Name of the Project	:	VISUAL INSPECTION OF FOB (B) AT BITRAGUNTA RAILWAY STATION
Location	:	BITRAGUNTA RAILWAY STATION
Location Co-ordinates	:	**14°46'01.6"N 79°59'00.6"E**
Date of Inspection	:	8th NOVEMBER, 2019



Summary:

a) Corrosion is observed at Floor beams, Bottom chord joints of all the Spans,
b) Corrosion is also observed at top and bottom chord of span-3 and top chord of Span-6.
c) Spalling and exposed reinforcement is observed at landings of Staircase-1 and 2.
d) Deformations are observed at horizontal ties of Stanchion 2 and Bottom chord of Span-2.
e) Patch work on spalling is observed at Staircase-2.

Tests to be conducted:

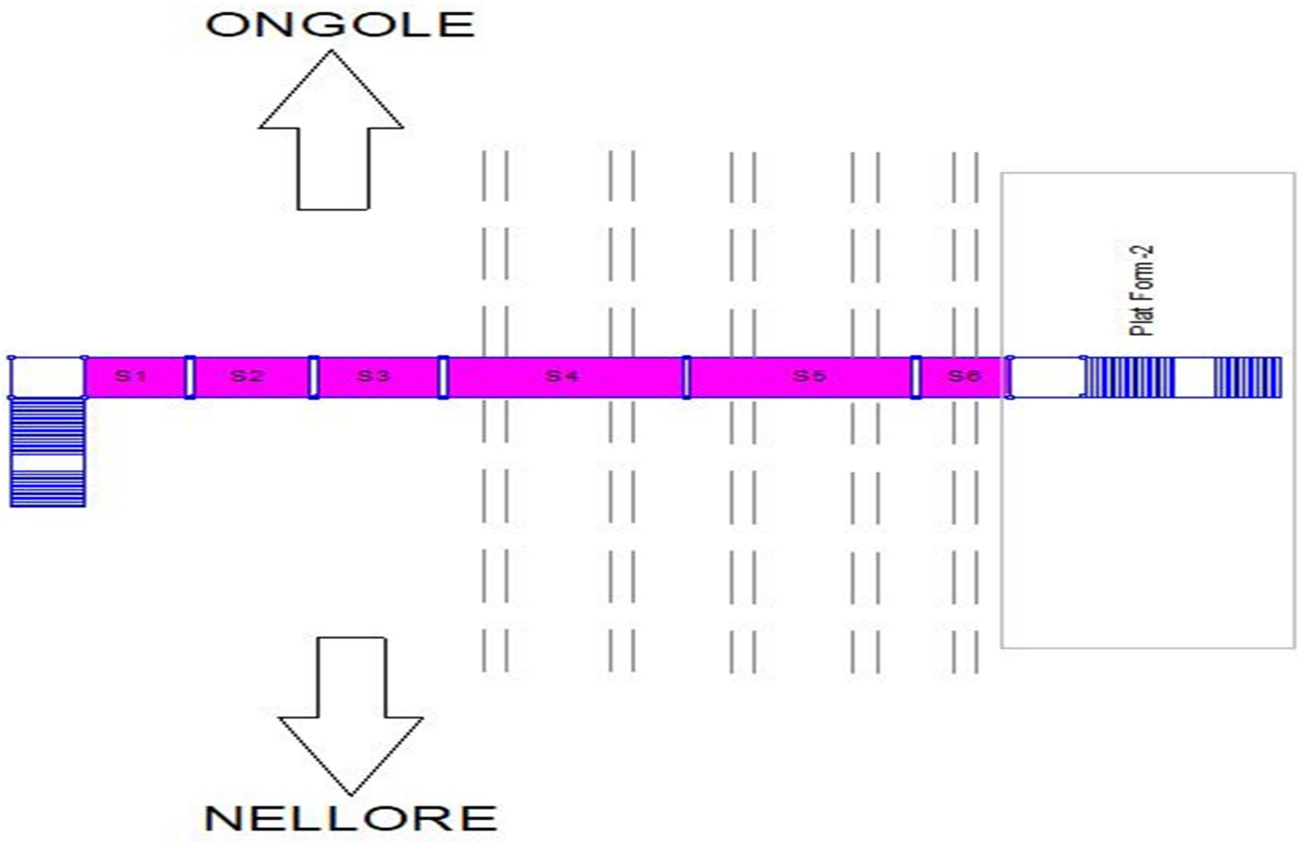
a) Ultrasonic Thickness gauge to measures local thickness of a solid element.
b) Elcometer (Coating thickness Gauge) to measures dry film thickness on steel surfaces.
c) Ultrasonic Flaw detector to detect hidden cracks, voids, porosity, and other internal discontinuities in metals.
d) Fillet weld gauge 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 (B) at Bitragunta railway station
Location	Bitragunta Railway Station
Date of Inspection	08-11-2019

PART 1 GENERAL INFORMATION AND OBSERVATION		
1.1	Name of the Bridge	FOB (B)
1.2	Location Location co-ordinates	Bitragunta Railway Station 14°46'01.6"N 79°59'00.6"E
1.3	Type of truss Structure	Warren Truss
1.4	Year of Construction	1968
1.5	Description of the main use of the bridge	Pedestrians Crossing
1.6	Major Materials used in different parts of bridge	a. NG Rail, Structural Steel (Truss, frame), b. Pre-cast RCC Slab panels (Floor slab, Staircase)
1.7	Width of the Pathway (m)	1.59 m
1.8	Length of the Pathway (m)	60.4 m
1.9	No of Railway Lines Crossings	5 No. of tracks Span 1 = - Span 2 = - Span 3 = - Span 4 = 2 Span 5 = 2 Span 6 = 1
1.10	Span arrangement (no x Span in meters)	5.38 + 9.301 + 9.45 + 9.8 + 10.983 + 11.97 m = 56.884 m
1.11	Vertical Clearance (from rail top to girder bottom)	5.732 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 at Stair case-2
1.15	Original Structural Drawings	Not available

1.16 Key Plan

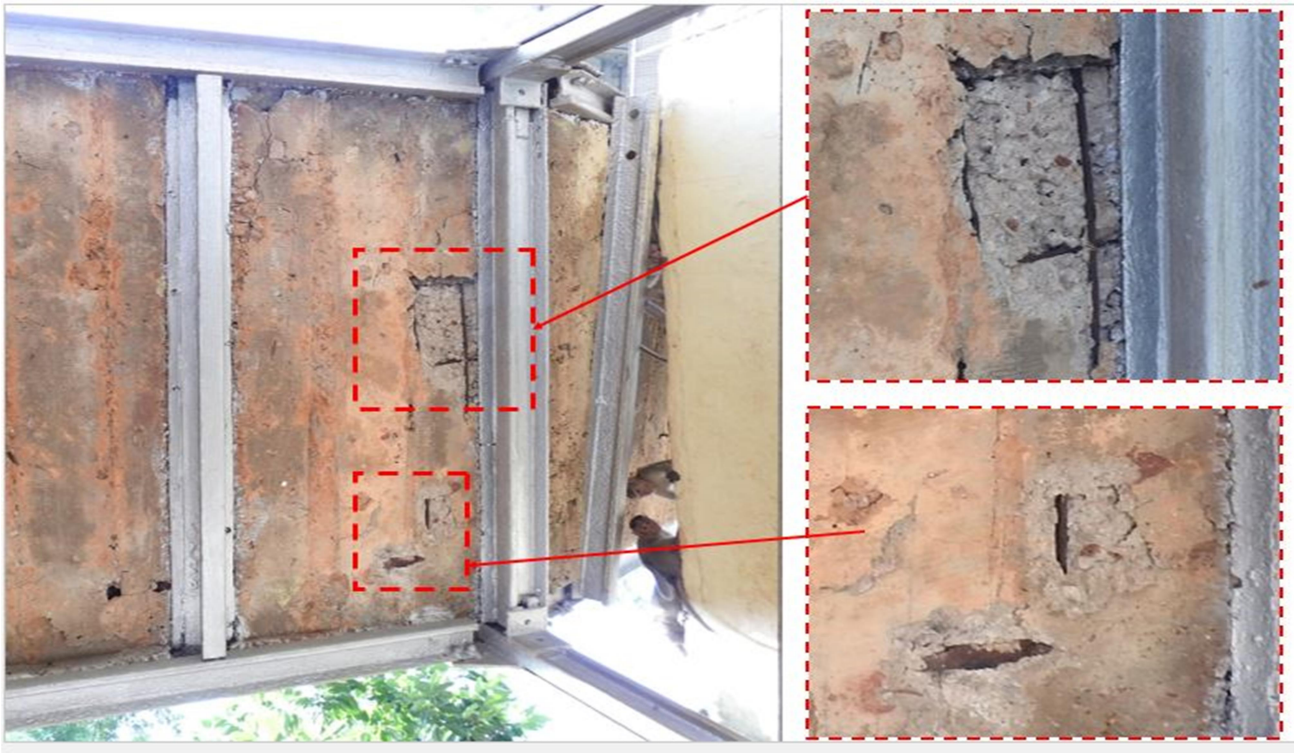


PART 2 IDENTIFICATION OF LOADS ON BRIDGE			
		Yes/No	**Notes**
	Dead Loads at Roof level		
2.1	a) Pipeline - Utilities	Yes	Electrical lines supported at Trestle-1. (Refer ***fig :7***)
	b) Cables	Yes	Cables are protected with 1-inch dia HDPE pipe supported on top chord, 60mm dia GI pipe supported at trestle 1 and at Stanchion-5 (Refer ***Part 4.2 g***)
	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	No	No additional wearing coat is provided
	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	

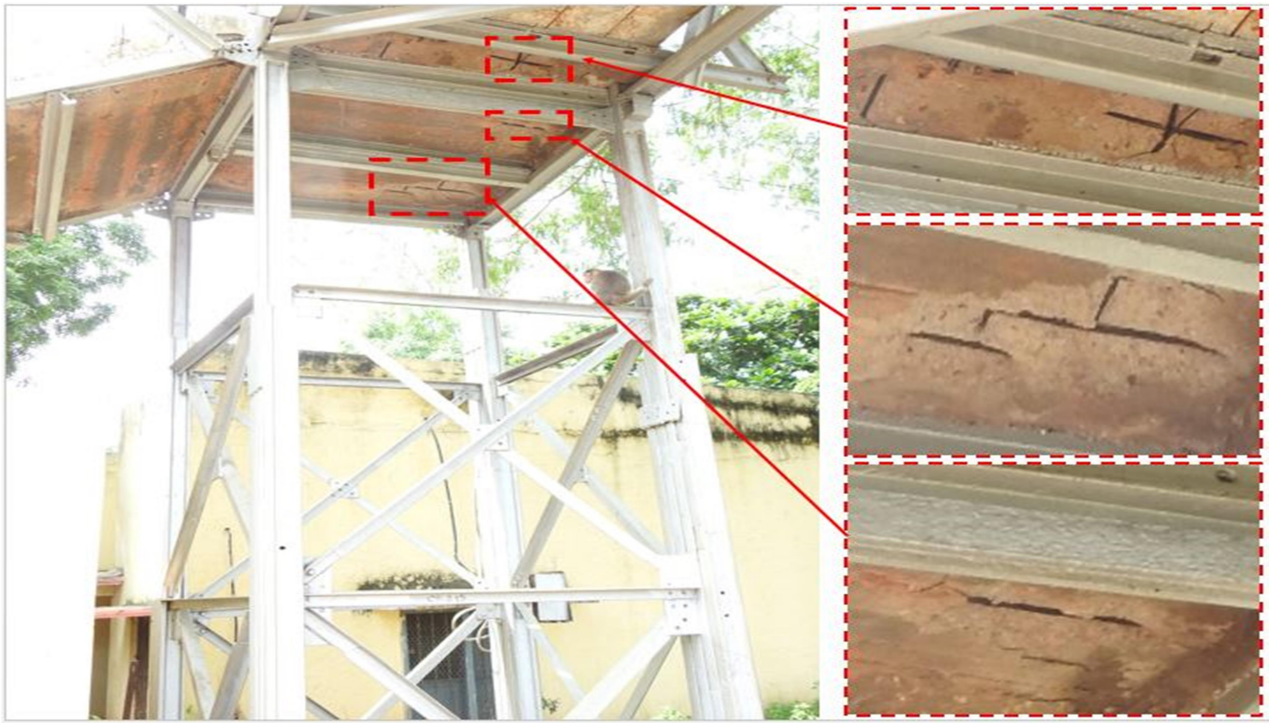
	PART 3 STRUCTURAL SYSTEM OF THE BRIDGE		
			Notes
3.1	**Foundation details**		Not visible at site
3.2	**Pedestals**		Not visible at site
	Trestles Connection Details		Encasement is provided of size 645 x 645 x 210 mm 630 x 630 x 330 mm
	No. of Bolts and size	-	
	Thickness of Base Plate	-	
3.3	**Roof Truss**		
	Element of roof truss section	King Post	King post of 65 x 65 x 8 mm Angle sections are used for roof truss supported on Vertical members of 65 x 65 x 8 mm double angle sections (Refer ***fig : 2***)
	Size of roof truss	1.78 x 0.5 m	
	Connection of Roof elements	Welded	
3.4	**Steel Truss**		
	Type /Shape of Truss Section	NG Rail section	a) Top and bottom Chord members are 60 x 135 x 120 (Head x Hight x Base) Rail section (Refer ***fig : 1***) b) 65 x120 x 100 mm Rail sections are used as diagonal bracing members. c) 65 x120 x 100 mm Rail sections are used as Floor beams supported with Knee bracings 65 x 120 x 100 mm Rail section to transfer load from slab to top chord member. d) Bottom Lateral Bracings 65 x 120 x 100 mm Rail section in Zig-zag pattern are used to support Floor beams.
	Height of Girder/Truss (H)	1.725 (span 1), 1.64m (span 2 -6)	
	Truss Support Condition	Rigid connection	
	Type/Shape of Floor beam /Bracings	NG Rail section	
	No of Floor beams/bracings per Span	6, 10, 11, 9, 12, 14	
	Arrangement of Bracings	Zig-Zag bracing	
	Type of Beam-Column Joint (shape of gusset plate if any)	Cleat Angles	
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 70, with bracings of 75 x 75 x 6 mm angle section. b. Trestles 1 have 4 columns with 4 rails up to a height of 3.1m and continued with 2 rails whereas Trestles 2,3, 4, 5, 6, 7 (Stanchions) have only 2 columns. (Refer ***fig (7)***) c. Stanchion column has built up section of 2 rail sections 65 x 130 x 65mm with bracings of 65 x 65 x 8 mm angle section. (Refer ***fig : 4***) Staircase landing is supported by 2 Rail section of 70 x 140 x 150mm, with bracings of 65 x 65 x 8 mm angle section. (Refer ***fig : 5***)
	No of Columns/ support	4, 2	
	Dimensions of Column	300 x 140 mm & 140 x 130 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 (Refer ***fig : 1***)
	Thickness of Slab	80 mm	
	Condition of Slab from Bottom	Minor Spalling is observed	
	Condition of Slab from Top	Good	
3.7	**Staircase Details**		
	Number of Staircase	2 No's	Staircase is observed as Pre cast RCC Slab panels supported on 65 x 120 x 100mm Rail tie beam and 65 x 120 x 100mm Rail Stringer beam on both sides of stair case.
	Number of Steps from PF – 2	38 no's	
	Number of Steps circulating Area	38 no's	
	Material used for steps	Pre-cast RCC Slab Panel	
3.8	**Staircase Railing**		
	Type of Parapet Railing	Hand Railing	Staircase is provided with railing on both sides using 60 x 120 x 100 Rail section and 50 x 6 mm M.S flats are used.
	Height of Railing	1.3	

4.1 ✓ Exposed reinforcement is observed at mid and main landing of Staircase-1 and Spalling at Mid landing of Stair case-2.



a) Reinforcement exposed at landing of Staircase-1



b) Reinforcement exposed at Main landing of Staircase-1

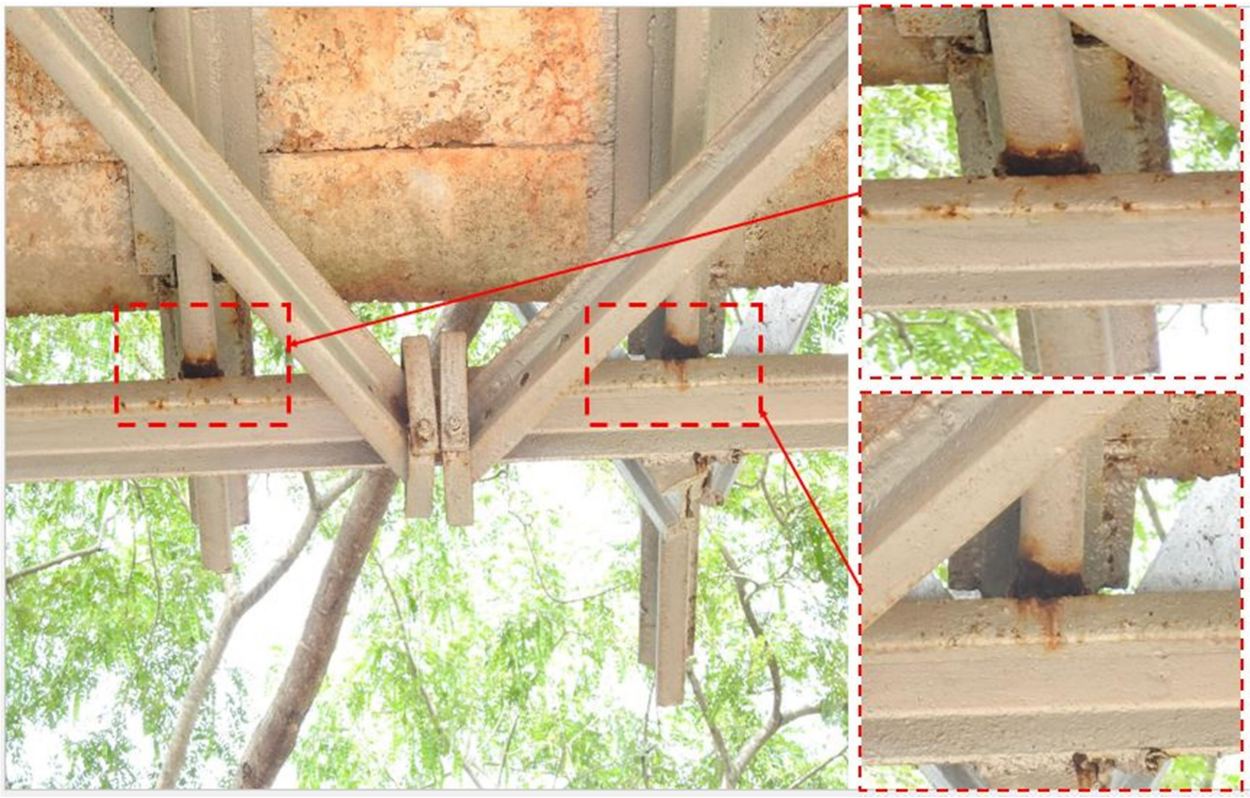


c) Spalling and Reinforcement exposed observed at Mid landing of Staircase-2

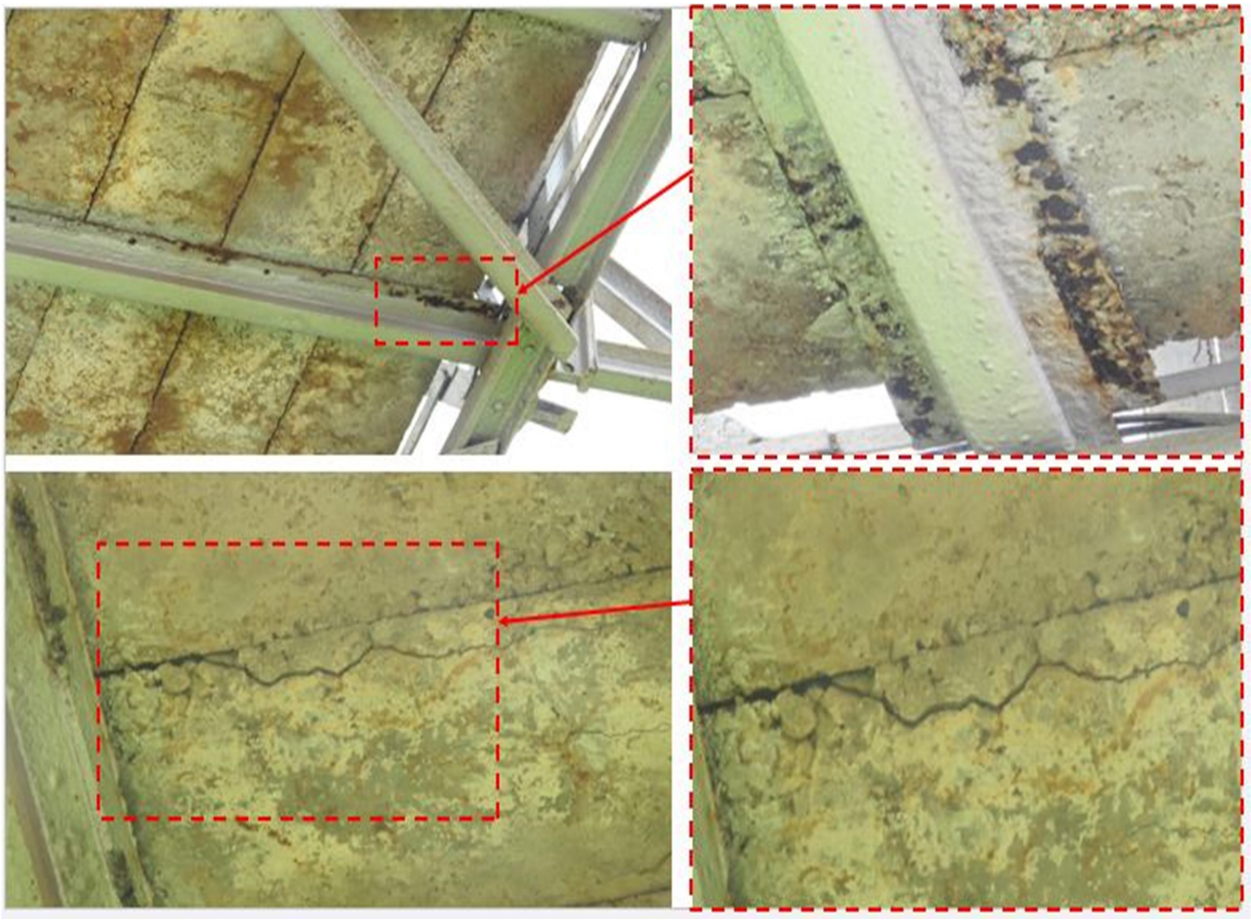
4.2	✓ Corrosion observed at Floor beams, Bottom chord joints of all Spans. and Cracks at Flight-1 of Staicase-2.



a) Corrosion observed at floor beams in Span-1



b) Corrosion observed at Bottom chord joints of Span-1



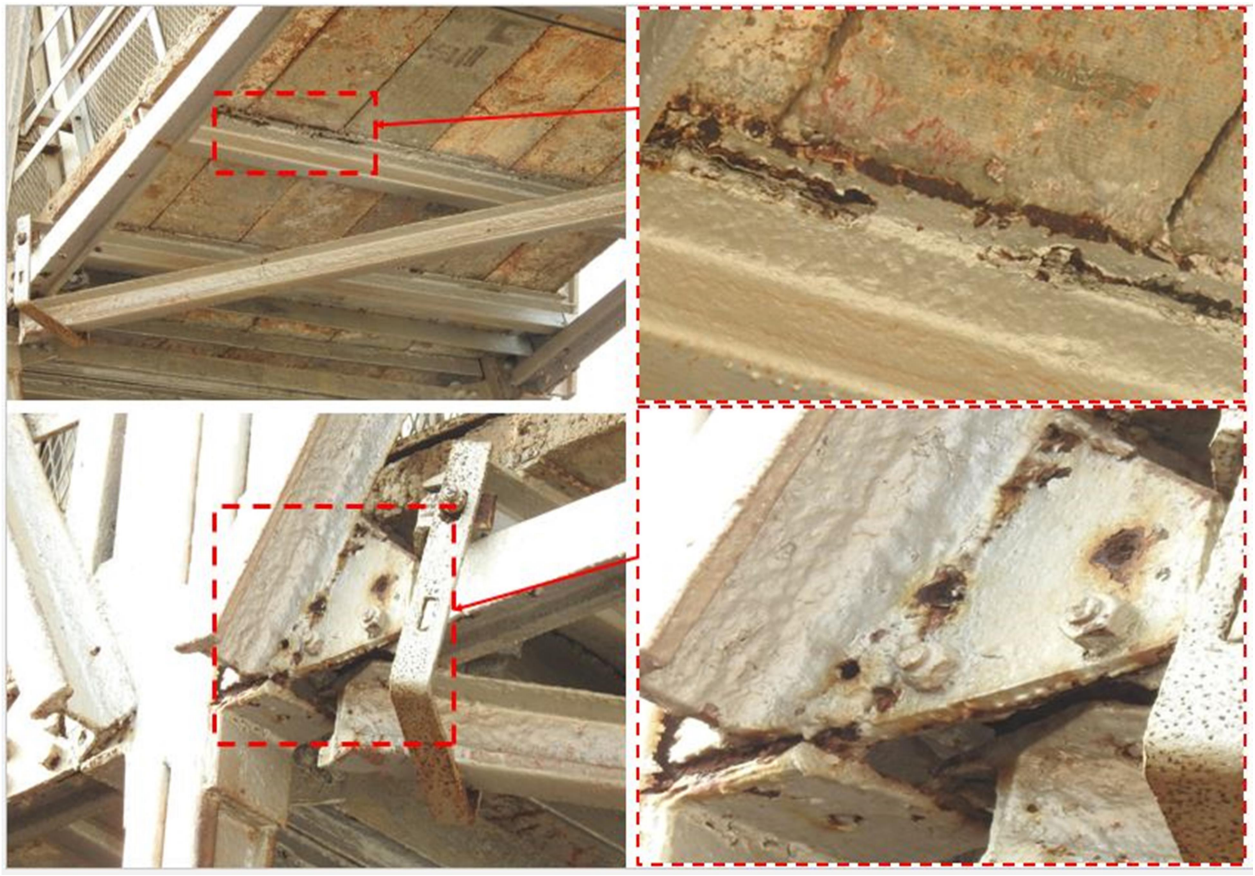
c) Corrosion & cracks observed at Span-3



d) Corrosion & cracks observed at Span-4



e) Corrosion observed at Floor beams and joints in Span-5



f) Corrosion observed at Floor beam & cleat angles of Span-6

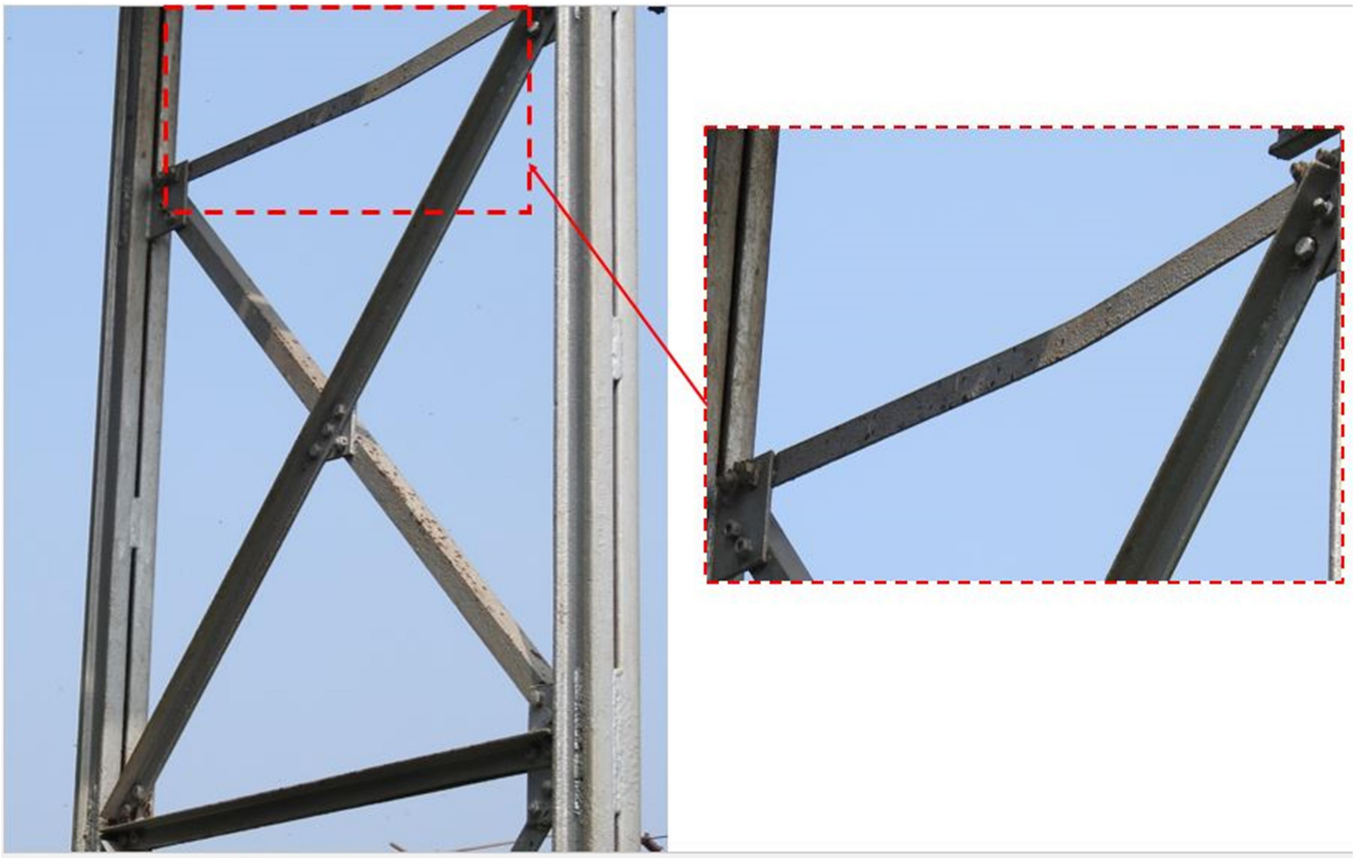


g) Corrosion observed at Top chord of Span-6



h) Cracks observed at Flight-1 of Staircase-2

4.3	✓ Deformation is observed at Horizontal bracing of stanchion 2 and Bottom chord of Span-2.



(a) Deformation in Horizontal ties of Stanchion-2





(b) Deformation observed in Bottom chord of Span-2

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***)
	Water seepage		No visual signs appear.
	Spalling		Spalling is observed at staircase-2 (Refer ***Part 4.1***)
	Rust straining		Slight rusting is observed at all the joints of FOB at floor level
	Corrosion in Gusset plate	Floor level	Corrosion is observed in floor beams and bottom chord joints (Refer ***Part 4.2***)
	Corrosion at steel-Concrete joint		corrosion is observed at steel concrete joint.
	Condition of Painting of steel structure		Painting is affected only at distressed places.
	Deformation in steel members	Bottom chord of span 2	Deformation observed in Bottom chord of Span-2 near the support & Horizontal ties of Stanchion-2



Fig 1(a): Front & Bottom view of span-1



Fig 1(b): Front & Bottom view of span-2



Fig 1(c): Front & Bottom view of span-3



Fig 1(d): Front & Bottom view of FOB span-4



Fig 1(e): Front & Bottom view of FOB span-5



Fig 1 (f): Front & Bottom view of FOB span-6



Fig 2: Pathway of FOB & protective screen



Fig 3: Additional loads of PVC pipes



Fig 4: Stanchion details



Fig 5: Unable to inspect under stair case-2 due to existing rooms (P.W Trolley shed)

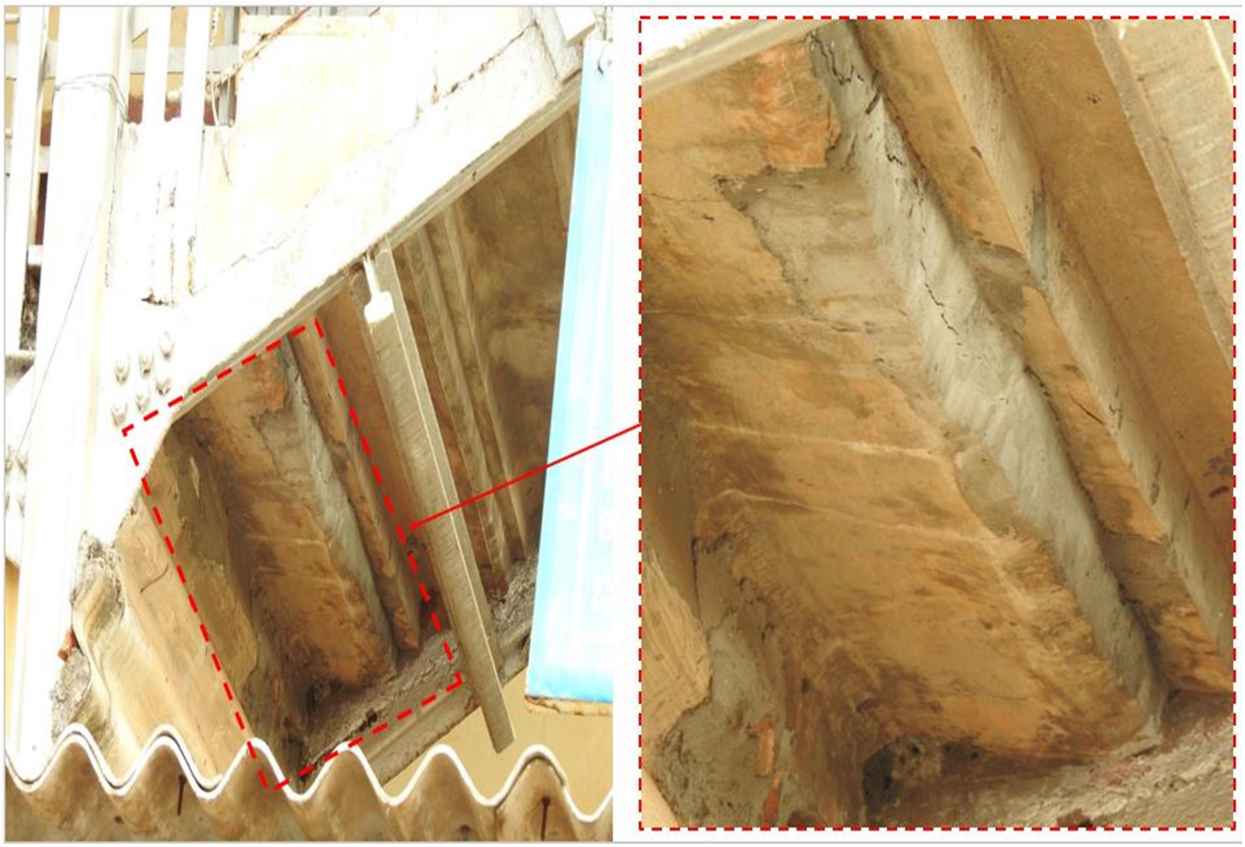


Fig 6: Patch work observed at Staircae-2



Fig 7: Electrical lines supported at Trestle 1



Fig 8: Inspection team at Bitragunta FOB (B)