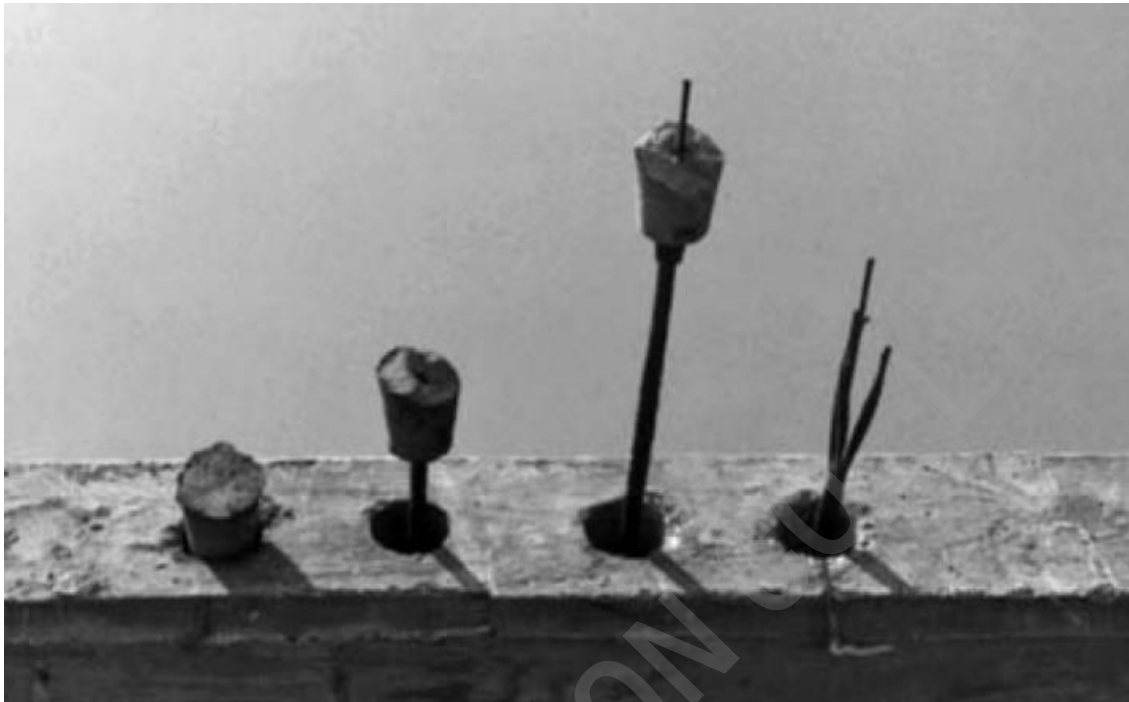
At edge of slab we will find number of anchorages equal to number of tendon. Tendon in slab were collected to bundle strip to easy to make their height vary in parabolic curve. In general tendon will be collected not more than 5 tendons in one strip.



Some cases we found tendon was arrange in horizontal curve around column for reducing number of anchorages.



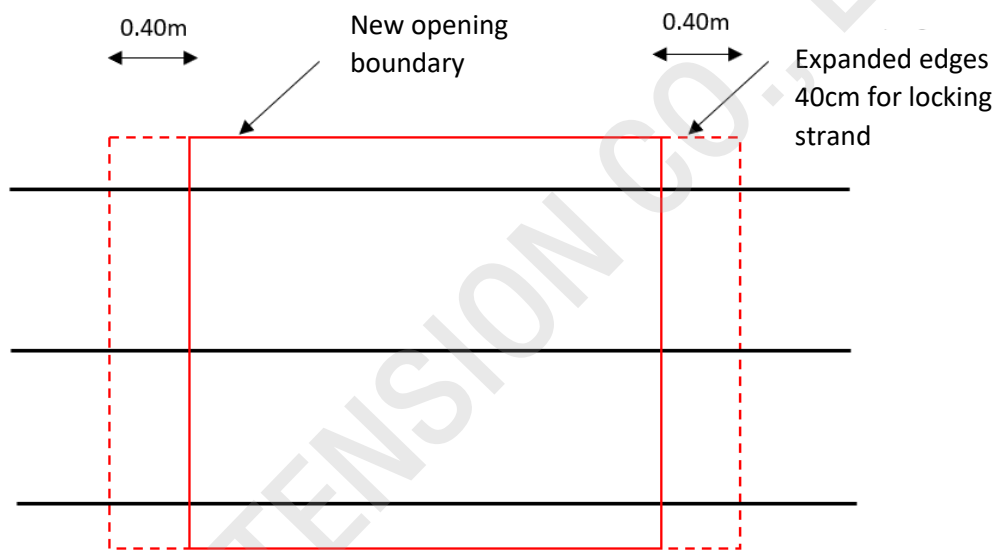
For old building in unbonded system, deteriorating anchorage and wedges can not lock strand. That is cause of strand can fly out from slab.



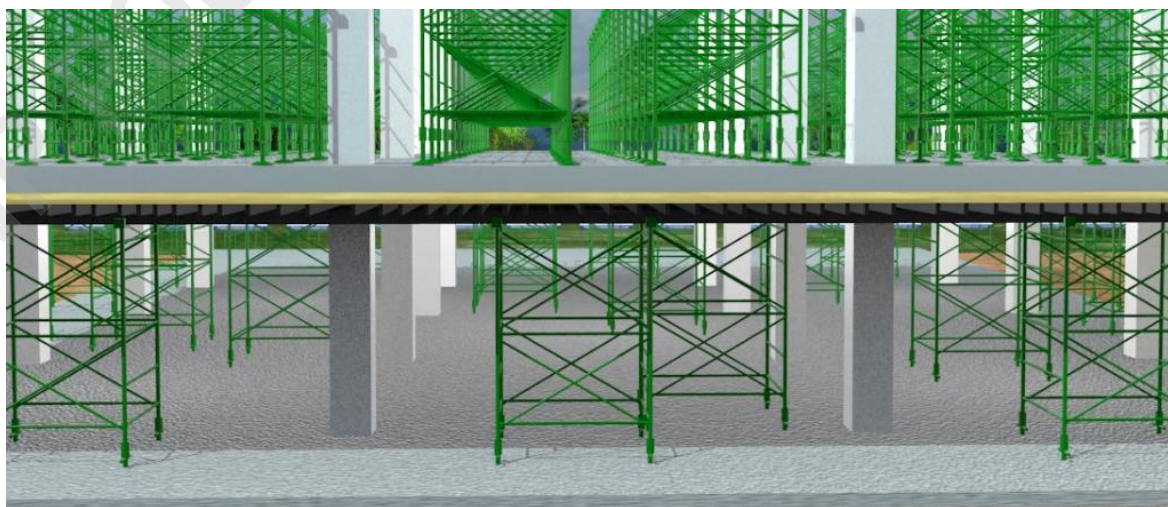
Process of cutting strand for unbonded post-tensioned slab

In this system, strands are not bond with concrete. Strand was stressed in 10 to 12 tons force. If strand was cut it can fly out from anchorage. In cut process we should do it carefully. Step of cutting can do in this following,

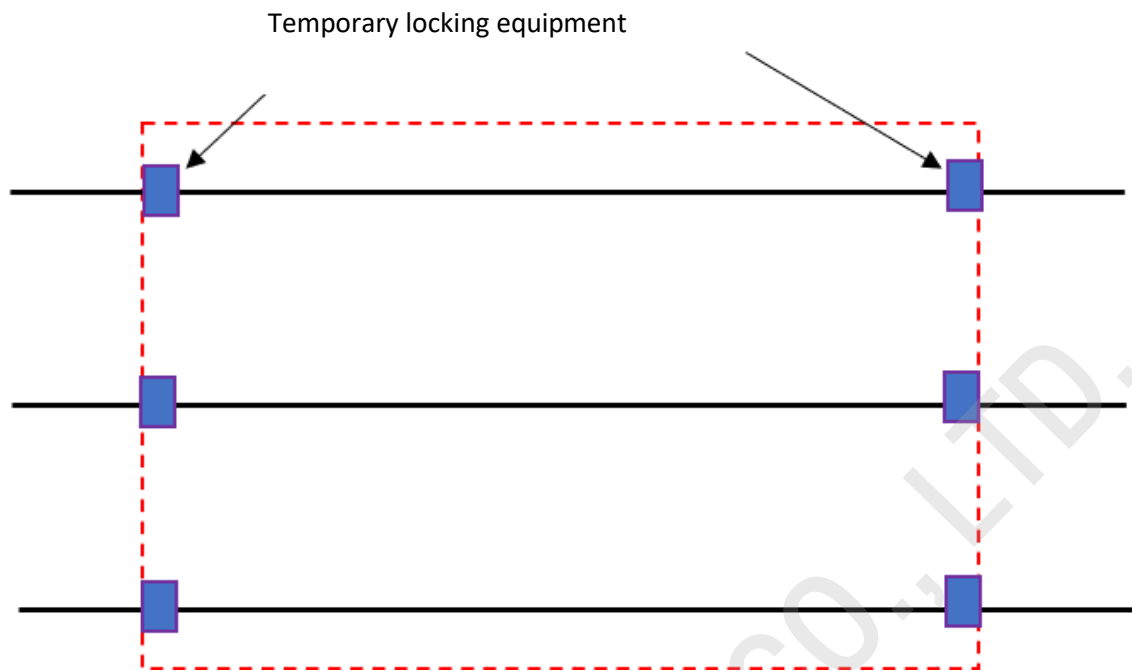
1. Marking area that require to make opening and marking tendon line from construction drawing or scan results. Marking expanded side for locking strand by new anchorages around 40cm.



2. Provide scaffolding along cutting strands line because when strand was cut there are no force in strand.



3. Extract concrete in marking area by remain strands. Install temporary locking equipment before cut strand.



- Clean grease from strand



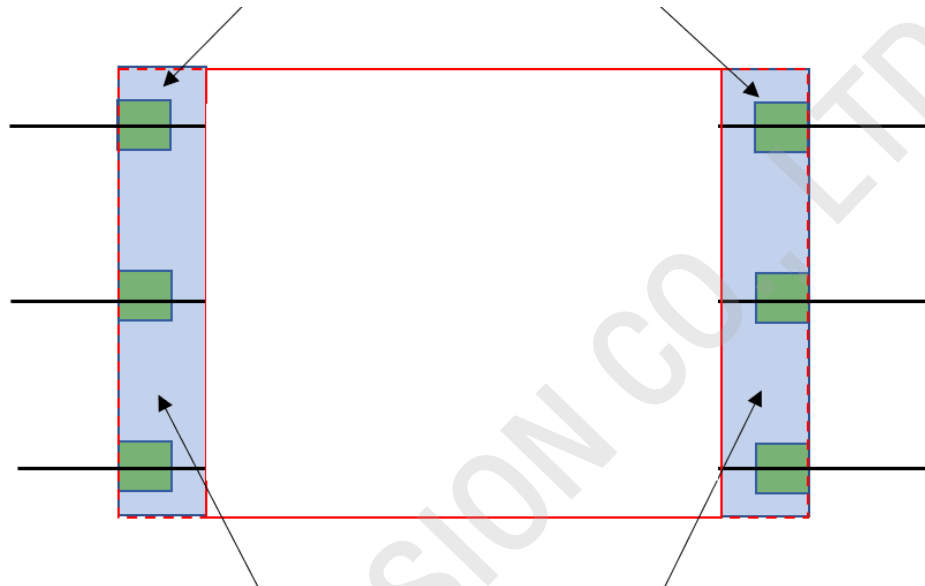


4. Cut strand after install temporary locking equipment and then release force in strand and move temporary locking out.



5. If strands are not in good condition, we can remove and replace by new one. Install anchorage for permanent locking stand. Stressing strand until reach calculated elongation.

Install permanent locking equipment



Add rebar and pour concrete back to required shape

Sometimes we found special cases or special details that different from general case. We should consult with specialist who had worked in unbonded post-tensioned slab for advice and solving problem as existing condition.

This is just step of cutting strand in unbonded system. When slab was added new opening, that slab will loss strength around that area. Sometimes slab need to be strengthen. We should consult about slab capacity with structural designer and planning strengthening method and cutting method together.

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