UNIT - V

MAINTENANCE AND REPAIR METHODS FOR RCC
Explain the probable crack location in RCC and causes of RCC failures

• Shrinkage cracking
• AAR cracking
• Corrosion cracking
• Fire damage (Micro cracking), R/f fossil impression
• Bending cracking
• Shear cracking
Explain the probable crack location in RCC and causes of RCC failures

Shrinkage cracking
Explain the probable crack location in RCC and causes of RCC failures

AAR cracking
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Corrosion cracking
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Fire damaged cracking
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Bending cracking
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Shear Cracking
Explain the causes of dampness in roof slab and its various repair techniques

• Cross section of waterproofing
• Purpose of each component of waterproofing
• Voids/Honeycombing
• Debonding of IPS/BB coba
• Moss growth
• Thermal cracking
• Improper slope
Explain the causes of dampness in roof slab and its various repair techniques

Cross section of waterproofing

- RCC/Stone Coping
- Plaster
- Rounding (vatta)
- IPS (38 mm thick)
- Brick Bat Coba (Thickness will depend on length of slope)
- RCC Slab
- Beam
Explain the causes of dampness in roof slab and its various repair techniques

Purpose of each component of waterproofing

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• Cement slurry :- Slurry of cement, water & non shrink additives is laid on naked slab to fill the shrinkage cracks on slab, if any

• Brick-bat :- To provide slope

• IPS :- IPS mixed with waterproofing compound acts as top finishing layer & the only water proofing component

• China Chips :- resistance from heat & also aesthetics

• Parapet Vatta – (‘Rounding off‘ of the junction)

• Coping :- To protect the parapet wall
Explain the causes of dampness in roof slab and its various repair techniques

Voids & honey combing
Explain the causes of dampness in roof slab and its various repair techniques

Cracking / Debonding of IPS/BB coba
Explain the causes of dampness in roof slab and its various repair techniques

Moss growth
Explain the causes of dampness in roof slab and its various repair techniques

Thermal cracking
Explain the causes of dampness in roof slab and its various repair techniques

Improper slope
Select the relevant repair techniques for the damages in the given civil structures with justification.

<table>
<thead>
<tr>
<th>MATERIAL STRENGTHENING</th>
<th>MEMBER STRENGTHENING</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ Re- Waterproofing</td>
<td>→ Jacketing</td>
</tr>
<tr>
<td>→ Re – Plastering</td>
<td>→ Fibre wrap</td>
</tr>
<tr>
<td>→ Grouting</td>
<td>→ Steel Plate Flitching</td>
</tr>
<tr>
<td>▪ Micro grouting</td>
<td>→ RCC footing strengthening</td>
</tr>
<tr>
<td>▪ Cement</td>
<td>→ Structural overlay</td>
</tr>
<tr>
<td>▪ Polymer / Epoxy</td>
<td>→ Substitute Framework technique</td>
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<tr>
<td>→ Polymer / Epoxy Mortar</td>
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Re-Waterproofing
Select the relevant repair techniques for the damages in the given civil structures with justification.

Re-Plastering
Select the relevant repair techniques for the damages in the given civil structures with justification.

- **Microgrouting**

  Cracks to be filled with micro concrete
Select the relevant repair techniques for the damages in the given civil structures with justification.

Grouting
Select the relevant repair techniques for the damages in the given civil structures with justification.

Polymer/ Epoxy Mortar
Select the relevant repair techniques for the damages in the given civil structures with justification.

Application of protective coating
Select the relevant repair techniques for the damages in the given civil structures with justification.

Jacketing
Select the relevant repair techniques for the damages in the given civil structures with justification.
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**Jacketing**

<table>
<thead>
<tr>
<th>Do’s &amp; Don’ts</th>
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<td>• The grade of concrete shall be 1 grade higher than the parent concrete.</td>
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<tr>
<td>• Ensure installation of shear connectors.</td>
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<tr>
<td>• Provide sufficient &amp; optimum propping to ensure effective stress / strain transfer</td>
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<tr>
<td>• Ensure pouring of jacket concrete before the specified pot life of bonding material</td>
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<tr>
<td>• Avoid extreme variation in grades of parent concrete &amp; jacketed concrete</td>
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<tr>
<td>• Check bonding between parent &amp; jacket concrete using NDT</td>
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<tr>
<td>• Release the prop after sufficient strength gain of jacket concrete</td>
</tr>
<tr>
<td>• Jacketing technique should almost always start from / taken down to foundation level.</td>
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Select the relevant repair techniques for the damages in the given civil structures with justification.

Fibre wrap
Select the relevant repair techniques for the damages in the given civil structures with justification.

Steel Plate Flitching
Select the relevant repair techniques for the damages in the given civil structures with justification.

**Steel Plate Flitching**

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<td>• Remove plaster.</td>
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<tr>
<td>• Grind parent concrete to as much smooth as possible without causing damage</td>
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<tr>
<td>• Through bolts are always preferred over expansion bolts.</td>
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<tr>
<td>• Grout the angular space of through bolts with epoxy.</td>
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<tr>
<td>• Use a plate that is straight &amp; corrosion free.</td>
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<tr>
<td>• Check bonding between parent &amp; jacket concrete using NDT</td>
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<tr>
<td>• Grout the space between plate &amp; parent concrete completely with epoxy</td>
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Select the relevant repair techniques for the damages in the given civil structures with justification.

RCC Footing strengthening
Select the relevant repair techniques for the damages in the given civil structures with justification.

Substitute framework technique
Know the repair methods for the cracked RCC elements

Structural cracking → Strengthening
- Flitching
- Fibre wrap
- Jacketing

Material cracking → Material replacement technique
- Polymer mortar
- Epoxy mortar
- Normal mortar

Voids → Grouting

AAR → Replacement

Corrosion /Fire/ Earthquake → All of the above combination
Explain the relevant repair methods for cracks in RCC structures

Covered in slide no. 18-33
Know the repair of corroded RCC elements, honeycomb and large voids in the given structure.

Covered in slide no. 18-35
THANK YOU