

## **Post-Tensioned Concrete Slab Bridge**

- 1.0 Bridge Description
  - 1.1 Superstructure Slab and Post-Tensioning
  - 1.2 Railings
  - 1.3 Substructure
  - 1.4 Bearings
  
- 2.0 Design Records
  - 2.1 Superstructure
  - 2.2 Substructures
  - 2.3 Design Records
  - 2.4 Post-Tensioning Shop Drawings
  
- 3.0 Construction Records
  - 3.1 Falsework Design Calculations
  - 3.2 As-Built Plans
  - 3.3 Material Records
    - 3.3.1 Concrete compressive strength
    - 3.3.2 Admixtures
    - 3.3.3 Post-Tensioning ducts
    - 3.3.4 Anchorage assemblies
    - 3.3.5 Post-Tensioning strands
    - 3.3.6 Grout
  - 3.4 Final Elevation survey
  - 3.5 Calculations
    - 3.5.1 Jacking Forces
    - 3.5.2 Elongation
    - 3.5.3 Anchorage Stresses
  - 3.6 Grouting Records
  - 3.7 Stressing Records
  - 3.8 Friction Test

### **SAMPLE OUTLINE OF A CONSTRUCTION, MAINTENANCE, AND INSPECTION MANUAL**

**Figure 70-1A**

- 3.9 Qualifications
  - 3.9.1 Qualification Requirements listed in Contract and Special Provision for Workers
  - 3.9.2 Qualifications of Workers performing the Post-Tensioning and Grouting
  - 3.9.3 Qualifications of Inspectors overseeing the Post-Tensioning and Grouting
- 4.0 Types and Causes of Distress
  - 4.1 General
  - 4.2 Cracking and Spalling in Concrete
  - 4.3 Corrosion of Reinforcing and Post-Tensioning Steel
  - 4.4 Relaxation of Post-Tensioning Steel
  - 4.5 Post-Tensioning wire breaks
  - 4.6 Creep and Shrinkage
  - 4.7 Voids in Concrete
  - 4.8 Improperly grouted tendons
  - 4.9 Anchorage and Coupler Stresses
- 5.0 Inspection Requirements and Procedures
  - 5.0.1 Inspection Plan of Action
  - 5.0.2 NDT / Testing Plan of Action
    - 5.0.2.1 What to Test
    - 5.0.2.2 Where to Test
    - 5.0.2.3 How to Access Areas to Test
    - 5.0.2.4 How to Re-cover Areas Tested
  - 5.1 Qualifications of Inspectors and NDT Technicians
  - 5.2 Equipment
    - 5.2.1 Access Equipment
    - 5.2.2 Inspection Equipment
    - 5.2.3 Safety Equipment
    - 5.2.4 Traffic Control and Miscellaneous Equipment
  - 5.3 NBIS Condition Survey
  - 5.4 Elevation Survey
  - 5.5 NDT / Testing
    - 5.5.1 Stresses in Strands
    - 5.5.2 Corrosion Activity
      - 5.5.2.1 Visual Rust Evaluation
      - 5.5.2.2 Corrosion Rate

**SAMPLE OUTLINE OF A CONSTRUCTION,  
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**Figure 70-1A contd.**

- 5.5.2.3 Corrosion Potential
- 5.5.2.4 pH of Grout
  - 5.5.2.4.1 At Duct Interface
  - 5.5.2.4.2 At Wire Surface
- 5.5.2.5 Moisture Content of Grout
- 5.5.2.6 Chloride Content of Grout
- 5.5.2.7 Petrographic Examination
- 5.6 Inspection Checklist
- 5.7 Schedule
  - 5.7.1 Regular Inspections
  - 5.7.2 In-Depth Inspections
  - 5.7.3 Elevation Surveys
  - 5.7.4 NDT / Testing
  
- 6.0 Bridge Load Capacity Ratings
  - 6.1 Initial Load Rating from Design
    - 6.1.1 Inventory and Operating Ratings
      - 6.1.1.1 H-20 Truck
      - 6.1.1.2 HS-20 Truck
      - 6.1.1.3 HL-93 Truck
      - 6.1.1.4 INDOT Group of Permitted Vehicles
  - 6.2 Load Rating based on As-Built Conditions
  - 6.3 Guidelines on when to Re-Load Rate
  
- 7.0 Drawings of Details for use during Inspections  
[Drawings should show all noted defects as of the date when the bridge was opened to traffic.]
  
- 8.0 Maintenance Requirements and Procedures
  - 8.1 Maintenance Plan of Action
  - 8.2 What to Maintain
  - 8.3 How to Maintain
  - 8.4 When to Maintain
  - 8.5 Maintenance Log

**SAMPLE OUTLINE OF A CONSTRUCTION,  
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**Figure 70-1A** contd.