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|---|---|---|
| **Name of the Project** | : | VISUAL INSPECTION OF FOB AT CHIRALA RAILWAY STATION |
| **Location** | : | CHIRALA RAILWAY STATION |
| **Location Co-ordinates** | : | **15°49'52.1"N 80°21'14.2"E** |
| **Date of Inspection** | : | 25th OCTOBER, 2019 |

**Summary:**

**a)** Cracks and Spalling observed in RCC slab panels of Staircase.
**b)** Corrosion is observed in stringer beams and Floor beams of Spans-3.
**c)** Corrosion is observed in Gusset Plates of mid landing of Circulating Area Staircase.
**d)** Corrosion is observed at Base Plates of Columns.
**e)** Spalling & Reinforcement exposure are observed in flights & landings of Staircases on Platform-4 and Circulating Area Staircase.

**Tests to be conducted:**

**a)** Ultrasonic Thickness gauge to measures local thickness of a solid element.
**b)** Elcometer (Coating thickness Gauge) to measures dry film thickness on steel surfaces.
**c)** Ultrasonic Flaw detector to detect hidden cracks, voids, porosity, and other internal discontinuities in metals.
**d)** Fillet weld gauge to measures the size of the weld.

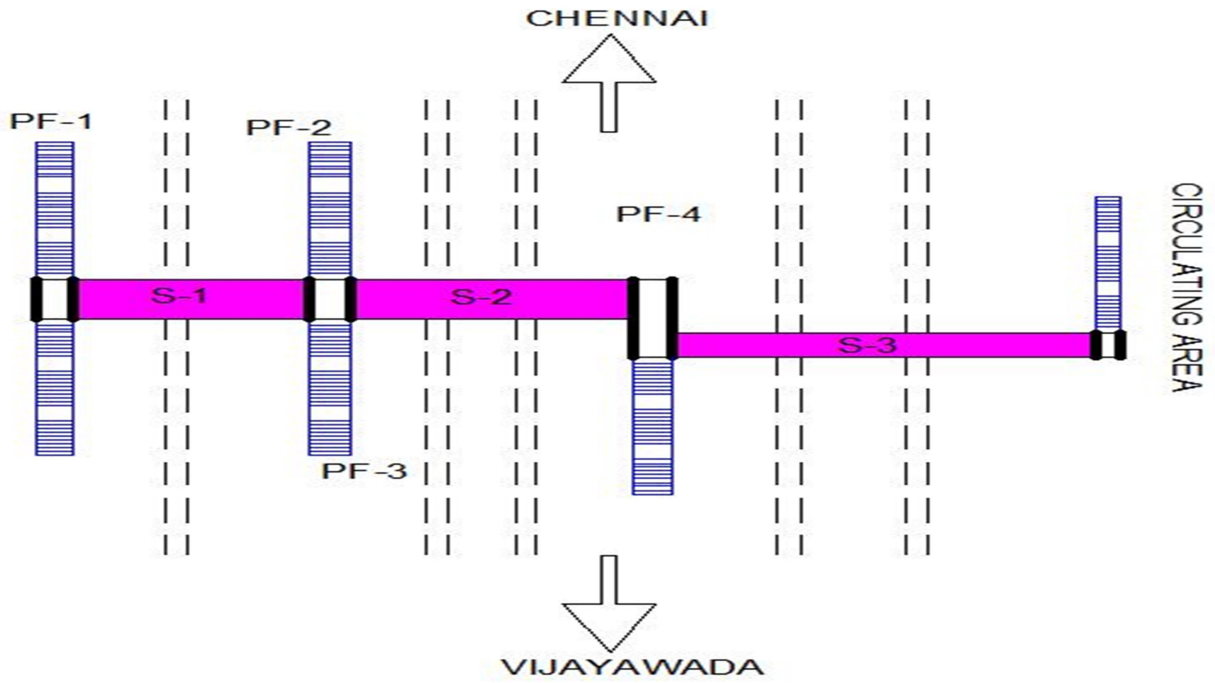
**e)** Profometer Test for concrete cover and diameter of rebar.
**f)** Rebound Hammer test surface strength of concrete (For Pre-cast slab panels and staircase)

## VISUAL INSPECTION OF STEEL FOOT OVER BRIDGE

| | |
|---|---|
| Name of the Project | Visual inspection of FOB at Chirala railway station |
| Location | Tenali Railway Station |
| Date of Inspection | 23-10-2019 |

| PART 1 GENERAL INFORMATION AND OBSERVATION | | |
|---|---|---|
| 1.1 | Name of the Bridge | FOB/ PLATFORM-1 TO CIRCILATING AREA |
| 1.2 | Location<br>Location co-ordinates | Chirala Railway Station<br>**15°49'52.1"N, 80°21'14.2"E** |
| 1.3 | Type of truss Structure | Pratt Truss ("N" Type Truss) |
| 1.4 | Year of Construction | Not available |
| 1.5 | Description of the main use of the bridge | Pedestrians Crossing |
| 1.6 | Major Materials used in different parts of bridge | a. Structural Steel (Truss, frame),<br>b. Cast in-Situ RCC Slab (Floor slab)<br>c. Pre-cast RCC Slab panels (Staircase) |
| 1.7 | Width of the Pathway (m) | Span 1 & 2 = 2.2 m<br>Span 3 = 1.8 m |
| 1.8 | Length of the Pathway (m) | 60.76 m |
| 1.9 | No of Railway Lines Crossings | **5 tracks**<br>Span 1 = 1 no's<br>Span 2 = 2 no's<br>Span 3 = 2 no's |
| 1.10 | Span arrangement (no x Span in meters) | 1 x 16.15 m + 1 x 19.35 m + 1 x 28.65 m = 64.15 m |
| 1.11 | Vertical Clearance (from rail top to girder bottom) | 6.77 m |
| 1.12 | Head Room | 2.65 m |
| 1.13 | Damages due to accidental hitting, Grazing Marks | No Visible signs appear |
| 1.14 | History of Repair/ Maintenance | Patch work observed in the staircase-2 Landing |
| 1.15 | Original Structural Drawings | Not available |

1.16 Key Plan




| PART 2 IDENTIFICATION OF LOADS ON BRIDGE | | | |
|---|---|---|---|
| | | **Yes/No** | **Notes** |
| | **Dead Loads at Roof level** | | |
| 2.1 | a) Pipeline - Utilities | Yes | Two nos. of 1-inch CPVC utility pipeline, observed in 1st span |
| | b) Cables | Yes | a. Cables are in 1-inch HDPE pipe of 5 Nos., 1-inch PVC pipe of 5 Nos. & 1.5-inch CPVC pipe of 2 Nos. supported on Roof Truss. (Refer ***fig :3*** ) b. King post of 65 x 65 x 8 mm Angles are used as Roof truss (Refer ***fig :2*** ) c. Metal Sheet is used for Roof (Refer ***fig : 2*** ) |
| | c) Roof Truss | Yes | |
| | d) Roof Sheet | Yes | |
| | e) load of advertising hoarding | Yes | |
| | f) load of train/coach display boards | Yes | display boards are provided |
| | g) Electrical equipment (OHE), signal | No | No electrical equipment and signal are provided |
| 2.2 | **Dead Loads at Floor level** | | |
| | a) Additional wearing coat on Floor | Yes | Chequered tiles used for Flooring (Refer ***fig :2***) |
| | b) Provision of protective screen for passengers | Yes | Fence made of galvanized wire of 2 mm gauge and 2 mm galvanized sheet is used above OHE Line on both side of pathway is used for passengers Protection. (Refer ***fig :2***) |
| | c) Type of Material used for mesh | GI wire mesh | |

| | PART 3 STRUCTURAL SYSTEM OF THE BRIDGE | | |
|---|---|---|---|
| | | | **Notes** |
| 3.1 | **Foundation details** | | Not visible at site |
| 3.2 | **Pedestals** | | |
| | Trestles Connection Details | Bolted Connections | |
| | No. of HD Bolts and size | 6 Nos. with 25mm Dia. Bolts | |
| | Thickness of Base Plate | 35 mm | |
| 3.3 | **Roof Truss** | | |
| | Element of roof truss section | | King post of 65 x 65 x 6 mm Angle sections are used for roof truss supported on Vertical members of 100 x 100 x 10 mm Double Angle section (Refer ***fig : 2***) |
| | Size of roof truss | | |
| | Connection of Roof elements | | |
| | | | |
| 3.4 | **Steel Truss** | | |
| | Type /Shape of Truss Section | Rail & Double Angle section | **Span 1 & 2**<br>a) Top & Bottom Chord members are 100 x 100 x 10 mm Double Angle Sections. (Refer ***fig : 5***)<br>b) 100 x 100 x 10 mm Double Angle sections are used as vertical and diagonal members.<br>c) 130 x 130 x 10 mm Double Angle sections and 100 x 100 x 10 mm Double Angle sections are used as Floor beams.<br>d) Bottom Lateral Bracings 100 x 100 x 10 mm Angle sections in Zigzag and cross pattern are used<br><br>**Span 3**<br>e) Top and bottom Chord members are 130 x 130 x 10 mm Double Angle sections (Refer ***fig : 5***)<br>f) 70 x 70 x 10 mm double Angle sections are used as vertical and diagonal members.<br>g) 130 x 130 x 10 mm double Angle sections are used as Floor beams.<br>h) Bottom Lateral Bracings 65 x 65 x 6 mm Angle sections in Zigzag pattern are used |
| | Height of Girder/Truss (H) | 1.90 m | |
| | Truss Support Condition | Rigid Connection | |
| | Type/Shape of Floor beam /Bracings | Single & Double Angle Sections | |
| | No of Floor beams/bracings | Span 1 = 4 No's<br>Span 2 = 3 No's<br>Span 3 = 7 No's | |
| | Arrangement of Bracings | Cross bracing | |
| | Type of Beam-Column Joint (shape of gusset plate if any) | Cleat Angle | |
| 3.5 | **COLUMN** | | |
| | Type/Shape of Column section | ISMB-300 & ISMB-350 | a. Spans 1 is supported on trestles whereas Span-2 & 3 is supported on trestles and Stanchion.<br>b. Trestles Columns are ISMB-350 sections. (Refer ***fig : 4***)<br>c. Stanchion-column are ISMB-350 & ISMB-300 Sections (Refer ***fig : 4***) |
| | No of Columns/ support | 4, 2 | |
| | Dimensions of Column | | |
| | BEAM-Column joint (bolted, welded, riveted) | Bolted | |

| | | | |
|---|---|---|---|
| 3.6 | **Floor of the Pathway** | | |
| | Material of Slab | Cast In-situ RCC Slab | a. Cast In-situ concrete slab is used for floor slab of 80 mm thick, RCC slab is resting on Floor beams, which are supported on Bottom chord member. |
| | Thickness of Slab | 80 mm | |
| | Condition of Slab from Bottom | Not Visible, Covered with Sacrificial Plate | |
| | Condition of Slab from Top | Not Visible, Covered with Chequered Tiles | |
| 3.7 | **Staircase Details** | | |
| | Number of Staircase | 6 No's | Staircases are observed as Pre cast RCC Slab panels supported on 75 x 75 x 8mm Angle section, 50 x 80 x 80 mm Rail section as tie beams and ISMC -250, 50 x 80 x 80 mm Rail sections as Stringer beam on both sides of stair cases. |
| | Number of Steps from Platform – 1A | 40 no's | |
| | Number of Steps from Platform – 1B | 40 no's | |
| | Number of Steps from Platform – 2A | 38 no's | |
| | Number of Steps from Platform – 2B | 41 no's | |
| | Number of Steps from Platform – 4 | 41 no's | |
| | Number of Steps from Circulating Area | 40 no's | |
| | Material used for steps | Pre-cast RCC Slab Panel | |
| | | | |
| 3.8 | **Staircase Railing** | | |
| | Type of Parapet Railing | Steel Railing | Staircase is provided with railing on both sides using 65 x 65 x 8mm Angle section and 50 x 6 mm M.S Flats are used. |
| | Height of Railing | 1.15 m | |
| | | | |

| PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES | |
|---|---|
| 4.1 | ✓ Exposed reinforcement is observed on Pre-cast RCC steps. |

a) Reinforcement exposed in slab panels

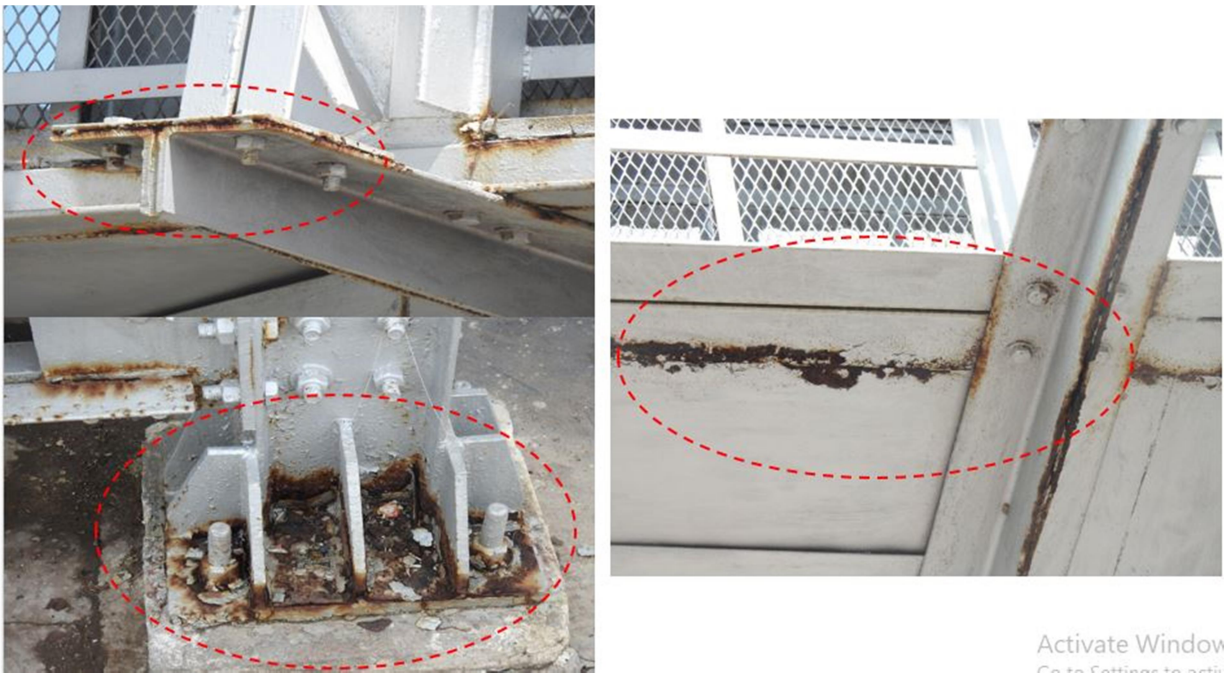
b) Spalling and cracks on staircase steps

| | |
|---|---|
| 4.2 | ✓ Leaching effect and Cracks are observed on Pre-cast slab panels. |

a) Cracks are observed on Pre-cast steps

b) Leaching effect on staircase pre cast slab panels

| | |
|---|---|
| 4.3 | ✓ Corrosion observed at floor beams, base plates and sacrificial plates. |




(a) Corrosion observed at floor beams, base plates & sacrificial plates

| PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES | | | |
|---|---|---|---|
| | **Defects** | **Location** | **Notes** |
| | Cracking in Steel Members | | No cracks are observed in Steel during visual inspection |
| | Cracking in RCC components | Slab panels | Cracks are observed in Pre-cast RCC slab panels of stair cases ***(***Refer ***Part 4.1)*** |
| | Water seepage | | Seepage observed in the slab panels of stair cases |
| | Spalling | | Spalling is observed in staircase-pre-cast panels. ***(***Refer ***Part 4.1)*** |
| | Rust straining | | Slight rusting is observed at all the joints of FOB at floor level |
| | Corrosion in Gusset plate | Floor level | corrosion is observed in Sacrificial Plates |
| | Corrosion at steel-Concrete joint | | corrosion is observed at steel concrete joints along length of FOB |
| | Condition of Painting of steel structure | | Painting is affected only at distressed places |

***Fig 1***: Front view of FOB span 1&3

***Fig 2***: FOB pathway, protective screen

***Fig 3***: Additional loads of PVC pipes

***Fig 4***: Stanchion column sections details

***Fig 5***: Bottom view of FOB

***Fig 6***: Patch work is observed at slab panels of stair case landing

***Fig 7***: Lift connected to Trestle at Plat form 2

***Fig 8***: Lift connected to Trestle at Plat form 4

***Fig 9***: Inspection Team at Chirala FOB