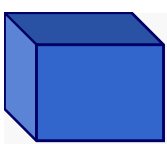


# CEL 774 CONSTRUCTION PRACTISES



*Concrete: Production  
(Pre-stressing )*

*B. Bhattacharjee*

**CIVIL ENGINEERING DEPARTMENT  
IIT DELHI**



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

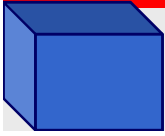
# *General Outline*

- **Examples**
- **Mass Concrete**
- **Cold weather problem**
- **Concreting in cold weather**

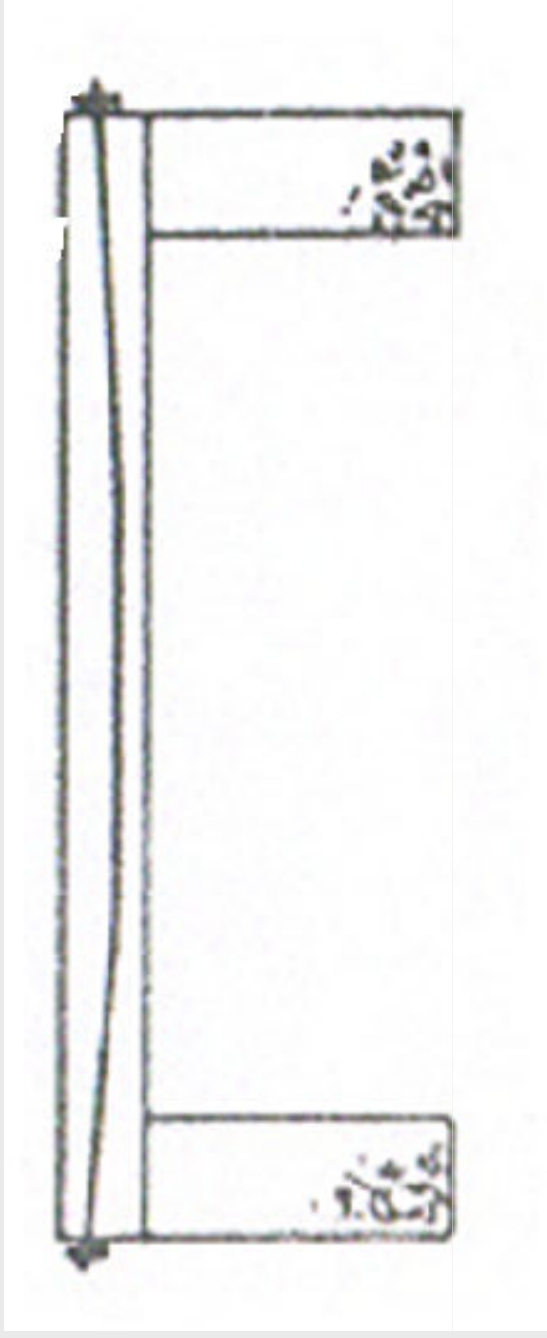
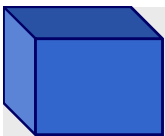


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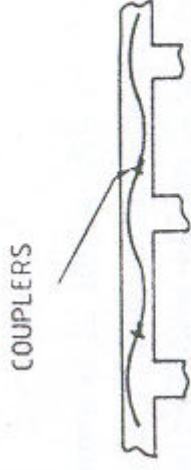


# EXAMPLES

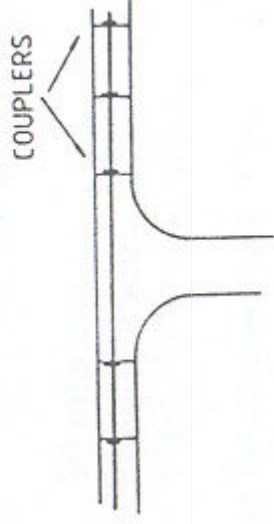


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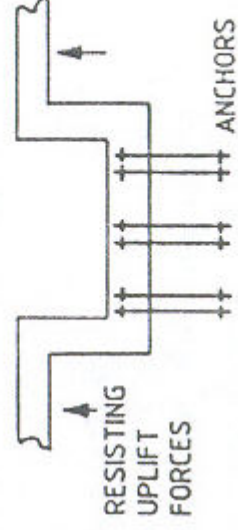
# EXAMPLES



**Figure 30.2(a)**  
Continuous deck with  
tendon coupling



**Figure 30.2(b)** Bridge  
deck with tendon  
couplings

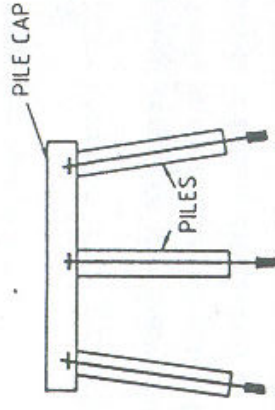


**Figure 30.3(a)**  
Basement anchors

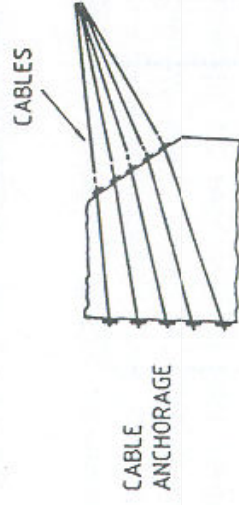


# EXAMPLES

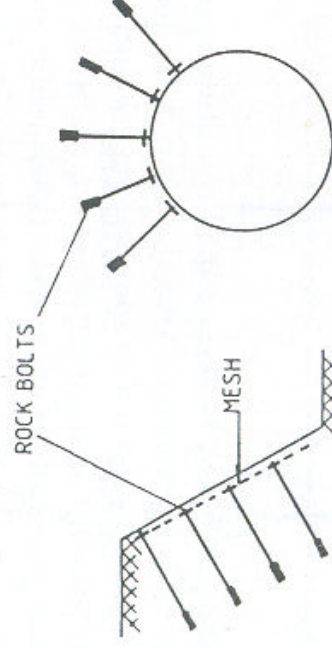
**Figure 30.3(b)**  
Foundation anchors



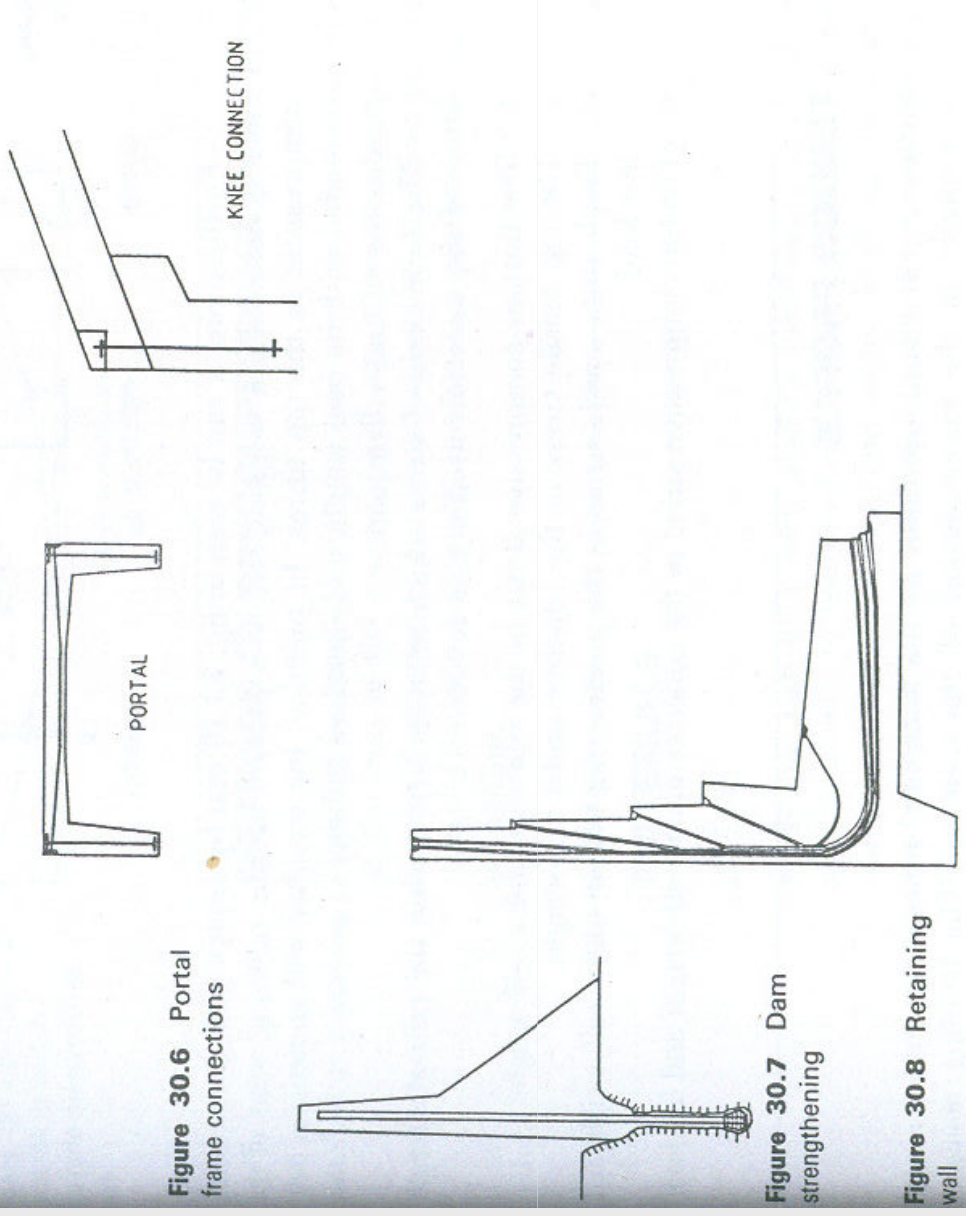
**Figure 30.4** Cables  
anchorage



**Figure 30.5** Rock  
bolting

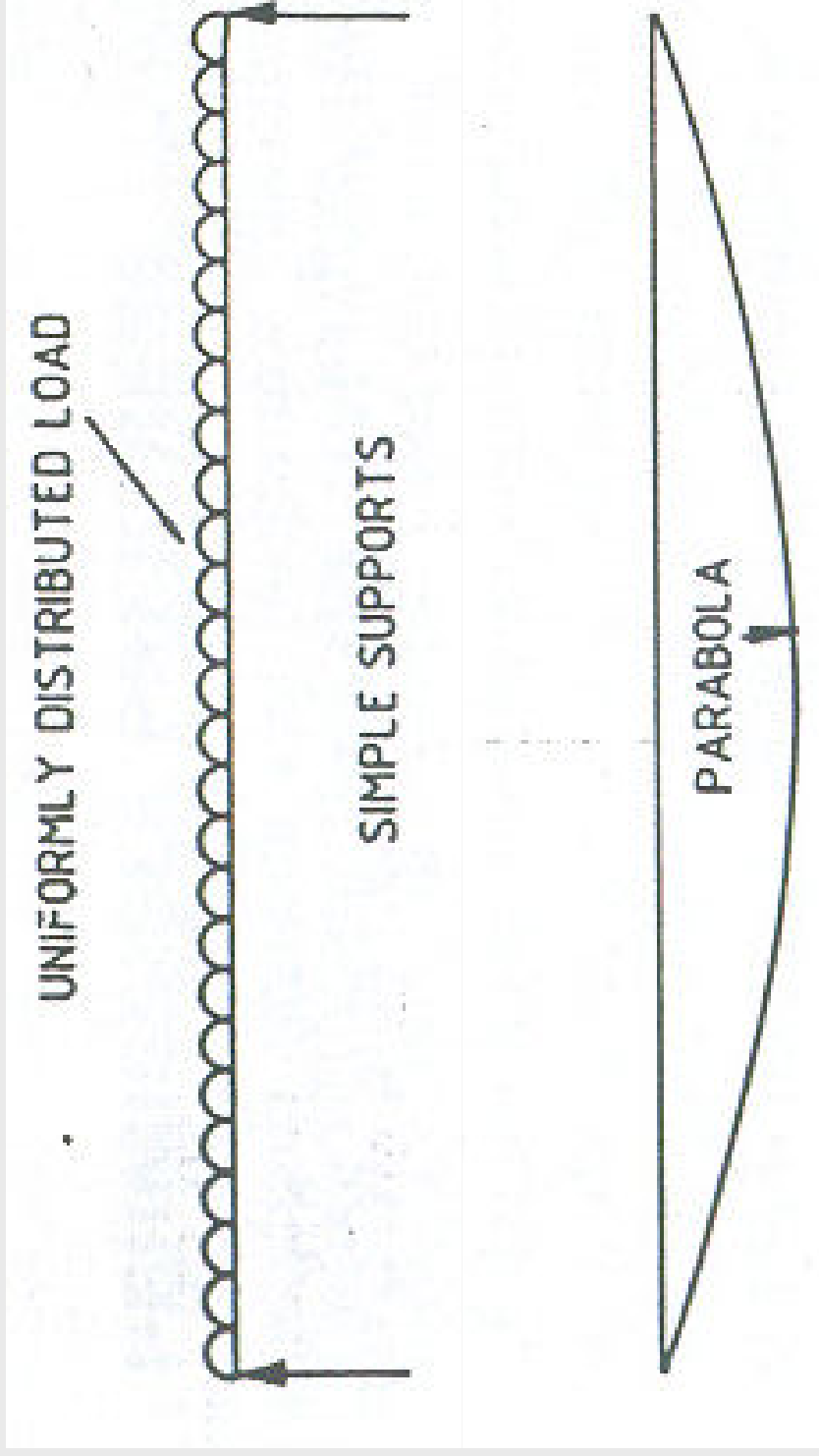


# EXAMPLES

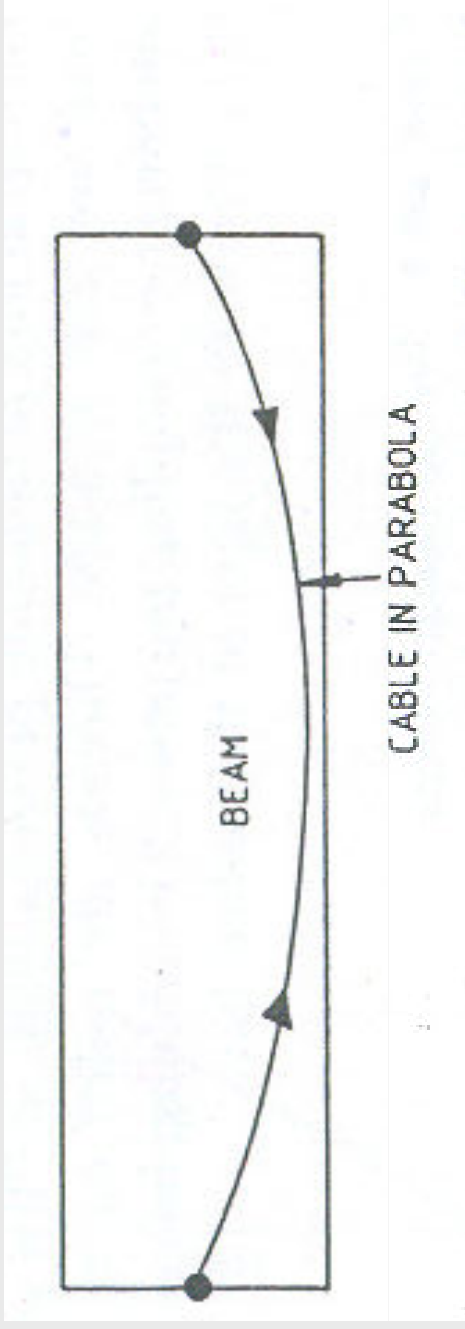


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# PROFILE

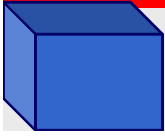


# PROFILE

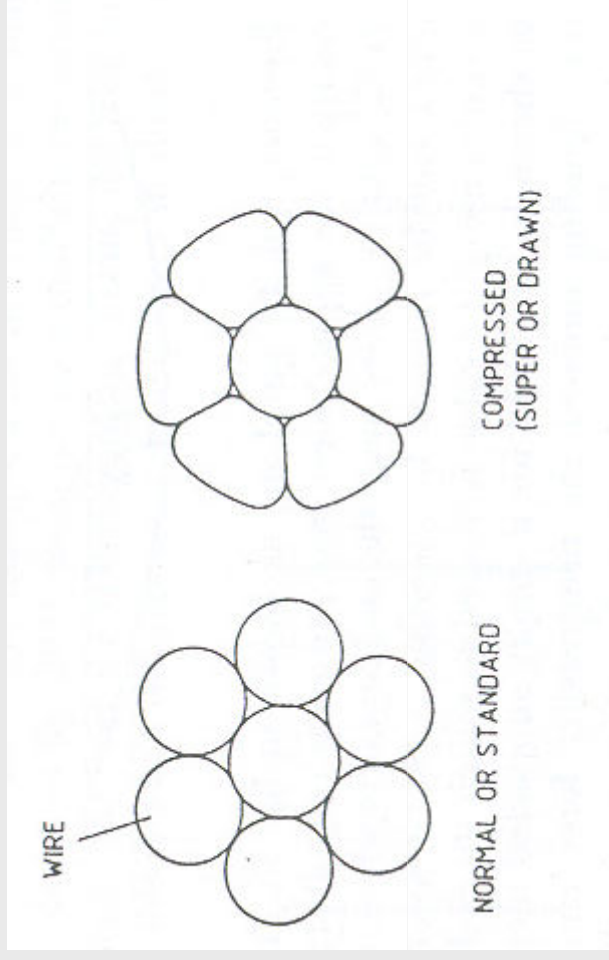
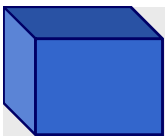


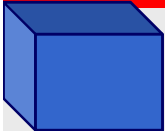
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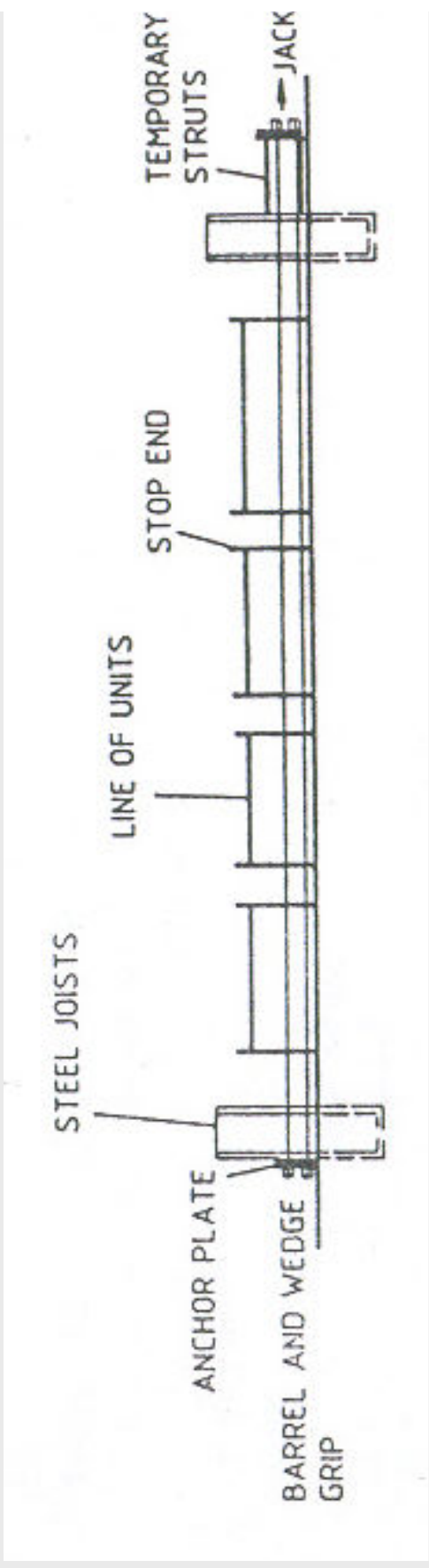
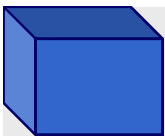


# STRAND



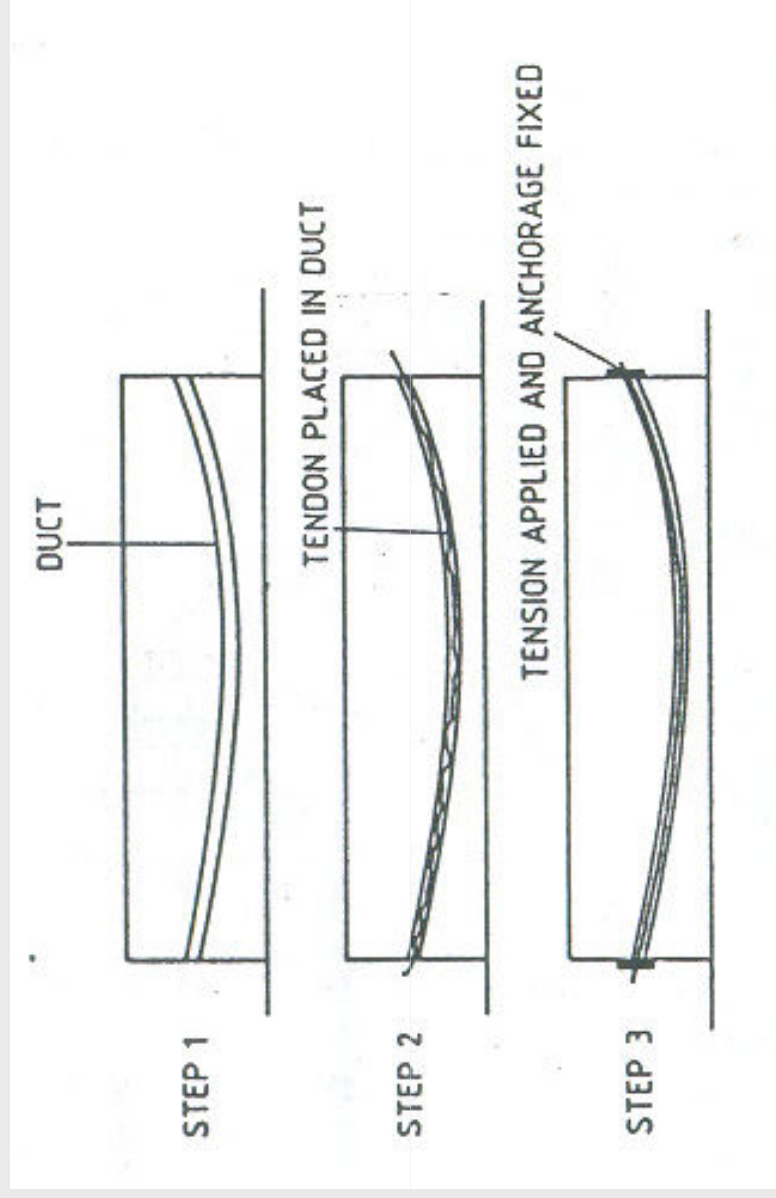


# LONGLINE METHOD



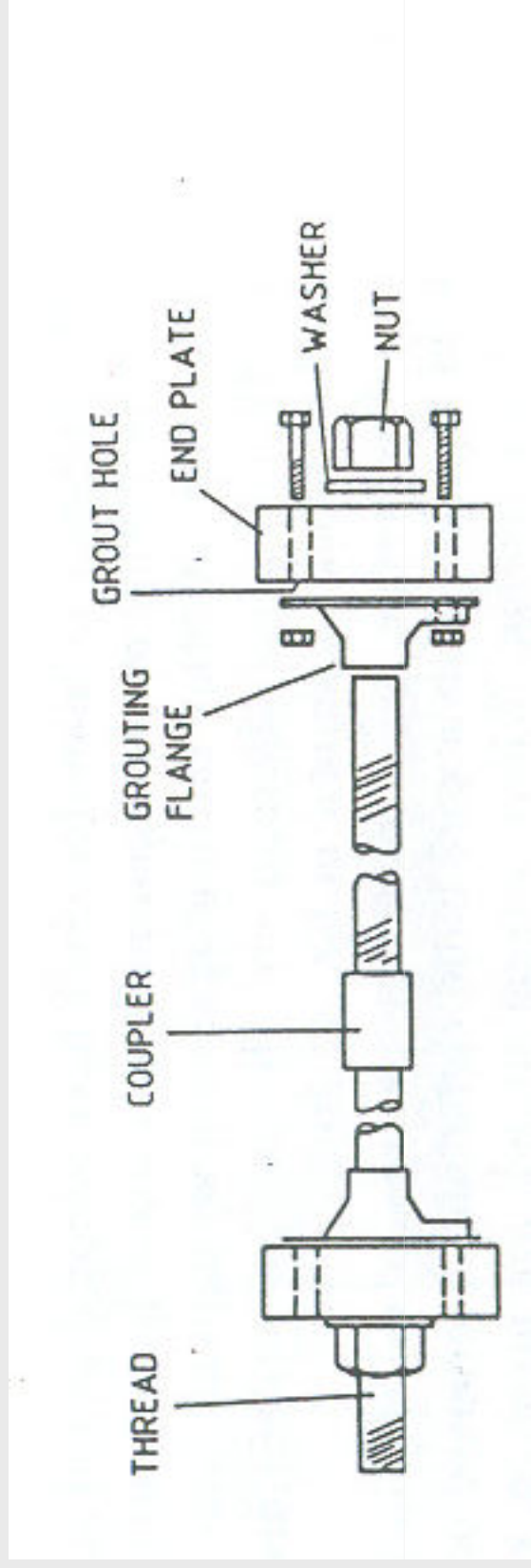
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# DUCT PROFILE



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# THREADED BAR & NUT SYSTEM



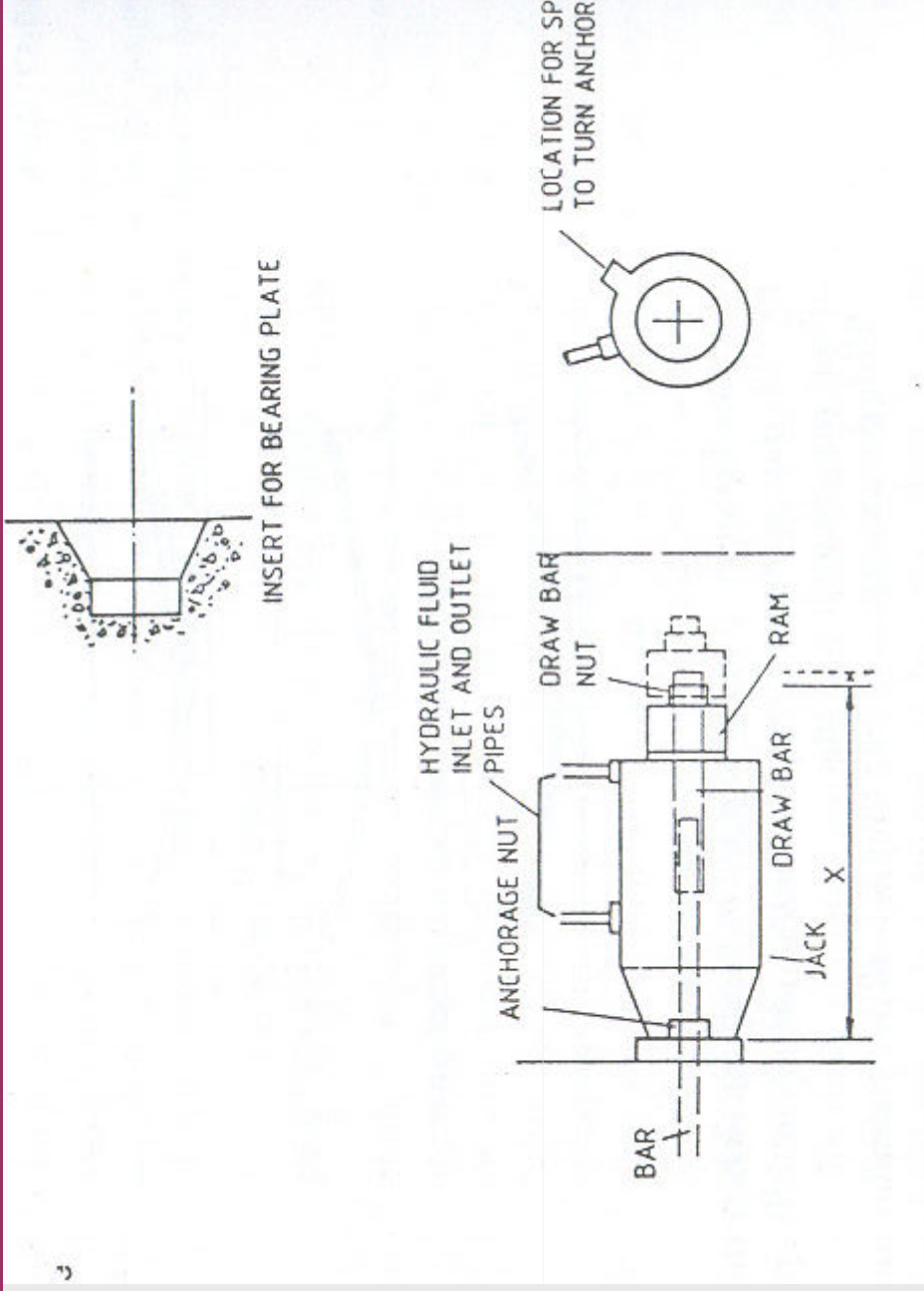
**TRANSFER OF TENSION THROUGH NUT & WASHER TO A SOLID PLATE, BEARING AGAINST CONCRETE**

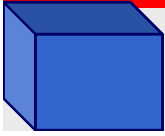


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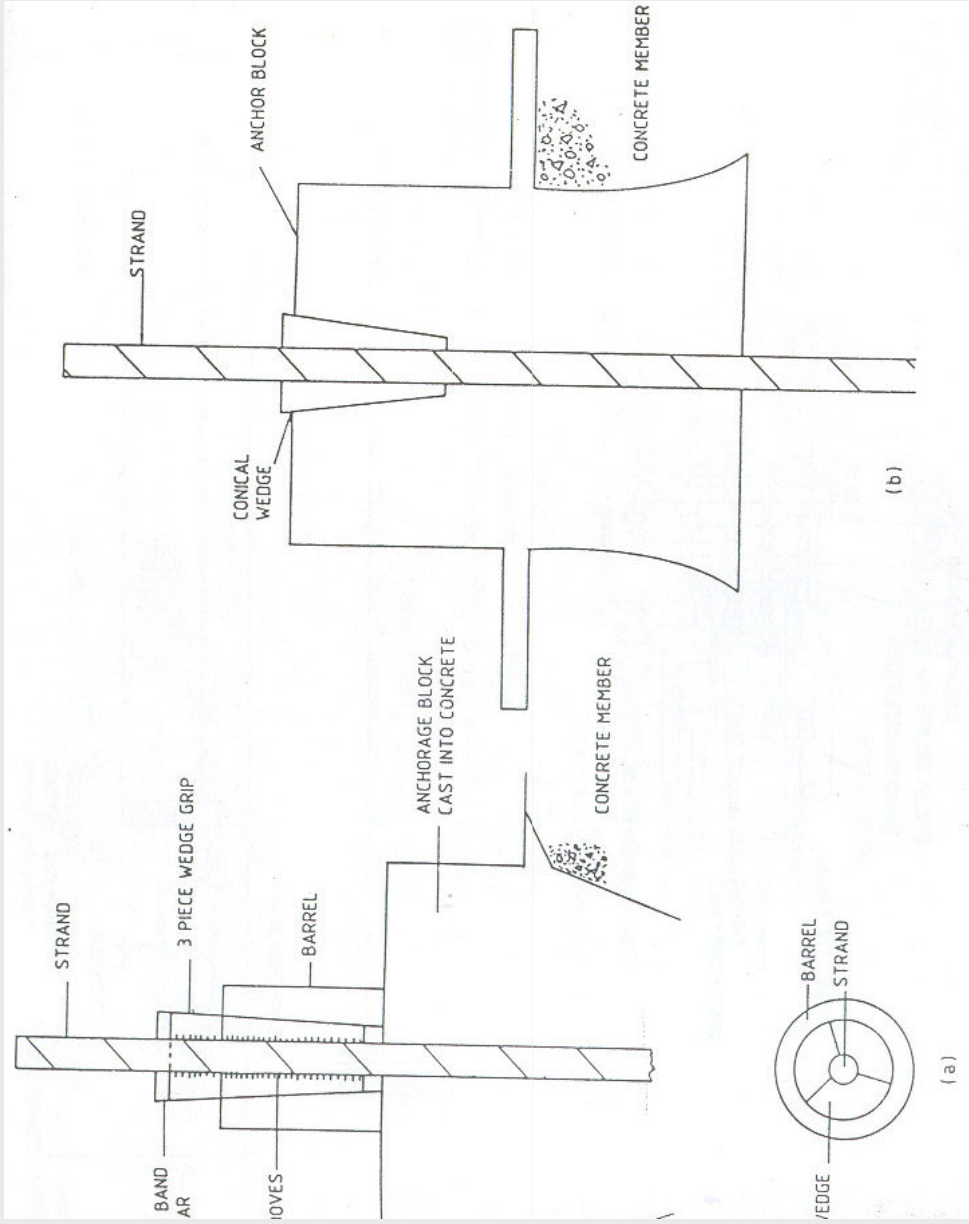
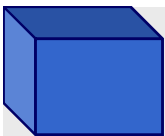
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# JACK





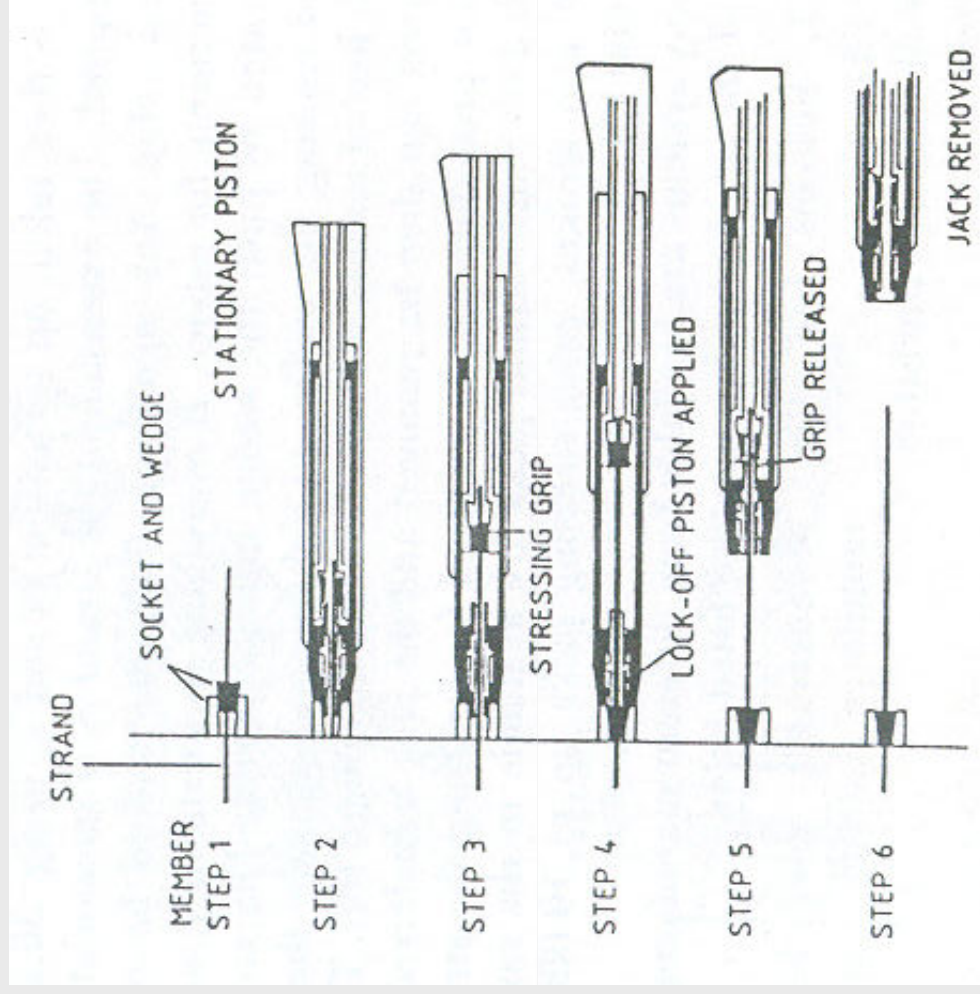
# BARREL & WEDGE SYSTEM



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# TENSIONING

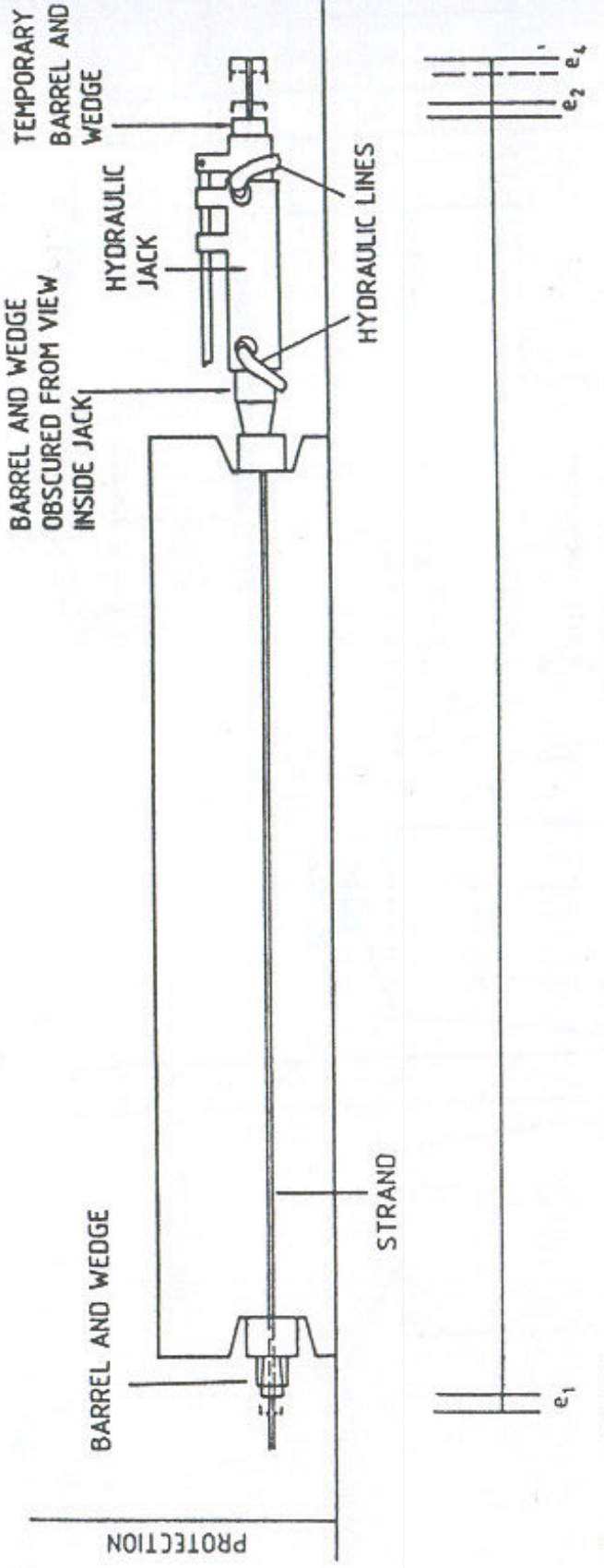


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# TENSIONING

## CONCRETE PRODUCTION AND EQUIPMENT



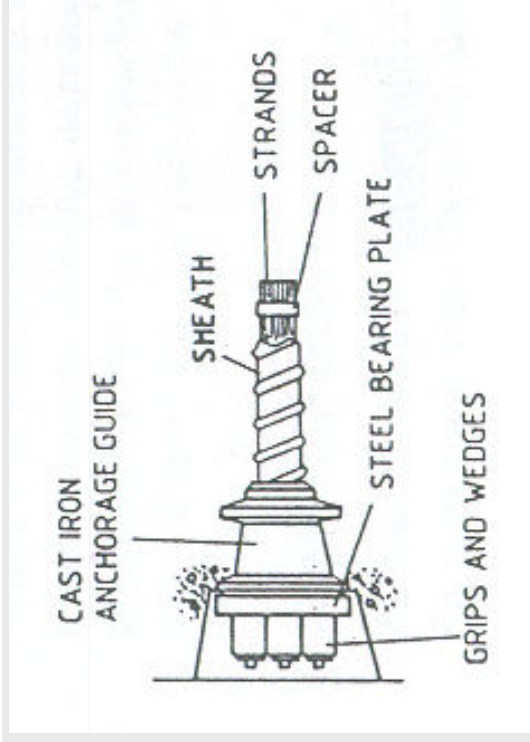
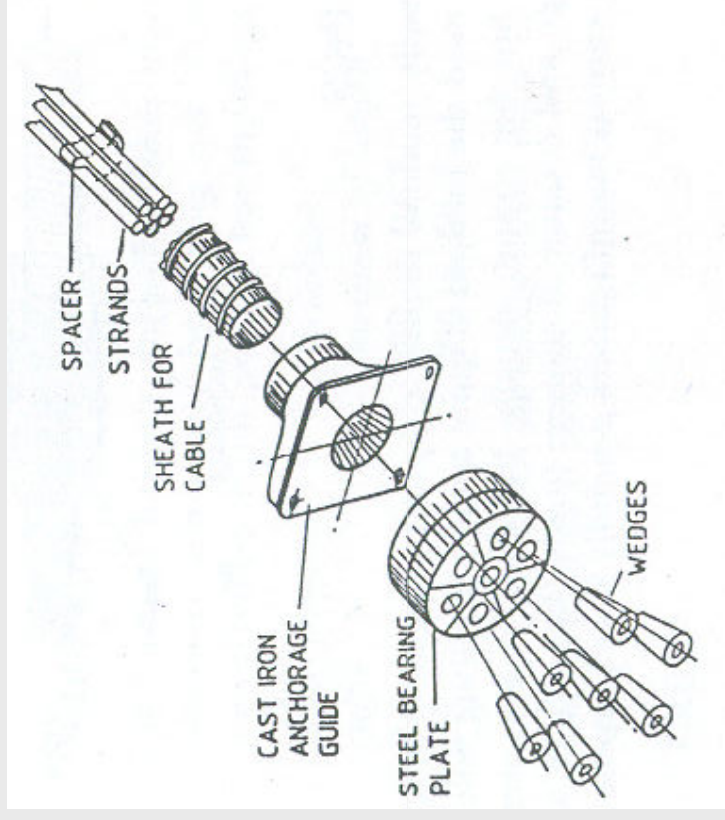
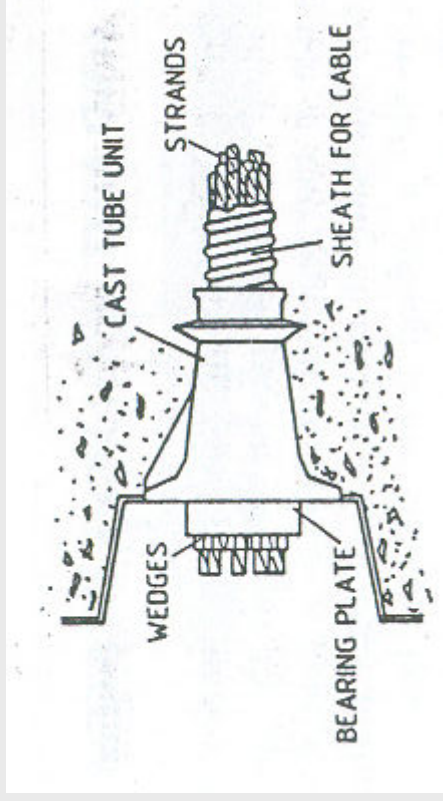
## REQUIRED EXTENSION $e_3$ IS APPLIED THROUGH LOAD



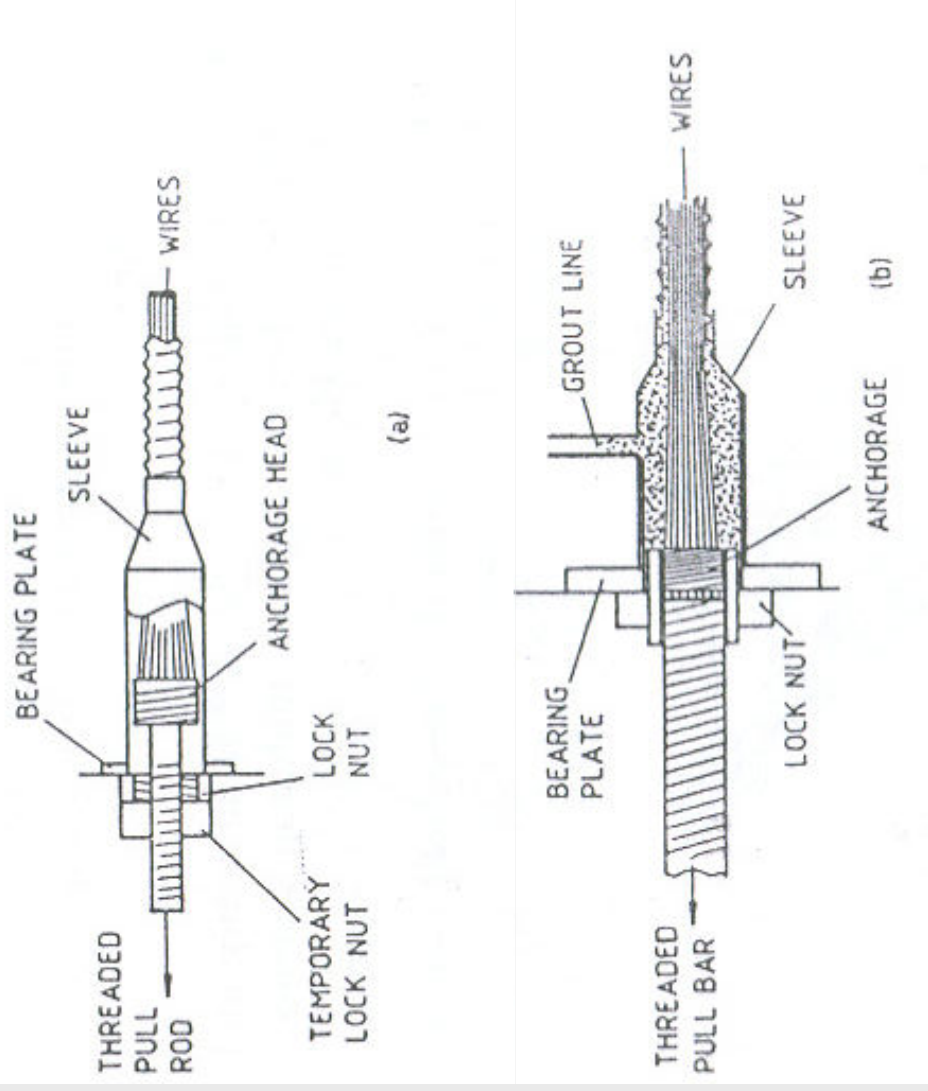
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# SYSTEMS



# THREAD & NUT SYSTEMS

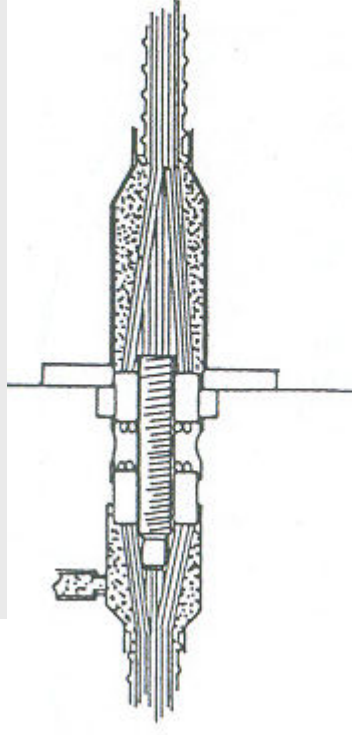
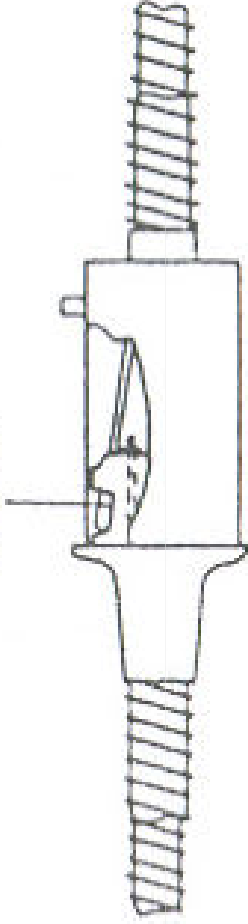


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# COUPLINGS



WEDGES



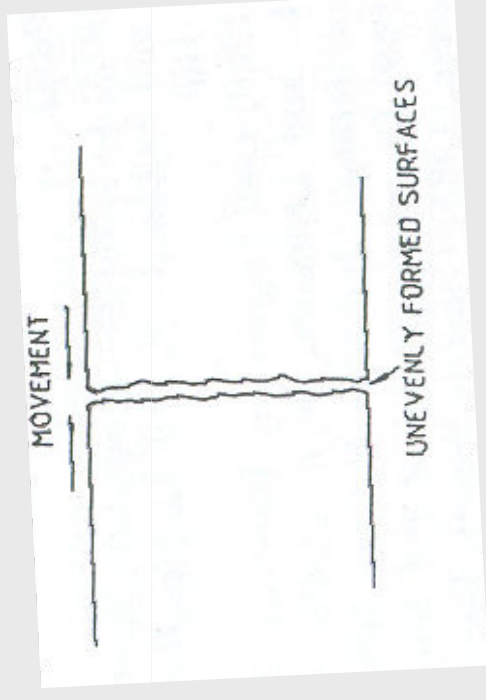
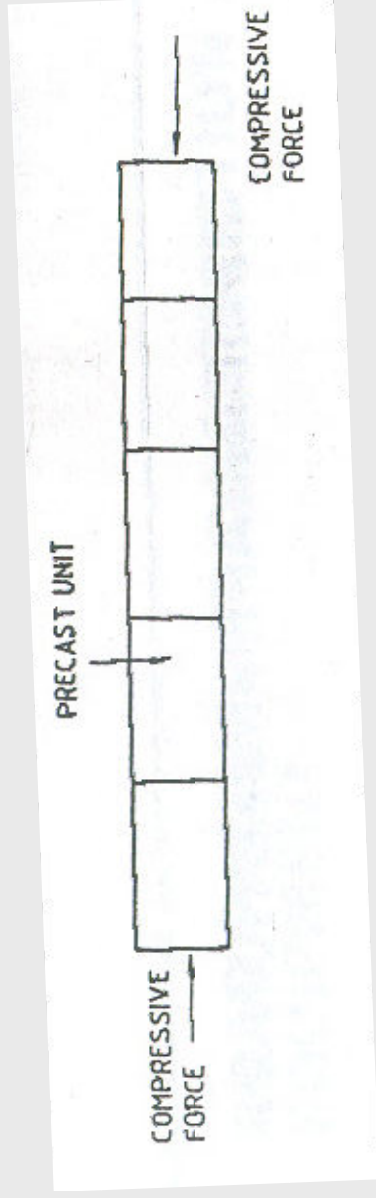
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# LOSS OF PRE-STRESS

- SHRINKAGE OF CONCRETE UP TO 5%.
  - CREEP OF CONCRETE UP TO 10%
  - ELASTIC STRAIN IN CONCRETE UP TO 5%
  - CREEP & RELAXATION IN STEEL UP TO 5%
  - LOSSES DURING TENSIONING & ANCHORING
- TOTAL 20-30 %**



# LOSS & MOVEMENTS



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**THANK YOU FOR  
HEARING**



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