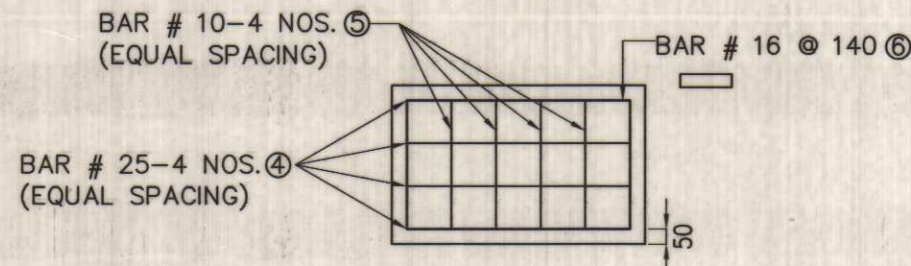
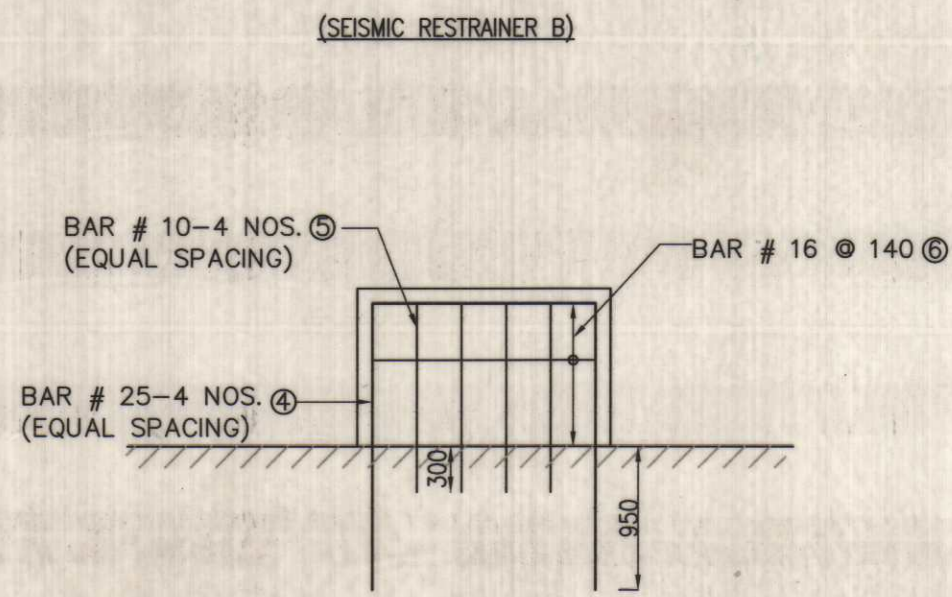


CROSS SECTION OF ELASTOMERIC BEARING  
(SCALE - 1:5)



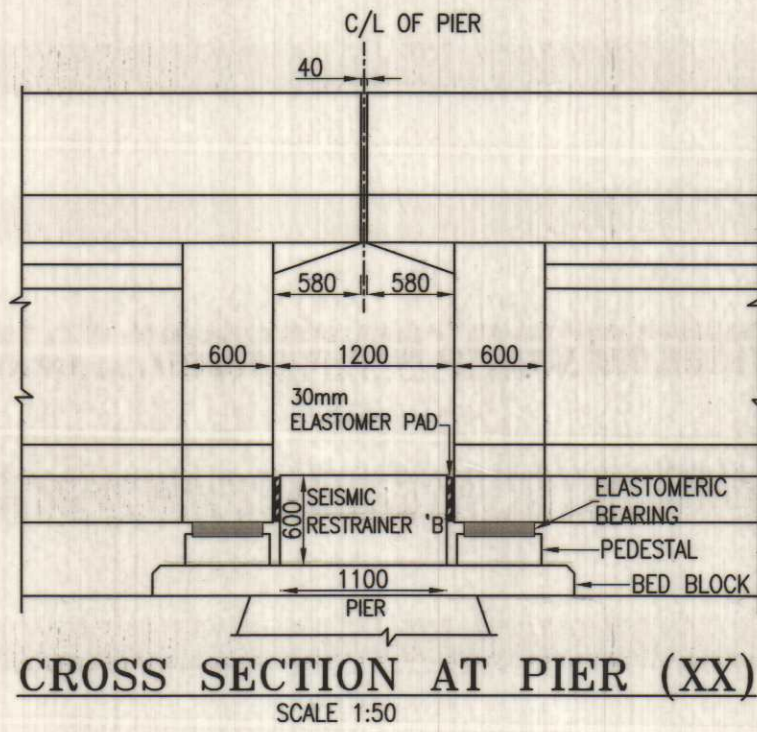
REINFORCEMENT  
AT TOP PLAN  
(SEISMIC RESTRAINER B)



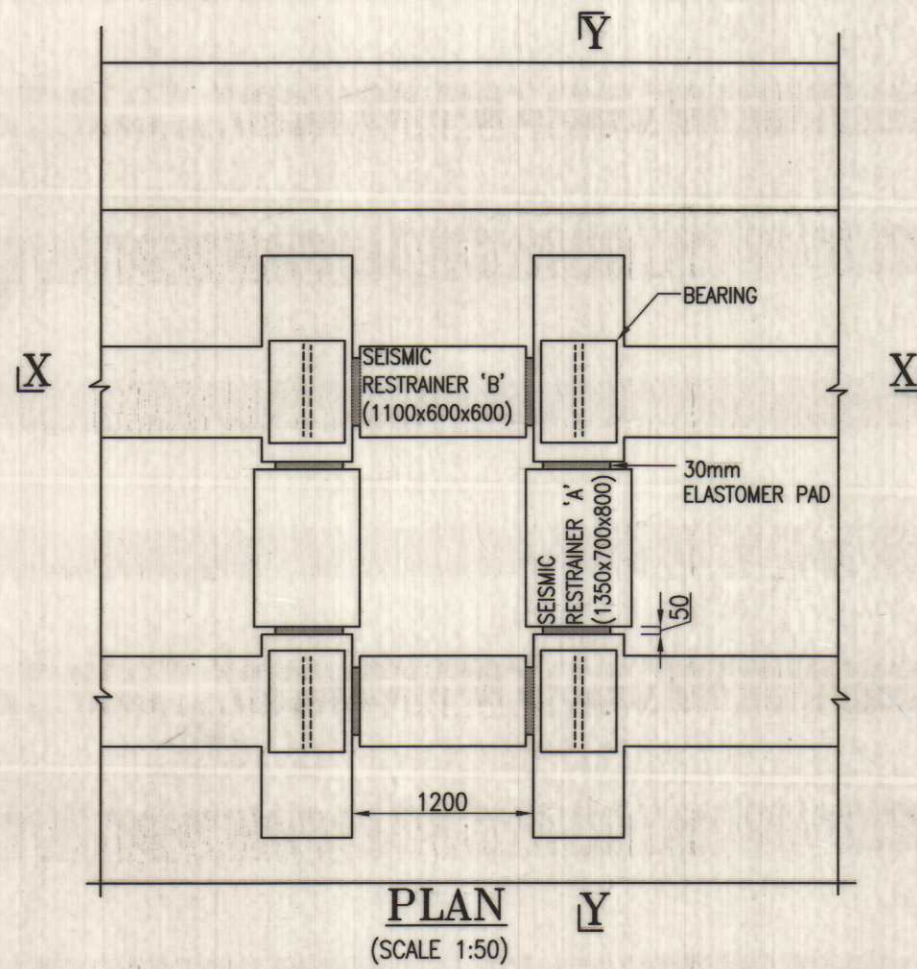
REINFORCEMENT AT  
SECTIONAL ELEVATION  
(SEISMIC RESTRAINER B)

BAR BENDING SCHEDULE

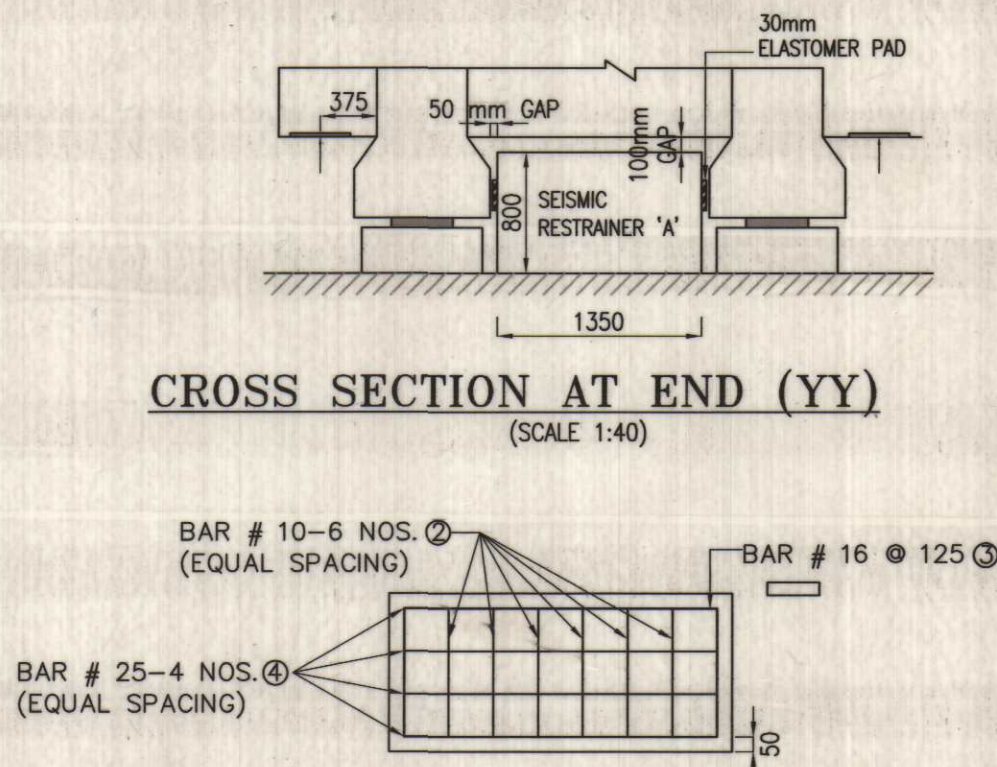
BAR MARK	DIA OF BARS	LENGTH (mm)	TOTAL Nos REQD.	BENDING SHAPE (DIMENSIONS SHOWN ARE OVER OUTER EDGES)	WGT PER M (kg)	TOTAL WGT (kg)
SEISMIC RESTRAINER A	1	25	4		1218	4872
	2	10	2618		568	1495024
	3	16	3956		1250	4945000
SEISMIC RESTRAINER B	4	25	3968		1250	4960000
	5	10	2118		568	1203024
	6	16	3256		1000	3256000



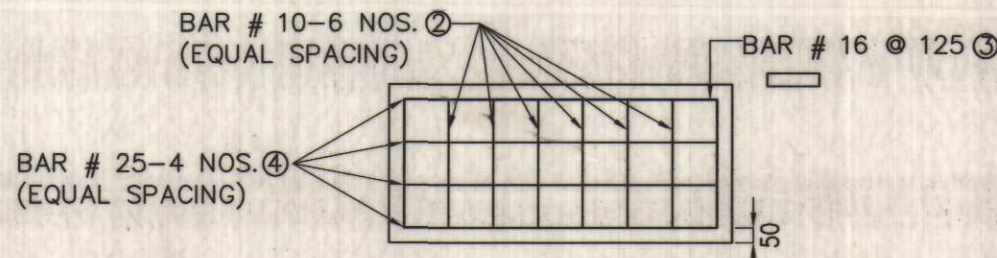
CROSS SECTION AT PIER (XX)  
SCALE 1:50



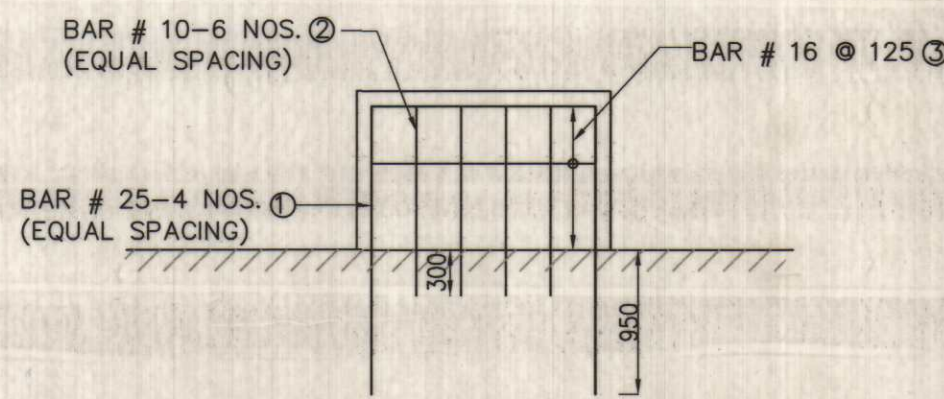
PLAN  
(SCALE 1:50)



CROSS SECTION AT END (YY)  
(SCALE 1:40)



REINFORCEMENT AT TOP PLAN  
(SEISMIC RESTRAINER A)



REINFORCEMENT AT  
SECTIONAL ELEVATION  
(SEISMIC RESTRAINER A)

## NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT WHERE OTHERWISE SHOWN.
- THE ELASOMERIC BEARING HAS BEEN DESIGNED AS PER UIC 772-2R AND IT HAS ALSO BEEN CHECKED WITH LOAD FACTORS AS PER IRS. CBC. THE BEARING SHALL BE HAVE FOLLOWING PROPERTIES:-  
(i) SHORE HARDNESS = 60± 5  
(ii) SHEAR MODULUS = 0.8 N/mm<sup>2</sup>
- ALL MATERIAL SPECIFICATIONS, FABRICATION, TESTING AND ACCEPTANCE OF BEARING SHALL BE IN ACCORDANCE WITH UIC CODE 772-2R.

### PRECAUTION

- CARE SHALL BE TAKEN IN PACKING, TRANSPORTATION, STORING AND HANDLING TO AVOID ANY MECHANICAL DAMAGE, CONTAMINATION WITH OIL, GREASE DIRT, UNDUE EXPOSURE TO SUNLIGHT, EXTREME COLD AND WEATHER.
- BEARING SHALL BE STORED NEATLY UNDER COVER TILL INSTALLATION.

### GUIDELINE FOR INSTALLATION OF ELASTOMERIC BEARING CASE-1 PRECAST PSC I-GIRDER:

#### 1. PREPARATION OF PEDESTAL/TOP OF BED BLOCK:

- ONCE THE PEDESTAL/TOP OF BED BLOCK IS READY, THE SAME SHALL BE CHECKED REGARDING CORRECT LEVELS AND LOCATION.
- THE CONCRETE SURFACE OF THE BED BLOCK SHALL BE FREE FROM ANY LOOSE MATERIAL AND CLEANED OF ANY GREASE, OIL PAINT ETC. AND IT SHALL BE DRY AT THE TIME OF FIXING OF BEARINGS.

- SURFACE OF PEDESTAL/BED BLOCK ON WHICH THE BEARING IS TO REST SHALL BE CHECKED BY LEVEL TUBE AND STRAIGHT EDGE SO THAT CONCRETE SURFACE IS FREE FROM LOCAL IRREGULARITIES AND THE MAXIMUM TOLERANCE IN THIS RESPECT IS ± 1mm. IN CASE THE SURFACE IS NOT WITHIN TOLERANCE, THE SAME SHALL BE REPAIRED BY CHIPPING OFF EXCESS MATERIAL/FILLING UP WITH SUITABLE EPOXY/POXY MORTAR.

- CENTRE LINE OF ALL BEARING SHALL BE MARKED WITH PAINT IN BOTH DIRECTIONS SUCH AS TO PROJECT BEYOND BEARING DIMENSION.

#### 2. PREPARATION OF UNDERSIDE OF GIRDER:

- SURFACE OF UNDERSIDE OF GIRDER SHALL BE CHECKED BY LEVEL TUBE AND STRAIGHT EDGE SO THAT CONCRETE SURFACE IS FREE FROM LOCAL IRREGULARITIES AND THE MAXIMUM TOLERANCE IN THIS RESPECT IS ± 1mm. IN CASE THE SURFACE IS NOT WITHIN TOLERANCE, THE SAME SHALL BE REPAIRED BY CHIPPING OFF EXCESS MATERIAL/FILLING UP WITH SUITABLE EPOXY/POXY MORTAR.

- THE BEARING MUST BE BETWEEN HORIZONTAL SURFACE. MAXIMUM TOLERANCE OF 0.2% PERPENDICULAR TO LOAD IS PERMITTED.

- CENTRE LINE OF ALL BEARING SHALL BE MARKED WITH PAINT IN BOTH DIRECTION SUCH AS TO PROJECT BEYOND BEARING DIMENSION.

#### 3. INSTALLATION OF BEARING:

- THE BEARING SHALL BE SUCH THAT ITS TOP AND BOTTOM SURFACE AREA ARE PARALLEL AND THE MAXIMUM PERMISSIBLE LIMIT IN THIS RESPECT IS 1 IN 200. CENTRE LINE OF ALL BEARING SHALL BE MARKED IN BOTH DIRECTIONS.

- IT IS PREFERABLE TO LAUNCH GIRDER OVER HARDWOOD PACKING AND LATER ON THE PACKING SHALL BE REPLACED BY ELASTOMERIC BEARING BY LIFTING GIRDER. IN CASE IT IS UNAVOIDABLE, BEARING MAY BE FIXED TO BED BLOCK/PEDESTAL DULY MATCHING THE CENTRE LINE IN EITHER DIRECTION WITH MARKING MADE IN STEP 1.

- TO GUARD AGAINST SHIFTING OF BEARING DURING LAUNCHING OPERATION, THE SAME MAY BE PASTED USING EPOXY TO PEDESTALS/BED BLOCK. HOWEVER THIS EPOXY SHALL NOT BE CONSIDERED AS AN ANTI SLIP DEVICE.

#### 4. CHECKING TO BE DONE AFTER LAUNCHING OF GIRDER:

- CENTRE LINE OF BEARING SHALL BE MATCHED WITH MARKING ON PEDESTALS/UNDERSIDE OF GIRDER. IN CASE THE MARKINGS ARE NOT MATCHING, THE GIRDER AND / OR BEARINGS SHALL BE ADJUSTED. THE MAXIMUM TOLERANCE FOR OUT OF POSITION IS ± 3mm.

### CASE-2 CAST-IN-SITU PSC I-GIRDER:

#### 1. PREPARATION OF PEDESTAL/TOP OF BED BLOCK:

- ONCE THE PEDESTAL/TOP OF BED BLOCK IS READY, THE SAME SHALL BE CHECKED REGARDING CORRECT LEVELS AND LOCATION.

- SURFACE OF PEDESTALS/ BED BLOCK ON WHICH THE BEARING IS TO REST SHALL BE CHECKED BY LEVEL TUBE AND STRAIGHT EDGE SO THAT CONCRETE SURFACE IS FREE FROM LOCAL IRREGULARITIES AND THE MAXIMUM TOLERANCE IN THE RESPECT IS ± 1mm. IN CASE THE SURFACE ARE NOT WITHIN TOLERANCE, THE SAME SHALL BE REPAIRED BY CHIPPING OFF EXCESS MATERIAL/FILLING UP WITH SUITABLE CEMENT/POXY MORTAR OR ANY OTHER SUITABLE MATERIAL.

- CENTRE LINE OF ALL BEARING SHALL BE MARKED WITH PAINT IN BOTH DIRECTIONS SUCH AS TO PROJECT BEYOND BEARING DIMENSION.

#### 2. INSTALLATION OF BEARING:

- THE BEARING SHALL BE SUCH THAT ITS TOP AND BOTTOM SURFACE AREA ARE PARALLEL AND THE MAXIMUM PERMISSIBLE LIMIT IN THIS RESPECT IS 1 IN 200. CENTRE LINE OF THE BEARING SHALL BE MARKED IN BOTH DIRECTIONS.
- TO GUARD AGAINST SHIFTING OF BEARING DURING CASTING OPERATIONS, THE SAME MAY BE PASTED USING EPOXY TO PEDESTAL/BED BLOCK. THIS EPOXY SHALL NOT BE CONSIDERED AS AN ANTI SLIP DEVICE.

#### 3. CASTING OF GIRDER:

- SIDE FRAME SHUTTERING SHALL BE PROVIDED ALL AROUND THE BEARING SUCH THAT IT IS EASILY REMOVABLE AND CAN BE MADE LEAK PROOF. GAP BETWEEN SIDE FRAME AND BEARING MAY BE FILLED WITH CLEAN SAND.
- PLACE TOP FORM OVER THE SIDE FORM/CLEAN SAND SUCH THAT THE OPENING IN TOP FRAME EXACTLY MATCHES THE SIDE FRAME THE JOINTS SHALL BE MADE LEAK PROOF BY USING SUITABLE PUTTY/TAPES.

- EXECUTION OF SOFFIT FORMWORK OF THE GIRDER/REINFORCEMENT FIXING/CONCRETING OF GIRDER SHALL BE DONE AS PLANNED TAKING CARE THAT THE BEARING AREA IS NOT DISTURBED.

- THE TOP/SIDE FORMWORK AROUND BEARING/WOODEN BLOCK SHALL BE REMOVED AFTER CONCRETE HAS HARDENED/PRESTRESSING IS DONE AS PER DESIGN.

- THE BEARING SHALL BE INSPECTED FOR ANY DAMAGE AND FOR ANY SLURRY WHICH MIGHT HAVE LEAKED. THE SLURRY AROUND THE BEARING SHALL BE REMOVED BY LIGHT CHIPPING.

#### 4. CHECKS AFTER CASTING OF GIRDER:

- AFTER 28 DAYS, THE BEARING SHALL BE EXAMINED. NORMALLY BEARING SHOULD NOT BE DISTURBED BY LIFTING THE GIRDER. IN CASE DUE TO CREEP/SHRINKAGE, DISTORTION IN BEARING IS EXCESSIVE, THE GIRDER SHOULD BE LIFTED AND BEHAVIOR OF BEARING SHOULD BE OBSERVED. IN THE BEARING REGAINS ITS ORIGINAL SHAPE GIRDER SHALL BE LOWERED OTHERWISE BEARING SHALL BE REPLACED.

STANDARD OF LOADING : 25-T (2008)  
भारण मानक 25 टन - 2008

उत्तर पश्चिम रेलवे NORTH WESTERN RAILWAY  
जयपुर मण्डल जयपुर सीकर खंड  
JAIPUR DIVISION JAIPUR - SIKAR SECTION

रिंगस के पास DFCCIL परियोजना की वजह से मारग परिवर्तित करना  
RINGAS DETOUR IN CONNECTION WITH DFCCIL PROJECT

VIADUCT ON RINGAS DETOUR  
TOTAL SPAN:- 164 X 18.30m PSC GIRDER +  
5 X 18.30m PSC GIRDER ON MINDA RIVER + 3  
X 18.30m COMPOSITE GIRDER ON RPC &  
DFCCIL TRACK

ON NEW ALIGNMENT  
BETWEEN STATION CHHOTA GUDA & RINGAS

DY.CE(C)JP/3049/B-JP-SIKR (Detour)

NO. CA0(C)JP/5803/D-JP-SIKR (Detour)

## SEISMIC RESRTAINER

- CONCRETE OF M35 GRADE SHALL BE USED FOR SEISMIC RESTRAINER.
- CLEAR COVER TO ANY REINFORCEMENT SHALL BE 50mm UNLESS SHOWN OTHER WISE.
- LAP AND ANCHORAGE LENGTH OF BARS SHALL BE PROVIDED AS PER CLAUSE 15.9.6 OF IRS CONCRETE BRIDGE CODE.
- LAP SHALL BE STAGGERED AND NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED AT ANY SECTION.
- THE DESIGN OF SEISMIC RESTRAINER 'A' CATER FOR PEDESTAL HEIGHT OF 300 TO 410mm.FOR ANY INCREASE BEYOND 410mm THE DESIGN OF RESTRAINER NEED TO BE CHECKED APPROPRIATELY.
- THE DESIGN OF SEISMIC RESTRAINER 'B' CATER FOR PEDESTAL HEIGHT OF 300mm FOR ANY INCREASE BEYOND 300mm THE DESIGN OF RESTRAINER NEED TO BE CHECKED APPROPRIATELY.

## REFERENCES :

- GENERAL ARRANGEMENT DRG.
- GENERAL ARRANGEMENT BASED ON DRG NO. RDSO/B-10273

## DRG. NO.

804/JY/350/2015  
VDUCI/09

REV. NO.	DATE	DESCRIPTION
DY. CE/C/D/JP	15-01-18	CE/C/I/JP
XEN/C/D/JP	21-11-17	
DYCE CC/IV	21-11-17	
CONTRACTOR		CONSULTANTS

PROJECT :  
VIADUCT ON RINGAS DETOUR  
RGS DETOUR IN CONNECTION WITH DFCCIL  
WORK-CONSTRUCTION OF VIADUCT(164X18.30M  
PSC GIRDER),5X18.30M PSC GIRDER ON MINDA  
RIVER, + 3X18.30 COMPOSITE GIRDER ON RPC  
AND DFCCIL TRACK.

CLIENTS :  
NORTH WESTERN RAILWAY,  
5TH FLOOR, HQ OFFICE NEAR JAWAHAR CIRCLE,  
MALVIYANAGAR JAIPUR - 302 017

CONTRACTORS :  
M.H. KHANUSIA-APEX TARMAC PVT. LTD.(JV)  
FF, Divine India Building, Near RTO Office : Bye pass Road,  
Po-Savgadhi (Panpur) : Himatnagar 383 001

CONSULTANTS :  
PANKAJ M PATEL CONSULTANTS PVT. LTD.  
303, CHAKRAVARTY COMPLEX, OPP. KIRAN PARK CIRCLE,  
NARAINA WADAJ, AHMEDABAD-380013.  
PH : (079)27643175, FAX : (079)27640428  
E-mail : paa\_99@yahoo.co.in, paa99@gmail.com

TITLE :  
ELASTOMERIC BEARING & SEISMIC RESTRAINER  
BASED ON DRG NO. RDSO/B-10273/4

DRAWN BY : NILESH DESIGNED BY PANKAJ PATEL

CHECKED BY : PANKAJ PATEL DRG. NO. REVISION

SCALE : AS SHOWN VIADUCT 13 R0

804/JY/350/2015  
SSE/C/DESIGN