

Name of the Project	:	VISUAL INSPECTION OF FOB/ PF-1 - PF-2 AT CHINNAGANJAM RAILWAY STATION
Location	:	CHINNAGANJAM RAILWAY STATION
Location Co-ordinates	:	15°41'23.5"N 80°14'12.6"E
Date of Inspection	:	03rd NOVEMBER, 2019



Summary:

- Exposed reinforcement and cracks are observed on Pre-cast RCC steps of staircase at platform 2.
- Deformations are observed at Tie beam of Mid landing and at Floor Slab between two floor beams of Span 1 and 2.
- Corrosion is observed at all Floor beams of FOB.
- Exposed reinforcement and Spalling is observed at Pathway Staircase in Span 1 and span 2.
- Corrosion is also observed at Cleat angles of Pathway staircase and Steel concrete joints of FOB.
- Patch work is observed at PF-1 and 2 stair case slab panels.

Tests to be conducted:

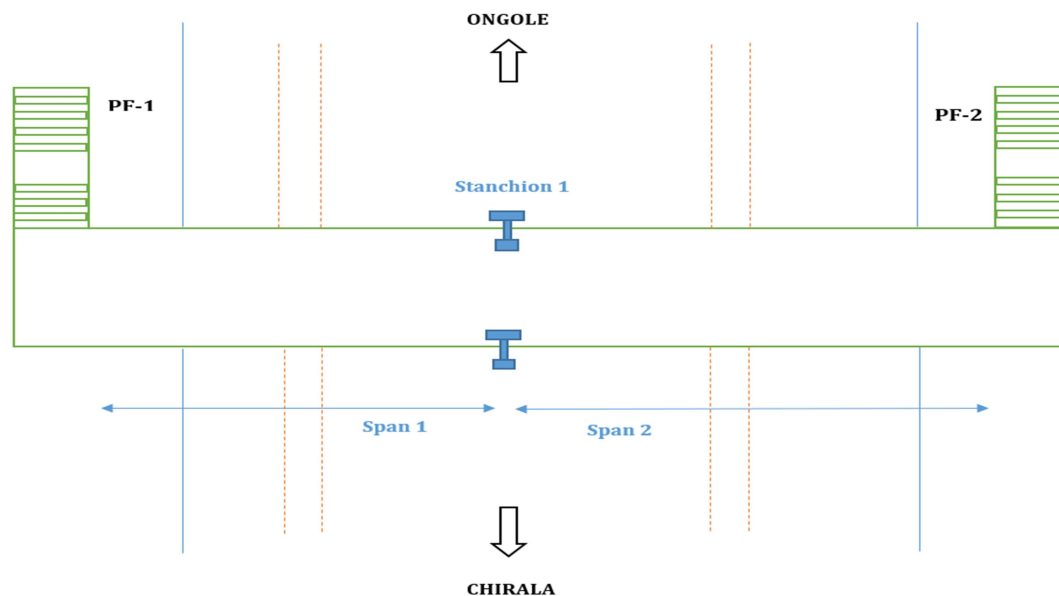
- Ultrasonic Thickness gauge to measures local thickness of a solid element.
- Elcometer (Coating thickness Gauge) to measures dry film thickness on steel surfaces.
- Ultrasonic Flaw detector to detect hidden cracks, voids, porosity, and other internal discontinuities in metals.
- Fillet weld gauge to measures the size of the weld.
- Profometer Test for concrete cover and diameter of rebar.
- Rebound Hammer test surface strength of concrete (For Pre-cast slab panels and staircase)

VISUAL INSPECTION OF FOOT OVER BRIDGE

Name of the Project	Visual inspection of FOB/ PF-1 - PF-2 at Chinnaganjam railway station
Location	Chinnaganjam Railway Station
Date of Inspection	03-11-2019

PART-1 GENERAL INFORMATION AND OBSERVATION		
1.1	Name of the Bridge	FOB/ PF-1 - PF-2
1.2	Location Location co-ordinates	Chinnaganjam Railway Station 15°41'23.5"N 80°14'12.6"E
1.3	Type of truss Structure	Warren Truss
1.4	Year of Construction	1955
1.5	Description of the main use of the bridge	Pedestrians Crossing
1.6	Major Materials used in different parts of bridge	a. Rail Structural Steel (Truss, frame), b. Pre-cast RCC Slab panels (Staircase), RCC Cast In situ Slab (Floor slab)
1.7	Width of the Pathway (m)	1.82 m
1.8	Length of the Pathway (m)	16.12 m
1.9	No of Railway Lines Crossings	2 tracks Span 1 = 1 Span 2 = 1
1.10	Span arrangement (no x Span in meters)	1 x 8 m + 1 x 8 m = 16.0 m
1.11	Vertical Clearance (from rail top to girder bottom)	6 m
1.12	Head Room	2.40 m
1.13	Damages due to accidental hitting, Grazing Marks	No Visible signs appear
1.14	History of Repair/ Maintenance	Patch work observed
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	No	Not observed in site
	b) Cables	Yes	a. Cables are protected with 1-inch HDPE pipe, 1.5-inch GI pipe supported on Top Chord, 1-inch PVC pipe supported on Roof Truss. (Refer fig :3)
	c) Roof Truss	Yes	b. Common Rafter Truss of 75 x 75 x 6 mm Angles are used as Roof truss (Refer fig :2)
	d) Roof Sheet	Yes	c. Metal Sheet is used for Roof (Refer fig : 2)
	e) load of advertising hoarding	No	
	f) load of train/coach display boards	No	No train coach 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	Only 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	Trestles	Not visible at site
	Trestles Connection Details	

	No. of Bolts and size		
	Thickness of Base Plate	Not visible at site	
3.3	Roof Truss		
	Element of roof truss section	Angle section	Common Rafter Truss of 75 x 75 x 6 mm Angles are used as Roof truss supported on Vertical members of 75 x 75 x 6 mm Angle section (Refer fig : 2)
	Size of roof truss	2.45 x 0.76 m	
	Connection of Roof elements	Welded	
3.4	Steel Truss		
	Type /Shape of Truss Section	Warren truss with NG Rail	a) Top and bottom Chord members are 50 x 80 x 80 (Head x Height x Base) Rail section (Refer fig : 1) b) 50 x 80 x 80 mm Rail section are used as diagonal bracing members. c) 50 x 80 x 80 mm Rail sections are used as Floor beams supported with Knee bracings 50 x 80x 80 mm rail section. d) Bottom Bracings 50 x 80 x 80 Rail section in Zig-zag pattern are used.
	Height of Girder/Truss (H)	1.69 m	
	Truss Support Condition	Rigid connection	
	Type/Shape of Floor beam /Bracings	Rail section	
	No of Floor beams/bracings	Span 1 = 7 No's Span 2 = 7 No's	
	Arrangement of Bracings	Zig-Zag bracing	
	Type of Beam-Column Joint (shape of gusset plate if any)	Cleat angle	
3.5	COLUMN		
	Type/Shape of Column section	Built up Section with Bull Headed Rail	a. FOB is supported on vertical column of 2 Rail section 65 x 130 x 65, with bracings of 65 x 130 x 65 Rail section b. Trestles 1 and 3 have 4 columns whereas Trestles 2 (Stanchion) had only 2 columns. (Refer Fig 4) c. Stanchion column has built up section of 2 rail sections 65 x 130 x 65mm with bracings of 65 x 130 x 65 Rail section and 65 x 65 x 8 mm angle section (Refer fig : 4) d. Staircase landing is supported by 2 Rail section of 65 x 130 x 65mm, with bracings of 65 x 130 x 65 Rail section (Refer fig : 6)
	No of Columns/ support	4, 2	
	Dimensions of Column	130 x 135 mm	
	BEAM-Column joint (bolted, welded, riveted)	Bolted	
3.6	Floor of the Pathway		
	Material of Slab	RCC	a. Cast in-situ Reinforced concrete slab is used for floor slab of 75 mm thick, RCC slab covered by Sacrificial Plate is resting on Floor beams. b. Chequered tile flooring is laid on the top of the Pre-cast slab panels.(Refer fig : 2)
	Thickness of Slab	75 mm	
	Condition of Slab from Bottom	RCC slab is not visible, Covered with Sacrificial plate	

	Condition of Slab from Top	RCC slab is not visible, Covered with Chequered tile flooring	
3.7	Staircase Details		
	Number of Staircase	2 No's	Staircase is observed as Pre cast RCC Slab panels supported on 50 x 80 x 80mm Rail Stringer beam on both sides of stair case. 50 x 80 x 80mm Rail tie beam are used. (Refer fig : 5)
	Number of Steps from PF – 1	29 no's	
	Number of Steps from PF – 2	27 no's	
	Material used for steps	Pre-cast RCC Slab	
3.8	Staircase Railing		
	Type of Parapet Railing	Steel Railing	Staircase is provided with railing on both sides using 50 x 80 x 80 Rail section and 50 x 6 mm M.S flats are used. (Refer fig : 6)
	Height of Railing	1.3	

PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES

- 4.1 ✓ Exposed Reinforcement, cracks and vegetation is observed on Staircase 1 &2.



a) Cracks and exposed reinforcement observed in Staircase 2 slabs



b) Vegetation, corrosion at cleat angles and cracks observed at staircase Span 1



c) Exposed Reinforcement, vegetation and corrosion at cleat angles observed at staircase Span 2

4.2

✓ Corrosion observed at floor beams on 1st & 2nd span



a) Corrosion observed at floor beams on Span-2



b) Corrosion observed at floor beams in landing and Stringer beams in Staircase 1



c) Corrosion observed at floor beams in landing and Stringer beams in Staircase 2



d) Deformation at slab panels on Span-1

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 case. (Refer Part 4.1 a, b)
	Water seepage		No visual signs appear.
	Deformation	Floor Slab, Staircase (PF-2)	Deformation is observed at Tie beam of Mid Landing and Floor Slab between floor beams. (Refer Part 4.2, fig:d)
	Spalling		Spalling is observed in -pre-cast steps of staircase. (Refer Part 4.1 a, c)
	Rust straining		Rusting is observed at all the joints of FOB at floor level and staircase.
	Corrosion	Floor level	Major Corrosion is observed at all the Floor Beams of FOB. (Refer Part 4.2)

	Corrosion at steel-Concrete joint		corrosion is observed at steel concrete joint along length of FOB (Refer <i>Part 4.2 c</i>)
	Condition of Painting of steel structure		Painting is affected at distressed places.



Fig 1(a): Front view of FOB span 1 &2



b) Bottom view of FOB



Fig 2: FOB span 1 & 2 pathway, additional wearing coat, protective screen



Fig 3: Additional loads of HDPE, PVC pipes



Fig 4: Trestles, Stanchion column Rail sections details.



Fig 5: Patch work is observed at PF- 2 stair case steps



Fig 6: Railing Details



Fig 7: Inspection Team at Chinnaganjam FOB