

Name of the Project	:	VISUAL INSPECTION OF FOB/ PF-1 – CIRCULATING AREA AT RAGHAVAPURAM RAILWAY STATION
Location	:	RAGHAVAPURAM RAILWAY STATION
Location Co-ordinates	:	18°40'53.5"N 79°24'41.2"E
Date of Inspection	:	26th September 2019



Summary:

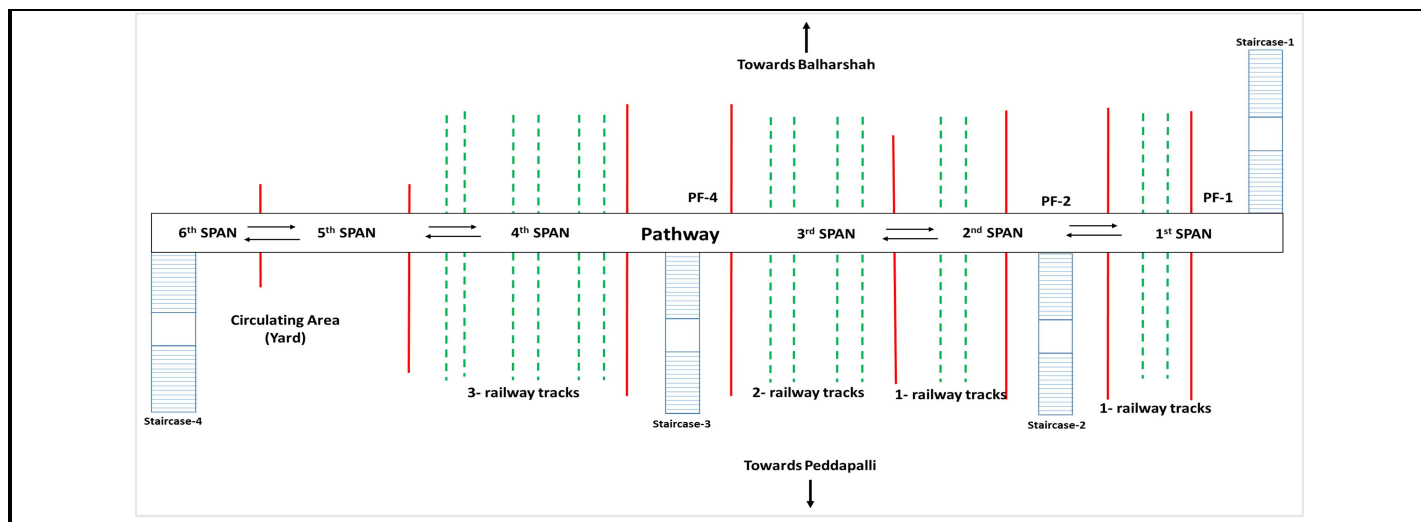
- a) Corrosion is observed in bottom chord member (Double angle section), gusset plate joints connecting floor beam.
- b) Corrosion observed in floor beams and bottom chord members at 3rd, 4th and 5th span of FOB.
- c) Corrosion and vegetation is observed along the span of FOB.

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)

Name of the Project	Visual inspection of FOB/ PF-1 - PF-4 at Raghavapuram Railway Station
Location	Raghavapuram Railway Station
Date of Inspection	26 th September 2019

PART 1 GENERAL INFORMATION AND OBSERVATION			
1.1	Name of the Bridge	FOB/ PF-1 – circulating area	
1.2	Location Location co-ordinates	Raghavapuram Railway Station 18°40'53.5"N 79°24'41.2"E	
1.3	Type of truss Structure	N – type Pratt truss	
1.4	Year of Construction, Maintenance History	Not available	
1.5	Description of the main use of the bridge	Pedestrians Crossing	
1.6	Type of Materials used in different parts of bridge	a. Structural Steel (Frame, truss) b. RCC Slab (Floor slab, staircase steps)	
1.7	Width of the Pathway (m)	2.35 m	
1.8	Length of the Pathway (m)	78.4 m	
1.9	No of Railway Lines Crossings	7 tracks Span 1 = 1 tracks Span 2 = 1 tracks	Span 3 = 2 tracks Span 4 = 1 tracks Span 5 = 2 tracks
1.10	Span arrangement (no x Span in meters)	1x9.5 m + 1x7.75 m+ 1 x14.95 m + 1x10.39 m+1x19.3 m+1x4.97 m	
1.11	Vertical Clearance (from rail top to girder bottom)	6.453 m	
1.12	Head Room	No roof truss	
1.13	Damages due to accidental hitting, Grazing Marks	Yes (due to hitting by road vehicles at coal siding) (Refer <i>fig :6</i>)	
1.14	History of Repair (if any...)	Not observed	
1.15	Original Structural Drawings	Not available	
1.16 Key Plan			



FORMAT FOR VISUAL INSPECTION OF STEEL FOOT OVER BRIDGE

PART 2 IDENTIFICATION OF LOADS ON BRIDGE			
		Yes/No	Photo ID
2.1	Dead Loads at Roof level		
	a) Pipeline - Utilities	No	No pipe lines are observed at roof level. Two GI pipes of 2 inch dia with cables running on the floor. a. Cables are protected with 2-inch GI pipe. b. No advertising boards are provided. (Refer fig :1)
	b) Cables	Yes	
	c) Roof Truss	No	
	d) Roof Sheet	No	
	e) load of advertising hoarding	No	
	f) load of train/coach display boards	No	No train display boards are provided
	g) Additional load of overhead electrical equipment (OHE), Signal	No	No Additional load of overhead electrical equipment (OHE), Signal
2.2	Dead Loads at Floor level		
	a) Additional wearing coat on Floor	No	Chequered tiles are used for flooring (Refer fig :1) Chain link fence made of galvanized wire of 2 mm gauge and 2 mm galvanized sheet is used above OHE line on both side of gangway is used for protection (Refer fig :1)
	b) Provision of protective screen for passengers	Yes	
	c) Type of Material used for mesh	Galvanized wire mesh	

PART 3 STRUCTURAL SYSTEM OF THE BRIDGE			
			Photo ID
3.1	Foundation details		Not visible at site
3.2	Pedestals		
	Column – Trestles Connection Details		Concrete encasement is observed on vertical supports at platform level. (Refer fig :2)
	No of Bolts and size	Not visible, filled with concrete	
	Thickness of Base Plate	Not visible, filled with concrete	

3.3	Roof Truss		
	Element of roof truss section		No roof truss. Open to sky.
	Size of roof truss		
	Connection of Roof elements		
3.4	Steel Truss		
	Type/Shape of Girder Section	Double angle sections	a. Top and bottom Chord members are ISA 75 x 75 x 8 mm Double angle section. b. ISA 75 x 75 x 8 mm double angle section are used as vertical members and ISA 75 x 75 x 8 mm diagonal bracing members. c. 12 mm thick gusset plate is used for welded joint. d. ISA 100 x 100 x 10 mm are used as Floor beams supported with ISA 75 x 75 x 8 mm bracing connected by gusset plate. (Refer fig :3)
	Height of Girder/ Truss (H)	1.63m	
	Truss Support Condition	Rigid connection	
	Type/Shape of Floor beams /Bracings	Double angle sections	
	No of Floor beams/bracings for span	1 st span :7 no's 2 nd span: 5 no's 3 rd span :9 no's 4 th span: 7no's 5 th span: 11 no's 6 th span: 3 no's	
	Arrangement of Bracings	Diagonal	
	Type of Beam-Column Joint (shape of gusset plate if any)	Cleat angles	
3.5	COLUMN		
	Type/Shape of Column section	I – Section	a. FOB is supported on vertical column of Four - ISMB 300 with bracings of IAS 75 x 75 x 8 mm angle section. b. Staircase landing is supported on ISMB 200. (Refer fig :2)
	No of Columns per support	4	
	Dimensions of Column	300 x 150 mm	
	BEAM-Column joint (bolted, welded, riveted)	Bolted	
3.6	Floor of the Gangway		
	Material of Slab	Pre-cast panels and cast in situ slab	a. For 1 st span RCC slab cast in situ supported on sacrificial plate. b. For 2 nd to 6 th span Pre-cast Reinforced concrete slab panels are used for floor slab of 100 mm thick, RCC slab panels are resting on floor beams. c. Chequered tile flooring is laid on the top of the slab panels (Refer fig : 1 and 4)
	Thickness of Slab	100 mm	
	Condition of Slab from Bottom	Leaching effect	
	Condition of Slab from Top	RCC slab is not visible, Covered with Chequered tiles	
3.7	Staircase Details		
	Number of staircases	4 No's	a. Staircase steps are observed as cast in situ slab. Steps size of 300 x 100 mm are supported on ISMC 200 channel using sacrificial plate only at PF-1. Staircase landing of 2.54 m wide is supported on ISMC 250. b. Staircase steps are observed as Pre cast
	Number of steps from at PF-1	37 no's	
	Number of steps from PF – 2	41 no's	
	Number of steps from PF – 4	40 no's	
	Number of steps at 6 th span Circulating area	38 no's	

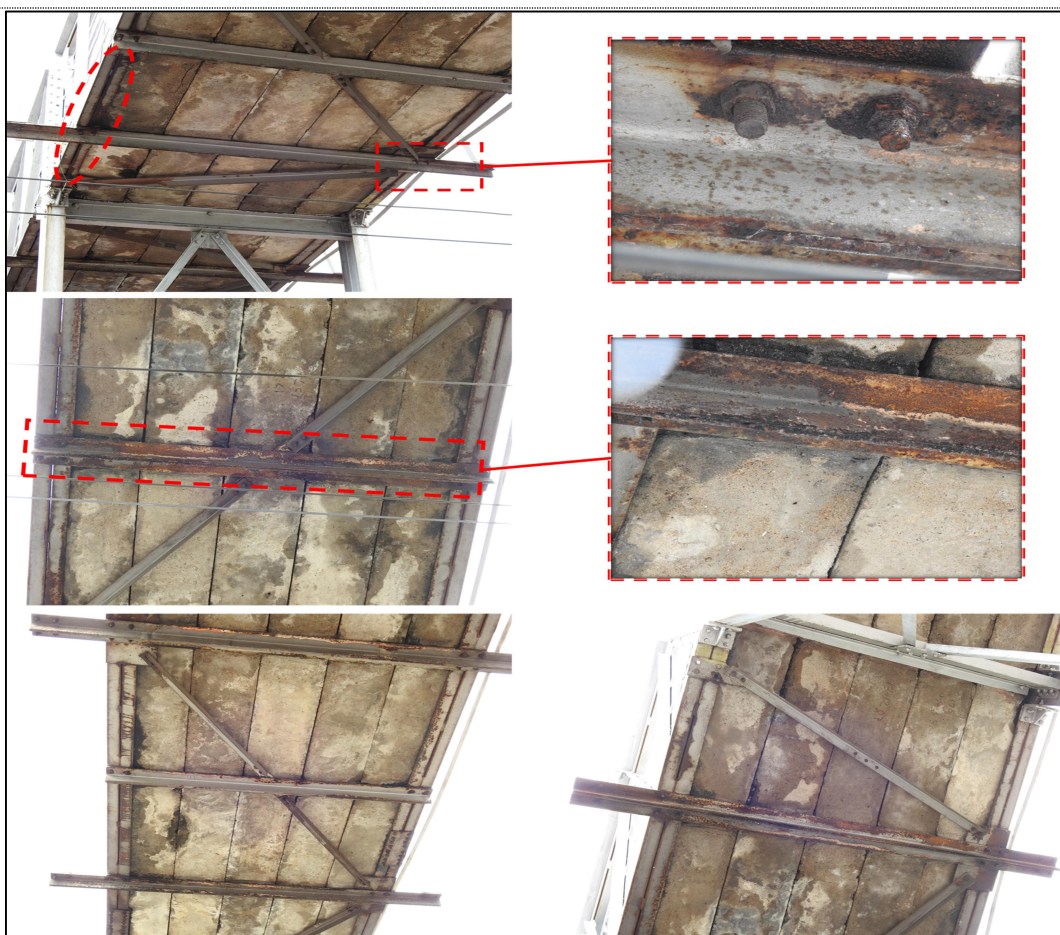
	Material used for steps	Pre cast slab panels and cast in situ slab	slab panels. Steps size of 300 x 100 mm are supported on ISMC 200 channel. Staircase landing of 2.54 m wide is supported on ISMC 250. (Refer fig :5)
3.8	Staircase Railing		
	Type of Parapet Railing	Steel railing	a. Staircase is provided with railing on both sides of one-meter height using ISA 75 x 75 x 10 mm angle section and 50 x 6 mm M.S flats are used. (Refer fig :5)
	Height of Railing	1 m	

PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES

- 4.1 ✓ Corrosion is observed in bottom chord member (Double angle section), gusset plate joints connecting floor beam



- 4.2 ✓ corrosion observed in floor beams and bottom chord members at 3rd, and 5th span of FOB



PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES			
	Defects	Location	
	Cracking in steel members		No cracks are observed in Steel during visual inspection
	Cracking in RCC components		No cracks are observed in Pre-cast RCC slab panels
	Water seepage		No water seepage is observed
	Spalling		No spalling is observed
	Rust straining	Bottom Chord members and floor beams joints	Rusting and corrosion is observed at joints of floor beam gusset plate connecting bottom chord is observed. (Refer Part 4 - 4.1 and 4.2)
	Extent Of Corrosion		
	Rusting in Gusset plate		Rusting is observed in Gusset plates (Refer Part 4 - 4.2)
	Corrosion at steel-Concrete joint		Corrosion is observed at steel concrete joint. (Refer fig :7)
	Condition of Painting of steel structure		Painting is affected at distressed places.

***Rust:** Rust is a part of corrosion and is a chemical process which results in the formation of red or orange coating on the surface of metals.

***Corrosion:** it is the process of deterioration of materials as a result of chemical, electrochemical or other reactions.



Fig 1: Cables, Flooring and protective screen



(a) Platform-1



(b) Platform-1 staircase landing



(c) Platform-2



(d) Platform-2 staircase landing



(e) Stanchion -1



(f) Platform-4 staircase landing





(g) Stanchion -2

(h) Stanchion -3

(i) circulating area (yard)

Fig 2: Trestles details



Fig 3: Chord members, Floor beams, vertical and diagonal bracings



Fig 4: Bottom view Slab panels



Fig 5: Staircase details



Fig 6: Accidental damage observed at stanchion in coal yard



Fig 7: Corrosion and vegetation