Temporary structures

BY

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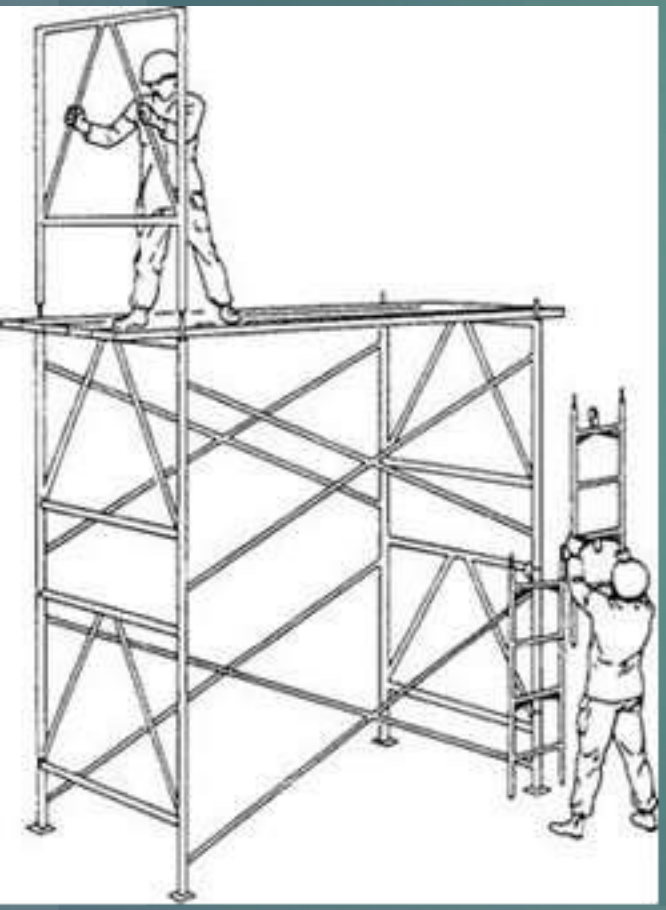
ASSISTANT PROFESSOR

COTM DEPARTMENT

Temporary structures

- Scaffolding
- Shoring
- Underpinning
- formwork

SCAFFOLDING



- Scaffolding, also called staging, is a temporary structure used to support people and material in the construction or repair of buildings and other structures
- Scaffolding has been used since ancient times. There are many kinds of prefabricated, modular system of metalpipes or tubes, although it can be custom made from other materials such as wood and bamboo which is frequently used in Southeast Asia

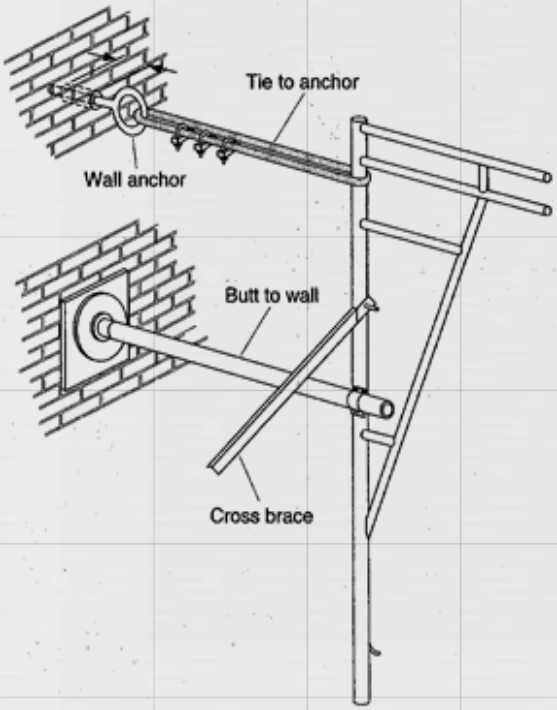


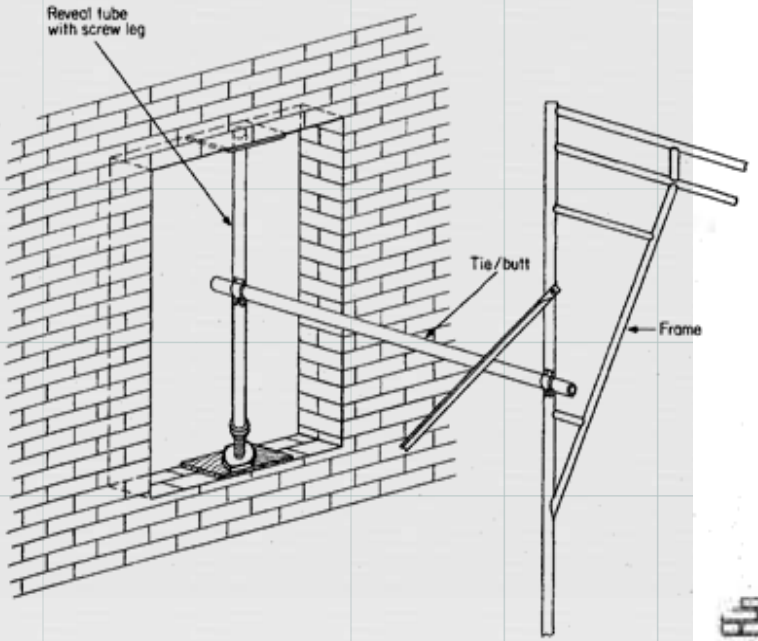
- The basic lightweight tube scaffolding that became the standard and revolutionised scaffolding

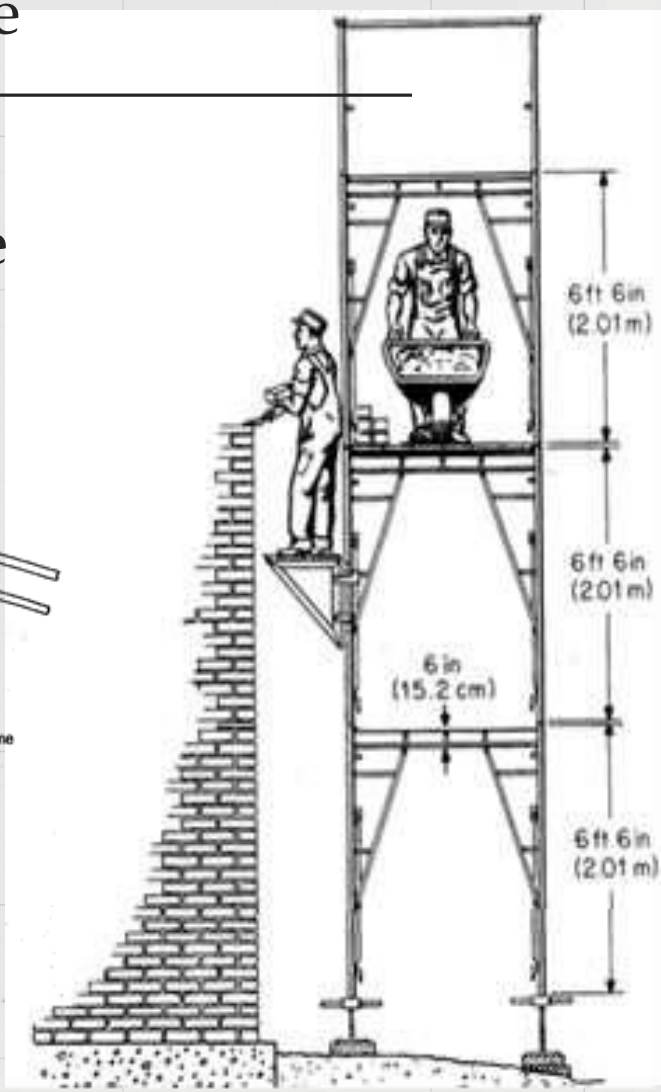
Tubes are usually made either of steel or aluminium, although there is composite scaffolding, which uses filament-wound tubes of glass fibre in a nylon or polyester matrix



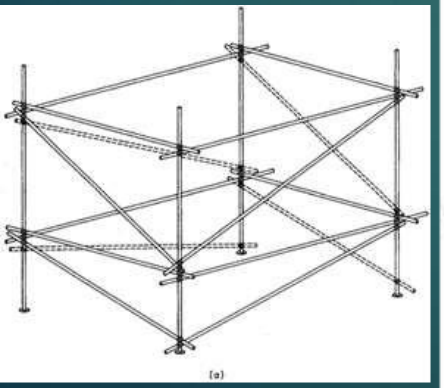
- The key elements of a scaffold are standards, ledgers and transoms. The standards, also called uprights, are the ~~vertical tubes that transfer the entire~~ mass of the structure to the ground where they rest on a square base plate to spread the load

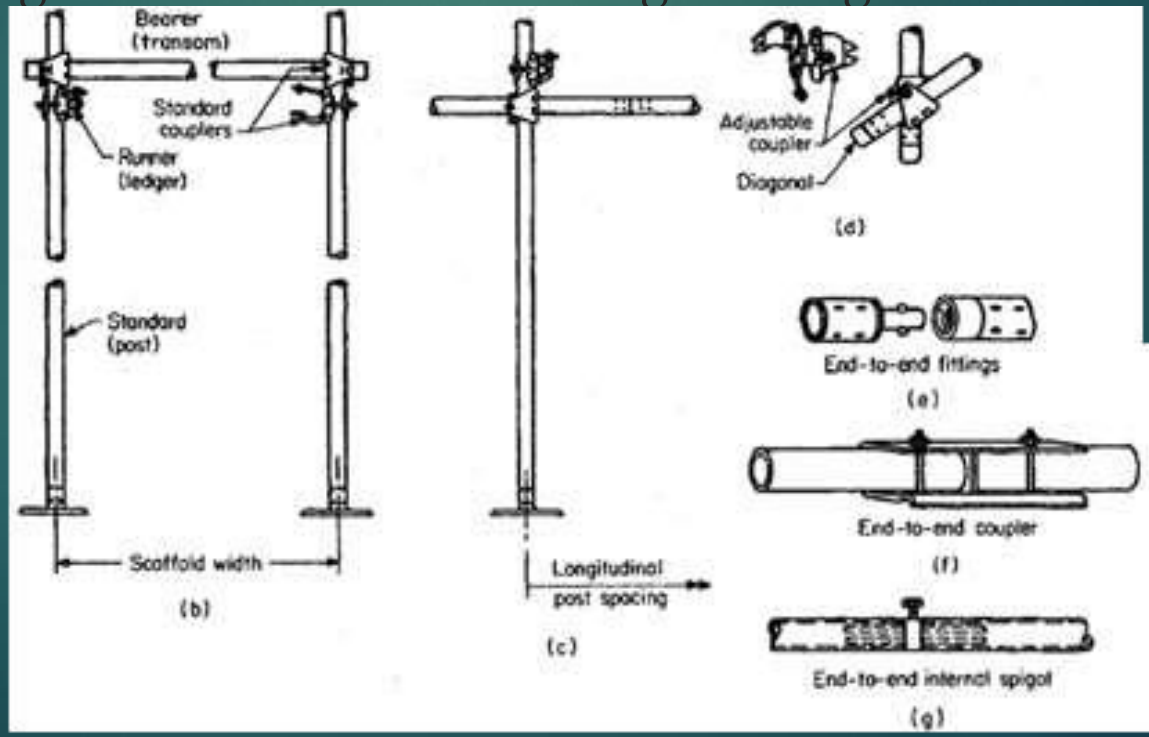






- Tube and CouplerScaffolds
- Tube and coupler scaffolds are assembled from three basic structural elements:
- *f* the uprights, or posts, which rise from ground or other solid support
- the bearer, which supports the work platforms and / or provide transverse horizontal connections between the posts;
- *f*herunners, which attach to the posts directly below the bearers and provide longitudinal connections along the length of the scaffold.





SHORING

- Shoring is the process of supporting a building, vessel, structure, or trench with shores (props) when in danger of collapse or during repairs or alterations. Shoring comes fromshore a timber or metal prop.[1] Shoring may be vertical, angled, or horizontal.

- **Foundations**
- Shoring is commonly used when installing the foundation of a building. A shoring system such as piles and lagging or shotcrete will support the surrounding loads until the underground levels of the building are constructed.
- **Trenches**
- During excavation, shoring systems provide safety for workers in a trench and speed excavation. In this case, shoring should not be confused with shielding. Shoring is designed to prevent collapse where shielding is only designed to protect workers when collapses occur. Concrete structures shoring, in this case also referred to as falsework, provides temporary support until the concrete becomes hard and achieves the desired strength to support loads.



wall-plate is typically used to increase the area of support.





- **Hydraulic Shoring**
- Hydraulic shoring is the use of hydraulic pistons that can be pumped outward until they press up against the trench walls. They are typically combined with steel plate or plywood, either being 1-1/8" thick plywood, or special heavy Finland Form (FINFORM) 7/8" thick.



- **Beam and Plate**
- Beam and Plate steel I-beams are driven into the ground and steel plates are slid in amongst them. A similar method that uses wood planks is called soldier boarding. Hydraulics tend to be faster and easier; the other methods tend to be used for longer term applications or larger excavations.

- **Soil Nailing**
- Soil nailing is a technique in which soil slopes, excavations or retaining walls are reinforced by the insertion of relatively slender elements - normally steel reinforcing bars. The bars are usually installed into a pre-drilled hole and then grouted into place or drilled and grouted simultaneously. They are usually installed untensioned at a slight downward inclination. A rigid or flexible facing (often sprayed concrete) or isolated soil nail heads may be used at the surface.

- **Square Shoring**
- This consists of a timber member jammed on a pad piece on either the deck or deck head depending on water

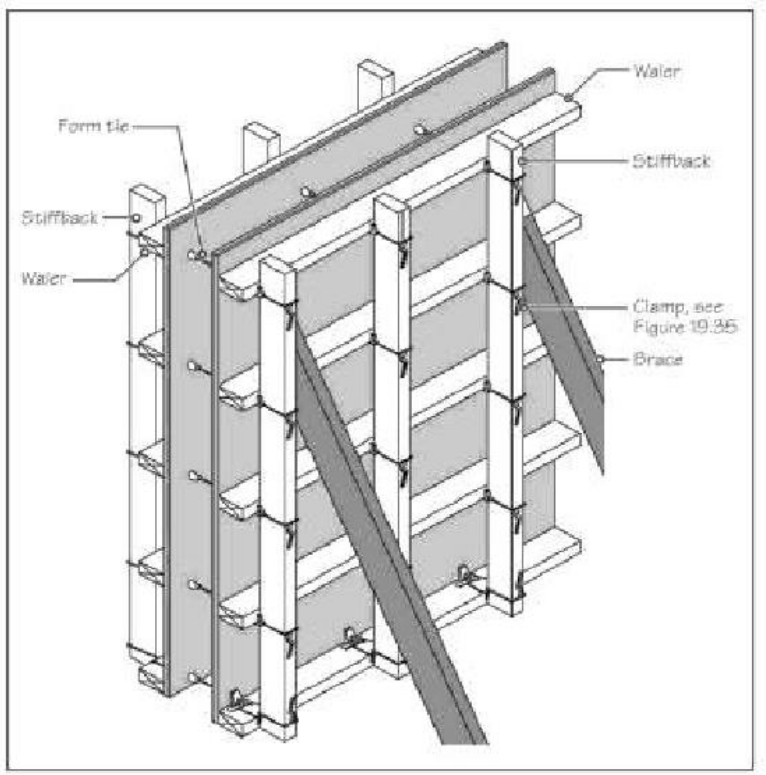
called the proud. then the is a horizontal timber cut to size to fit between this and what it is shoring up, e.g. a splinter box, bulkhead or door. Timber wedges are then used to tighten up the structure if necessary

- **Vertical Shoring**
- This is to support a hatch or splint box on the deck, consisting of a vertical timber between the deck and deck head, with to wedges used opposing each other to tighten it. pad pieces are used to spread the load on weak structures.

FORMWORK

- Formwork is the term given to either temporary or permanent molds into which concrete or similar materials are poured. In the context of concrete construction, the falsework supports the shuttering moulds.





- Traditional timber formwork
- Engineered Formwork System.
- Re-usable plastic formwork
- Permanent Insulated Formwork





- Metal beam slab formwork
- Modular slab formwork
- Table or flying form systems





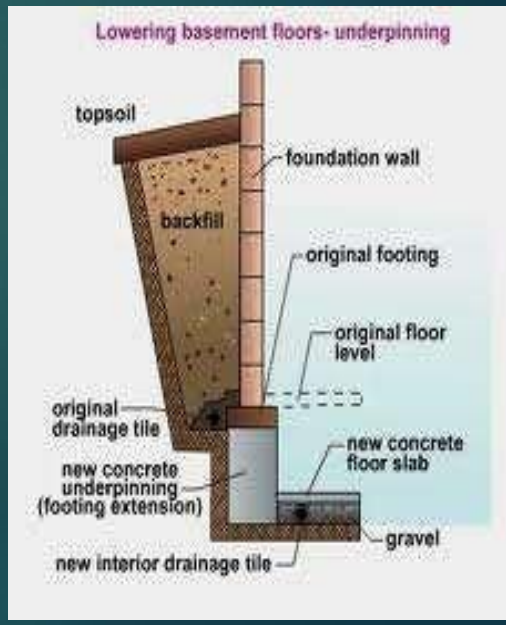


UNDERPINNING

- In construction or renovation, underpinning is the process of strengthening the foundation of an existing building or other structure.

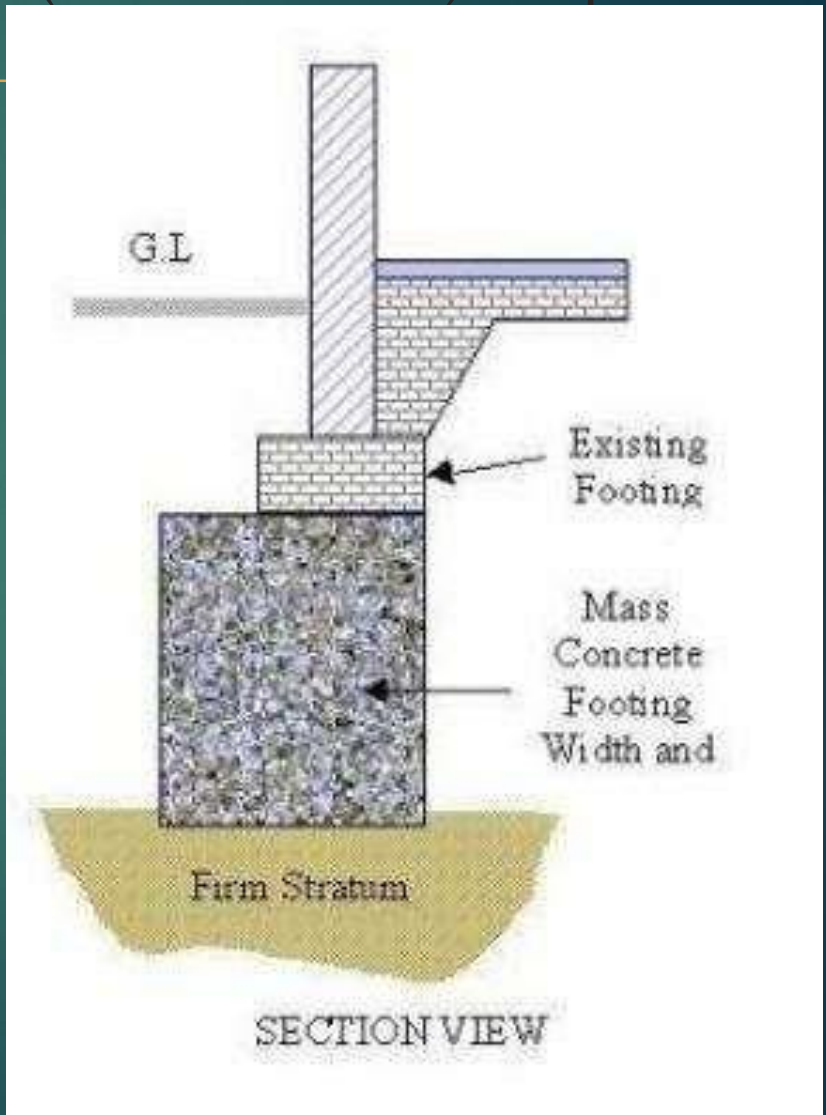


- Underpinning may be necessary for a variety of reasons:
- ƒ Construction of a new project with a deeper foundation adjacent to an existing building
- ƒ Settlement of an existing structure
- ƒ Change in use of a structure
- ƒ Addition of a basement below an
- existing structure



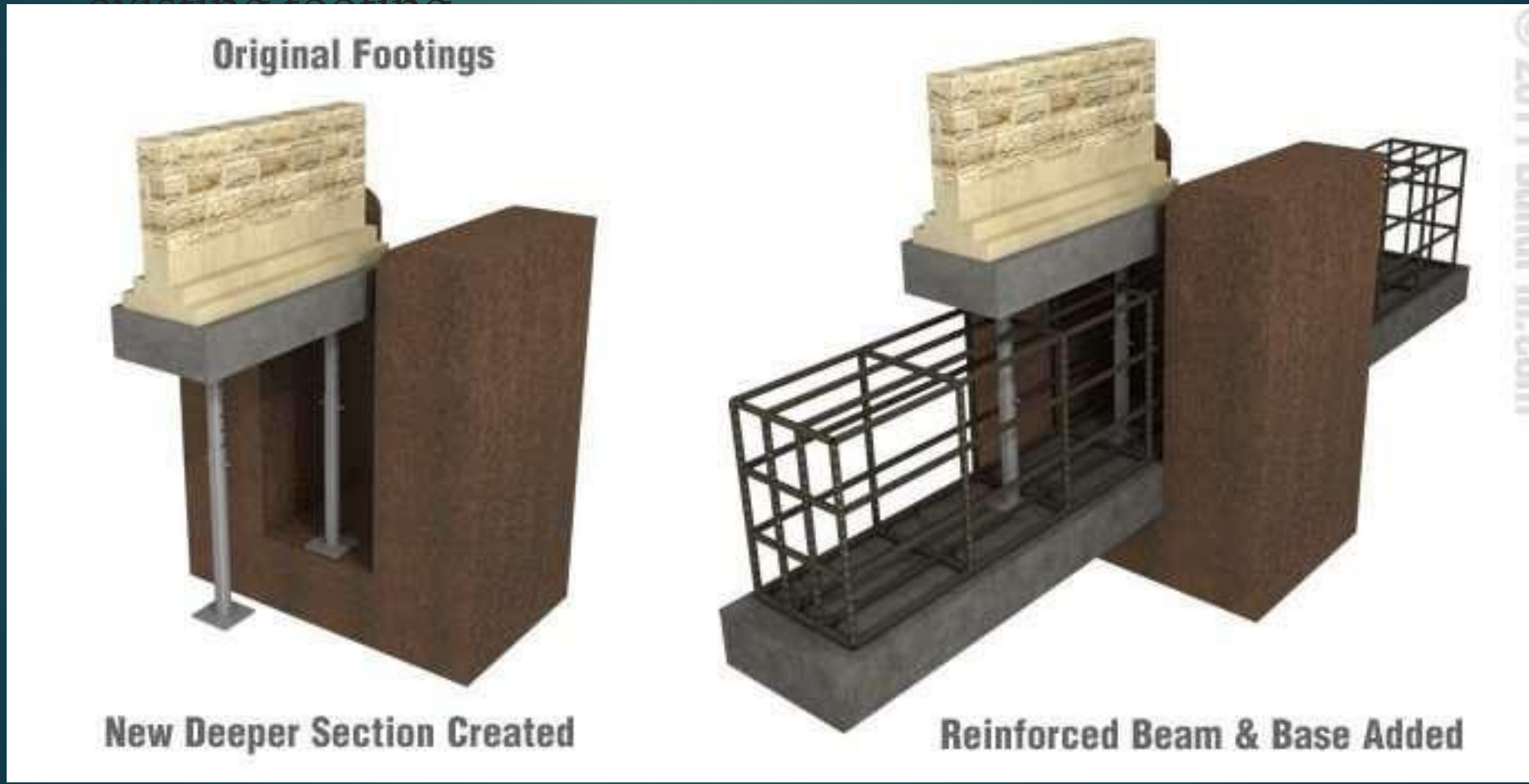
- **Mass Concrete Underpinning**
  - This underpinning method is generally applied when the existing founation is at a shallow depth, however, the method still works very well even at fifty feet (fifteen metres) deep
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Beam and base underpinning

- The beam and base method of underpinning is a more technically advanced adaptation of traditional mass concrete underpinning. A reinforced concrete beam is constructed below, above or in replacement of the existing footing



- Mini-piled underpinning is generally used when the stable soils at considerable depths loads from the foundations need to be transferred to

