

Name of the Project	:	VISUAL INSPECTION OF FOB/ PF-1 – CIRCULATING AREA AT BELLAMPALLI RAILWAY STATION
Location	:	BELLAMPALLI RAILWAY STATION
Location Co-ordinates	:	19°03'07.0"N 79°29'11.3"E
Date of Inspection	:	25 th September 2019



Summary:

- a) Exposed reinforcement and leaching is observed at Pre-cast RCC slab panels at slab bottom of FOB.
- b) Corrosion observed in bottom chord member (ISMC 150 Double channel section) near concrete steel joint of FOB.
- c) Corrosion is observed at gusset plate joints and bottom chord double channel section and vegetation is also observed.

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)
- g) Vibration test

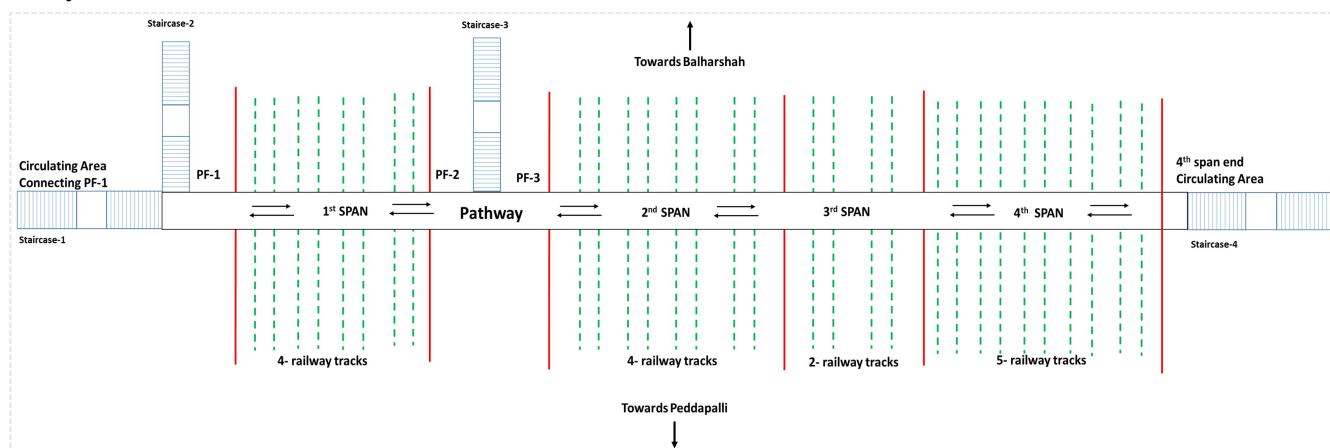
FORMAT FOR VISUAL INSPECTION OF STEEL FOOT OVER BRIDGE

Name of the Project	Visual inspection of FOB/ PF-1 – Circulating area (Yard) at Bellampalli Railway Station
Location	Bellampalli Railway Station
Date of Inspection	25 th September 2019

PART 1 GENERAL INFORMATION AND OBSERVATION

1.1	Name of the Bridge	FOB
1.2	Location Location co-ordinates	Bellampalli Railway Station 19°03'07.0"N 79°29'11.3"E
1.3	Type of truss Structure	Warren Truss with alternate verticals
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. Pre-cast RCC Slab panels (Floor slab, staircase steps)
1.7	Width of the Pathway (m)	1.95 m
1.8	Length of the Pathway (m)	97.35 m
1.9	No of Railway Lines Crossings	15 tracks Span 1 = 4 tracks Span 2 = 4 tracks Span 3 = 2 tracks Span 4 = 5 tracks
1.10	Span arrangement (no x Span in meters)	1x23.45 m + 1x24.28 m+ 1 x15.35 m + 1x27.50 m = 90.58 m
1.11	Vertical Clearance (from rail top to girder bottom)	5.185 m
1.12	Head Room	2.75 m
1.13	Damages due to accidental hitting, Grazing Marks	Yes (Damage due to accidental hitting) (Refer fig :6)
1.14	History of Repair (if any...)	Yes (Patch work are observed)
1.15	Original Structural Drawings	Not available

1.16 Key Plan



PART 2 IDENTIFICATION OF LOADS ON BRIDGE			
		Yes/No	Photo ID
	Dead Loads at Roof level		
2.1	a) Pipeline - Utilities	No	No pipe lines are observed
	b) Cables	Yes	a. Cables 1-inch pipe running in cable tray b. King post of ISA 65 x 65 x 6 mm are used c. Metal sheet is used for roof d. No advertising boards are provided. (Refer fig :1)
	c) Roof Truss	Yes	
	d) Roof Sheet	Yes	
	e) load of advertising hoarding	Yes	
	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)
	b) Provision of protective screen for passengers	Yes	Chain link fence made of galvanized wire of 2 mm gauge and 2mm galvanized sheet is used above OHE line on both side of pathway is used for protection (Refer fig :1)
	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		
	No of HD Bolts and size	Not visible, filled with concrete	Concrete encasement is observed in vertical supports at platform level. (Refer fig :2)
	Thickness of Base Plate	Not visible, filled with concrete	
3.3	Roof Truss		
	Element of roof truss section	ISA	Span roof truss is made with ISA 65 x 65 x 6 mm and supported on ISMC 150 Double channel section top chord member. (Refer fig :1)
	Size of roof truss	2.5 X 0.8 m	
	Connection of Roof elements	Bolted	
3.4	Steel Truss		
	Type/Shape of Girder Section	Double channel section	a. Main top and bottom Chord members are ISMC 150 Double channel section. b. ISMC 150 section are used as vertical and diagonal bracing members. c. 12 mm thick gusset plate is used for welded joint. d. Built-up section of ISMC 150 and ISA 65 x x65 8 mm are used as Floor beams supported with ISA 65 x 65 x 8 mm bracings
	Height of Girder/ Truss (H)	2.73 m	
	Truss Support Condition	Rigid connection	
	Type/Shape of Floor beams /Bracings	Built up section (ISA 65 x65 x 8mm and ISMC 150)	
	No of Floor beams/bracings	1 st span :13 no's	

	for span	2 nd span: 13 no's 3 rd span :9 no's 4 th span: 15 no's	riveted gusset plate. (Refer fig :3)
	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 10 mm double angle section.
	No of Columns per support	4	b. Staircase landing is supported ISA 100 x 100 x 12 mm star angle section at PF-1 and PF-2.
	Dimensions of Column	300x150 mm	c. Staircase landing is supported ISMB 200 at circulating area to PF-1.
	BEAM-Column joint (bolted, welded, riveted)	Bolted and riveted	d. Stanchion-1 and Stanchion-2 are built up section of ISMC 250 and ISMB 300. (Refer fig :2)
3.6	Floor of the Gangway		
	Material of Slab	Pre-cast panels	a. Pre-cast Reinforced concrete slab panels are used for floor slab of 125 mm thick, RCC slab panels are resting on Bottom chord ISMC 150 double channel section supported on Floor beams and bracing from bottom.
	Thickness of Slab	125 mm	b. Chequered tile flooring is laid on the top of the slab panels (Refer fig : 1 and 4)
	Condition of Slab from Bottom	Leaching and spalling	
	Condition of Slab from Top	RCC slab is not visible, Covered with Chequered tiles	
3.7	Staircase Details		
	Number of staircases	4 No's	Staircase steps are observed as cast in situ slab. Steps size of 300 x 100 mm are supported on ISMC 250 channel stringer beam. Staircase landing of 1.82 m wide is supported on ISMC 250. (Refer fig :5)
	Number of steps from Circulating area to PF-1	47 no's	
	Number of steps from PF – 1	34 no's	
	Number of steps from PF – 2	35 no's	
	Number of steps at 4 th span Circulating area	31 no's	
	Material used for steps	cast in situ slab	
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 double angle section and 50 x 6 mm M.S flats are used.
	Height of Railing	1 m	b. Staircase roof is supported with ISA 75 x75 x6 mm double angle section which is supported on ISMC 250. (Refer fig :5)

PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES

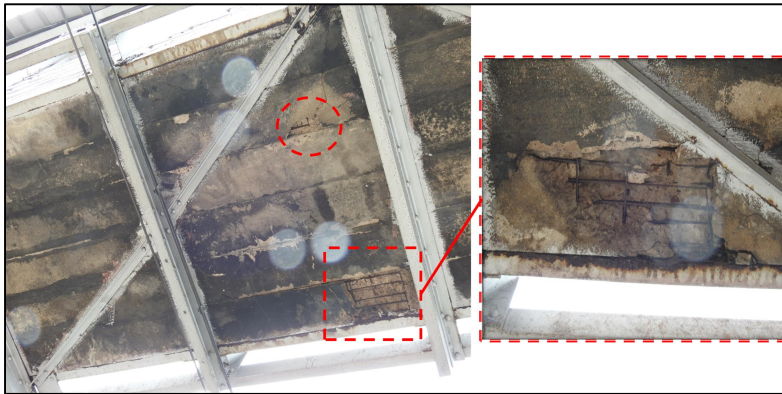
4.1 ✓ Exposed reinforcement and leaching is observed at Pre-cast RCC slab panels at slab bottom of FOB.



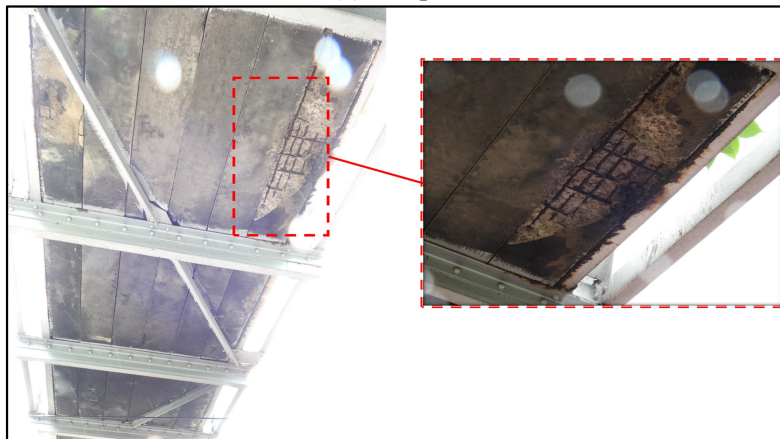
(a) Circulating area (Yard) landing



(b) 4th span



(c) 3rd span



(d) 1st span

- 4.2 ✓ Corrosion observed in bottom chord member (ISMC 150 Double channel section) near concrete steel joint of FOB.



Leaching and Cracks in Pre-cast panels of 1st span

- 4.3 ✓ Corrosion is observed at gusset plate joints and bottom chord double channel section and vegetation is also observed.



Corrosion and vegetation

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	Slab Panels	Cracks are observed in Pre-cast RCC slab panels in deck(Refer Part 4 - 4.1)
	Water seepage		No water seepage is observed
	Spalling	Spalling and reinforcement exposure	Spalling and reinforcement exposed in slab panels at 1 st , 2 nd and 3 rd span of FOB and 4 th span end circulating area landing. (Refer Part 4 - 4.1)
	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 - 4.3)
	Extent Of Corrosion		
	Rusting in Gusset plate		Rusting is observed in Gusset plates (Refer Part 4 - 4.3)
	Corrosion at steel-Concrete joint		Corrosion is observed at steel concrete joint. (Refer Part 4 - 4.3)
	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.



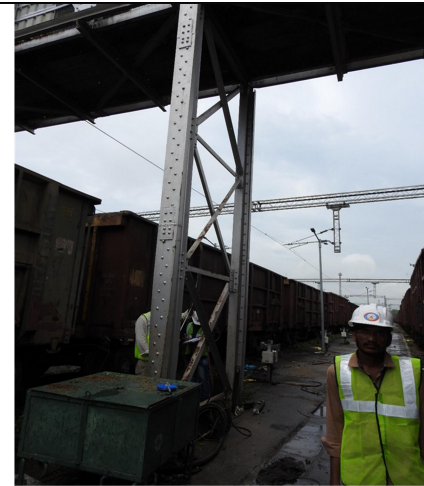
Fig 1: Cables, Roof truss, Flooring and protective screen



(a) Plat form -1



(b) Platform-2 staircase landing



(c) Stanchion-1



(d) Stanchion-2



(e) Circulating area

Fig 2: Trestles details



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



Fig 4: Bottom view Slab panels



Fig 5: Staircase details



Fig 6: Accidental damage observed at stanchion 1