

Name of the Project	:	VISUAL INSPECTION OF FOB/ PF-1 - PF-2 AT ELURU RAILWAY STATION
Location	:	ELURU RAILWAY STATION
Location Co-ordinates	:	16°43'05.09"N 81°07'12.0"E
Date of Inspection	:	19th OCTOBER, 2019



Summary:

- a) Exposed reinforcement is observed on Pre-cast RCC slab panels of Span 1, Span 2 and staircase panels at platform 1.
- b) Deformations are observed at Trestle column of PF-1, Floor beam in Span-1.
- c) Corrosion is observed at Bottom chord members of both spans.
- d) Reinforcement exposure & Spalling is observed at PF-1 Main landing panels and Slab Panels.
- e) Patch work is observed at PF-2 stair case flight slab panels.
- f) Vibrations are observed in 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.

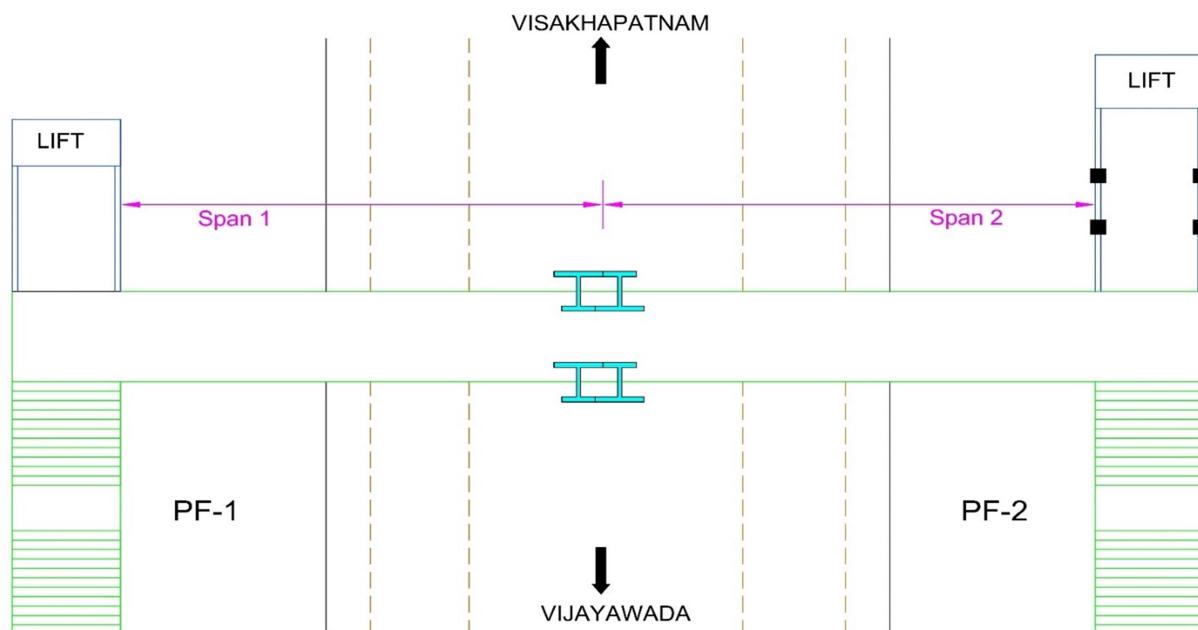
- f) Rebound Hammer test surface strength of concrete (For Pre-cast slab panels and staircase)

VISUAL INSPECTION OF STEEL FOOT OVER BRIDGE

Name of the Project	Visual inspection of FOB/ PF-1 - PF-2 at Eluru railway station
Location	Eluru Railway Station
Date of Inspection	19-10-2019

PART 1 GENERAL INFORMATION AND OBSERVATION		
1.1	Name of the Bridge	FOB/ PF-1 - PF-2
1.2	Location Location co-ordinates	Eluru Railway Station 16°43'05.9"N 81°07'12.0"E
1.3	Type of truss Structure	Warren Truss (with NG Rails)
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. Rail (Truss, frame), b. Pre-cast RCC Slab panels (Floor slab, Staircase)
1.7	Width of the Pathway (m)	2.5 m
1.8	Length of the Pathway (m)	16.12 m
1.9	No of Railway Lines Crossings	2 tracks Span 1 = 1 track Span 2 = 1 track
1.10	Span arrangement (no x Span in meters)	1 x 7.75 + 1 x 7.808 m = 15.558 m
1.11	Vertical Clearance (from rail top to girder bottom)	6.45 m
1.12	Head Room	2.70 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 in 1-inch HDPE pipe of 2 No's, 1.5-inch HDPE pipe of 1 No's, 1-inch PVC pipe of 9 No's and 1-inch GI pipe of 2 No's supported on Roof Truss. (Refer fig :3) b. King post of 65 x 65 x 10 mm Angles are used as Roof truss (Refer fig :2) c. Corrugated Metal Sheet is used for Roof (Refer fig : 2) d. Advertising boards are provided (Refer fig : 3)
	c) Roof Truss	Yes	
	d) Roof Sheet	Yes	
	e) load of advertising hoarding	Yes	
	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	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		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	King post of 65 x 65 x 10 mm Angle sections are used for roof truss supported on Vertical members of 65 x 110 x 110 mm top chord Rail section (Refer fig : 2)
	Size of roof truss	2.45 x 0.76 m	
	Connection of Roof elements	Bolted	
3.4	Steel Truss		
	Type /Shape of Truss Section	Warren Truss (with NG Rails)	a) Top and bottom Chord members are 60 x 110 x 110 (Head x Web x Foot) Flat-bottom Rail section (Refer fig : 7) b) 60 x 110 x 110 mm Rail section are used as vertical and diagonal bracing members. c) 60 x 110 x 110 mm Rail sections are used as Floor beams supported with Knee bracings 60 x 110 x 110 mm rail section. d) Bottom Lateral Bracings 60 x 110 x 110 Rail sections connected to bottom chord member using MS flat.
	Height of Girder/Truss (H)	1.84 m	
	Truss Support Condition	Rigid connection	
	Type/Shape of Floor beam /Bracings	Flat- Bottom NG Rail section	
	No of Floor beams/bracings	Span 1: 9 No's Span 2: 9 No's	
	Arrangement of Bracings	Bottom Laterals bracing	
	Type of Beam-Column Joint (shape of gusset plate if any)	Gusset plate	
3.5	COLUMN		
	Type/Shape of Column section	Bull headed Rail Section	a. FOB is supported on vertical column of 2 Rail section 70 x 140 x 135, with bracings of 75 x 75 x 6 mm angle section b. Trestles 1 and 3 have 4 columns where as Trestles 2 (Stanchion) have only 2 columns. (Refer 4.3 b). c. Stanchion column has built up section of 4 nos. rail sections 70 x 140 x 135mm up to a height of 2.8m and continued with 2 rails (Refer fig : 4) d. Staircase landing is supported by 2 nos. Rail section of 70 x 140 x 135mm, with bracings of 75 x 75 x 6 mm angle section (Refer fig :6)
	No of Columns/ support	4, 2	
	Dimensions of Column	140 x 200 mm	
	BEAM-Column joint (bolted, welded, riveted)	Bolted	
3.6	Floor of the Pathway		
	Material of Slab	Pre-cast slab panels	a. Pre-cast Reinforced concrete slab panels are used for floor slab of 80 mm thick, RCC slab panels are resting on Floor beams, which are supported on Bottom chord member and bottom lateral bracings. (Refer fig :9)
	Thickness of Slab	80 mm	
	Condition of Slab from Bottom	Spalling is observed	
	Condition of Slab from Top	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 60 x 110 x 110mm Rail tie beam and 60 x 110 x 110mm Rail Stringer beam on both sides of stair case. (Refer fig : 6)
	Number of Steps from PF – 1	39 no's	
	Number of Steps from PF – 2	36 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 60 x 110 x 110 Rail section and 50 x 6 mm M.S flats.
	Height of Railing	1.3 m	

PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES

4.1 ✓ Exposed reinforcement is observed on Pre-cast RCC slab panels of Span 1, Span 2 and staircase panels.



(a) Exposed reinforcement, concrete spalling



(b) Exposed reinforcement and cracks in steps

4.2	✓ Loss of Effective thickness is observed in floor beams, bottom bracings joints due to corrosion.
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(a) Corrosion observed at floor beams



(b) Corrosion observed at Bottom chord and bracings joints.



(c) Rusting and corrosion at Bottom chord



(d) Rusting and corrosion at top chord

4.3	✓ Deformation is observed at floor beam of span 1 and Trestle column in span 1.
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(a) Deformations in floor beam of 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	Staircase and bottom slab panels	Cracks are observed in Pre-cast RCC slab panels of stair case.
	Water seepage		No visual signs appear.
	Spalling	Staircase	Spalling is observed in Slab panels and in staircase-pre-cast panels.
	Rust straining	Top and bottom chord	Slight rusting is observed at all the joints of FOB at floor level
	Corrosion in Gusset plate	Floor level	corrosion is observed in Gusset plates
	Corrosion at steel-Concrete joint		No Major corrosion is observed at steel concrete joint along length of FOB
	Condition of Painting of steel structure		Painting is affected only at distressed places.



Fig 1: Front view of FOB



Fig 2: FOB span 1 & 2 pathway, Roof Truss, Chequered tiles, protective screen and Hoardings



Fig 3: Additional loads of HDPE, PVC pipes



Fig 4: Stanchion Rail sections details



Fig 5: Lift is connected to staircase landing in both platforms



Fig 6: Unable to inspect under stair case due to existing rooms below Stair case flight,



Fig 7: Bottom view of FOB



Fig 8: Patch work is observed at PF-2 stair case flight slab panels



Fig 9: Bottom view of FOB and details of floor slab



Fig 10: Inspection Team at Eluru FOB