Repair of Concrete Session in Memory of Tony Murray

Post Tensioning Repairs and Modifications

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Conditions that Lead to Damage or Deterioration

- Not Encapsulated/Protected
- Improper Handling During Placement
- Improper Grouting
- Exposure to High Concentrations of Chemicals/Chlorides
- Post Stressing Errors
  - Core Drillers/Saw Cutters
  - Post Installed Anchors
Conditions that Can Lead to PT Deterioration

Chloride Accelerators in Grout

Missing Grease Caps
Poorly Protected or Unprotected Anchors

Grease Only—No Grease Cap

Severe Corrosion of Wedges and Anchor
Failed Post Tensioning Due to Anchorage Corrosion

External Post Tensioning

Laying on the Parking Garage Slab Monday Morning
Design and Environmental Concerns

- Swimming Pool Leaking Chlorinated Water
- Scupper/Drain Above Anchorage
Previously Unprotected Anchors
Post Stressing Errors

Slab Grinding Exposes Post Tensioning

Errant Core Driller

Direct Hit Post Installed Fence Anchor
Grout Issues

- Shrinkage
- Tempering
- Poor Consolidation
- Addition of Chlorides

Varying Qualities of Grout

Shrinkage or Poor Placement Practices
Stressing Pocket Grouting

Cut Tendon Ends and Properly Clean Grout Pockets

Properly Mixed and Placed Non Shrink Grout
Grease Caps

Note Melted Grease Cap
Grease Cap Placement
Design Consideration/Conditions Initiating Repairs

• No Tendon Repair is Needed:
  • No Significant Deterioration
  • No Loss of Pre-Stressing

• Selective Abandonment:
  • Sufficient Reserve Capacity

• Repair:
  • Severely Deteriorated/Damaged
  • Lost or Failed Pre-Stressing

• Tendon Supplement/Replacement:
  • Insufficient Capacity
  • Unrepairable

• Selective or Full Structure Replacement
  • Insufficient Capacity
  • Significant Deterioration

• Stabilizing/Strengthening
  • Restoration
  • Improvement

REF--PTI DC80.3-12

No Repair Necessary—Tendons Never Stressed
Know What You Are Getting Into

- Review PT Shop Drawings
- Locate Tendons
- Locate Anchors
- #of Tendons/Group
- Location in Slab
Concrete Removal—Cautiously

*ACTUAL LIMITS TO BE DETERMINED BY THE LICENSED DESIGN PROFESSIONAL ON A CASE-BY-CASE BASIS.
Repair of Unintentionally Cut Tendons

Severed Anchors by Core Drilling

Installing New Anchors

Casting New Anchors
Destressing & Restressing

Staggered Destressing & Restressing

Destressing & Restressing in Both Directions
Examples of Tendon Couplers
Temporary Anchors/Trouble Shooting Anchors
Tendon Extraction

Extraction Frame

Breaking Loose Anchorage

Pulling Tendon
Externally Installed Post Tensioning
Thank You--Questions

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