Name of the Project	:	VISUAL INSPECTION OF FOB/ PF-1 - PF-4 AT KRISHNA CANAL RAILWAY STATION
Location	:	KRISHNA CANAL RAILWAY STATION
Location Co-ordinates	:	**16°28'37.20"N 80°36'20.80"E**
Date of Inspection	:	21st OCTOBER, 2019

Summary:

a) Exposed reinforcement is observed on Stair case main landing in all platforms and Span-3.
b) Cracks & spalling observed in pre cast slab panels throughout the length.
c) Floor beams gusset plate is corroded in Span 1, 2 & 3.
d) Rusting on floor beams & bottom chord.
e) Leaching and cracks are observed on along the length.

Tests to be conducted:

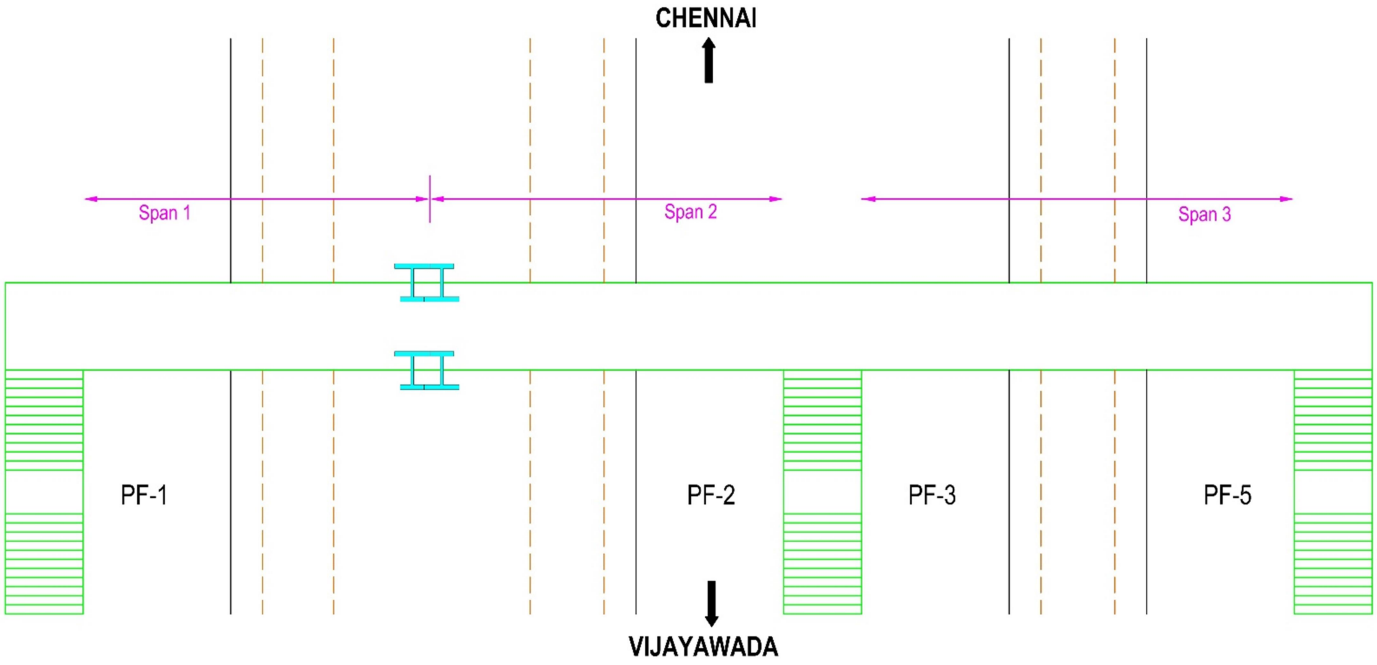
a) Ultrasonic Thickness gauge to measures local thickness of a solid element.
b) Elcometer (Coating thickness Gauge) to measures dry film thickness on steel surfaces.
c) Ultrasonic Flaw detector to detect hidden cracks, voids, porosity, and other internal discontinuities in metals.
d) Fillet weld gauge 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-4 at Krishna Canal Railway Station
Location	Krishna Canal Railway Station
Date of Inspection	21-10-2019

PART 1 GENERAL INFORMATION AND OBSERVATION		
1.1	Name of the Bridge	FOB/ PF-1 to PF-4
1.2	Location Location co-ordinates	Krishna Canal Railway Station 16°43'05.9"N, 81°07'12.0"E
1.3	Type of truss Structure	Warren Truss with verticals (fabricated with NG Rail)
1.4	Year of Construction	1962
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)	1.63 m
1.8	Length of the Pathway (m)	**30.86 m**
1.9	No of Railway Lines Crossings	**3 tracks** Span 1 = 1 Span 2 = 1 Span 3 = 1
1.10	Span arrangement (no x Span in meters)	1 x 7.5 + 1 x 8 + 1x 9.25 m = 24.75 m
1.11	Vertical Clearance (from rail top to girder bottom)	6.223 m
1.12	Head Room	2.78 m
1.13	Damages due to accidental hitting, Grazing Marks	No Visible signs appear
1.14	History of Repair/ Maintenance	Repair of Slab panels, Staircase & roof truss (2016)
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	
	b) Cables	Yes	a. Cables in 1-inch HDPE pipe of 2 No's, 1.5-inch HDPE pipe of 2 No's, 0.7-inch HDPE pipe of 2 No's, 2-inch PVC pipe of 1 No's, 2.5-inch GI pipe of 1 No's and 4 inch GI pipe of 1 No's supported on Roof Truss. (Refer ***fig :2***) b. 2 inch GI Pipe supported on Truss c. King post of 65 x 65 x 12 mm Angles are used as Roof truss (Refer ***fig :2***) d. Steel Metal Sheet is used for Roof (Refer ***fig : 2***)
	c) Roof Truss	Yes	
	d) Roof Sheet	Yes	
	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	No	Only Slab panels observed
	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	King post	King post of 65 x 65 x 12 mm Angle sections are used for roof truss supported on Vertical members of 100 x 100 x 12 mm angle section (Refer ***fig : 2***) subsequently erected on the FOB.
	Size of roof truss	1.85 x 0.67 m	
	Connection of Roof elements	Welded	
3.4	**Steel Truss**		
	Type /Shape of Truss Section	Warren Truss (NG Rail section)	a) Top and bottom Chord members are 45 x 100 x 100 (Head x Height x Base) Rail section(Refer ***fig : 6***) b) 50 x80 x 80 mm Rail section are used as diagonal bracing members. c) 50 x80 x 80 mm Rail sections are used as Floor beams supported with Knee bracings 50 x 80x 80 mm rail section. d) Bottom Lateral Bracings 50 x 80 x 80 Rail section in Zig-zag pattern are used.
	Height of Girder/Truss (H)	1.68 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 Span 2 = 8 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	Bull headed Rail Section	a. FOB is supported on vertical column of 2 Rail section 65 x 130 x 65, with bracings of 65 x 65 x 10 mm angle section. b. Trestles 1, 3 and 4 have 4 columns whereas Trestles 2 (Stanchion) have only 2 columns. c. Trestle 2 (Stanchion column) and Trestle 3 has built up section of 4 rail sections 65 x 130 x 65mm up to a height of 2.94 and 2.25 m respectively and continued with 2 rails (Refer ***fig : 4, 5***). d. Staircase landing is supported by 2 Rail section of 65 x 130 x 65mm.
	No of Columns/ support	4, 2-stanchion	
	Dimensions of Column	140 x 200 mm	
	BEAM-Column joint (bolted, welded, riveted)	Welded	
3.6	**Floor of the Pathway**		

	Material of Slab	Pre-cast slab panels	Pre-cast Reinforced concrete slab panels are used for floor slab of 75 mm thick, RCC slab panels are resting on Floor beams, which are supported on Bottom chord.
	Thickness of Slab	75 mm	
	Condition of Slab from Bottom	Leaching, cracks and Spalling is observed	
	Condition of Slab from Top	Cracks and no proper plastering at panel joints	
3.7	**Staircase Details**		
	Number of Staircase	3 No's	Staircase is observed as In-situ RCC Slab supported on 50 x 90 x 90mm Rail Stringer beam. (Refer ***fig : 7***)
	Number of Steps from PF – 1	38 no's	
	Number of Steps from PF – 2	39 no's	
	Number of Steps from PF – 3	40 no's	
	Material used for steps	In-situ 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 8 mm M.S flats.
	Height of Railing	1.3	

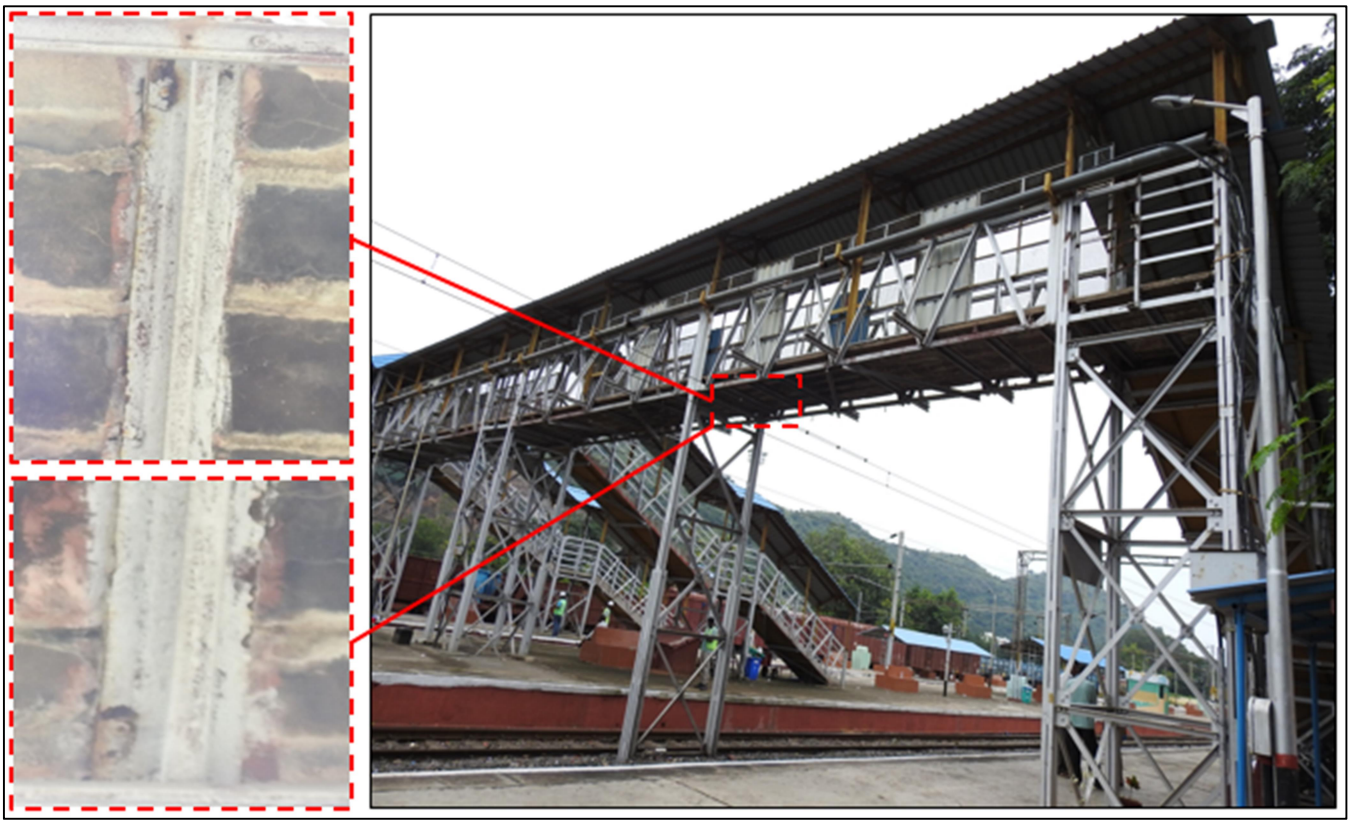
PART 4 SURVEY OF SIGNS OF DISTRESS, DEFORMATION IN BRIDGES	
4.1	✓ Exposed reinforcement is observed on Pre-cast RCC slab panels of staircase Landing at platform 1 2 & 3.

a) Exposed reinforcement and cracks on bottom of slab panels (Staircase 1 Main landing)

b) Exposed reinforcement and cracks on bottom of slab panels (Staircase 2 - Main landing)

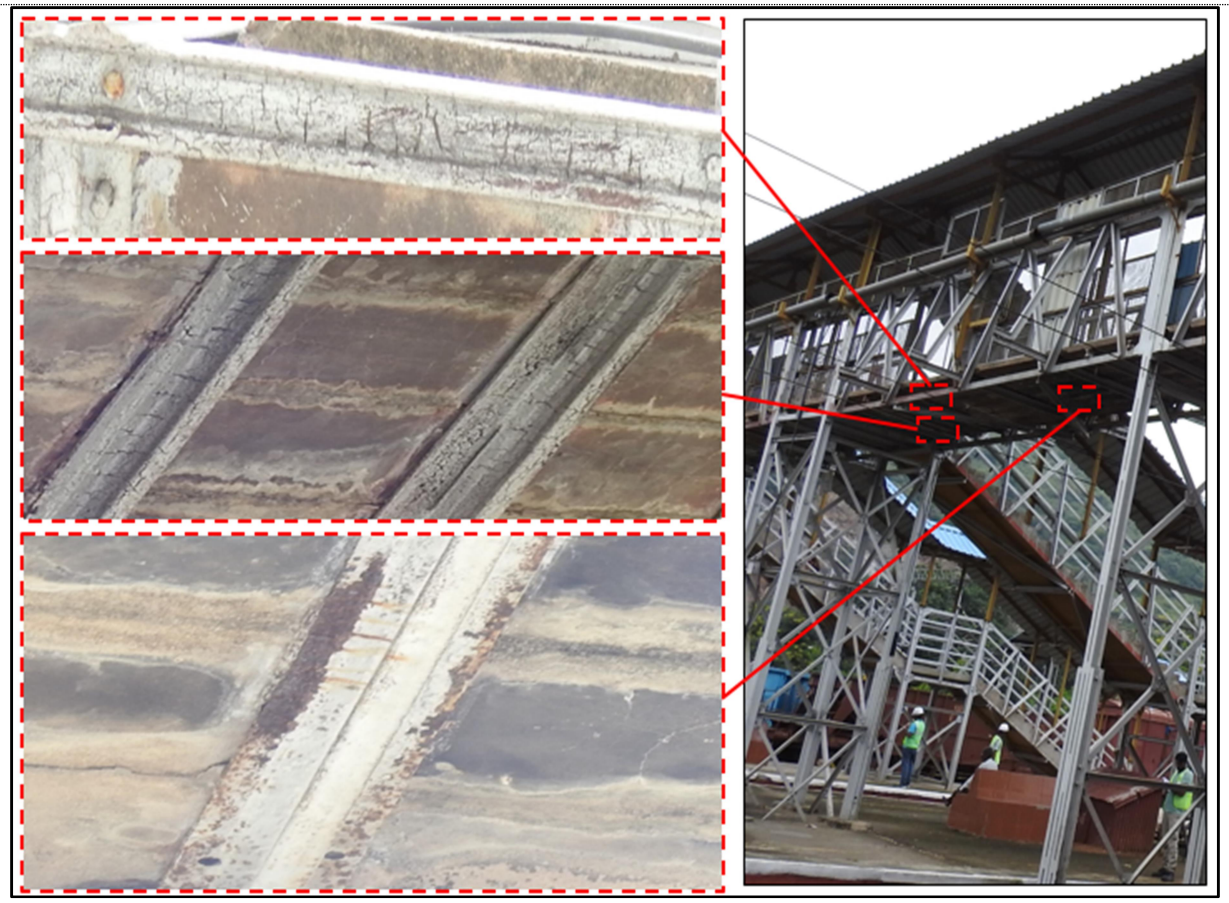
c) Exposed reinforcement on bottom of slab panels (Staircase 3 - Main landing)

4.2	✓ Corrosion, Leaching effect and Cracks are observed on Pre-cast slab panels on 1st ,2nd & 3rd spans.



a) Corrosion observed at floor beams on Span-1

b) Cracks and Leaching on slab panels on Span-1



c) Corrosion observed at floor beams and bottom chord on Span-2

d) Cracks and Leaching in slab panels on Span-2

e) Cracks , Corrosion and Leaching in slab panels on Span-3

f) Corrosion and rusting observed in Floor beam and bottom chord bolt connection

g) Rusting observed at Floor beam and bottom chord

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 panel. (Refer ***part 4.2***)
	Water seepage		No visual signs appear.
	Spalling	Staircase landing.	Spalling is observed in Slab panels (Refer ***part 4.1***)
	Rust straining		Slight rusting is observed at all the joints of FOB at floor level (Refer ***part 4.2 g***)
	Corrosion at steel-Concrete joint		Rusting is observed at steel concrete joint along length of FOB(Refer ***part 4.2 g***)
	Condition of Painting of steel structure		Painting is affected at distressed places.

Fig 1: Front view of FOB

Span -1 & 2 Pathway

Span-3 Pathway

Fig 2: FOB span 1, 2 & 3 pathway & protective screen

Fig 3: Additional loads of GI, HDPE, PVC pipes

Fig 4: Stanchion column Rail sections details

Fig 5: Staircase bottom view

Fig 6: Bottom view of FOB

Fig 7: Staircase side view of FOB

Fig 8: Inspection Team at Krishna canal FOB