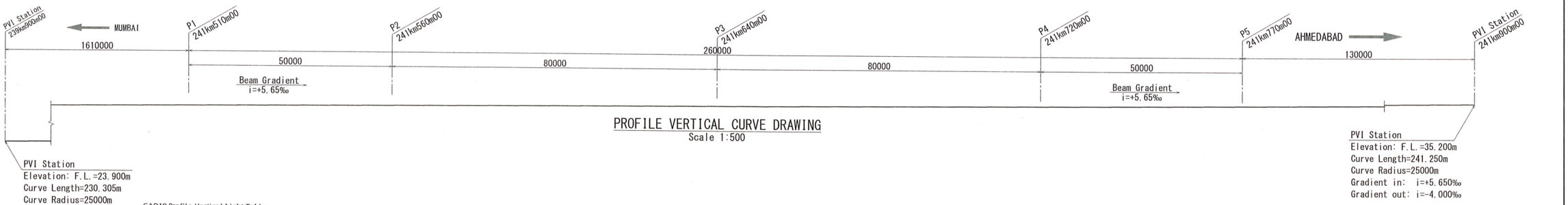
ATTACHMENT NO. 6

MAHSR-P-3: REVISED DRAWINGS

Sl.No	Drawing Number	Title	Revision Items
1	DD-JIC-C06-TDC-B06-BRD-B60- 11003 001	GAD11 Superstructure Coordinate Drawing (Part1)	LCX box deleted.
2	DD-JIC-C06-TDC-B06-BRD-B60- 11107 001	GAD11 General Superstructure Drawing (Part7)	LCX box deleted.
3	DD-JIC-C06-TDC-B06-BRD-B60- 11405 002	GAD11 P1(A)・P5(A) Detail of Elastomeric Bearing	Steel plate grade E250 changed as E350 and Bearing notes are modified.
4	DD-JIC-C06-TDC-B06-BRD-B60- 11406 002	GAD11 P2・P4 Detail of Elastomeric Bearing	Steel plate grade E250 changed as E350 and Bearing notes are modified.
5	DD-JIC-C06-TDC-B06-BRD-B60- 11407 002	GAD11 P3 Detail of Elastomeric Bearing	Steel plate grade E250 changed as E350 and Bearing notes are modified.
6	DD-JIC-C06-TDC-B06-BRD-B60- 11410 001	GAD11 Detail of Stopper at P1(A) P5(A) (Part1)	List of material table no. 2, 3 & 5 (Material column B0 Grade is added instead of A) and no.1 (Material column B0 Grade is deleted)
7	DD-JIC-C06-TDC-B06-BRD-B60- 11501 002	GAD11 P1 Pier Substructure General Drawing (Part1)	LCX box deleted.
8	DD-JIC-C06-TDC-B06-BRD-B60- 11514 002	GAD11 P2 Pier Substructure General Drawing (Part1)	LCX box deleted.
9	DD-JIC-C06-TDC-B06-BRD-B60- 11526 002	GAD11 P3 Pier Substructure General Drawing (Part1)	LCX box deleted.
10	DD-JIC-C06-TDC-B06-BRD-B60- 11538 002	GAD11 P4 Pier Substructure General Drawing (Part1)	LCX box deleted.
11	DD-JIC-C06-TDC-B06-BRD-B60- 11550 001	GAD11 P5 Pier Substructure General Drawing (Part1)	LCX box deleted.
12	DD-JIC-C06-TDC-B06-BRD-B60- 11701 001	GAD11 Earthing Arrangement for End Pier	LCX box deleted, G.I Binding wire changed as copper binding wire on Details of Part'b' and notes are modified.
13	DD-JIC-C06-TDC-B06-BRD-B60- 11702 001	GAD11 Earthing Arrangement for Middle Pier	LCX box deleted, G.I Binding wire changed as copper binding wire on Details of Part'b' and notes are modified.
14	DD-JIC-C06-TDC-B06-BRD-B60- 11703 001	GAD11 Earthing Arrangement for Intermediate Pole	LCX box deleted, Steel plate t=10mm added on Details of Part'a' and notes are modified.
15	DD-JIC-C06-TDC-B06-BRD-B60- 11706 001	GAD11 Structures of Ducts (Part1)	LCX box deleted.
16	DD-JIC-C06-TDC-B06-BRD-B60- 11707 001	GAD11 Structures of Ducts (Part2)	LCX box deleted and notes are modified.
17	DD-JIC-C06-TDC-B06-BRD-B60- 11708 001	GAD11 Structures of Ducts (Part3)	LCX box deleted and notes are modified.
18	DD-JIC-C06-TDC-B06-BRD-B60- 11709	**DELETED**	**DELETED**
19	DD-JIC-C06-TDC-B06-BRD-B60- 11710 001	GAD11 Ducts Bar Arrangement Drawing (Part1)	LCX box deleted and notes are modified.
20	DD-JIC-C06-TDC-B06-BRD-B60- 11711 001	GAD11 Ducts Bar Arrangement Drawing (Part2)	LCX box deleted and notes are modified.
21	DD-JIC-C06-TDC-B06-BRD-B60- 11712 001	GAD11 Water Stopper Concrete Drawing	LCX box deleted.
22	DD-JIC-C06-TDC-B06-BRD-B60- 11713 001	GAD11 Adjusting Concrrete for Electrical Cable Duct (Part1)	LCX box deleted.
23	DD-JIC-C06-TDC-B06-BRD-B60- 11723 001	GAD11 Drainage Plan (Part1)	LCX box deleted.
24	DD-JIC-C06-TDC-B06-BRD-B60- 11728 001	GAD11 Cable Crossing Pipe Conduits	LCX box deleted.
25	DD-JIC-C06-TDC-B06-BRD-B60- 11729 002	GAD11 Noise Barrier / Precast Fence	This Drawings has changed with referance to C4 Package
26	DD-JIC-C06-TDC-B06-BRD-B60- 11730 001	GAD11 Drainage Slope Drawing (Part1)	LCX box deleted.
27	DD-JIC-C06-TDC-B06-BRD-B60- 11732 001	GAD11 Bridge Name Paintings and Posts Drawing	LCX box deleted.

GAD11 Superstructure Coordinate Drawing (Part1)



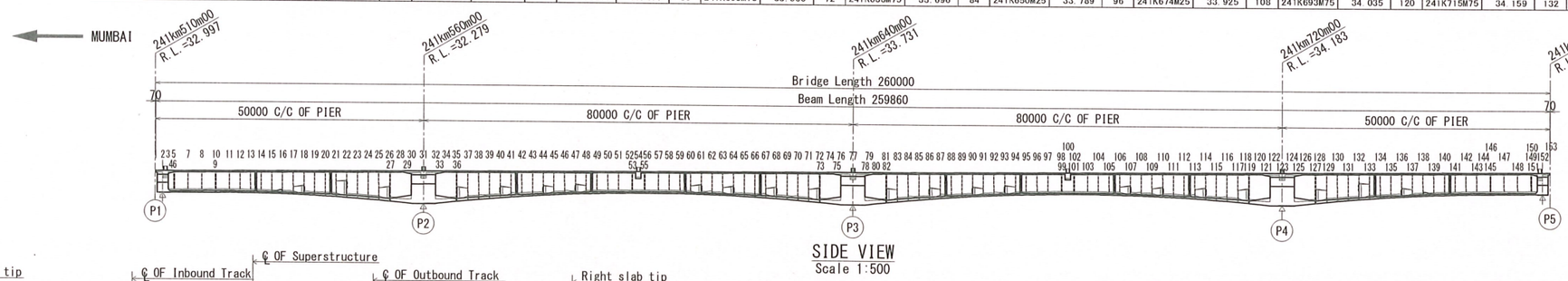
PROFILE VERTICAL CURVE DRAWING
Scale 1:500

PVI Station
Elevation: F.L.=23.900m
Curve Length=230.305m
Curve Radius=25000m
Gradient in: i=-3.562‰
Gradient out: i=+5.560‰

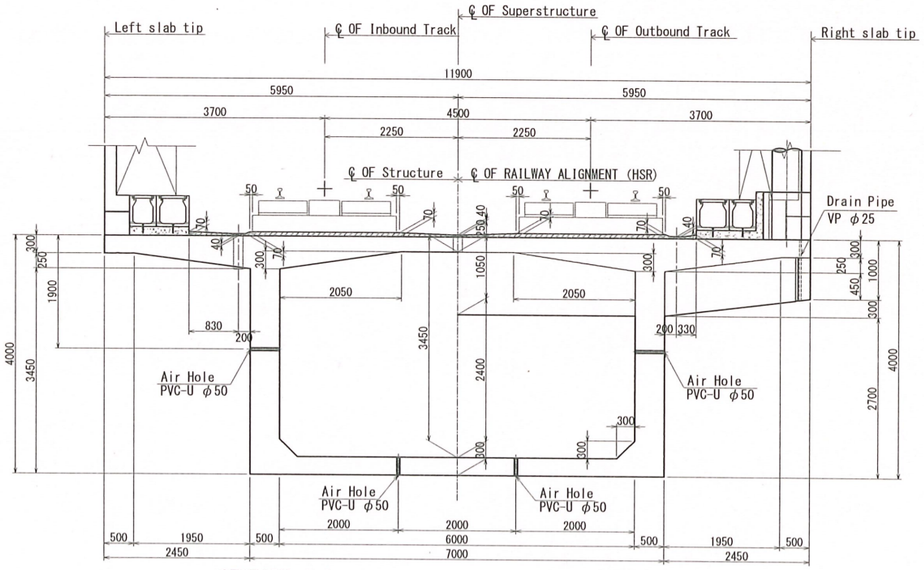
PVI Station
Elevation: F.L.=35.200m
Curve Length=241.250m
Curve Radius=25000m
Gradient in: i=+5.650‰
Gradient out: i=-4.000‰

GAD10 Profile Vertical hight Table

Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation	Place	Station	Elevation
1	241K510M07	32.997	13	241K527M75	33.097	25	241K551M75	33.232	37	241K568M25	33.326	49	241K592M25	33.461	61	241K611M75	33.571	73	241K633M90	33.697	85	241K652M25	33.800	97	241K676M25	33.936	109	241K695M75	34.046	121	241K717M00	34.166	133	241K736M25	34.275	145	241K758M90	34.403
2	241K511M40	33.004	14	241K529M75	33.108	26	241K553M75	33.244	38	241K570M25	33.337	50	241K594M25	33.473	62	241K613M75	33.583	74	241K635M75	33.707	86	241K654M25	33.812	98	241K678M75	33.950	110	241K697M75	34.057	122	241K717M75	34.170	134	241K738M25	34.286	146	241K761M40	34.417
3	241K512M40	33.010	15	241K531M75	33.119	27	241K553M90	33.245	39	241K572M25	33.348	51	241K596M25	33.484	63	241K615M75	33.594	75	241K637M00	33.714	87	241K656M25	33.823	99	241K678M90	33.951	111	241K699M75	34.069	123	241K720M00	34.183	135	241K740M25	34.297	147	241K763M90	34.431
4	241K513M40	33.016	16	241K533M75	33.131	28	241K555M75	33.255	40	241K574M25	33.360	52	241K598M75	33.498	64	241K617M75	33.605	76	241K637M75	33.718	88	241K658M25	33.834	100	241K680M00	33.957	112	241K701M75	34.080	124	241K722M25	34.196	136	241K742M25	34.309	148	241K766M40	34.445
5	241K513M45	33.016	17	241K535M75	33.142	29	241K557M00	33.262	41	241K576M25	33.371	53	241K598M90	33.499	65	241K619M75	33.617	77	241K640M00	33.731	89	241K660M25	33.845	101	241K681M10	33.963	113	241K703M75	34.091	125	241K723M00	34.200	137	241K744M25	34.320	149	241K766M55	34.446
6	241K513M60	33.017	18	241K537M75	33.153	30	241K557M75	33.266	42	241K578M25	33.382	54	241K600M00	33.505	66	241K621M75	33.628	78	241K642M25	33.744	90	241K662M25	33.857	102	241K681M25	33.964	114	241K705M75	34.102	126	241K724M25	34.207	138	241K746M25	34.331	150	241K766M60	34.446
7	241K516M10	33.031	19	241K539M75	33.165	31	241K560M00	33.279	43	241K580M25	33.393	55	241K601M10	33.511	67	241K623M75	33.639	79	241K643M00	33.748	91	241K664M25	33.868	103	241K683M75	33.978	115	241K707M75	34.114	127	241K726M10	34.217	139	241K748M25	34.343	151	241K767M60	34.452
8	241K518M60	33.045	20	241K541M75	33.176	32	241K562M25	33.292	44	241K582M25	33.405	56	241K601M25	33.512	68	241K625M75	33.650	80	241K644M25	33.755	92	241K666M25	33.879	104	241K685M75	33.989	116	241K709M75	34.125	128	241K726M25	34.218	140	241K750M25	34.354	152	241K768M60	34.458
9	241K521M10	33.059	21	241K543M75	33.187	33	241K563M00	33.296	45	241K584M25	33.416	57	241K603M75	33.526	69	241K627M75	33.662	81	241K646M10	33.765	93	241K668M25	33.891	105	241K687M75	34.001	117	241K711M75	34.136	129	241K728M25	34.230	141	241K752M25	34.365	153	241K769M93	34.465
10	241K521M25	33.060	22	241K545M75	33.198	34	241K564M25	33.303	46	241K586M25	33.427	58	241K605M75	33.537	70	241K629M75	33.673	82	241K646M25	33.766	94	241K670M25	33.902	106	241K689M75	34.012	118	241K713M75	34.148	130	241K730M25	34.241	142	241K754M25	34.377			
11	241K523M75	33.074	23	241K547M75	33.210	35	241K566M10	33.313	47	241K588M25	33.439	59	241K607M75	33.549	71	241K631M75	33.684	83	241K648M25	33.778	95	241K672M25	33.913	107	241K691M75	34.023	119	241K713M90	34.149	131	241K732M25	34.252	143	241K756M25	34.388			
12	241K525M75	33.085	24	241K549M75	33.221	36	241K566M25	33.314	48	241K590M25	33.450	60	241K609M75	33.560	72	241K633M75	33.696	84	241K650M25	33.789	96	241K674M25	33.925	108	241K693M75	34.035	120	241K715M75	34.159	132	241K734M25	34.264	144	241K758M75	34.402			



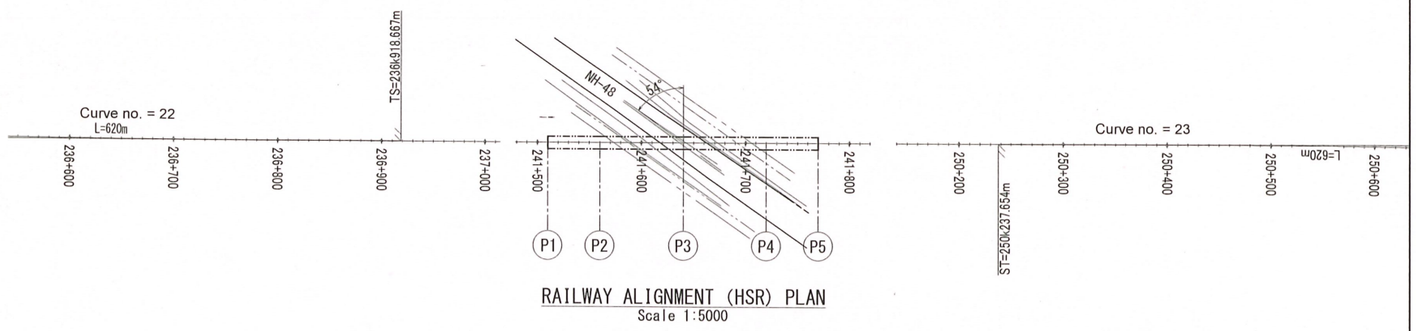
SIDE VIEW
Scale 1:500



SECTION J-J
Scale 1:50

SECTION H-H
Scale 1:50

LEGEND
; RETAINER & PEDESTAL CONCRETE
; DRAINAGE SLOPE & COVER CONCRETE



RAILWAY ALIGNMENT (HSR) PLAN
Scale 1:5000

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

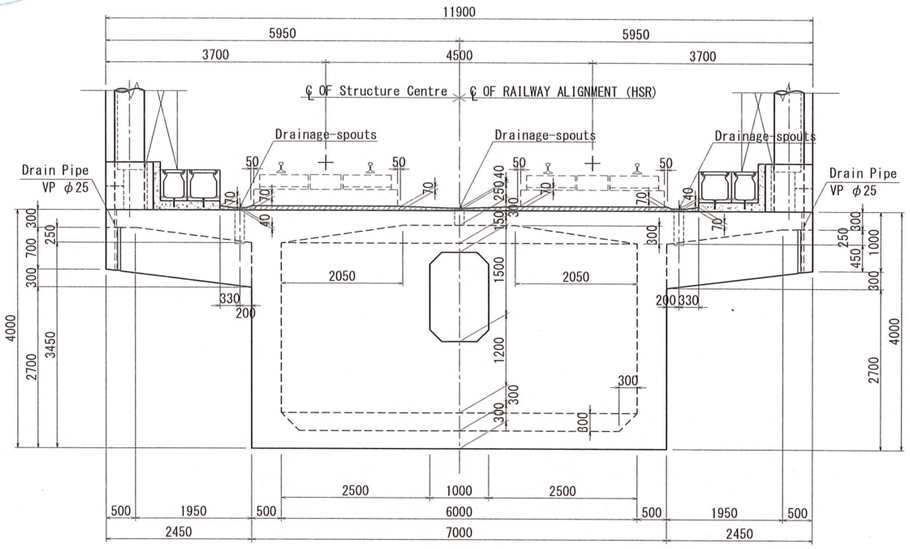
Adopted by: NHSRCL

Project	OWNER	JICA Study Team
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL

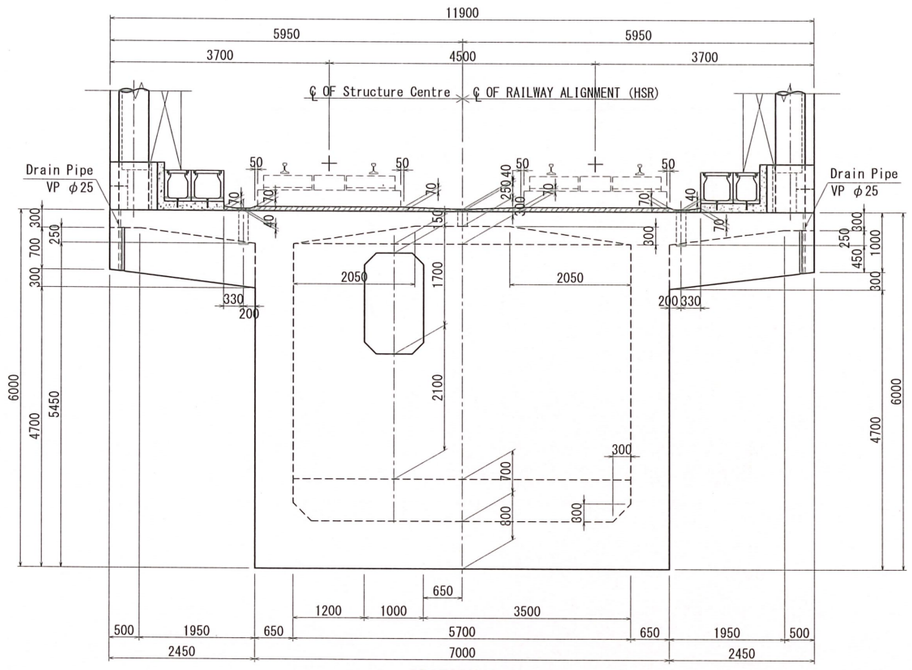
Revised		Date	16 DEC 2019
Prepared			
Checked			16 DEC 2019
Approved			16 DEC 2019

Title: GAD11 Superstructure Coordinate Drawing (Part1)
Scale: 1:1000 @ A3
Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11003 001

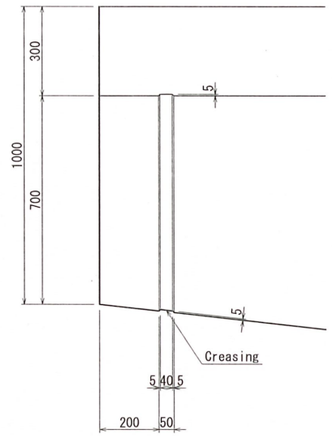
GAD11 General Superstructure Drawing (Part7)



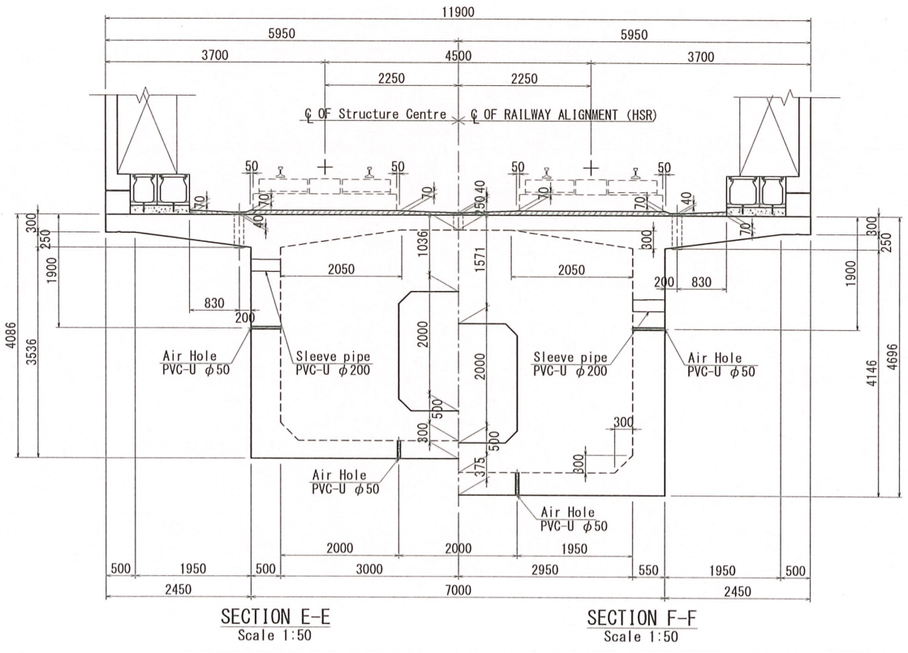
SECTION D-D
Scale 1:50



SECTION G-G
Scale 1:50

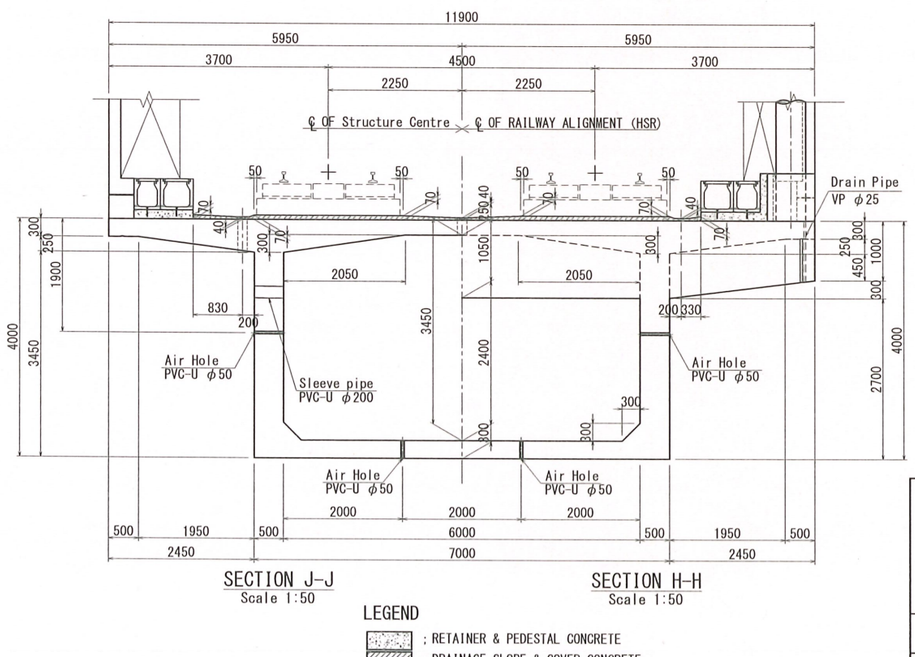


Details of Creasing & Pole Supporting Beam
Scale 1:10



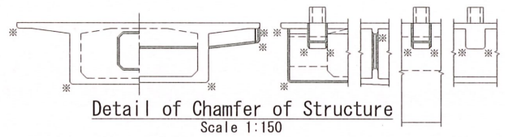
SECTION E-E
Scale 1:50

SECTION F-F
Scale 1:50

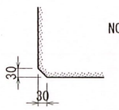


SECTION J-J
Scale 1:50

SECTION H-H
Scale 1:50



Detail of Chamfer of Structure
Scale 1:150



NOTE: THE CHAMFER (※ AND ▨) SHOWN IN ABOVE FIGURE OF THE STRUCTURE SHOULD BE CUT AT 30mm x 30mm AS SHO AS LEFT FIGURE.

Detail of Chamfer
Scale 1:10

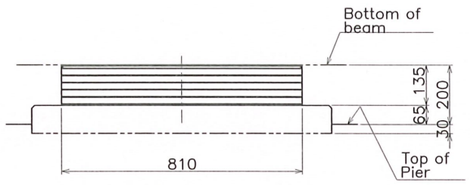
LEGEND
; RETAINER & PEDESTAL CONCRETE
; DRAINAGE SLOPE & COVER CONCRETE

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

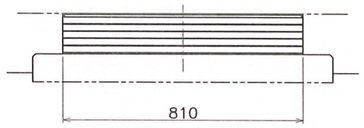
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.
JICA Study Team	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL
Revised	Date 16 DEC 2019
Prepared	
Checked	16 DEC 2019
Approved	16 DEC 2019
Title	GAD11 General Superstructure Drawing (Part7)
Scale	1:100 @ A3
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11107 001

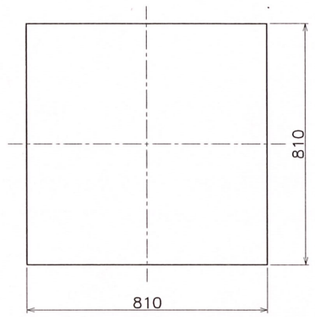
GAD11 P1(A) - P5(A) Detail of Elastomeric Bearing



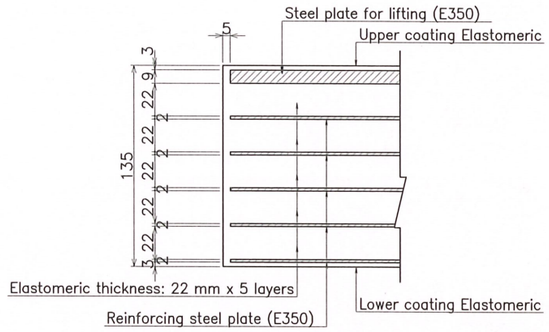
Bridge axis direction



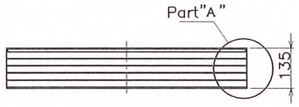
Perpendicular Direction with Bridge Axis

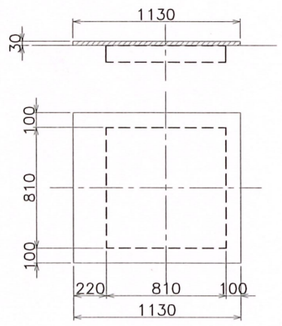


① ～ Chloroprene Elastomeric+E350

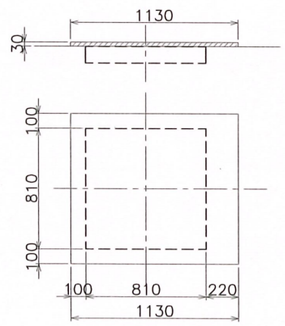


Part "A"
Scale 1:2





P1 Pier Bearing
P2 direction



P5 Pier Bearing
P4 direction

Embeded Form Plate
Scale 1:80

Note: 1. Based on material procurement in India, the 2 mm and 9 mm steel thickness of members can be changed to a higher thickness by the contractor.
2. According to 1, the following measures should also be taken if the thickness is changed:
(1) Any increase in the total thickness of the rubber shoe resulting from the change of steel thickness should be adjusted with the thickness of the concrete pedestal, and the embedding depth from the surface of the pier cap should be fixed at 30 mm.
(2) When adjusting the thickness of the concrete pedestal in (1), 50 mm of covering should be secured from the upper surface of the concrete pedestal against [Superstructure Design Drawing N1, 2, 3 reinforcement bar (D12), Substructure Design Drawing h1 reinforcement bar (D12)]
3. Steel plate for lifting shall be provided with a threaded hole for lifting bolt.

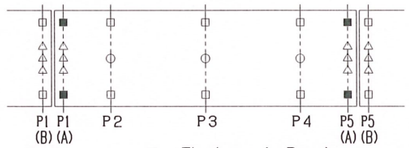
Design conditions

Max. reaction force per bearing (Rmax)	4600 kN
Min. reaction force per bearing (Rmin)	2400 kN
Shifting amount	76 mm

Material table

Part No.	Part Name	Material	Quantity	Mass(kg)	Remarks
1 set	Elastomeric Bearing	Chloroprene Elastomeric and E350	1	208.3	0.8 N/mm²

Layout



□ : Elastomeric Bearing
○ : Viscous fluid resistance Damper stopper
△ : Steel stopper

Release from shear deformation
1. Jacking up P1 and P5, then release the deformation of the bearing. Jacking up shall be after completion of the structures on the slab.
2. After at least three months pass from the erection of a beam, the beam shall be jacked up to release Elastomeric bearings from shear deformation.
3. Jacking up control value shall be or more 3.0mm.
4. If the timing of jacking up differs from the designed schedule, computation and a review will be necessary.

About the Elastomeric quality specification

1) Testing of Elastomeric shall be done at normal temperature.
2) Among the symbols that are described in the column for test specimen dimensions, "a" and "b" indicate the side lengths of Elastomeric Bearing, and "te" indicates the thickness of Elastomeric.

Notes;
1. The quality specification of Elastomeric and the test results assuring the performance of Elastomeric bearing shall be submitted.
2. A plate indicating the Elastomeric bearing manufacturer and the date of manufacturing shall be attached on a side surface of the relevant beam.
3. The Elastomeric baring shall be of coated type, and the coating Elastomeric to be used shall have properties to prevent rust on reinforcing steel plates and to make the reinforcing steel plates fit well with the beam. The coating thickness on the side of the Elastomeric bearing shall be 5 mm or more.

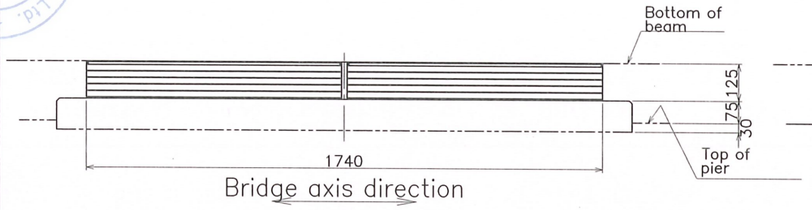
About the Embedded Form Plate
1. In principle, embedded form plate shall only be used in a 100-mm range on the outside of the bearing at the top of the bearing.
2. The material of embedded form plate shall have the strength, elastic coefficient, shear elastic coefficient, and durability equivalent to those of the concrete of the beam body, and enable the form plate to keep flatness against the bearing stress given from supporting points.
3. The embedded form plate shall be of single-plate type, and a measure shall be taken to prevent mortar from flowing out at the connection with other form plate.
4. The top surface of embedded form plate to be joined with the beam concrete shall have a structure that enables the form plate to be integrated with the beam concrete, so as to prevent detachment from the beam.
5. The bottom surface of embedded form plate to contact with the Elastomeric bearing shall have an appropriate frictional property.

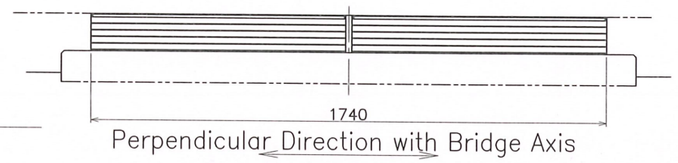
NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

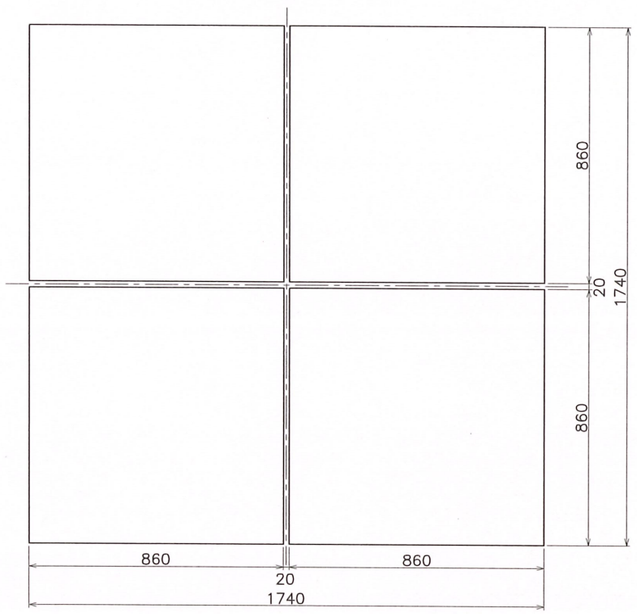
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019
Title	GAD11 P1(A) - P5(A) Detail of Elastomeric Bearing	
Scale	1:40 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11405 002	

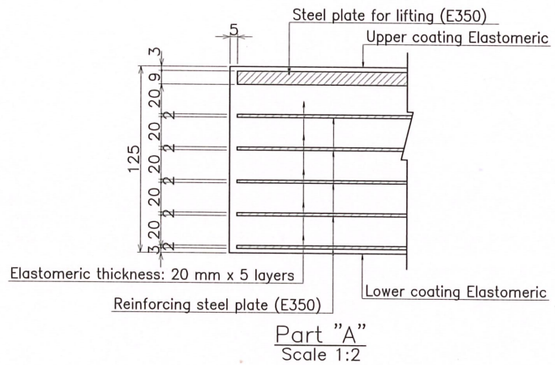
GAD11 P2・P4 Detail of Elastomeric Bearing



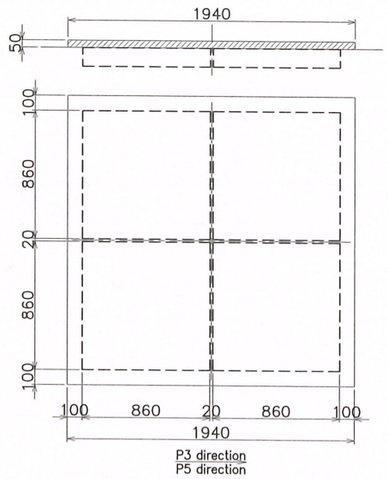




① ～ Chloroprene Elastomeric+ E350



Part "A"
Scale 1:2



Embeded Form Plate
Scale 1:80

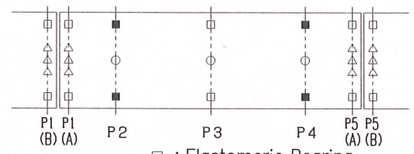
Design conditions

Max. reaction force per bearing (Rmax)	6200 kN
Min. reaction force per bearing (Rmin)	4800 kN
Shifting amount	68 mm

Material table

Part No.	Part Name	Material	Quantity	Mass(kg)	Remarks
1 set	Elastomeric Bearing	Chloroprene Elastomeric and E350	4	895.2	0.8 N/mm²

Layout



□ : Elastomeric Bearing
○ : Viscous fluid resistance Damper stopper
△ : Steel stopper

Release from shear deformation

1. Jacking up P1 and P5, then release the deformation of the bearing. Jacking up shall be after completion of the structures on the slab.
2. After at least three months pass from the erection of a beam, the beam shall be jacked up to release Elastomeric bearings from shear deformation.
3. Jacking up control value shall be or more 3.0mm.
4. If the timing of jacking up differs from the designed schedule, computation and a review will be necessary.

About the Elastomeric quality specification

1) Testing of Elastomeric shall be done at normal temperature.
2) Among the symbols that are described in the column for test specimen dimensions, "a" and "b" indicate the side lengths of Elastomeric Bearing, and "te" indicates the thickness of Elastomeric.

Notes;

1. The quality specification of Elastomeric and the test results assuring the performance of Elastomeric bearing shall be submitted.
2. A plate indicating the Elastomeric bearing manufacturer and the date of manufacturing shall be attached on a side surface of the relevant beam.
3. The Elastomeric baring shall be of coated type, and the coating Elastomeric to be used shall have properties to prevent rust on reinforcing steel plates and to make the reinforcing steel plates fit well with the beam. The coating thickness on the side of the Elastomeric bearing shall be 5 mm or more.

About the Embedded Form Plate

1. In principle, embedded form plate shall only be used in a 100-mm range on the outside of the bearing at the top of the bearing.
2. The material of embedded form plate shall have the strength, elastic coefficient, shear elastic coefficient, and durability equivalent to those of the concrete of the beam body, and enable the form plate to keep flatness against the bearing stress given from supporting points.
3. The embedded form plate shall be of single-plate type, and a measure shall be taken to prevent mortar from flowing out at the connection with other form plate.
4. The top surface of embedded form plate to be joined with the beam concrete shall have a structure that enables the form plate to be integrated with the beam concrete, so as to prevent detachment from the beam.
5. The bottom surface of embedded form plate to contact with the Elastomeric bearing shall have an appropriate frictional property.

Note: 1. Based on material procurement in India, the 2 mm and 9 mm steel thickness of members can be changed to a higher thickness by the contractor.
2. According to 1, the following measures should also be taken if the thickness is changed:
(1) Any increase in the total thickness of the rubber shoe resulting from the change of steel thickness should be adjusted with the thickness of the concrete pedestal, and the embedding depth from the surface of the pier cap should be fixed at 30 mm.
(2) When adjusting the thickness of the concrete pedestal in (1), 50 mm of covering should be secured from the upper surface of the concrete pedestal against 〔Superstructure Design Drawing N1, 2, 3 reinforcement bar (D12), Substructure Design Drawing h1 reinforcement bar (D12)〕
3. Steel plate for lifting shall be provided with a threaded hole for lifting bolt.

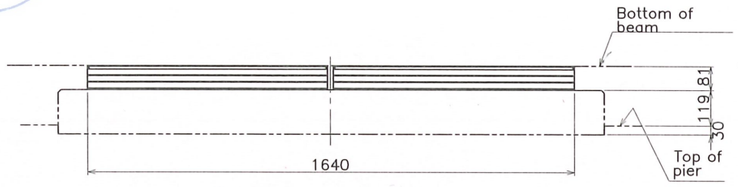
NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

Adopted by: NHSRCL

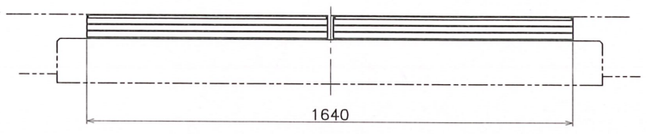
Project	OWNER	JICA Study Team	Revised	Date
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL	Prepared	
			Checked	16 DEC 2019
			Approved	16 DEC 2019

Title: GAD11 P2・P4 Detail of Elastomeric Bearing
Scale: 1:40 @ A3
Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11406 002

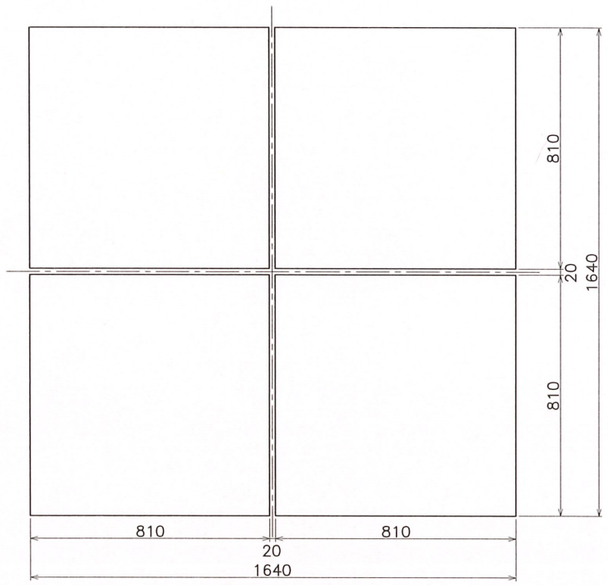
GAD11 P3 Detail of Elastomeric Bearing



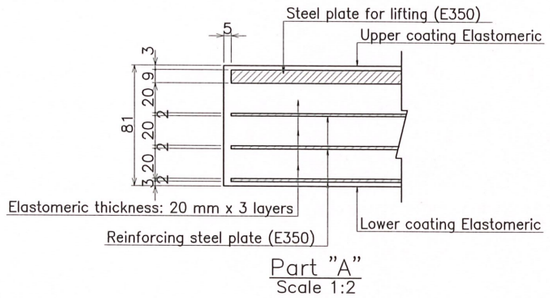
Bridge axis direction



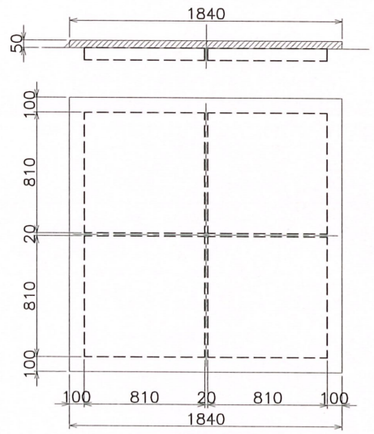
Perpendicular Direction with Bridge Axis



① ～ Chloroprene Elastomeric+ E350



Part "A"
Scale 1:2



Embeded Form Plate
Scale 1:80

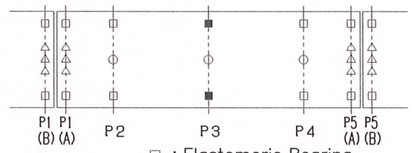
Design conditions

Max. reaction force per bearing (Rmax)	6200	kN
Min. reaction force per bearing (Rmin)	5000	kN
Shifting amount	---	mm

Material table

Part No.	Part Name	Material	Quantity	Mass(kg)	Remarks
1 set	Elastomeric Bearing	Chloroprene Elastomeric and E350	4	556.8	0.8 N/mm²

Layout



□ : Elastomeric Bearing
○ : Viscous fluid resistance Damper stopper
△ : Steel stopper

Release from shear deformation

1. Jacking up P1 and P5, then release the deformation of the bearing. Jacking up shall be after completion of the structures on the slab.
2. After at least three months pass from the erection of a beam, the beam shall be jacked up to release Elastomeric bearings from shear deformation.
3. Jacking up control value shall be or more 3.0mm.
4. If the timing of jacking up differs from the designed schedule, computation and a review will be necessary.

About the Elastomeric quality specification

1) Testing of Elastomeric shall be done at normal temperature.
2) Among the symbols that are described in the column for test specimen dimensions, "a" and "b" indicate the side lengths of Elastomeric Bearing, and "te" indicates the thickness of Elastomeric.

1. The quality specification of Elastomeric and the test results assuring the performance of Elastomeric bearing shall be submitted.
2. A plate indicating the Elastomeric bearing manufacturer and the date of manufacturing shall be attached on a side surface of the relevant beam.
3. The Elastomeric baring shall be of coated type, and the coating Elastomeric to be used shall have properties to prevent rust on reinforcing steel plates and to make the reinforcing steel plates fit well with the beam. The coating thickness on the side of the Elastomeric bearing shall be 5 mm or more.

About the Embedded Form Plate

1. In principle, embedded form plate shall only be used in a 100-mm range on the outside of the bearing at the top of the bearing.
2. The material of embedded form plate shall have the strength, elastic coefficient, shear elastic coefficient, and durability equivalent to those of the concrete of the beam body, and enable the form plate to keep flatness against the bearing stress given from supporting points.
3. The embedded form plate shall be of single-plate type, and a measure shall be taken to prevent mortar from flowing out at the connection with other form plate.
4. The top surface of embedded form plate to be joined with the beam concrete shall have a structure that enables the form plate to be integrated with the beam concrete, so as to prevent detachment from the beam.
5. The bottom surface of embedded form plate to contact with the Elastomeric bearing shall have an appropriate frictional property.

Note: 1. Based on material procurement in India, the 2 mm and 9 mm steel thickness of members can be changed to a higher thickness by the contractor.
2. According to 1, the following measures should also be taken if the thickness is changed:
(1) Any increase in the total thickness of the rubber shoe resulting from the change of steel thickness should be adjusted with the thickness of the concrete pedestal, and the embedding depth from the surface of the pier cap should be fixed at 30 mm.
(2) When adjusting the thickness of the concrete pedestal in (1), 50 mm of covering should be secured from the upper surface of the concrete pedestal against {Superstructure Design Drawing N1, 2, 3 reinforcement bar (D12), Substructure Design Drawing h1 reinforcement bar (D12)}
3. Steel plate for lifting shall be provided with a threaded hole for lifting bolt.

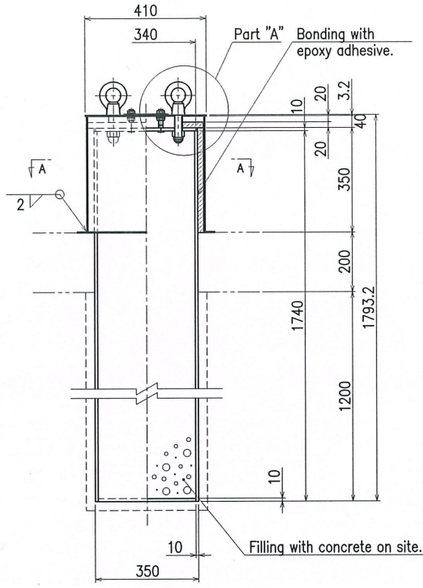
NOTES :
1. ALL DIMENSIONS ARE IN MM. EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

Adopted by: NHSRCL

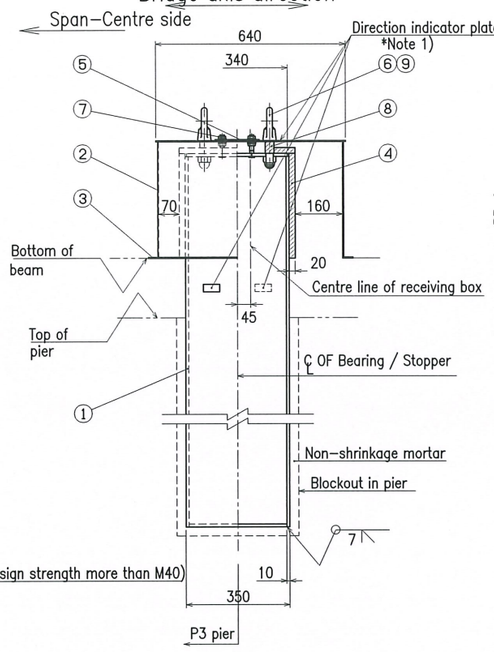
Project	OWNER	JICA Study Team	Revised	Date	Title
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL		16 DEC 2019	GAD11 P3 Detail of Elastomeric Bearing
			Prepared		
			Checked	16 DEC 2019	Scale 1:40 @ A3
			Approved	16 DEC 2019	Drawing No. DD-JIC-C06-TDC-B06-BRD-B60-11407 002

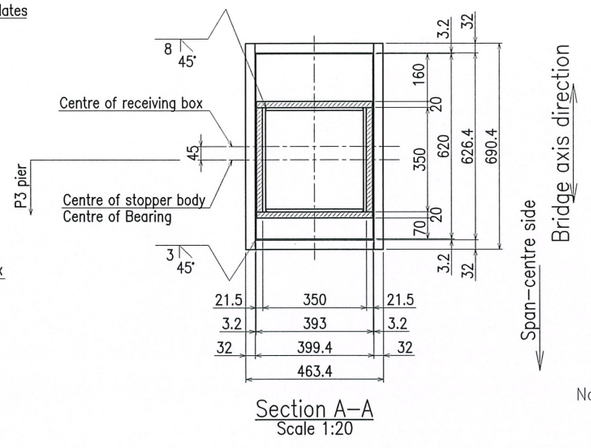
GAD11 Details of Stopper at P1(A)・P5(A) (Part1)

Perpendicular Direction with Bridge Axis



Bridge axis direction





Section A–A
Scale 1:20

Note: The above dimensions of the spacing between stopper and end cross beam indicate those in the status with the stopper installed.

Design conditions (per 1 stopper)

Design horizontal force	Bridge–axis direction	0	kN
	Perpendicular direction with bridge axis	683	kN
Steel material	Allowable bending strength	330	N/mm²
	Allowable shear strength	190	N/mm²

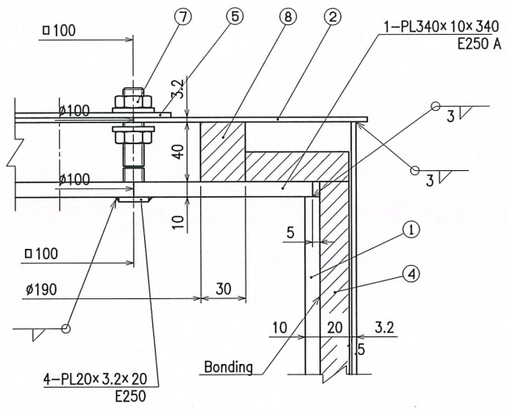
List of materials

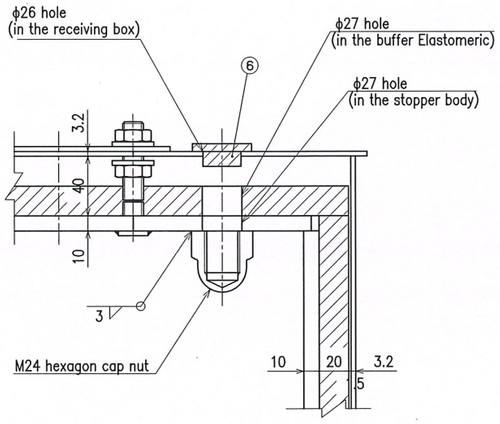
No.	Name	Material	Quantity	Weight(kg)	Remarks
1	Stopper body	E350	1	202.5	
2	Receiving box	E250 B0	1	26.3	
3	Corner fitting	E250 B0	1	1.8	
4	Shock absorbing Elastomeric	Chloroprene Elastomeric	1	18.5	
5	Cover A	E250 B0	1	0.5	
6	Cover B	Chloroprene Elastomeric	4	0.1	
7	Threaded rod and nut	8.8	4	0.4	IS 1363 Part–1 With plain washers
8	Sealing ring	Chloroprene Elastomeric	1	1.2	
9	Eyebolt for lifting	—	4	4.5	IS 4190
Weight per 1 stopper (kg)				255.8	

Note: The steel thickness of members No. 1, 2, 3, 5 can be revised to 3.2 mm or more by the contractor.

QUALITY STANDARD OF RESILIENT Elastomeric, COVER B, AND SEAL RING

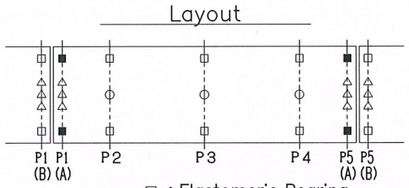
Physical properties		Unit	Standard value	Applicable codes	
(1) Static shear modulus		Mpa	0.60±0.10	Low displacement tensile test	IRC:83(PartII)
(2) Elongation		%	500 or more	Tensile test	IRC:83(PartII)
(3) Oil resistance properties (Rate of volume change)		%	≤ +120	Oil resistance test	ISO 1817 Oil:IRM903(ASTM D471 Duration (h) : 72 Temperature (℃) : 100
(4) Ageing resistance properties	Rate of stress change at 25% elongation	%	−10 to +100	Ageing test	ISO 188 Duration (h) : 72 Temperature (℃) : 100
	Elongation change rate	%	≥ −50		
(5) Permanent compressive strain rate		%	35 or less	Permanent compressive strain test	IRC:83(PartII) Duration (h) : 24 Temperature (℃) : 100
(6) Ozone resistance properties		–	No cracking detected by visual observation	Resistance to ozone cracking – static strain test	IRC:83(PartII) Strain (%) : 30 Duration (h) : 72 Temperature (℃) : 40 Ozone concentration (pphm) : 100





Details of Part "A"
Scale 1:4

Layout



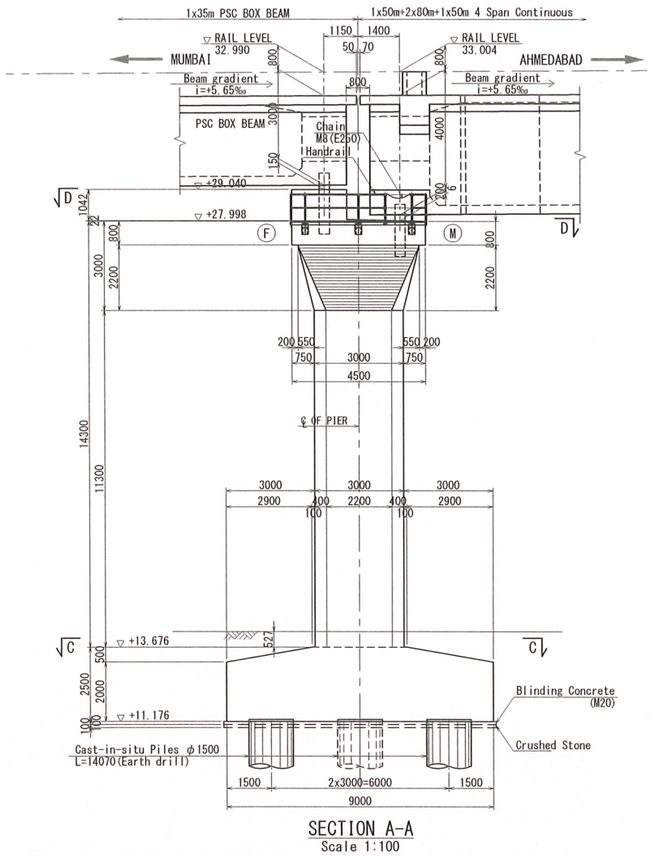
□ : Elastomeric Bearing
○ : Viscous fluid resistance Damper stopper
△ : Steel stopper

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

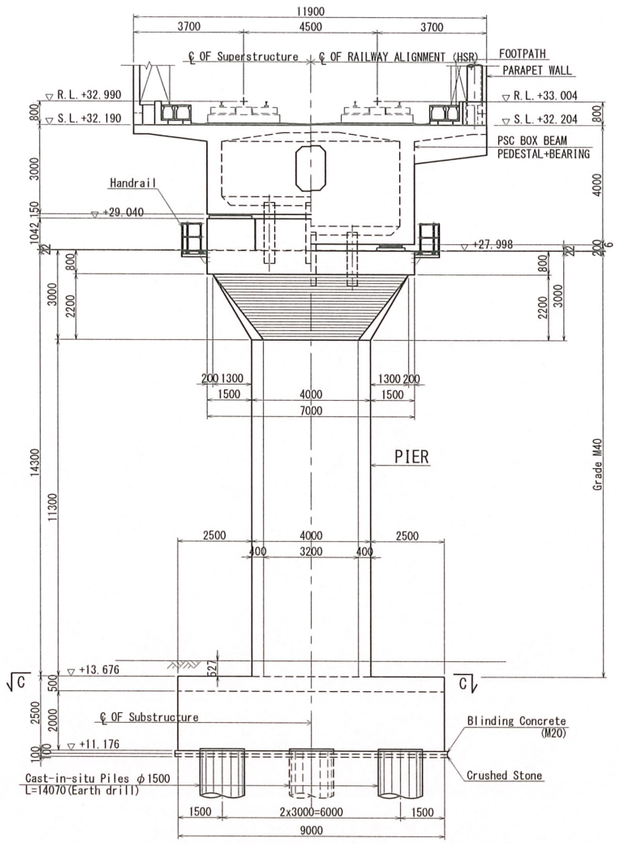
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 11 DEC 2019
Prepared		
Checked		11 DEC 2019
Approved		11 DEC 2019
Title	GAD11 Details of Stopper at P1(A)・P5(A) (Part1)	
Scale	1:20,1:4 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11410 001	

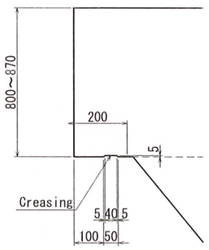
GAD11 P1 Pier Substructure General Drawing (Part1)



SECTION A-A
Scale 1:100



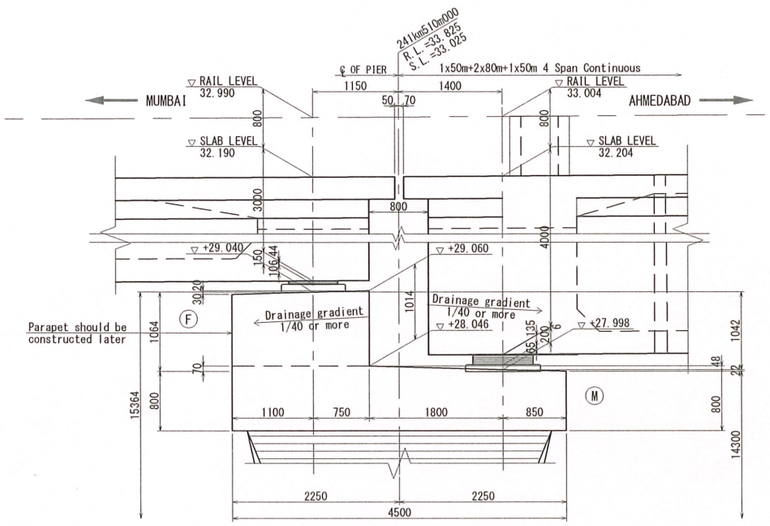
SECTION B-B
Scale 1:100



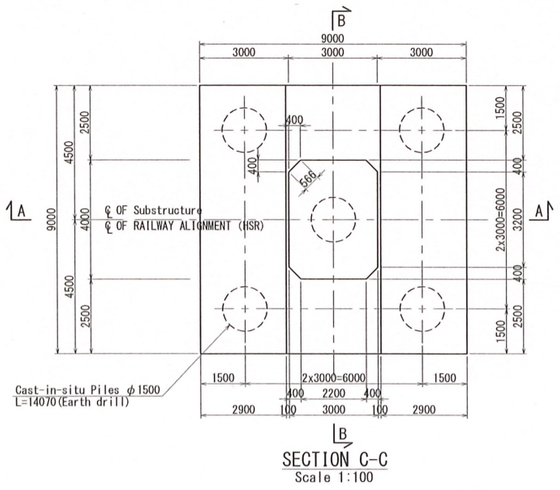
Details of Creasing
Scale=1:10

DESIGN CONDITIONS

Mumbai-Ahmedabad High Speed Railway Corridor					
Design Train Load			P-17		
Radius			LINE (R=∞)		
Design Maximum Speed			V = 350km/h		
Seismic Zone			Ⅲ		
Regional Factor Z for Horizontal Motion			0.16		
Horizontal Seismic Coefficient (DBE)			Kh=0.18 , Kh=0.15 (Foundation)		
Environment Condition			Corrosive(Pier Cap)、Normal(Column,Pile Cap)		
Cover	Pier	Cap	50mm		
		Column	75mm		
	Pile Cap	Upper Side	75mm		
		Side	75mm		
		Lower Side	75mm		
	Pile	Main R.Bar	120mm (Earth drill)		
Concrete	Member		Pier(Cap, Column)	Pile Cap	Pile
	Grade		M40	M40	M40
	Maximum Water-Cement Ratio		40%	40%	40%
	Size of Coarse Aggregate		20 mm	20 mm	20 mm
Reinforcement Steel	Diameter (mm)		12, 16, 20, 25, 28, 32, 36, (40)		
	Type of Bar		Fe500D		
	Tensile Strength		565N/mm^2		
	Yield Strength		500N/mm^2		
Supporting Ground	Ultimate Bearing Capacity		18000kN (Per one pile)		



Detail of Pier Cap Part
Scale 1:40



SECTION C-C
Scale 1:100

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. IF THE PILE LOAD TEST RESULT DOES NOT SATISFY THE DESIGN ULTIMATE BEARING CAPACITY, THE CONTRACTOR SHALL NOT PROCEED WITH FURTHER WORKS, AND THE TREATMENT SHALL BE SUBMITTED BY THE CONTRACTOR AND GOT APPROVED FROM THE ENGINEER PROMPTLY.
3. SINCE THE SUPPORTING GROUND OF P5 IS DIFFERENT FROM THE OTHERS, THE CONTRACTOR SHALL PERFORM THE INITIAL PILE LOAD TEST AT P5 AND THE OTHER ONE PLACE TO CONFIRM THE ULTIMATE BEARING CAPACITY.
4. CONSTRUCTION CONDITIONS OF PILES : IF THE BENTONITE CONCENTRATION IS LESS THAN 3%, IT CAN BE CONSIDERED NATURAL MUD WATER.

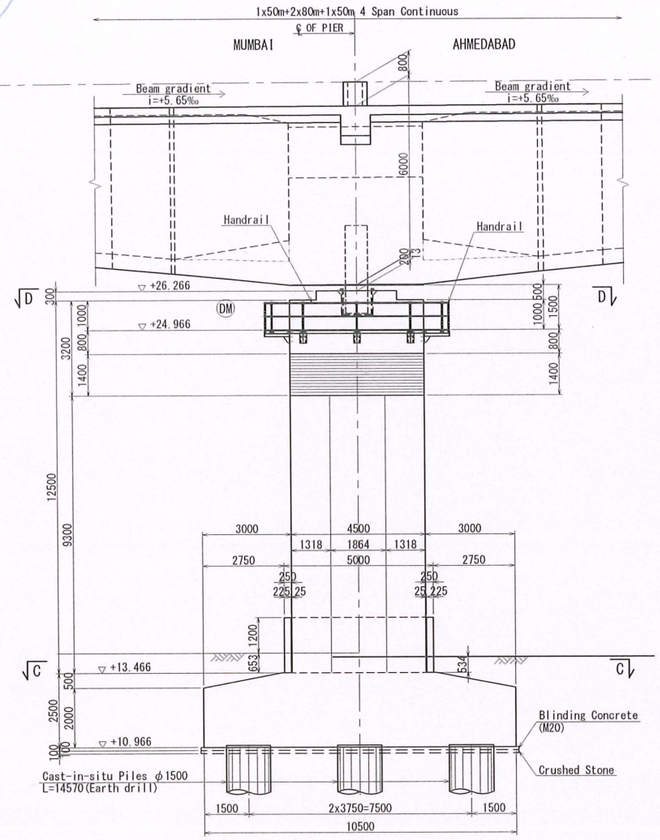
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019
Title	GAD11 P1 Pier Substructure General Drawing (Part1)	
Scale	1:20,40,80&200 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11501 002	

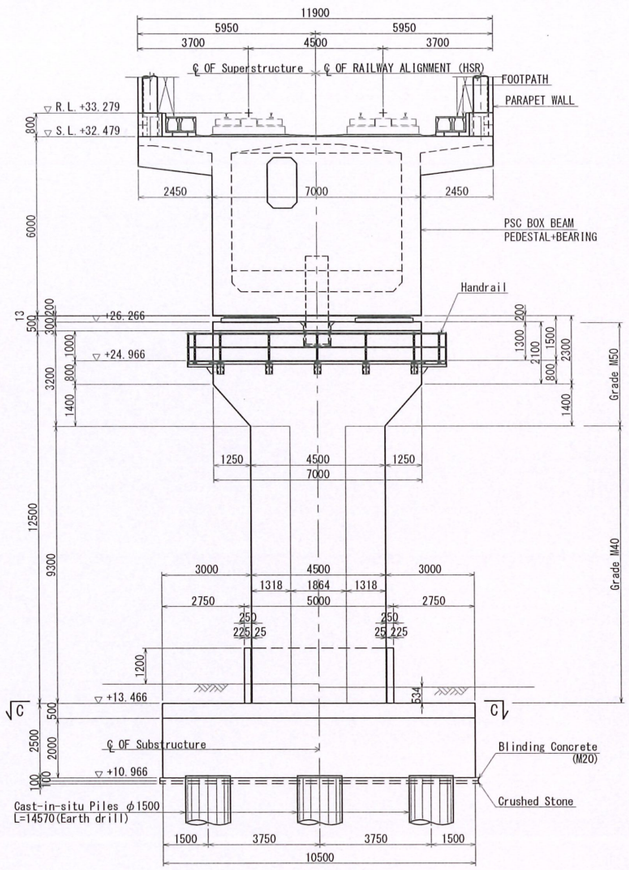
GAD11 P2 Pier Substructure General Drawing (Part1)

DESIGN CONDITIONS

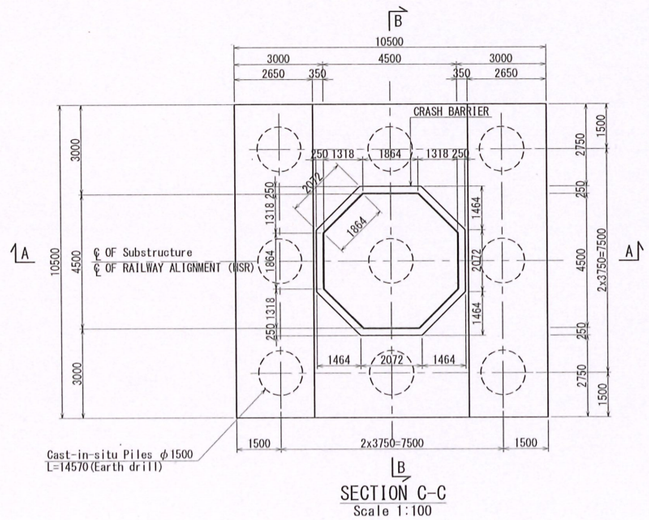
Mumbai-Ahmedabad High Speed Railway Corridor						
Design Train Load			P-17			
Radius			LINE (R=∞)			
Design Maximum Speed			V = 350km/h			
Seismic Zone			Ⅲ			
Regional Factor Z for Horizontal Motion			0.16			
Horizontal Seismic Coefficient (DBE)			Kh=0.18 , Kh=0.15 (Foundation)			
Environment Condition			Corrosive(Pier Cap)、Normal(Column,Pile Cap)			
Cover	Pier	Cap	50mm			
		Column	75mm			
	Pile Cap	Upper Side	75mm			
		Side	75mm			
		Lower Side	75mm			
	Pile	Main R.Bar	120mm (Earth drill)			
Concrete	Member		Pier Cap	Column	Pile Cap	Pile
	Grade		M50	M40	M40	M40
	Maximum Water-Cement Ratio		40%	40%	40%	40%
	Size of Coarse Aggregate		20 mm	20 mm	20 mm	20 mm
Reinforcing Bars	Diameter (mm)		12, 16, 20, 25, 28, 32, 36, (40)			
	Type of Bar		Fe500D			
	Tensile Strength		565N/mm^2			
	Yield Strength		500N/mm^3			
Supporting Ground	Ultimate Bearing Capacity		19000kN (Per one pile)			



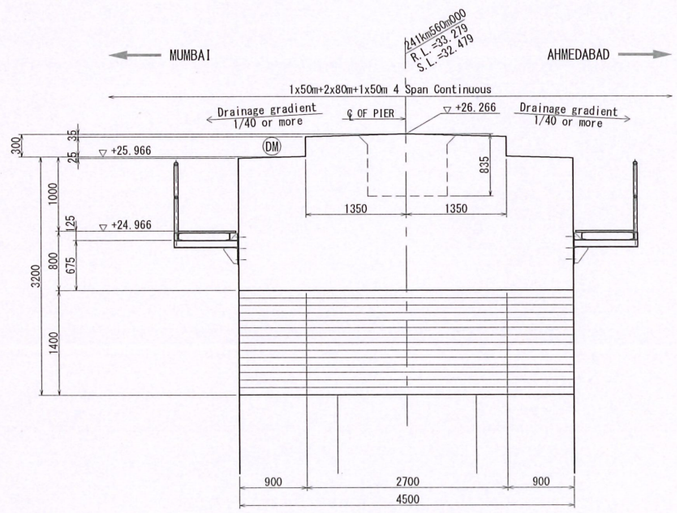
SECTION A-A
Scale 1:100



SECTION B-B
Scale 1:100



SECTION C-C
Scale 1:100



Detail of Pier Cap Part
Scale 1:40

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. IF THE PILE LOAD TEST RESULT DOES NOT SATISFY THE DESIGN ULTIMATE BEARING CAPACITY, THE CONTRACTOR SHALL NOT PROCEED WITH FURTHER WORKS, AND THE TREATMENT SHALL BE SUBMITTED BY THE CONTRACTOR AND GOT APPROVED FROM THE ENGINEER PROMPTLY.
3. SINCE THE SUPPORTING GROUND OF P5 IS DIFFERENT FROM THE OTHERS, THE CONTRACTOR SHALL PERFORM THE INITIAL PILE LOAD TEST AT P5 AND THE OTHER ONE PLACE TO CONFIRM THE ULTIMATE BEARING CAPACITY.
4. CONSTRUCTION CONDITIONS OF PILES ; IF THE BENTONITE CONCENTRATION IS LESS THAN 3%, IT CAN BE CONSIDERED NATURAL MUD WATER.

Adopted by: NHSRCL

Project
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project
[Package No. MAHSR – P-3]

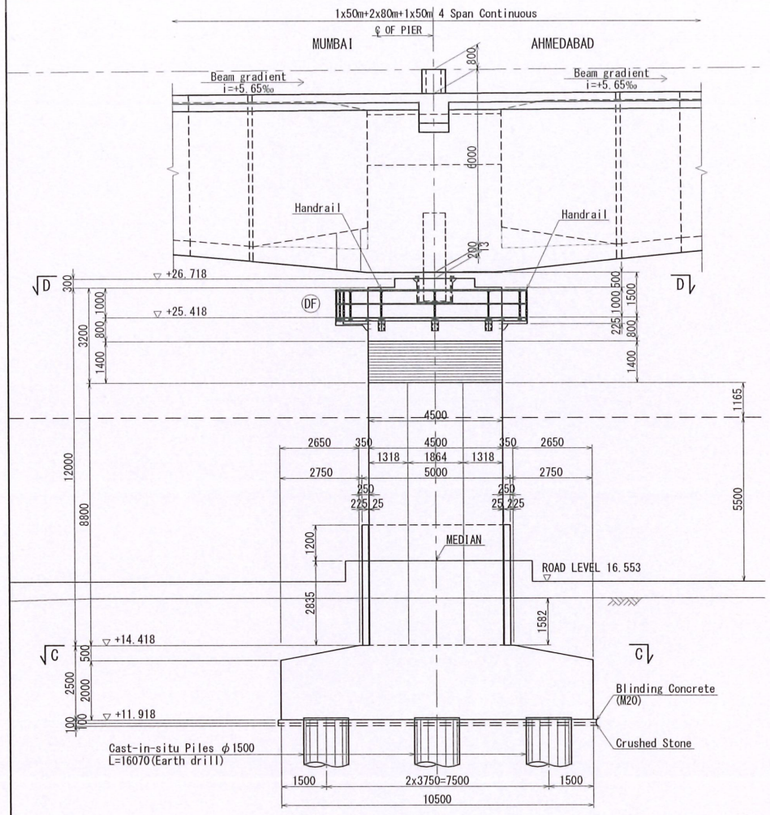
OWNER
NATIONAL HIGH SPEED RAIL CORPORATION LTD.

JICA Study Team
Japan International Consultants for Transportation
NIPPON KOEI
ORIENTAL CONSULTANTS GLOBAL

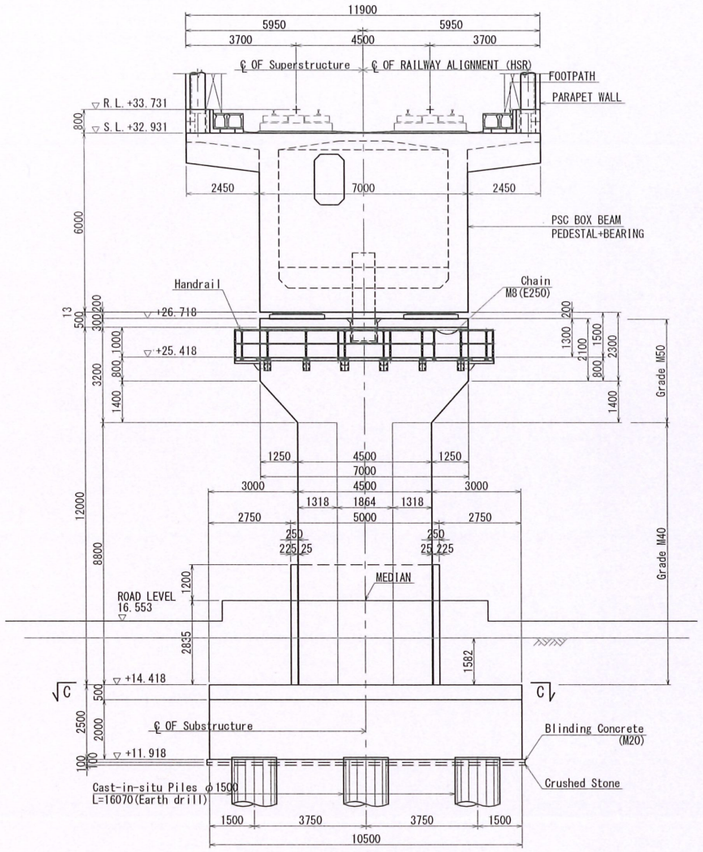
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019

Title: GAD11 P2 Pier Substructure General Drawing (Part1)
Scale: 1:40,80&200 @ A3
Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11514 002

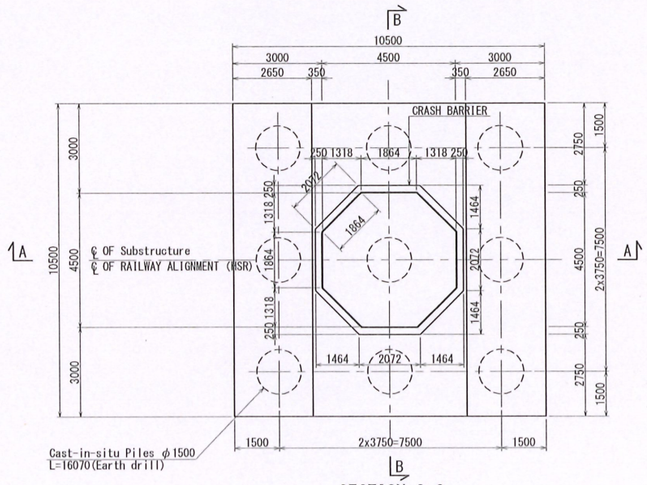
GAD11 P3 Pier Substructure General Drawing (Part1)



SECTION A-A
Scale 1:100



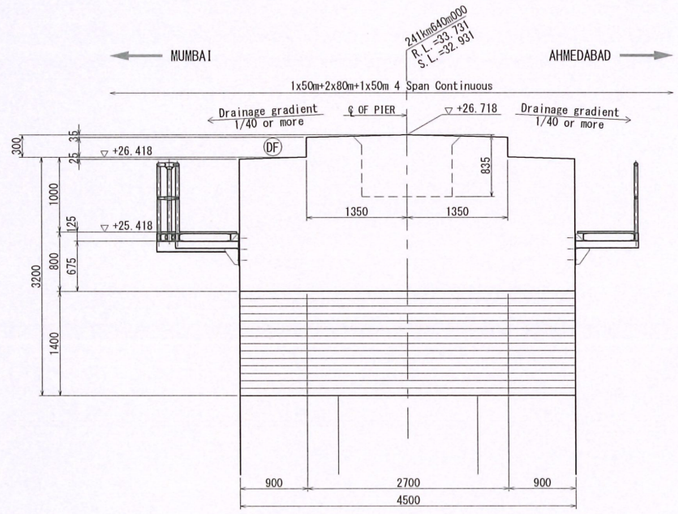
SECTION B-B
Scale 1:100



SECTION C-C
Scale 1:100

DESIGN CONDITIONS

Mumbai-Ahmedabad High Speed Railway Corridor						
Design Train Load			P-17			
Radius			LINE (R=∞)			
Design Maximum Speed			V = 350km/h			
Seismic Zone			Ⅲ			
Regional Factor Z for Horizontal Motion			0.16			
Horizontal Seismic Coefficient (DBE)			Kh=0.18 , Kh=0.15 (Foundation)			
Environment Condition			Corrosive(Pier Cap)、Normal(Column,Pile Cap)			
Cover	Pier	Cap	50mm			
		Column	75mm			
	Pile Cap	Upper Side	75mm			
		Side	75mm			
		Lower Side	75mm			
	Pile	Main R.Bar	120mm (Earth drill)			
Concrete	Member		Pier Cap	Column	Pile Cap	Pile
	Grade		M50	M40	M40	M40
	Maximum Water-Cement Ratio		40%	40%	40%	40%
	Size of Coarse Aggregate		20 mm	20 mm	20 mm	20 mm
Reinforcing Bars	Diameter (mm)		12, 16, 20, 25, 28, 32, 36, (40)			
	Type of Bar		Fe500D			
	Tensile Strength		565N/mm^2			
	Yield Strength		500N/mm^3			
Supporting Ground	Ultimate Bearing Capacity		20000kN (Per one pile)			



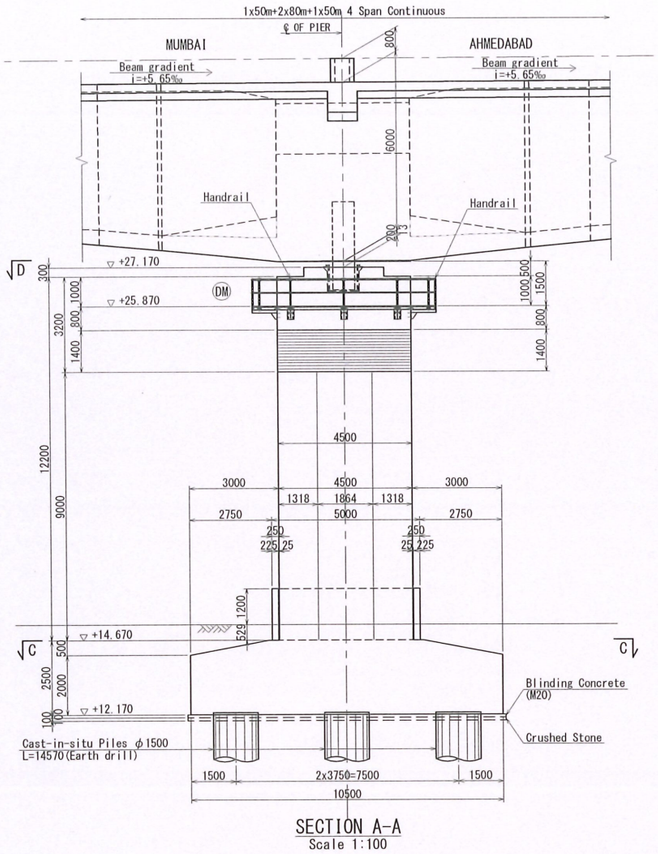
Detail of Pier Cap Part
Scale 1:40

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. IF THE PILE LOAD TEST RESULT DOES NOT SATISFY THE DESIGN ULTIMATE BEARING CAPACITY, THE CONTRACTOR SHALL NOT PROCEED WITH FURTHER WORKS, AND THE TREATMENT SHALL BE SUBMITTED BY THE CONTRACTOR AND GOT APPROVED FROM THE ENGINEER PROMPTLY.
3. SINCE THE SUPPORTING GROUND OF P5 IS DIFFERENT FROM THE OTHERS, THE CONTRACTOR SHALL PERFORM THE INITIAL PILE LOAD TEST AT P5 AND THE OTHER ONE PLACE TO CONFIRM THE ULTIMATE BEARING CAPACITY.
4. CONSTRUCTION CONDITIONS OF PILES : IF THE BENTONITE CONCENTRATION IS LESS THAN 3%, IT CAN BE CONSIDERED NATURAL MUD WATER.

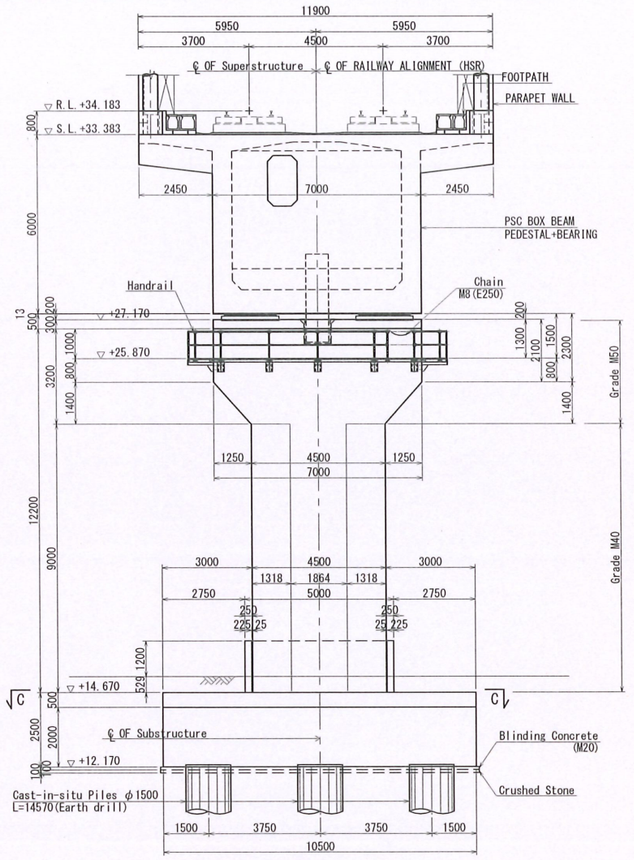
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019
Title	GAD11 P3 Pier Substructure General Drawing (Part1)	
Scale	1:40,80&200 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11526 002	

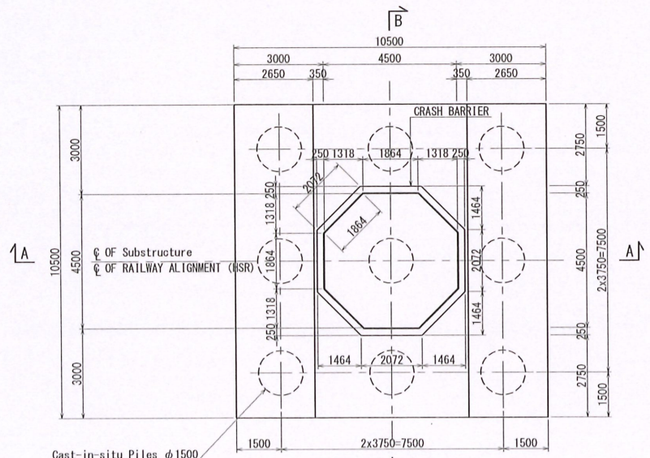
GAD11 P4 Pier Substructure General Drawing (Part1)



SECTION A-A
Scale 1:100



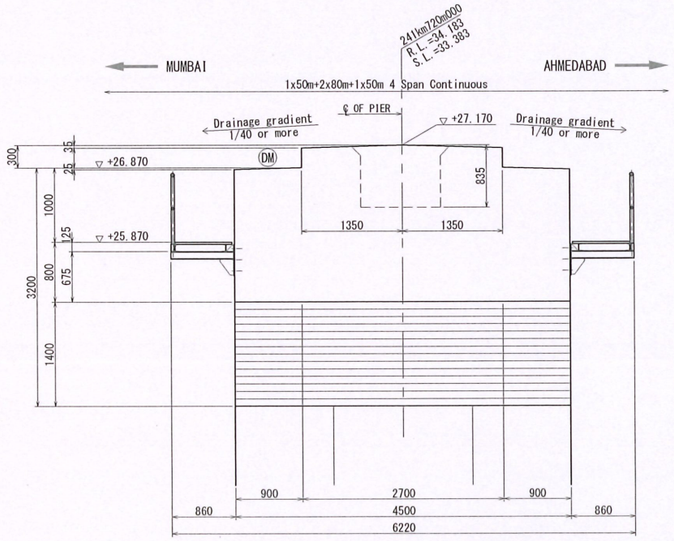
SECTION B-B
Scale 1:100



SECTION C-C
Scale 1:100

DESIGN CONDITIONS

Mumbai-Ahmedabad High Speed Railway Corridor						
Design Train Load			P-17			
Radius			LINE (R=∞)			
Design Maximum Speed			V = 350km/h			
Seismic Zone			Ⅲ			
Regional Factor Z for Horizontal Motion			0.16			
Horizontal Seismic Coefficient (DBE)			Kh=0.18 , Kh=0.15 (Foundation)			
Environment Condition			Corrosive(Pier Cap)、Normal(Column,Pile Cap)			
Cover	Pier	Cap	50mm			
		Column	75mm			
	Pile Cap	Upper Side	75mm			
		Side	75mm			
		Lower Side	75mm			
	Pile	Main R.Bar	120mm (Earth drill)			
Concrete	Member		Pier Cap	Column	Pile Cap	Pile
	Grade		M50	M40	M40	M40
	Maximum Water-Cement Ratio		40%	40%	40%	40%
	Size of Coarse Aggregate		20 mm	20 mm	20 mm	20 mm
Reinforcing Bars	Diameter (mm)		12, 16, 20, 25, 28, 32, 36, (40)			
	Type of Bar		Fe500D			
	Tensile Strength		565N/mm^2			
	Yield Strength		500N/mm^3			
Supporting Ground	Ultimate Bearing Capacity		19000kN (Per one pile)			



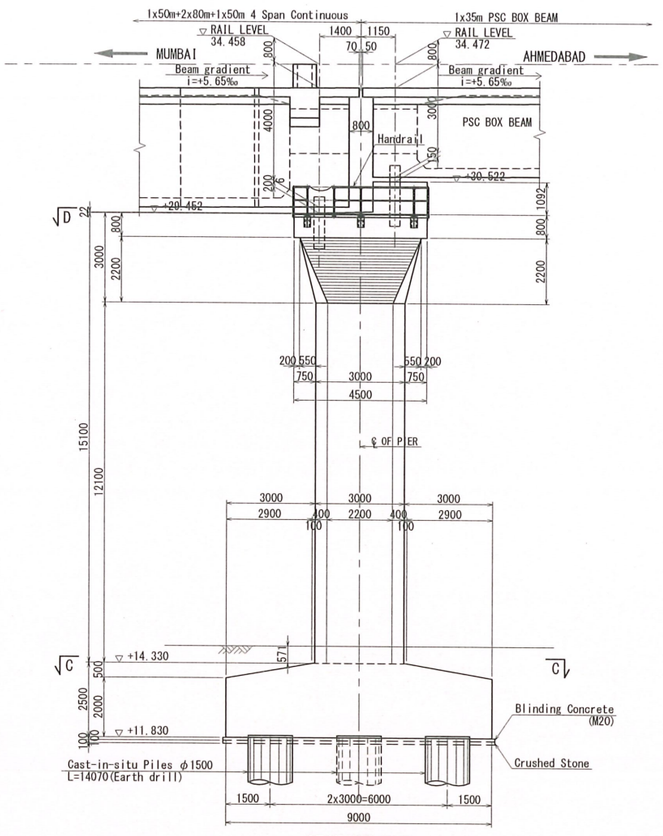
Detail of Pier Cap Part
Scale 1:40

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. IF THE PILE LOAD TEST RESULT DOES NOT SATISFY THE DESIGN ULTIMATE BEARING CAPACITY, THE CONTRACTOR SHALL NOT PROCEED WITH FURTHER WORKS, AND THE TREATMENT SHALL BE SUBMITTED BY THE CONTRACTOR AND GOT APPROVED FROM THE ENGINEER PROMPTLY.
3. SINCE THE SUPPORTING GROUND OF P5 IS DIFFERENT FROM THE OTHERS, THE CONTRACTOR SHALL PERFORM THE INITIAL PILE LOAD TEST AT P5 AND THE OTHER ONE PLACE TO CONFIRM THE ULTIMATE BEARING CAPACITY.
4. CONSTRUCTION CONDITIONS OF PILES : IF THE BENTONITE CONCENTRATION IS LESS THAN 3%, IT CAN BE CONSIDERED NATURAL MUD WATER.

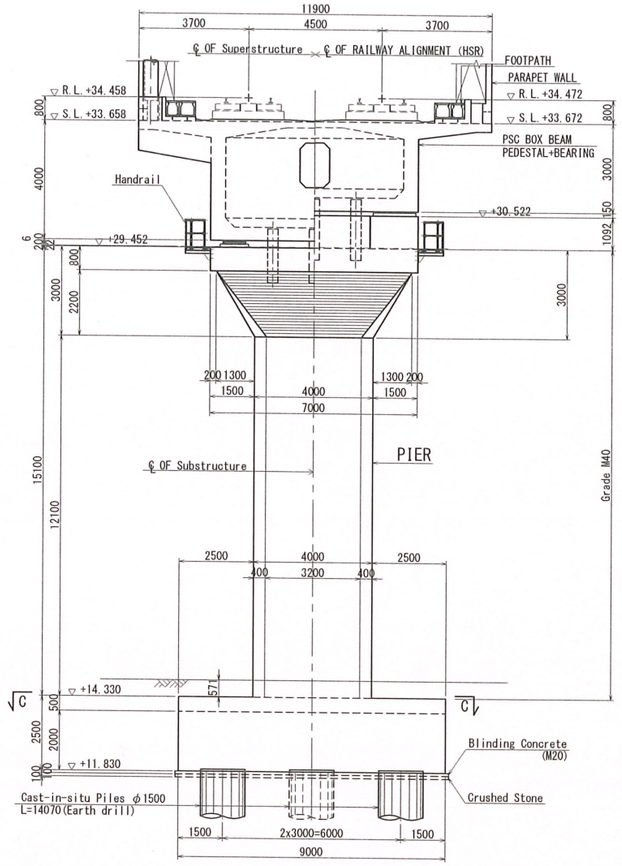
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019
Title	GAD11 P4 Pier Substructure General Drawing (Part1)	
Scale	1:40,80&200 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11538 002	

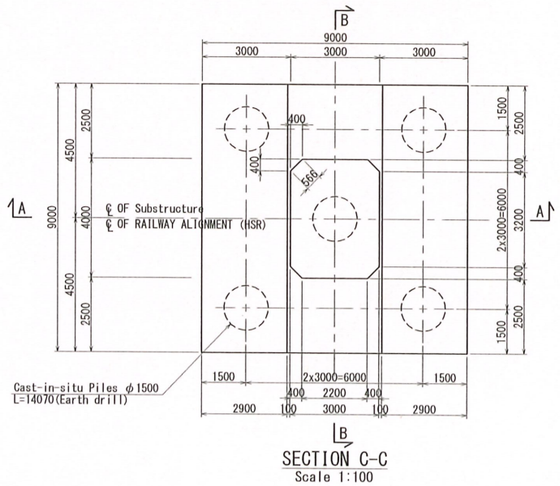
GAD11 P5 Pier Substructure General Drawing (Part1)



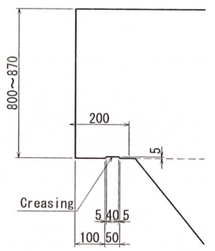
SECTION B-B
Scale 1:100



SECTION B-B
Scale 1:100



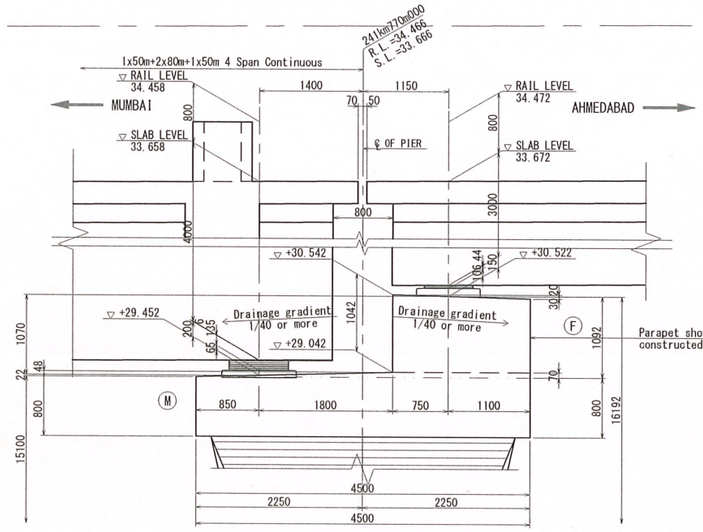
SECTION C-C
Scale 1:100



Details of Creasing
Scale=1:10

DESIGN CONDITIONS

Mumbai-Ahmedabad High Speed Railway Corridor					
Design Train Load			P-17		
Radius			LINE (R=∞)		
Design Maximum Speed			V = 350km/h		
Seismic Zone			Ⅲ		
Regional Factor Z for Horizontal Motion			0.16		
Horizontal Seismic Coefficient (DBE)			Kh=0.18 , Kh=0.15 (Foundation)		
Environment Condition			Corrosive(Pier Cap)、Normal(Column, Pile Cap)		
Cover	Pier	Cap	50mm		
		Column	75mm		
	Pile Cap	Upper Side	75mm		
		Side	75mm		
		Lower Side	75mm		
	Pile	Main R.Bar	120mm (Earth drill)		
Concrete	Member		Pier (Cap, Column)	Pile Cap	Pile
	Grade		M40	M40	M40
	Maximum Water-Cement Ratio		40%	40%	40%
	Size of Coarse Aggregate		20 mm	20 mm	20 mm
Reinforcement Steel	Diameter (mm)		12, 16, 20, 25, 28, 32, 36, (40)		
	Type of Bar		Fe500D		
	Tensile Strength		565N/mm²		
	Yield Strength		500N/mm²		
Supporting Ground	Ultimate Bearing Capacity		18000kN (Per one pile)		



Detail of Pier Cap Part
Scale 1:40

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. IF THE PILE LOAD TEST RESULT DOES NOT SATISFY THE DESIGN ULTIMATE BEARING CAPACITY, THE CONTRACTOR SHALL NOT PROCEED WITH FURTHER WORKS, AND THE TREATMENT SHALL BE SUBMITTED BY THE CONTRACTOR AND GOT APPROVED FROM THE ENGINEER PROMPTLY.
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4. CONSTRUCTION CONDITIONS OF PILES : IF THE BENTONITE CONCENTRATION IS LESS THAN 3%, IT CAN BE CONSIDERED NATURAL MUD WATER.

Adopted by: NHSRCL

Project
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project
[Package No. MAHSR – P-3]

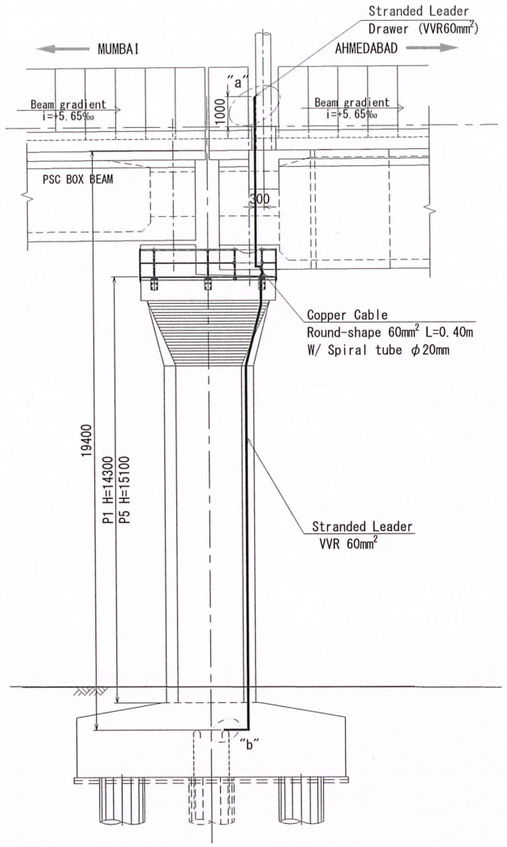
OWNER
NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.

JICA Study Team
Japan International Consultants for Transportation
NIPPON KOEI
ORIENTAL CONSULTANTS GLOBAL

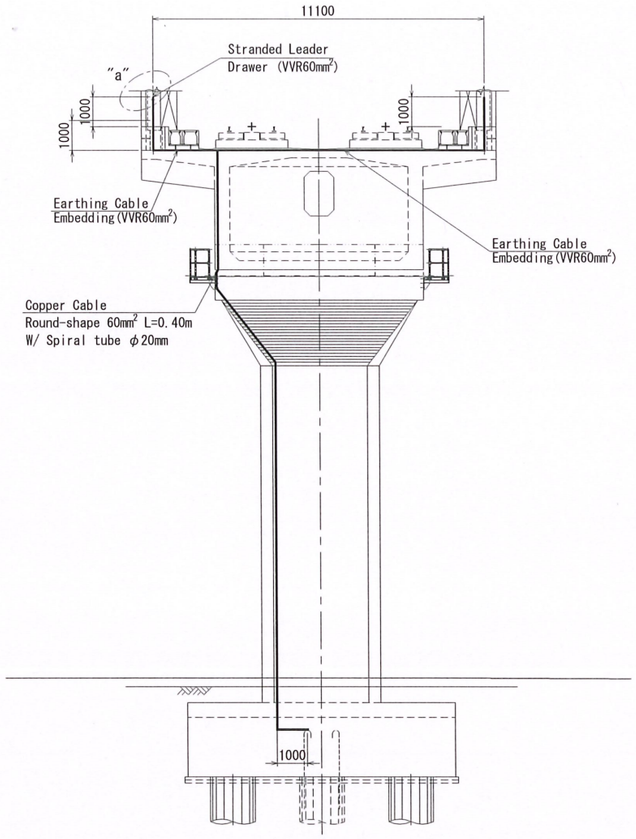
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019

Title: GAD11 P5 Pier Substructure General Drawing (Part1)
Scale: 1:20,40,80&200 @ A3
Drawing No. DD-JIC-C06-TDC-B06-BRD-B60-11550 001

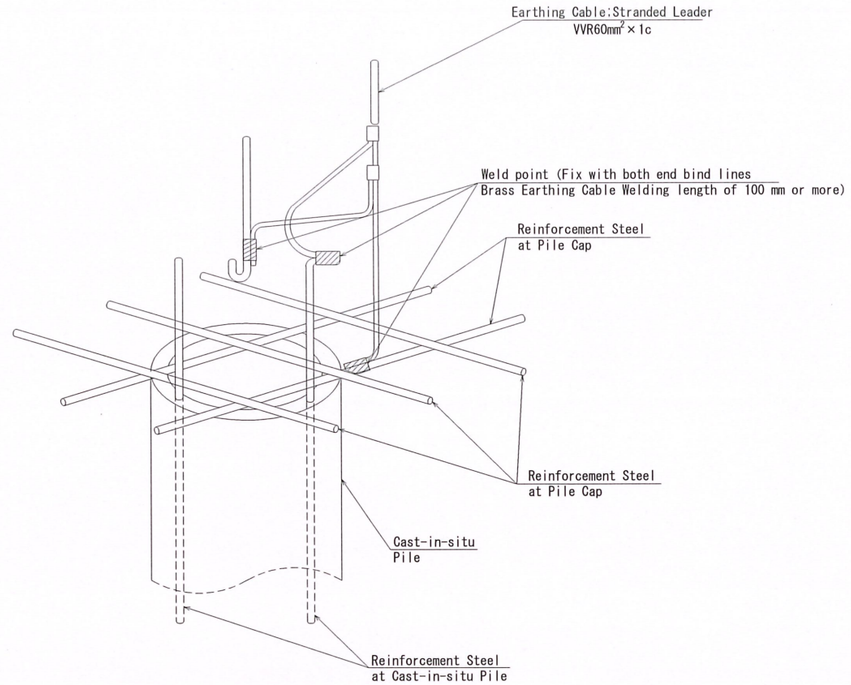
GAD11 Earthing Arrangement for End Pier



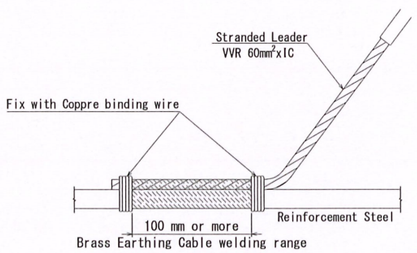
Side view
Scale 1:100



Front view
Scale 1:100



Detail of Connection
Scale Non



Detail of Part "b"
Scale 1:5

Material Table

Place	Item type	Unit	Length					
			Right	Left	Horizontal	Vertical	Total	
P1 Piar	Stranded Leader	m	1.8	1.8	11.1	3.0	19.8	37.5
P5 Piar	Stranded Leader	m	1.8	1.8	11.1	3.0	20.6	38.3

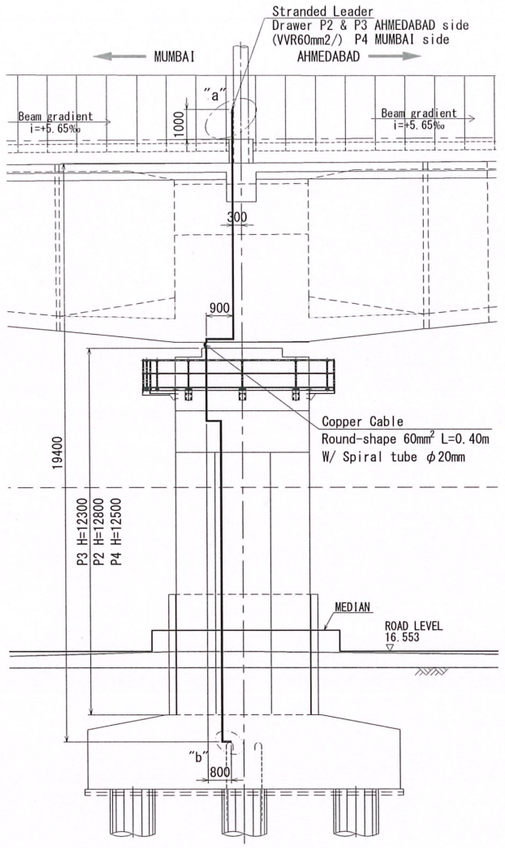
Power Supply team	Date
	11 DEC 2019

NOTE:
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. IF A RESISTANCE OF 10Ω CANNOT BE KEPT, GROUNDING ROD SHALL BE ADDED AS REQUIRED.
4. EARTHING CABLES SHOULD BE ALIGNED WITH REINFORCEMENT BAR.
5. THE INSULATION VINYL TAPE SHALL BE PUT ON CONNECTION POINT AFTER WORK.
6. CONNECT SECURELY BY CRIMP CONNECTION OR WELDING.
7. VVR SHALL CONFORM TO JIS C3342 OR EQUIVALENT.
8. VVR MEANS 600V POYVINYL CHORIDE INSULATED AND SHEATHED CABLE ROUND TYPE.

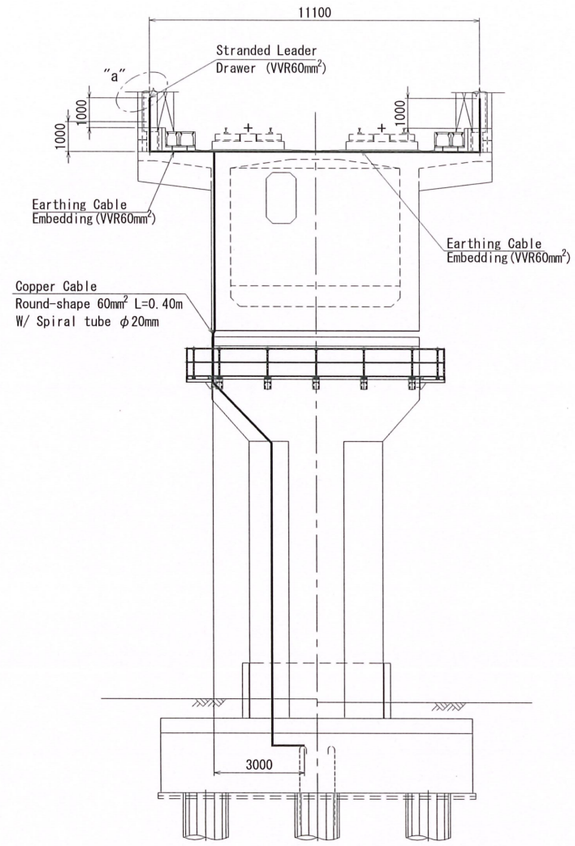
Adopted by: NHSRCL

Project	OWNER	JICA Study Team			
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	Revised	Date 11 DEC 2019	Title: GAD11 Earthing Arrangement for End Pier
			Prepared		Scale: 1:200&1:10 @ A3
			Checked	11 DEC 2019	Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11701 001
			Approved	11 DEC 2019	

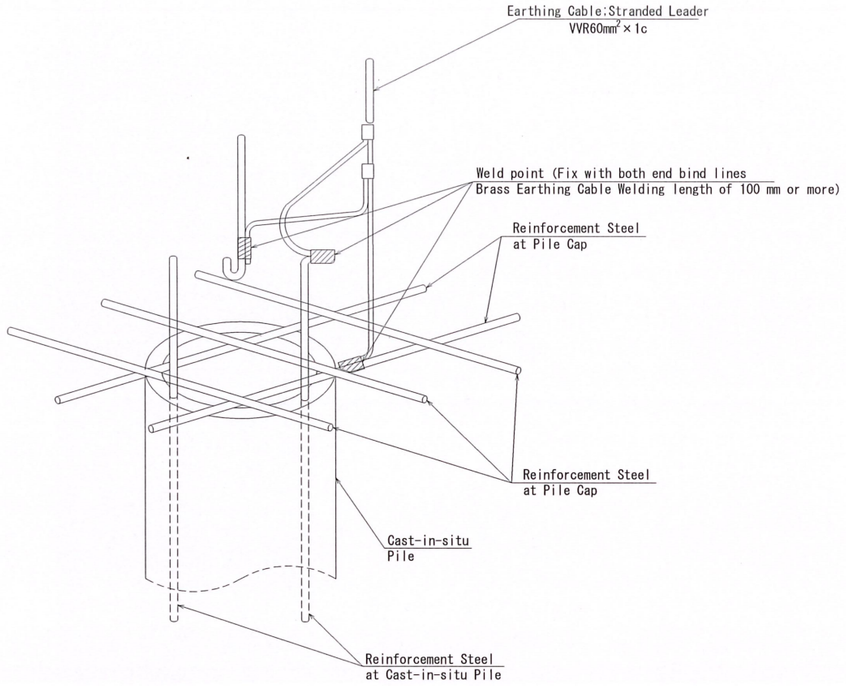
GAD11 Earthing Arrangement for Middle Pier



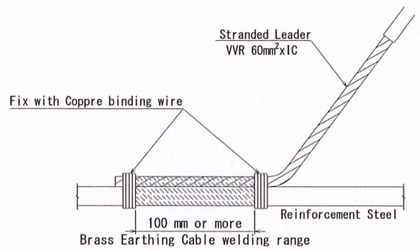
Side view
Scale 1:100



Front view
Scale 1:100



Detail of Connection
Scale Non



Detail of Part "b"
Scale 1:5

Material Table

Place	Item type	Unit	Length											
			Right		Left		Horizontal					Vertical	To the Pole	Total
P2 Piar	Stranded Leader	m	1.8	1.8	1.8	1.8	11.1	11.1	2.7	0.9	0.8	19.4	39.3	92.5
P3 Piar	Stranded Leader	m	1.8	1.8	1.8	1.8	11.1	11.1	2.7	0.9	0.8	18.9	39.3	92.0
P4 Piar	Stranded Leader	m	1.8	–	1.8	–	11.1	–	2.7	0.9	0.8	19.1	–	38.2

Power Supply team	Date
	11 DEC 2019

NOTE;
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2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. IF A RESISTANCE OF 10Ω CANNOT BE KEPT, GROUNDING ROD SHALL BE ADDED AS REQUIRED.
4. EARTHING CABLES SHOULD BE ALIGNED WITH REINFORCEMENT BAR.
5. THE INSULATION VINYL TAPE SHALL BE PUT ON CONNECTION POINT AFTER WORK.
6. CONNECT SECURELY BY CRIMP CONNECTION OR WELDING.
7. VVR SHALL CONFORM TO JIS C3342 OR EQUIVALENT.
8. VVR MEANS 600V POYVINYL CHORIDE INSULATED AND SHEATHED CABLE ROUND TYPE.

Adopted by: NHSRCL

Project
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project
[Package No. MAHSR – P-3]

OWNER
NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.

JICA Study Team
Japan International Consultants for Transportation
NIPPON KOEI
ORIENTAL CONSULTANTS GLOBAL

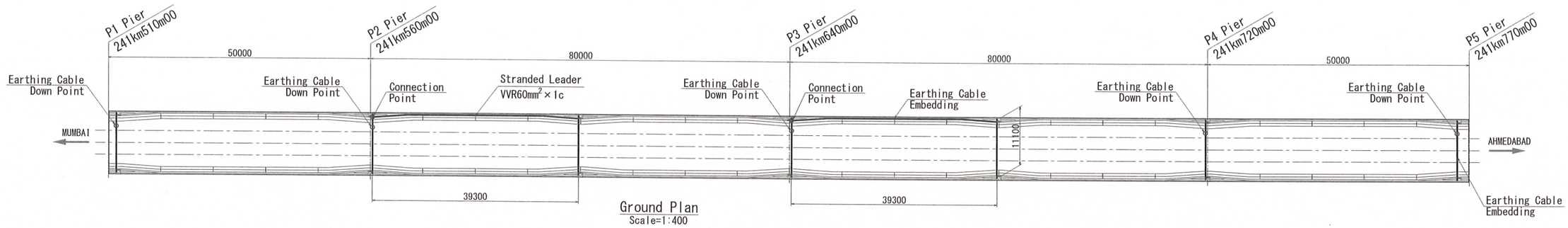
Revised		Date 11 DEC 2019
Prepared		
Checked		11 DEC 2019
Approved		11 DEC 2019

Title: GAD11 Earthing Arrangement for Middle Pier

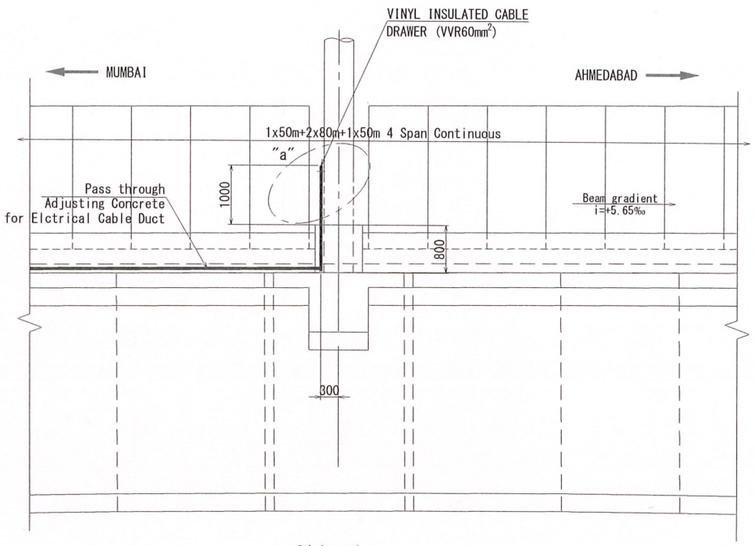
Scale: 1:200&1:10 @ A3

Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11702

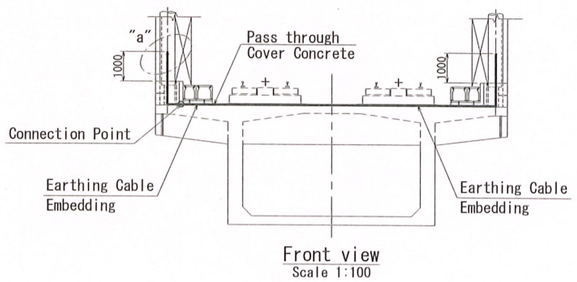
GAD11 Earthing Arrangement for Intermediate Pole



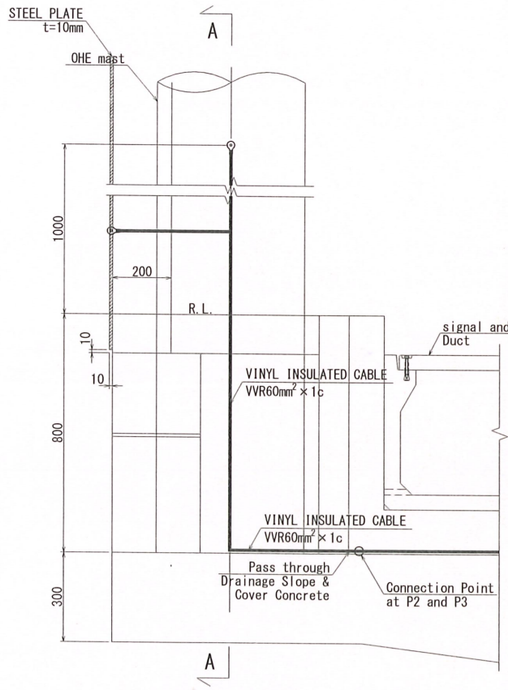
Ground Plan
Scale=1:400



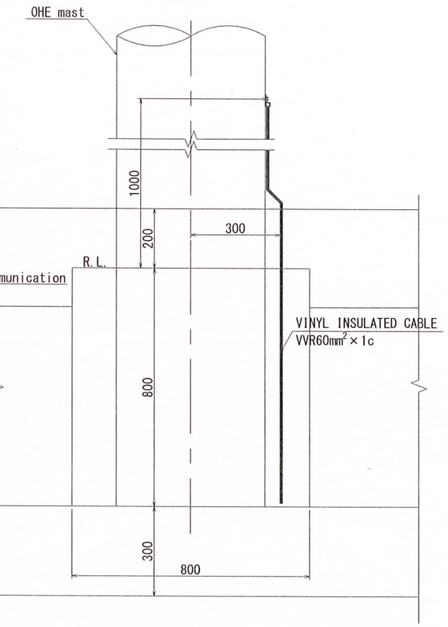
Side view
Scale 1:50



Front view
Scale 1:100



Detail of Part "b"
Scale 1:20



Section A-A
Scale 1:20

Material Table

Item Name	Item type	Unit	Quantity					
			P1	P2	P3	P4	P5	Total
Earthing Cable	Stranded Leader VVR60mm² × 1c	m	37.5	92.5	92.0	38.2	38.3	298.5
Earthing Cable	Copper Wire Round-shape 60mm²	m	0.4	0.4	0.4	0.4	0.4	2.0
Brass wire welding	Welding length of 100 mm or more	Nos	1	1	1	1	1	5

Power Supply Team | Date 11 DEC 2019

NOTE:
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. IF A RESISTANCE OF 10Ω CANNOT BE KEPT, GROUNDING EARTHING CABLES SHALL BE ADDED AS REQUIRED.
4. EARTHING CABLES SHOULD BE ALIGNED WITH REBAR.
5. CONNECT THE INSULATION VINYL TEPE AFTER CONNECTING, AFTER CONNECTION.
6. CONNECT SECURELY BY CRIMP CONNECTION OR WELDING.
7. VVR SHALL CONFORM TO JIS C3342 OR EQUIVALENT.
8. VVR MEANS 600V POLYVINYL CHORIDE INSULATED AND SHEATHED CABLE ROUND TYPE.

Adopted by: NHSRCL

Project
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]

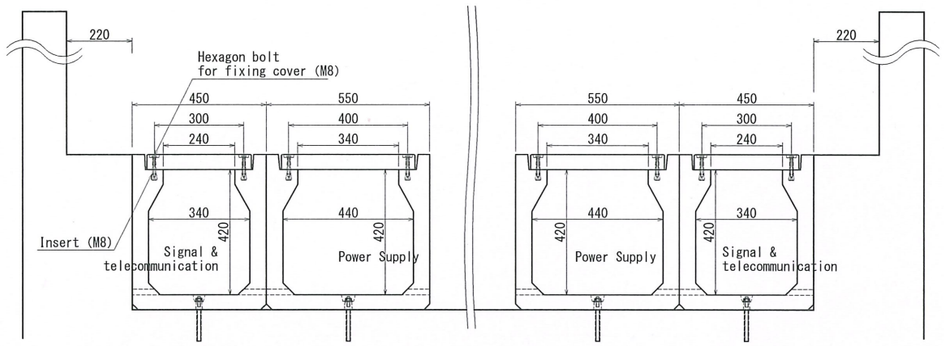
OWNER
NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.

JICA Study Team
Japan International Consultants for Transportation
NIPPON KOEI
ORIENTAL CONSULTANTS GLOBAL

Revised		Date 11 DEC 2019
Prepared		
Checked		11 DEC 2019
Approved		11 DEC 2019

Title: GAD11 Earthing Arrangement for Intermediate Pole
Scale: 1:800 & 1:100 @ A3
Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11703 001

GAD11 Structures of Ducts (Part1)

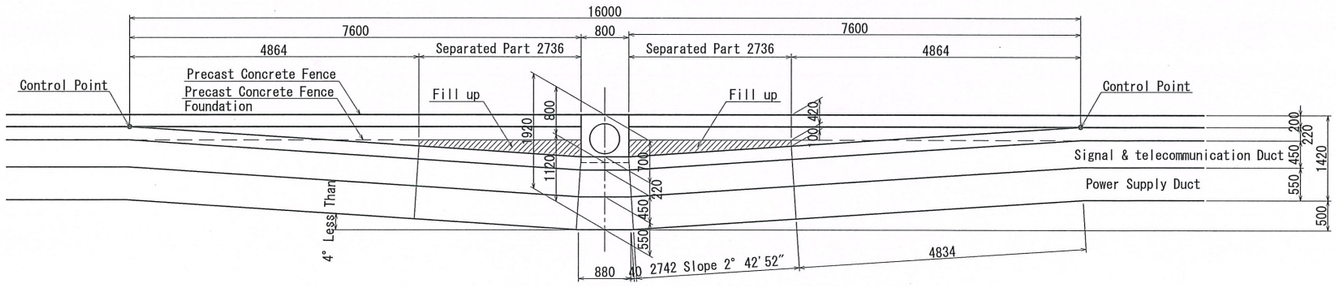


1. Purpose

Cable ducts are constructed to lay and set the cables for signal, communication, and power supply.

2. Details of construction

- In addition to the cable ducts, the covers of cable ducts and the bolts to fix the covers shall be prepared.
- The covers of cable ducts and the bolts to fix the covers shall be delivered to the electrical work office as per instruction of the Engineer.
- The cable ducts shall also serve as the passages for maintenance.
- The cable ducts shall be constructed for up and down tracks at stations and in the open section.
- If the cable ducts are detoured because of another structure. the space between the cable duct and another structure shall be filled up.
- The bending angle of detoured cable ducts shall be ≦ 30 degrees for power and communication cable duct.
- If the cable ducts have a gap at a expansion joint on viaduct, the gap shall be closed by a channel steel plate installed inside the cable ducts (the channel steel plate shall be fixed only at one end to accommodate expansion and contraction due to temperature variation). Also, the head structure of fixing bolts shall be designed in such a way not to damage cables.
- If the cable ducts have unevenness in height at joint, the cable ducts shall be sloped. (The limitation of slope angle shall be the same as that of the bending angle.)
- An appropriate drainage measure shall be taken to prevent rain water get accumulated in the cable ducts, for example, making drainage holes at appropriate intervals in the cable ducts according to the drainage specification of the civil design.
- Cable ducts (Signal & Telecommunication Cable with power supply cable ducts) are made of Precast – RCC (M75 Grade).
- To prevent cable ducts and their covers from being blown away by wind pressure of train, the covers shall be fixed with M8 hexagon bolts, and the main bodies of cable ducts shall be fixed with anchor bolts. The structures of bolt heads shall be designed carefully to prevent stumbling over the bolts and damage to cables.



Duct detour
Scale 1:20

Power Supply Team	Date 11 DEC 2019
Signal & Telecommunication Team	Date 11 DEC 2019

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2. DON NOT SCALE THE DIMENSION. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.

Adopted by: NHSRCL

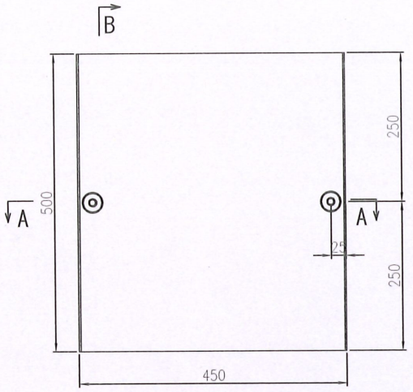
Project	OWNER	JICA Study Team	Revised / Date 11 DEC 2019
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL	Prepared / Checked 11 DEC 2019 / Approved 11 DEC 2019

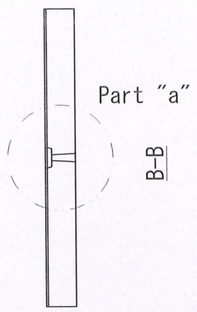
Title: GAD11 Structures of Ducts (Part1)

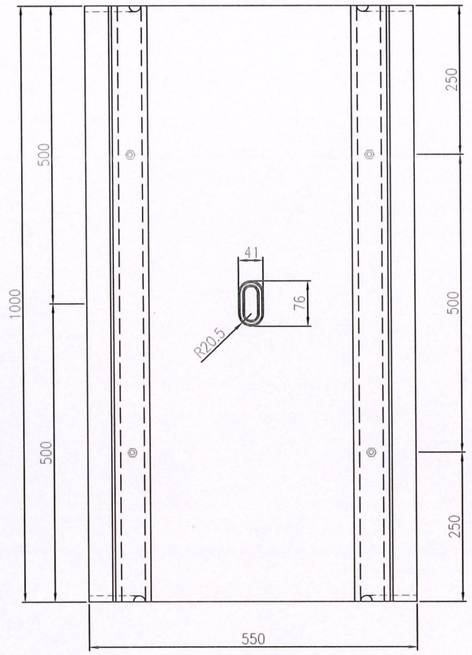
Scale: Indicated in the Drawing@A3

Drawing No. DD-JIC-C06-TDC-B06-BRD-B60- 11706 001

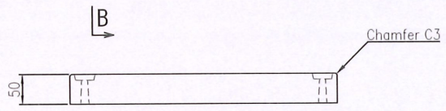
GAD11 Structures of Ducts (Part2) for Power Supply





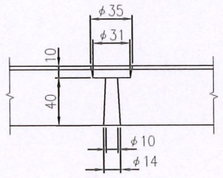


C-C

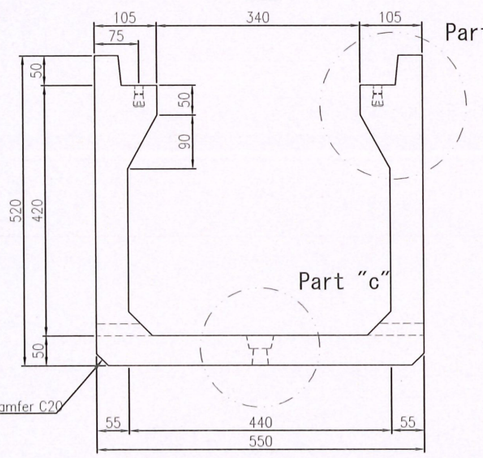


A-A

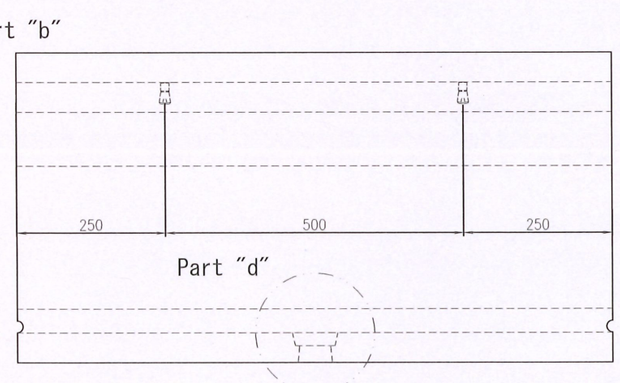
POWER SUPPLY DUCT LID
(WITH LOCK MECHANISM)
(SCALE=1:10)

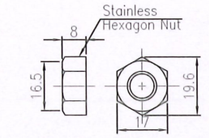


DETAIL OF PART "a"
(SCALE=1:5)

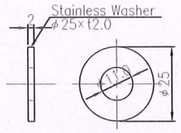


POWER SUPPLY DUCT BODY (WITH LOCK MECHANISM)
(SCALE=1:10)

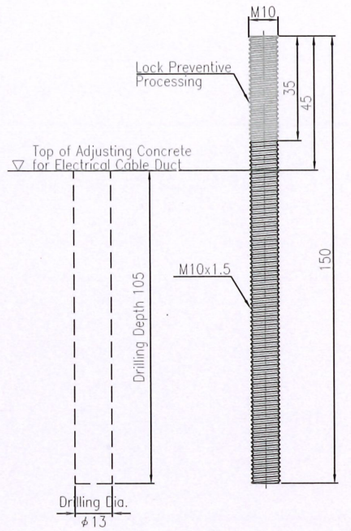




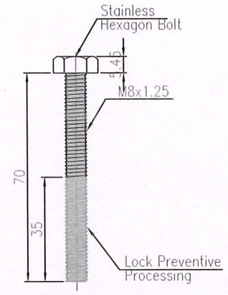
DETAIL OF WASHER FOR M10
(SCALE=1:2)



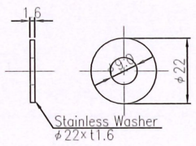
DETAIL OF WASHER FOR M10
(SCALE=1:2)



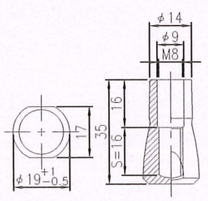
DETAIL OF MORTAR ANCHOR
(SCALE=1:2)



DETAIL OF BOLT
(SCALE=1:2)



DETAIL OF WASHER FOR M8
(SCALE=1:2)



DETAIL OF CERAMIC INSERT (M8x35)
(SCALE=1:2)

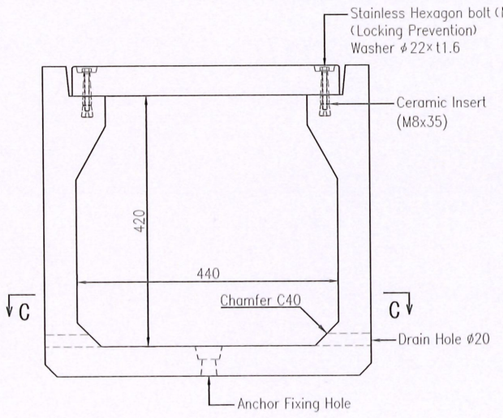
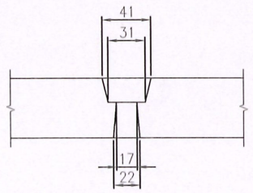
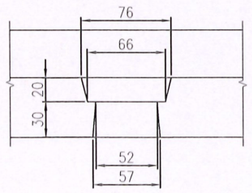


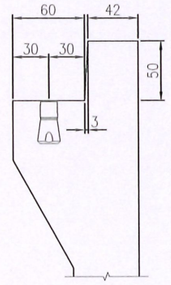
ILLUSTRATION
(SCALE=1:10)



DETAIL OF PART "c"
(SCALE=1:5)



DETAIL OF PART "d"
(SCALE=1:5)



DETAIL OF PART "b"
(SCALE=1:5)

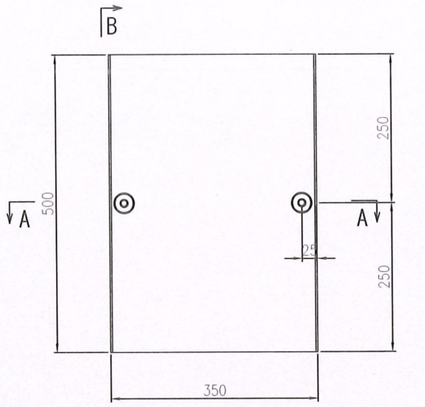
Power Supply Team	Date
	11 DEC 2019

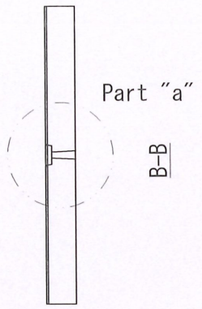
NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METERS, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSION, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CONCRETE GRADE SHALL BE M75.
4. MORTAR GRADE SHALL BE M40.
5. BENDING STRENGTH SHALL BE MORE THAN 4.0 KN FOR BODY AND MORE THAN 25.0 KN FOR LID.
6. STAINLESS ID SHALL BE AS IS:1367.14.1
7. CERAMIC INSERT SHALL BE AS PER SECTION VI-2. SPECIFICATIONS (TECHNICAL SPECIFICATION) CL 10.6

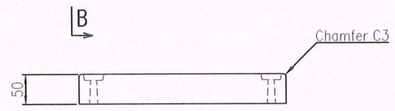
Adopted by: NHSRCL

Project	OWNER	JICA Study Team			
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	Revised	Date 16 DEC 2019	Title: GAD11 Structures of Ducts (Part2)
			Prepared		Scale: Indicated in the Drawing@A3
			Checked	16 DEC 2019	Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60- 11707 001
			Approved	16 DEC 2019	

GAD11 Structures of Ducts (Part3)
for Signal and telecommunication

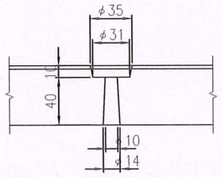




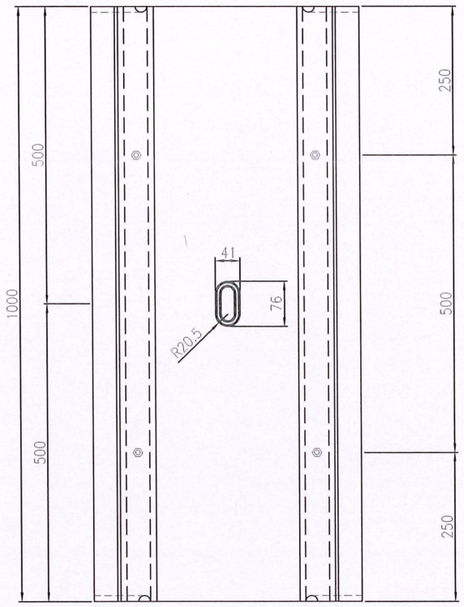


A-A

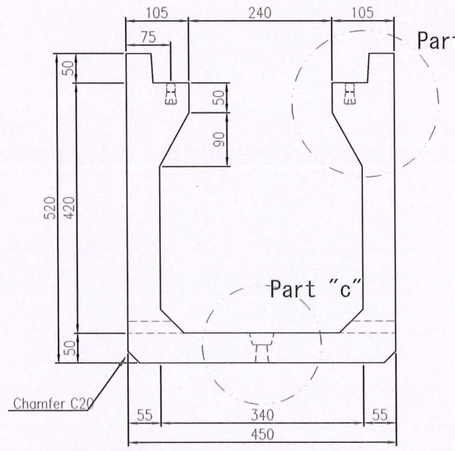
COMMUNICATION DUCT LID
(WITH LOCK MECHANISM)
(SCALE=1:10)

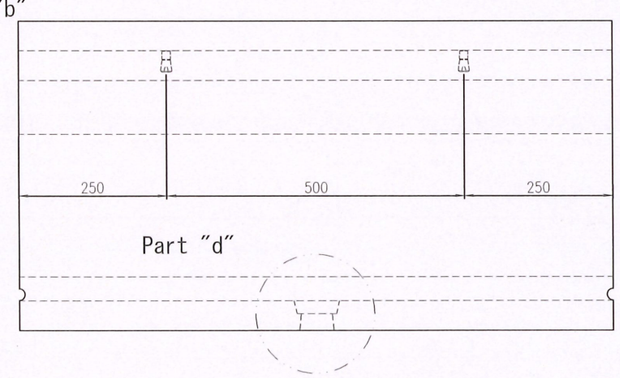


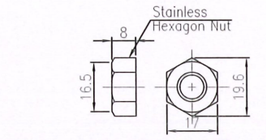
DETAIL OF PART "a"
(SCALE=1:5)



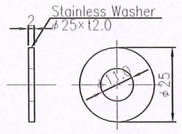
C-C



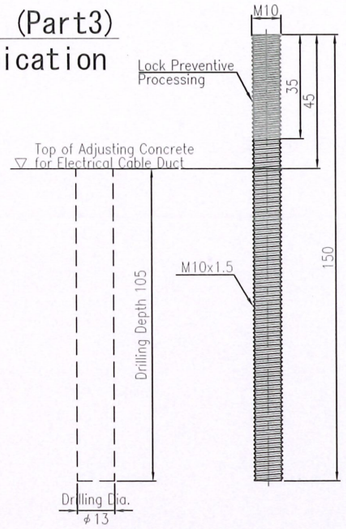




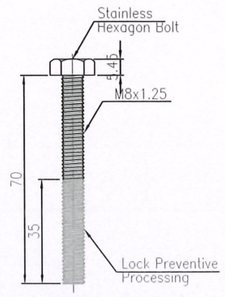
DETAIL OF WASHER FOR M1
(SCALE=1:2)



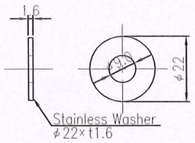
DETAIL OF WASHER FOR M10
(SCALE=1:2)



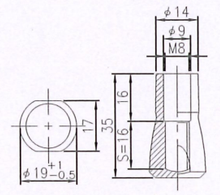
DETAIL OF MORTAR ANCHOR
(SCALE=1:2)



DETAIL OF BOLT
(SCALE=1:2)



DETAIL OF WASHER FOR M8
(SCALE=1:2)



DETAIL OF CERAMIC INSERT (M8x35)
(SCALE=1:2)

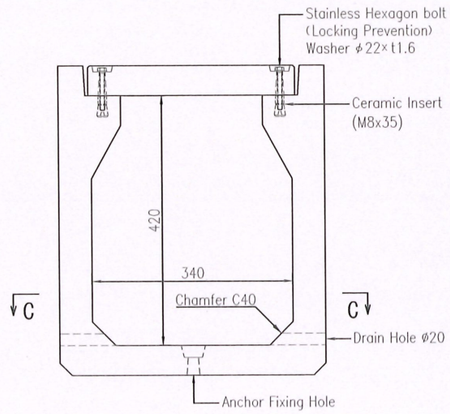
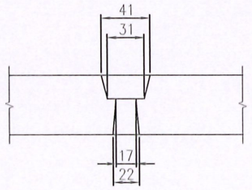
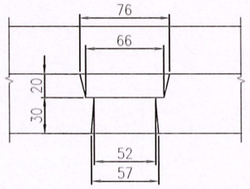


ILLUSTRATION
(SCALE=1:10)

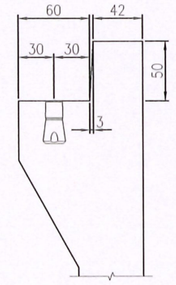
COMMUNICATION DUCT BODY (WITH LOCK MECHANISM)
(SCALE=1:10)



DETAIL OF PART "c"
(SCALE=1:5)



DETAIL OF PART "d"
(SCALE=1:5)



DETAIL OF PART "b"
(SCALE=1:5)

Signal and Telecommunication Team | Date 11 DEC 2019

NOTES :
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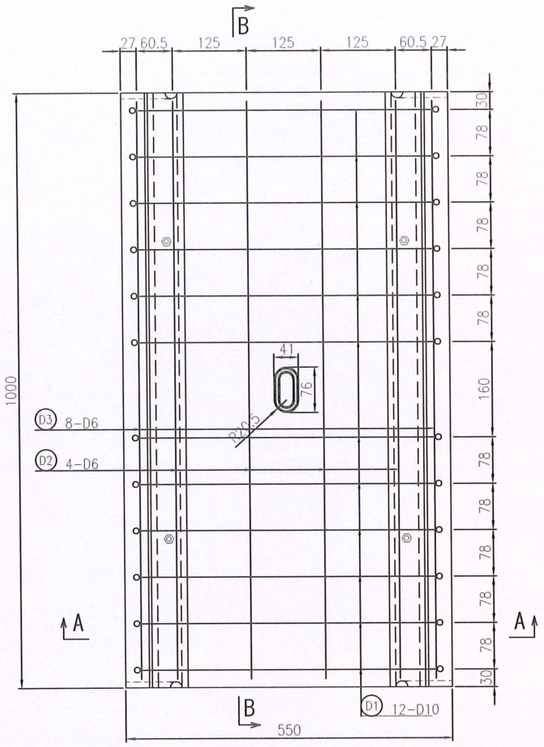
6. STAINLESS ID SHALL BE AS IS:1367.14.1
7. CERAMIC INSERT SHALL BE AS PER SECTION VI-2. SPECIFICATIONS (TECHNICAL SPECIFICATION) CL 10.6

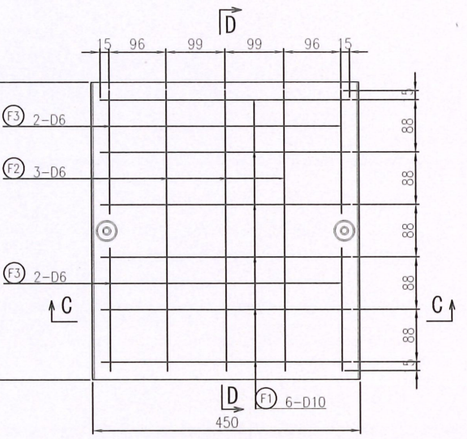
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.
JICA Study Team	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL
Revised	Date 16 DEC 2019
Prepared	
Checked	16 DEC 2019
Approved	16 DEC 2019
Title	GAD11 Structures of Ducts (Part3)
Scale	Indicated in the Drawing@A3
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11708 001

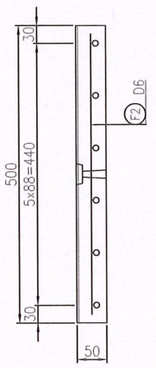
GAD11 Ducts Bar Arrangement Drawing (Part1)
for Power Supply



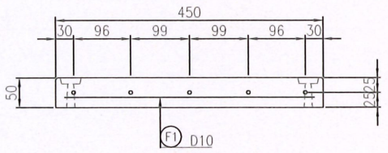
PLAN
(SCALE=1:10)



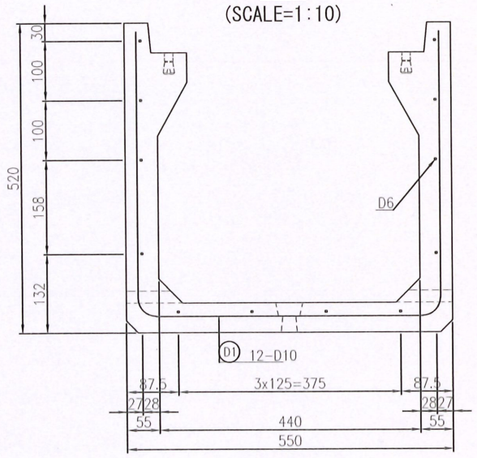
PLAN
(SCALE=1:10)



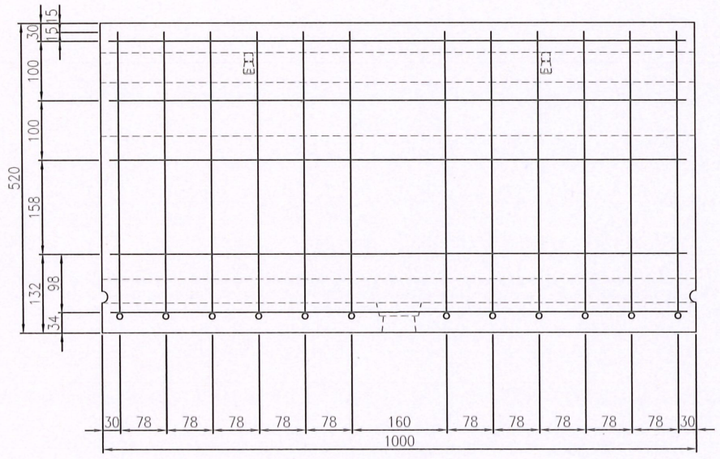
SECTION D-D
(SCALE=1:10)



SECTION C-C
(SCALE=1:10)



SECTION A-A
(SCALE=1:10)



SECTION B-B
(SCALE=1:10)

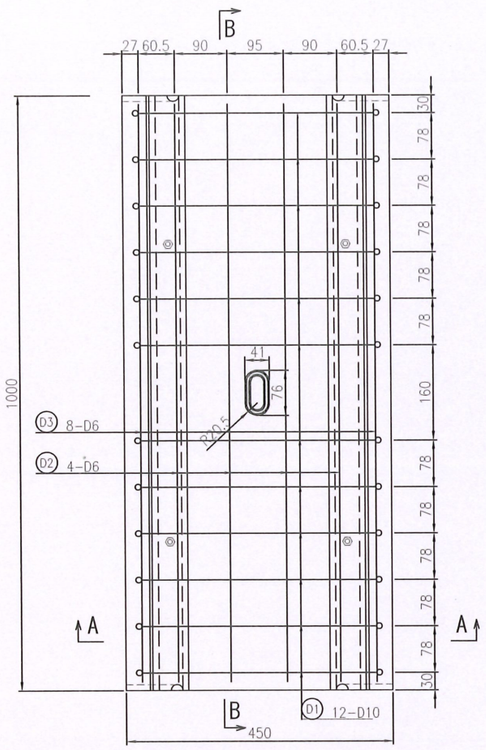
Power Supply Team	Date
	11 DEC 2019

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METERS, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CLEAR COVER TO REBAR IS 15mm.

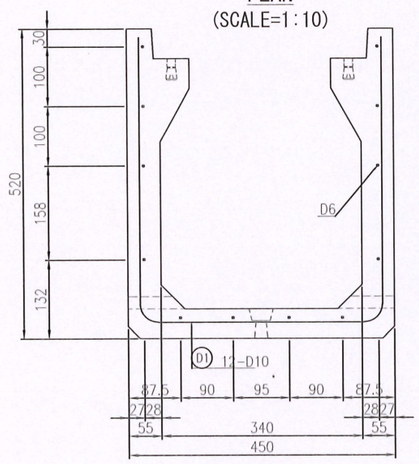
Adopted by: NHSRCL

Project	OWNER	JICA Study Team			Title
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	Revised	Date 16 DEC 2019	GAD11 Ducts Bar Arrangement Drawing (Part1)
			Prepared		
			Checked	16 DEC 2019	Scale: Indicated in the Drawing@A3
			Approved	16 DEC 2019	Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60- 11710 001

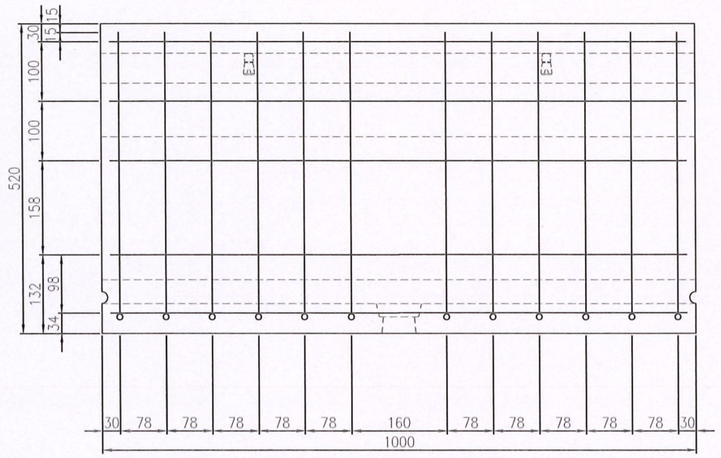
GAD11 Ducts Bar Arrangement Drawing (Part2)
for Signal and Telecommunication



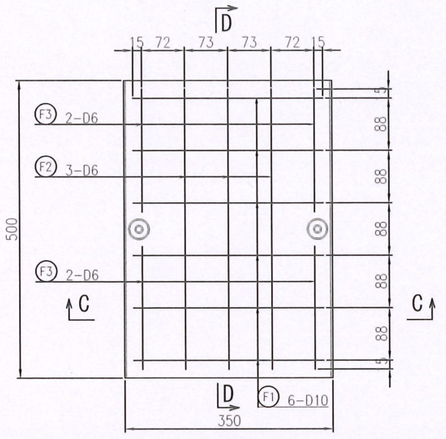
PLAN
(SCALE=1:10)



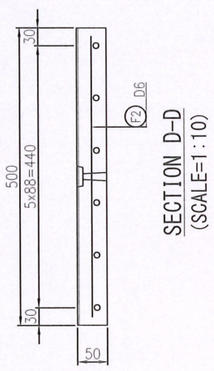
SECTION A-A
(SCALE=1:10)



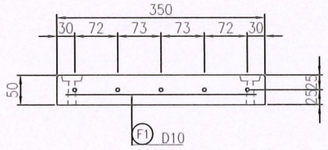
SECTION B-B
(SCALE=1:10)



PLAN
(SCALE=1:10)



SECTION D-D
(SCALE=1:10)



SECTION C-C
(SCALE=1:10)

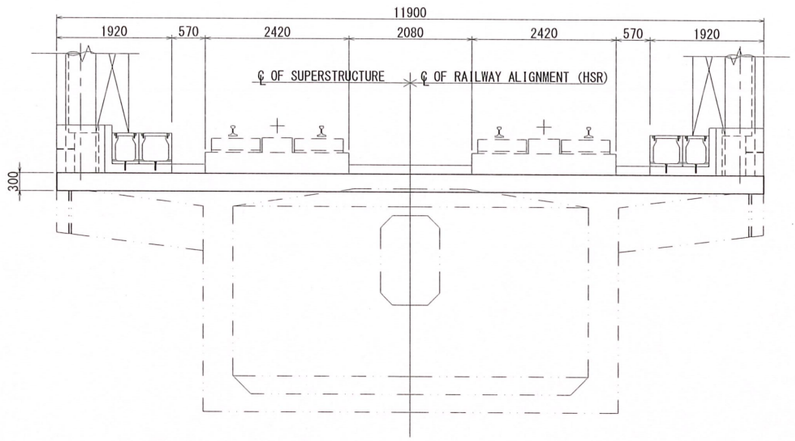
Signal and Telecommunication Team	Date
	11 DEC 2019

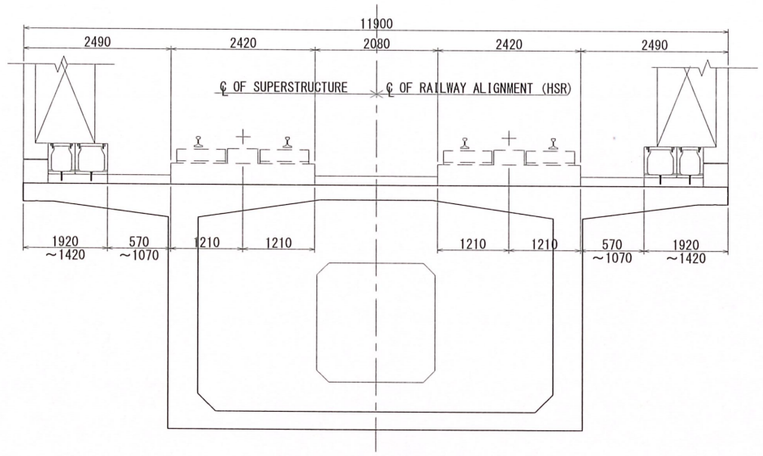
NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METERS, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CLEAR COVER TO REBAR IS 15mm.

Adopted by: NHSRCL

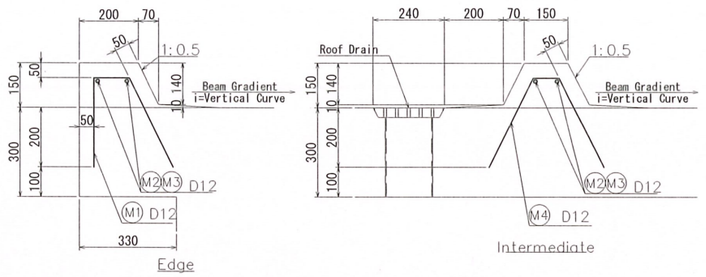
Project	OWNER	JICA Study Team			
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	Revised	Date 16 DEC 2019	Title: GAD11 Ducts Bar Arrangement Drawing (Part2
			Prepared		Scale: Indicated in the Drawing@A3
			Checked	16 DEC 2019	
			Approved	16 DEC 2019	Drawing No. DD-JIC-C06-TDC-B06-BRD-B60-11711 001

GAD11 Water stopper Concrete Drawing

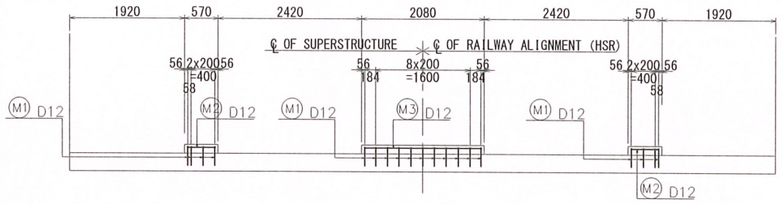


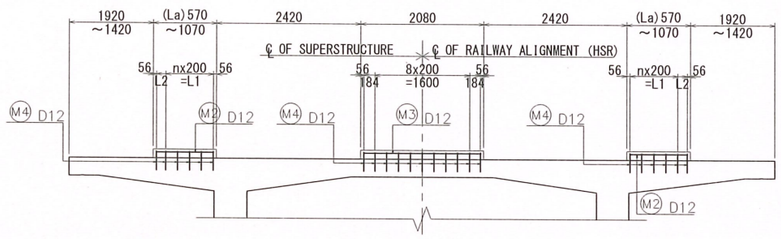


Intermediate Section
Scale 1:50



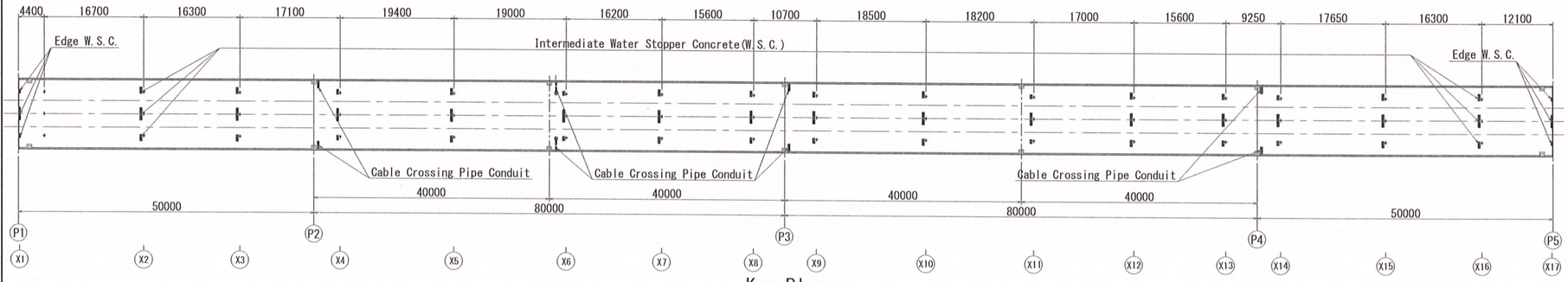
Detail of Water Stopper Concrete
Scale 1:10





Dimension table

Section No.	La	n	L1	L2
X1	570	2	400	58
X2	1070	4	800	158
X3	1070	4	800	158
X4	816	3	600	104
X5	1070	4	800	158
X6	706	2	400	194
X7	1070	4	800	158
X8	925	3	600	2x106.5
X9	870	3	600	158
X10	1070	4	800	158
X11	655	2	400	143
X12	1070	4	800	158
X13	925	3	600	2x106.5
X14	775	3	600	63
X15	1070	4	800	158
X16	1070	4	800	158
X17	570	2	400	58

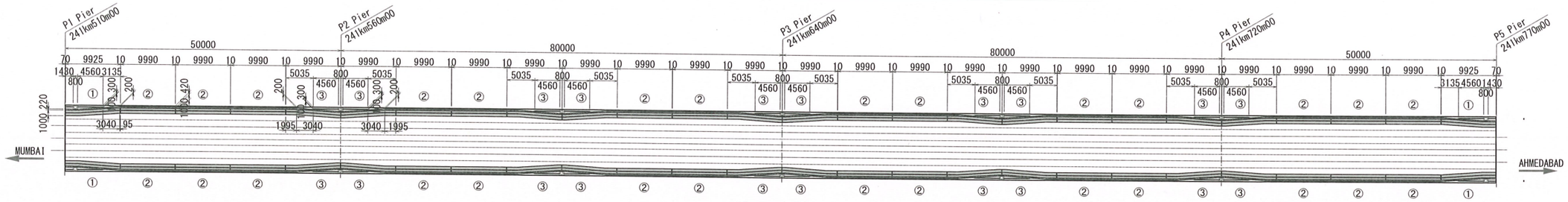


Key Plan
Scale 1:500

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. Expansion Joint at P1 and P5 will be set at the time of construction of adjacent bridges.

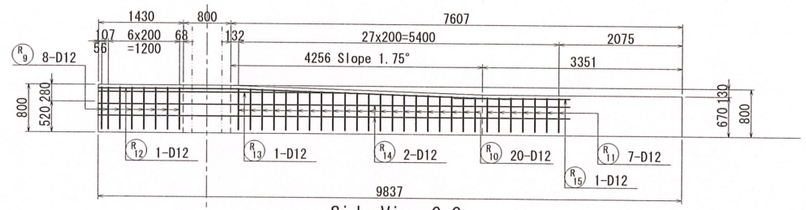
Adopted by: NHSRCL		
Project: Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	OWNER: NATIONAL HIGH SPEED RAIL CORPORATION LTD.	JICA Study Team: Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL
Revised / Prepared	Date: 16 DEC 2019	Title: GAD11 Water stopper Concrete Drawing
Checked	16 DEC 2019	Scale: 1:100&1:20 @ A3
Approved	16 DEC 2019	Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11712 001

GAD11 Adjusting Concrete for Elctrical Cable Duct(Part1)

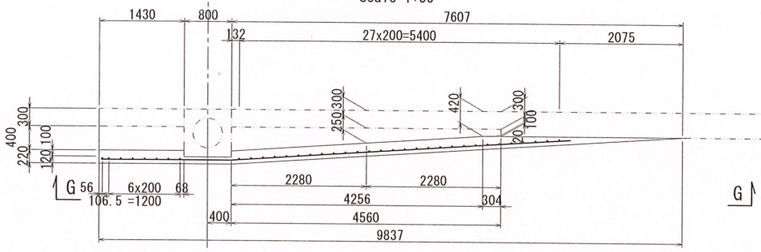


Ground Plan
Scale=1:400

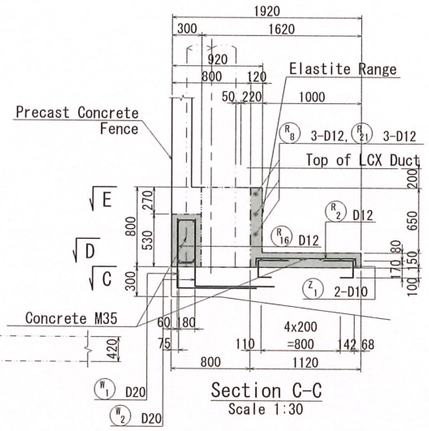
LEGEND
Aria Duct Adjustment Concrete t=150
Aria Duct Adjustment Concrete t=670~800



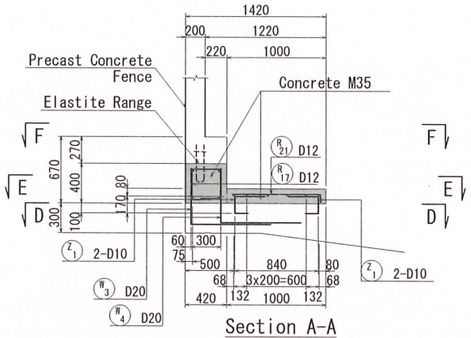
Side View G-G
Scale 1:50



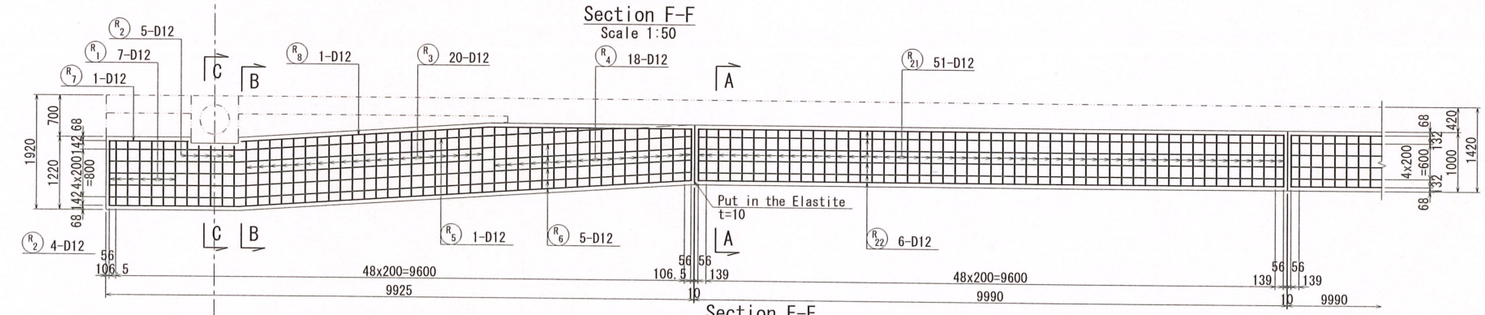
Section F-F
Scale 1:50



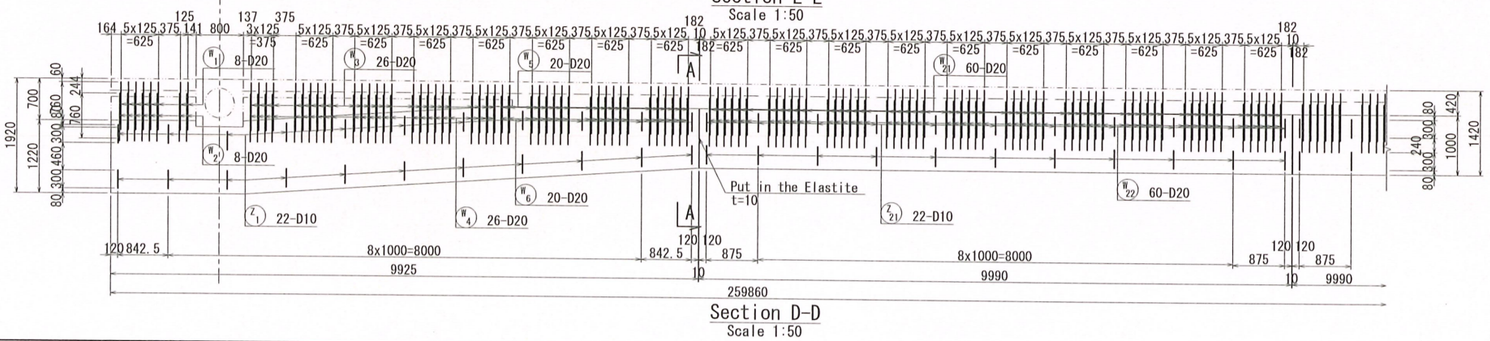
Section C-C
Scale 1:30



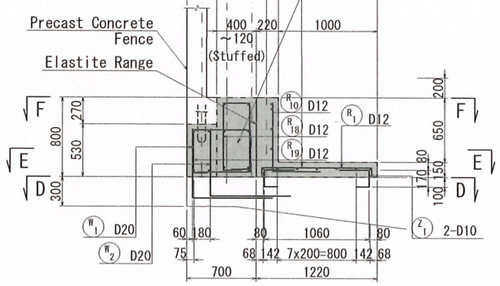
Section A-A
Scale 1:30



Section E-E
Scale 1:50



Section D-D
Scale 1:50



Section B-B
Scale 1:30

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

Adopted by: NHSRCL

Project	OWNER	JICA Study Team
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL

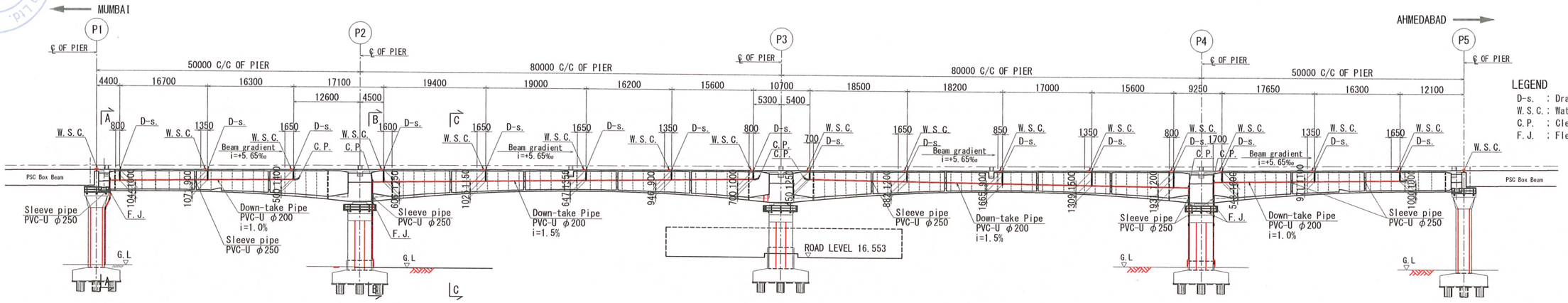
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019

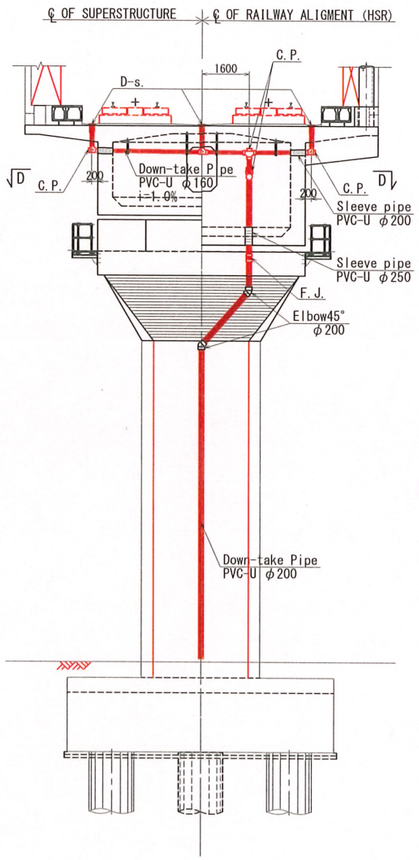
Title: GAD11 Adjusting Concrete for Elctrical Cable Duct(Part1)

Scale: 1:800,1:100 & 1:60 @ A3

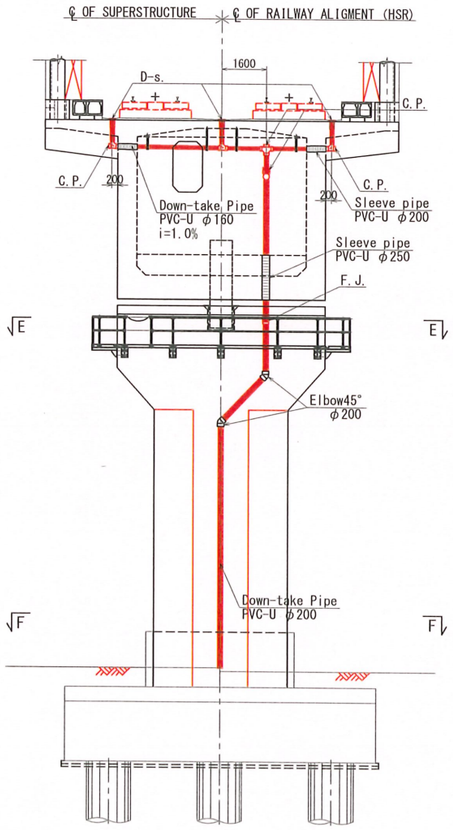
Drawing No. DD-JIC-C06-TDC-B06-BRD-B60-11713 001

GAD11 Drainage Plan(Part1)

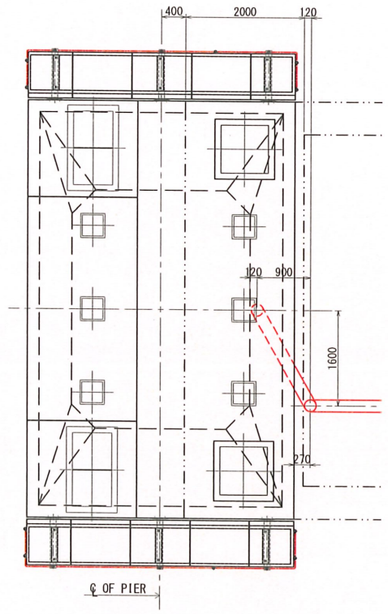




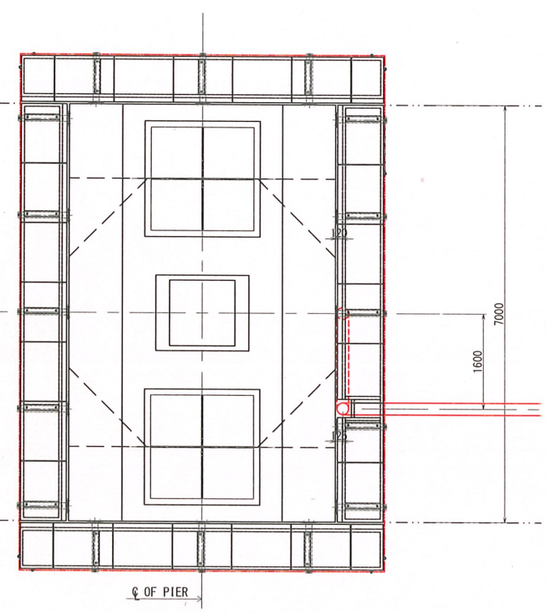
Section A-A (P1 Pier)
Scale 1:100



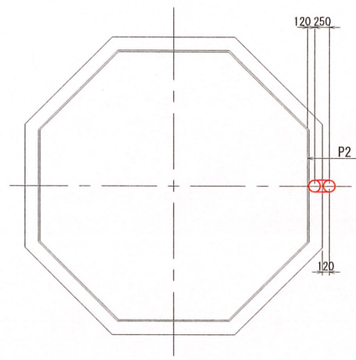
Section B-B (P2 Pier)
Scale 1:100



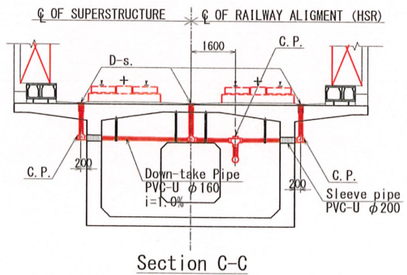
Section D-D
Scale 1:50



Section E-E
Scale 1:50



Section F-F
Scale 1:50



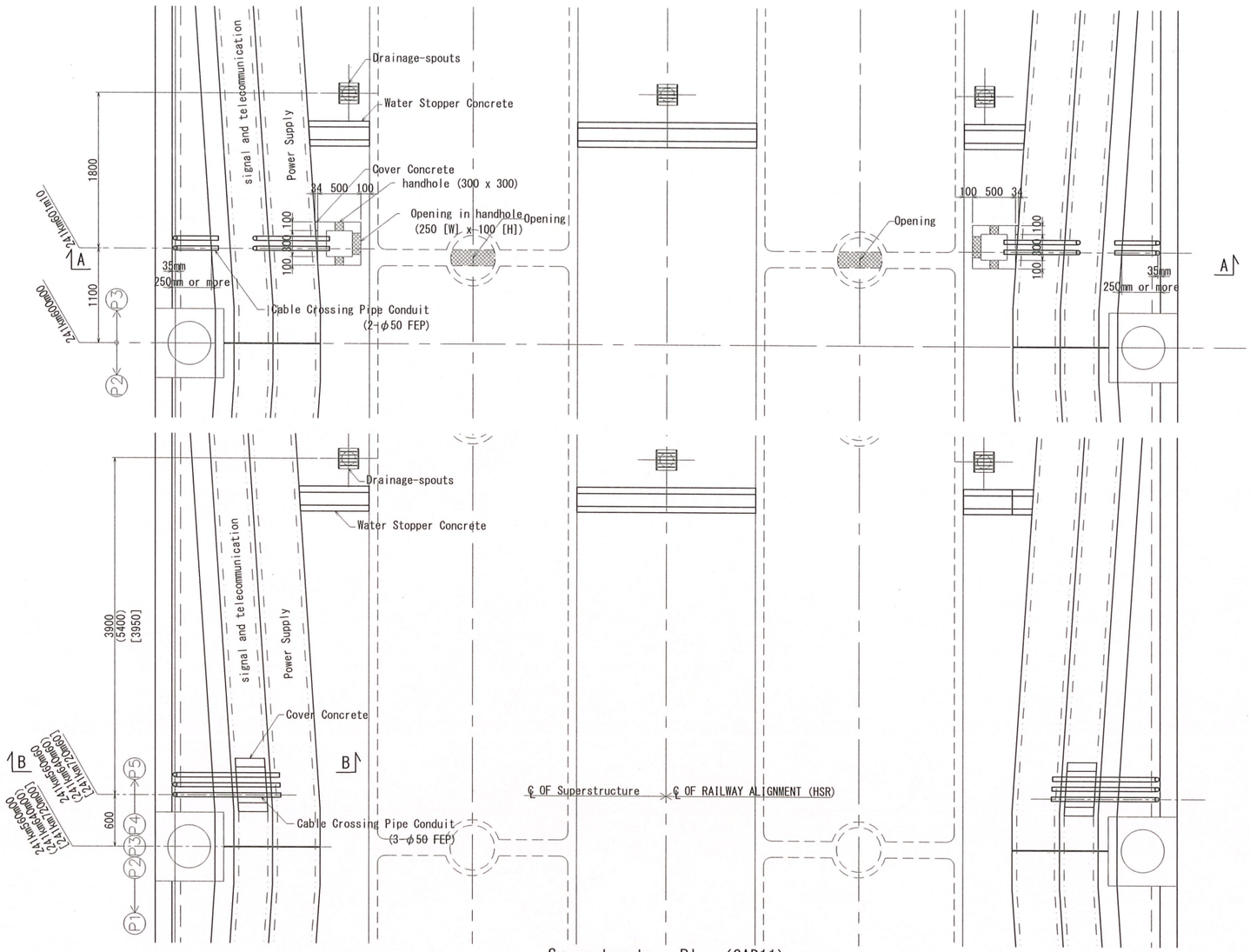
Section C-C
Scale 1:100

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. PIPING MATERIAL SHALL BE PVC-U.

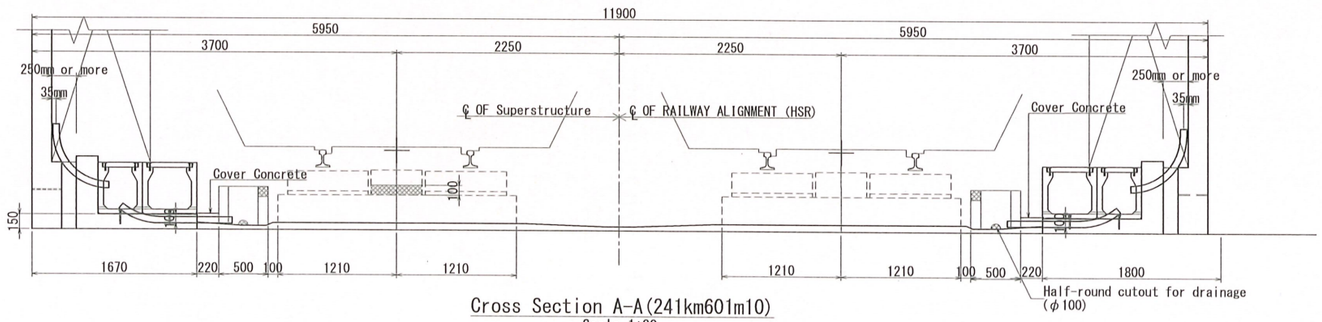
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	
JICA Study Team	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL	
Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019
Title	GAD11 Drainage Plan(Part1)	
Scale	1:200&1:10 @ A3	
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11723 001	

GAD11 Cable Crossing Pipe Conduit

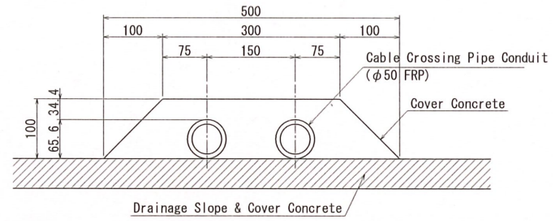


Superstructure Plan (GAD11)
Scale 1:30

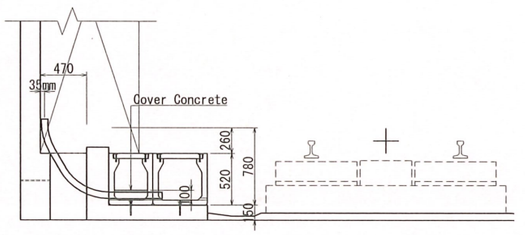


Cross Section A-A(241km601m10)
Scale 1:30

NOTES ;
1. Purpose
   The Cable Crossing Pipe Conduit are constructed to install warning switches on the sound barrier.
2. Details of construction
   - The construction work for handholes, cutouts, and Cable Crossing Pipe Conduit shall be consigned to electric section.
   - A measure shall be taken to prevent water from entering in the Cable Crossing Pipe Conduit.
3. Others
   - The structure of cable duct shall be designed to prevent water from staying in the cable duct.
   - The FEP to be used for the Cable Crossing Pipe conduit shall be flame-resistant.
   - A guide wire shall be run through each Cable Crossing Pipe Conduit.
   - Care shall be taken not to damage the insert fittings and cover hooks for fixing the cover.



Detail of Cover Concrete
Scale 1:5



Section B-B
Scale 1:30

Power Supply team	Date 11 DEC 2019
Signal&Telecommunication team	Date 11 DEC 2019

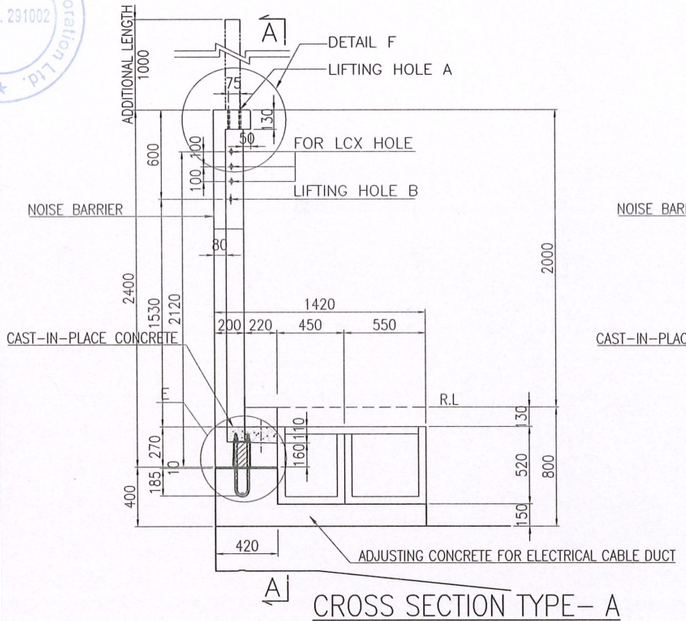
NOTES ;
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

Adopted by: NHSRCL

Project	OWNER	JICA Study Team
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL

Revised	Date 11 DEC 2019	Title: GAD11 Cable Crossing Pipe Conduit
Prepared		Scale: 1:60&1:10 @A3
Checked	11 DEC 2019	Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11728 001
Approved	11 DEC 2019	

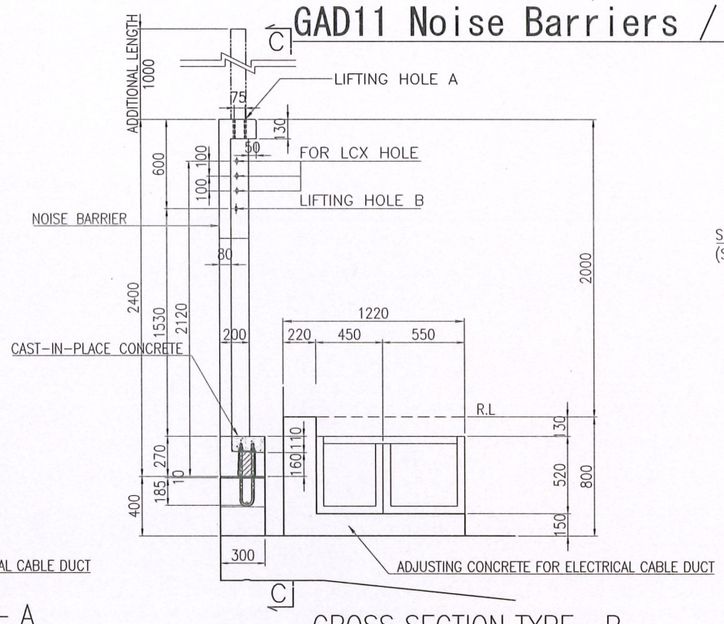
GAD11 Noise Barriers / Precast Fences



CROSS SECTION TYPE– A

(SCALE=1:40)

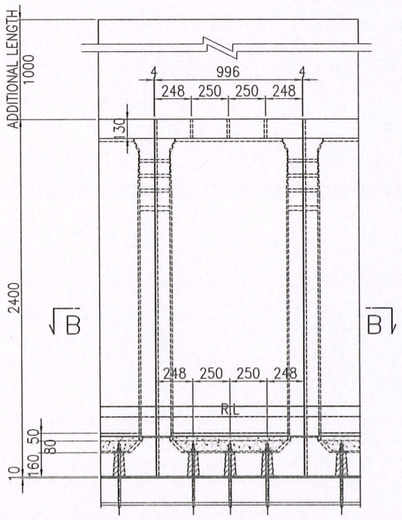
* NOTE–TYPE–A NOISE BARRIER IS FOR GENERAL AREA



CROSS SECTION TYPE– B

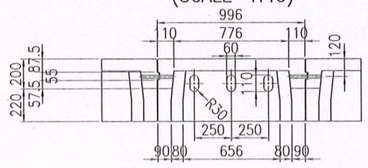
(SCALE=1:40)

*NOTE–TYPE–B NOISE BARRIER IS FOR NARROW AREA REFER DRAWINGS
(1)SD–JIC–CO1–DRW–ALL–VDT–B99–10301
(2)SD–JIC–CO1–DRW–ALL–VDT–B99–11101
(3)SD–JIC–CO1–DRW–ALL–VDT–B99–11102



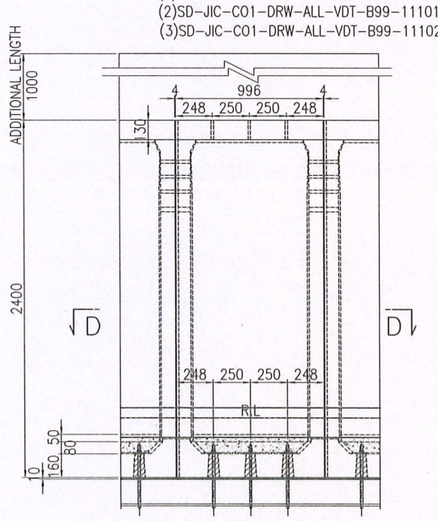
SECTIONAL ELEVATION A–A

(SCALE=1:40)



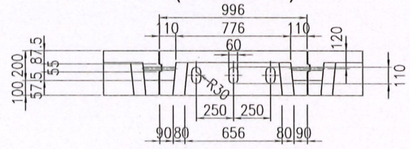
SECTIONAL PLAN B–B

(SCALE=1:40)



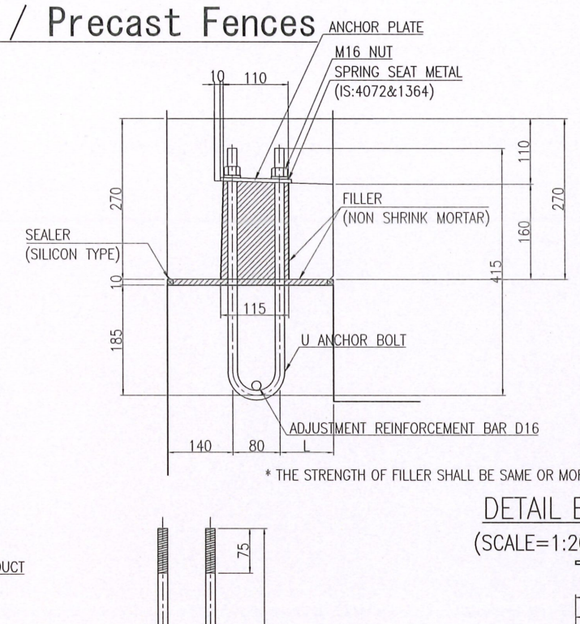
SECTIONAL ELEVATION C–C

(SCALE=1:40)

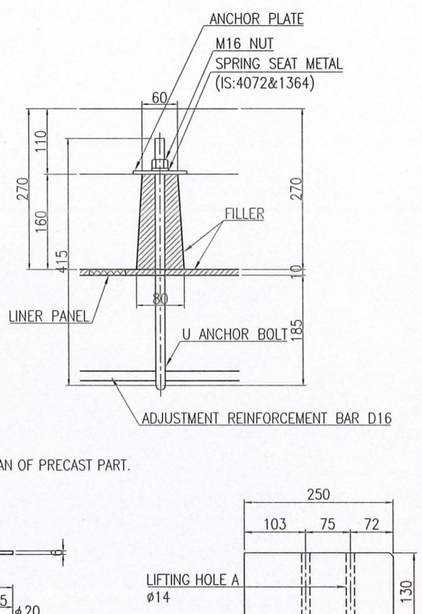


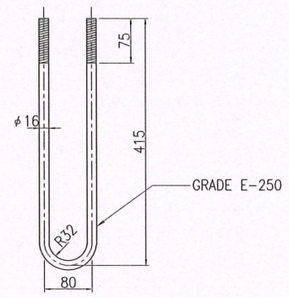
SECTIONAL PLAN D–D

(SCALE=1:40)



* THE STRENGTH OF FILLER SHALL BE SAME OR MORE THAN OF PRECAST PART.



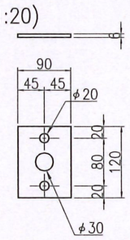


DETAIL OF U ANCHOR BOLT

(SCALE=1:20)

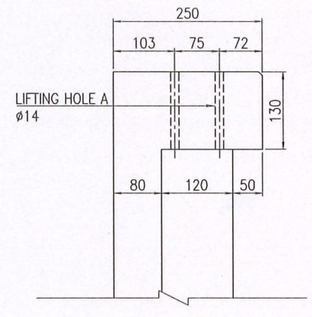
DETAIL E

(SCALE=1:20)



DETAIL OF ANCHOR PLATE

(SCALE=1:20)



DETAIL F

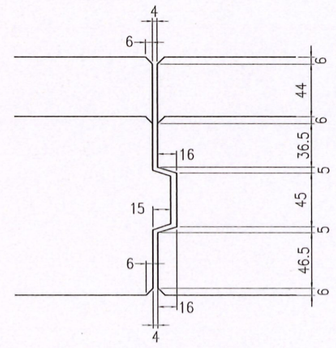
(SCALE=1:20)

DETAIL OF "FOR LCX HOLE"

(SCALE=1:5)

DETAIL OF "LIFTING HOLE B"

(SCALE=1:5)



DETAIL OF CONNECTION PART OF EACH FENCE

(SCALE=1:5)

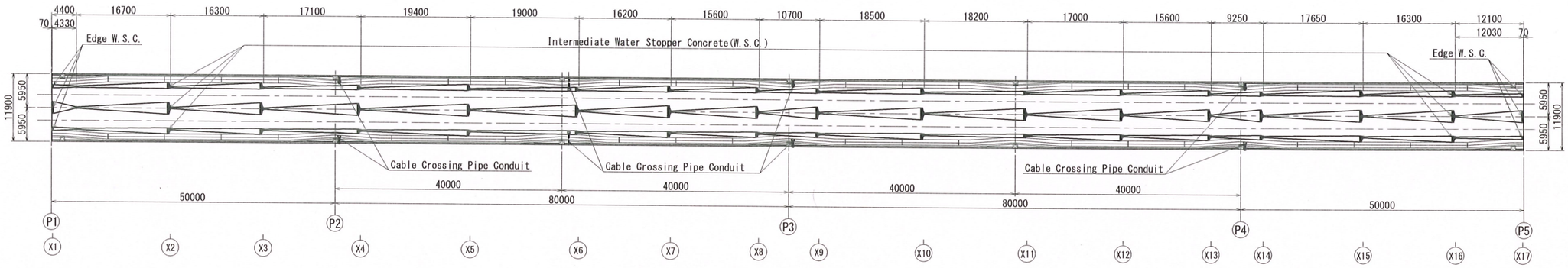
NOTE;
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METERS, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. NOISE BARRIERS HEIGHT SHALL BE 3M FOR RESEDENTIAL/URBAN AREAS (LOCATIONS,WHERE HEIGHT OF NOISE BARRIER SHALL BE 3M, SHALL BE APPROVED BY THE ENGINEER)
4. HANG UP OF THE PRECAST CONCRETE FENCE USES HOLES FOR CONNECTING ADDITIONAL PARTS.
5. THE HEIGHT OF NOISE BARRIER SHOULD BE 3.0 METERS FROM THE R.L. IN URBAN AREAS
6. GRADE OF ANCHOR BOLTS ARE E250(410MPa).
7. THE NUT SHALL BE AS PAR IS:1364.
8. FOR VALUES OF "L" REFER BELOW:
   CROSS SECTION TYPE–A: 200mm
   CROSS SECTION TYPE–B: 80mm

Standard Design Team: Hiranga DOI — Date: 16 DEC 2019

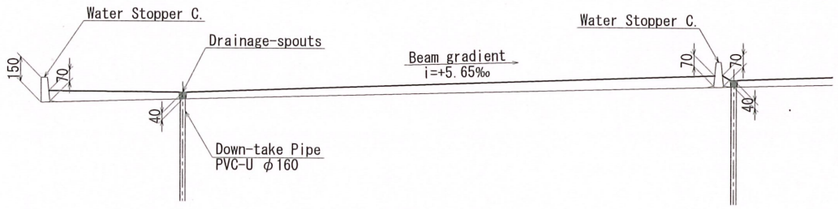
Adopted by: NHSRCL

Project	Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]
OWNER	NATIONAL HIGH SPEED RAIL CORPORATION LTD.
JICA Study Team	Japan International Consultants for Transportation; NIPPON KOEI; ORIENTAL CONSULTANTS GLOBAL
Revised	Date: 16 DEC 2019
Prepared	
Checked	16 DEC 2019
Approved	16 DEC 2019
Title	GAD10 NOISE BARRIER / PRECAST FENCES
Scale	As Shown
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60-11729 002

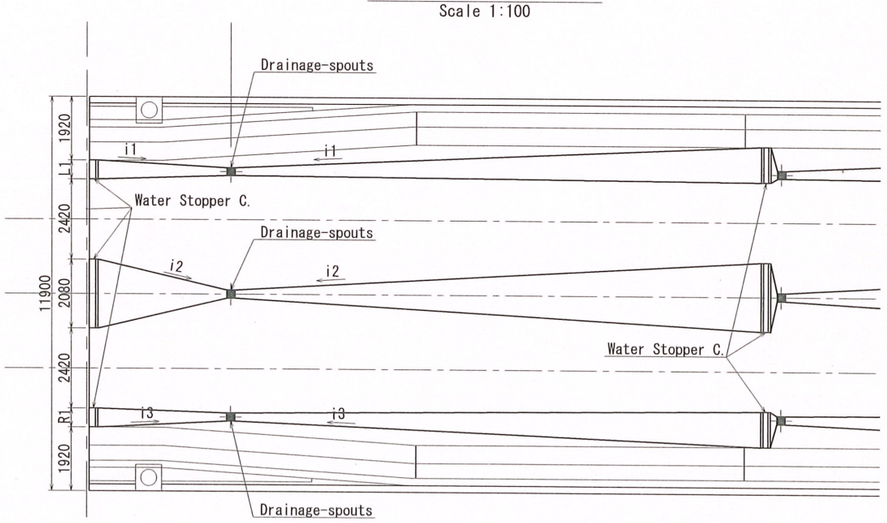
GAD11 Drainage Slope Drawing (Part1)



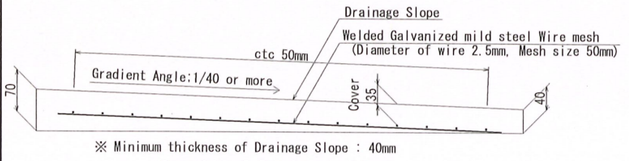
Drainage Slope Plan
Scale 1:400



Start Point Side View
Scale 1:100



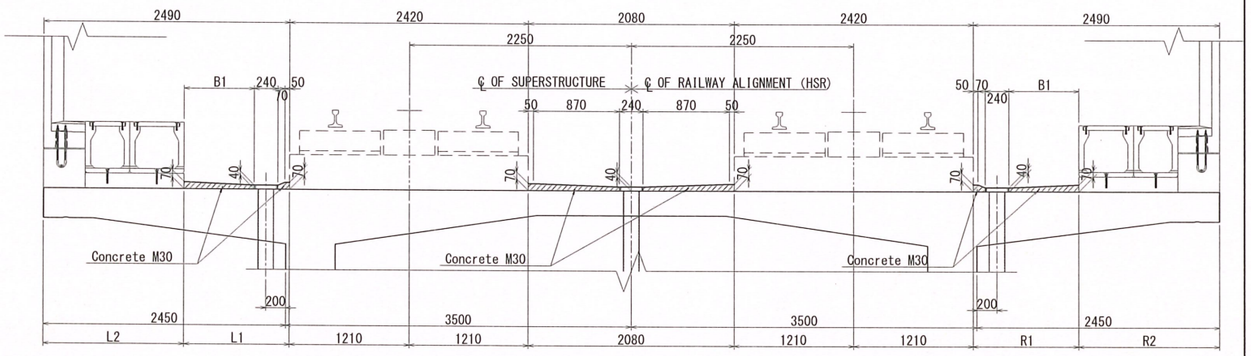
Start Point Side Plan
Scale 1:100



※ Minimum thickness of Drainage Slope : 40mm

Detail of Drainage Slope
Scale 1:5

Note:
If the Drainage Slope is cast after construction of the slab, the work shall be as below.
(1) Concrete with poor quality such as laitance and the like shall be removed from the surface of the slab, the surface of the slab shall be roughened to promote good adhesion, and also water shall be absorbed into the surface, before adjoining concrete is cast.
(2) The reinforcement steel used for this drainage concrete shall be 2.5mm dia Galvanized mild steel wire mesh, 50mm size, conforming to IS : 280 IS : 4826.
(3) Concrete shall be cast so as not to generate cold joint, surface shall be finished smoothly with predetermined shape.
(4) After finishing, Drainage Slope shall be cured so as not to dry rapidly.



Intermediate Section at Roof Drain
Scale 1:30

LEGEND
▨ ; Drainage Slope & Cover Concrete

Dimension table

Section No..				D.S.G.A (‰)					
				i1		i2		i3	
	L1,R1	L2,R2	B1	P1←	→P5	P1←	→P5	P1←	→P5
X1	570	1920	210		1.75		1.71		1.75
X2	1070	1420	710	-7.54	70.67	-29.24	6.82	-7.54	71.79
X3	1070	1420	710	-7.60	70.67	-28.76	6.82	-7.60	71.79
X4	816	1674	456	-7.48	70.67	-29.73	6.82	-7.48	71.79
X5	1070	1420	710	-7.25	70.67	-32.90	6.82	-7.25	71.79
X6	706	1784	346	-7.30	70.67	-32.41	6.82	-7.30	71.79
X7	1070	1420	710	-7.59	70.67	-28.51	6.82	-7.59	71.79
X8	925	1565	565	-7.69	70.67	-27.78	6.82	-7.69	71.79
X9	870	1620	510	-8.67	70.67	-20.96	6.82	-8.67	71.79
X10	1070	1420	710	-7.34	70.67	-31.68	6.82	-7.34	71.79
X11	655	1835	295	-7.35	70.67	-31.19	6.82	-7.35	71.79
X12	1070	1420	710	-7.52	70.67	-29.73	6.82	-7.52	71.79
X13	925	1565	565	-7.69	70.67	-27.78	6.82	-7.69	71.79
X14	775	1715	415	-9.21	70.67	-19.01	6.82	-9.21	71.79
X15	1070	1420	710	-7.41	70.67	-30.46	6.82	-7.41	71.79
X16	1070	1420	710	-7.60	70.67	-28.76	6.82	-7.60	71.79
X17	570	1920	210	-8.20		-23.40		-8.20	

D.S.G.A : Drainage Slope Gradient Angle

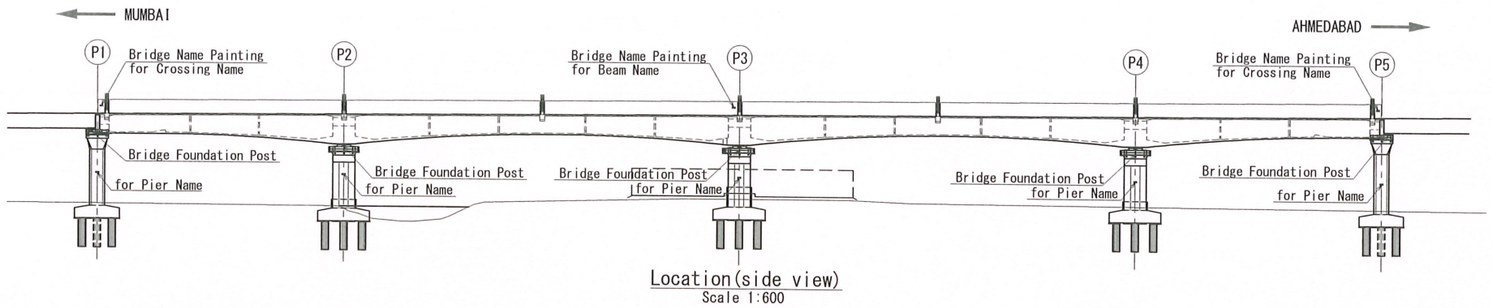
NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.

Adopted by: NHSRCL

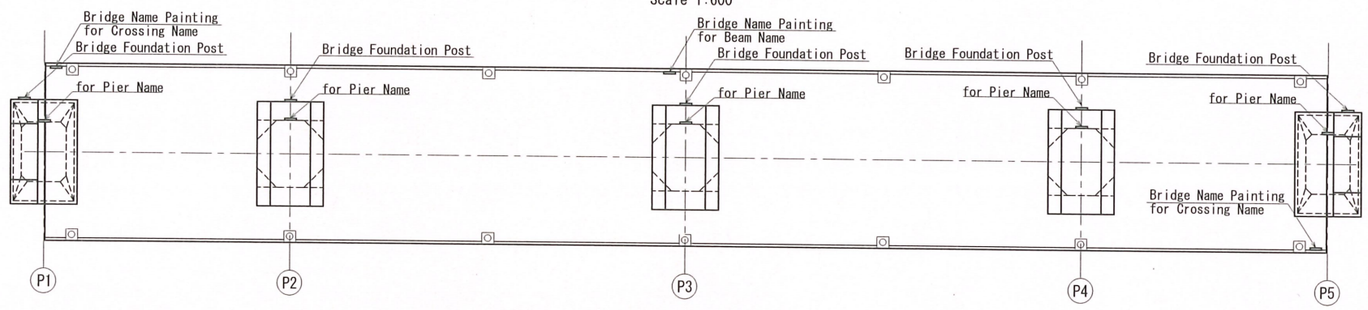
Project	OWNER	JICA Study Team	Revised	Date
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project [Package No. MAHSR – P-3]	NATIONAL HIGH SPEED RAIL CORPORATION LTD.	Japan International Consultants for Transportation NIPPON KOEI ORIENTAL CONSULTANTS GLOBAL	Prepared Checked Approved	16 DEC 2019 16 DEC 2019 16 DEC 2019

Title	GAD11 Drainage Slope Drawing (Part1)
Scale	1:600,1:200 & 1:60 @ A3
Drawing No.	DD-JIC-C06-TDC-B06-BRD-B60- 11730 001

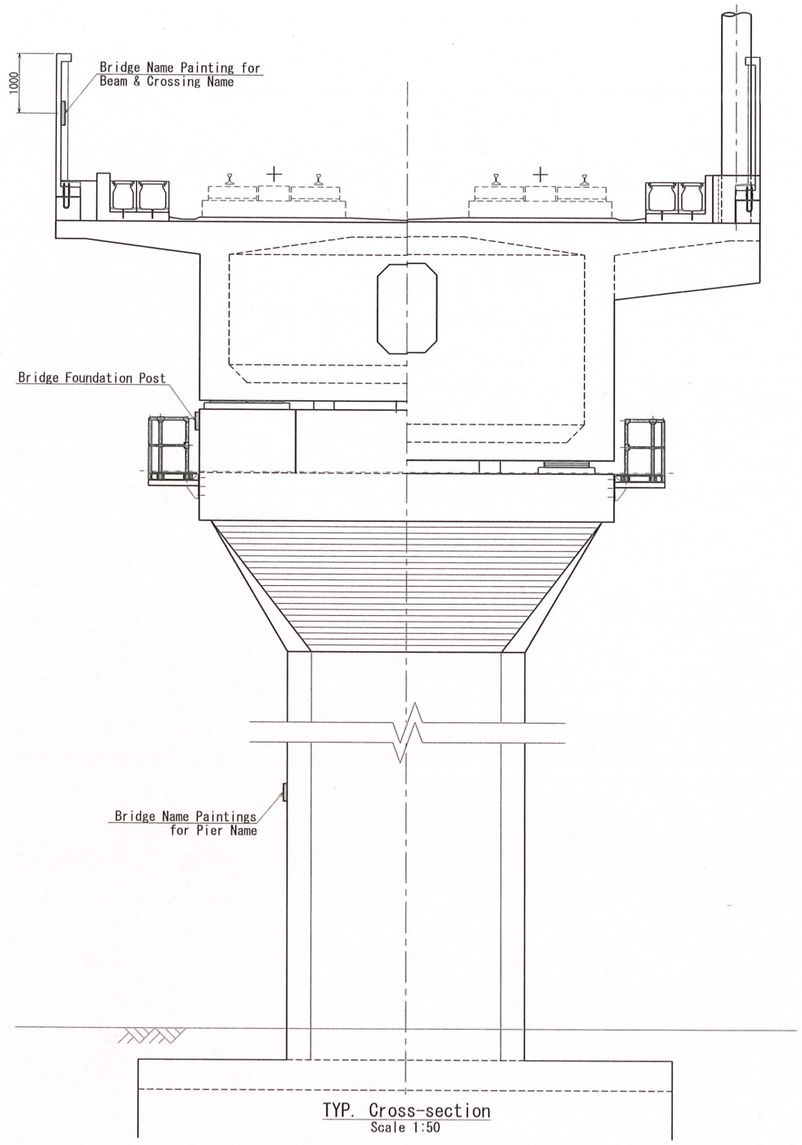
GAD11 Bridge Name Paintings and Posts Drawing



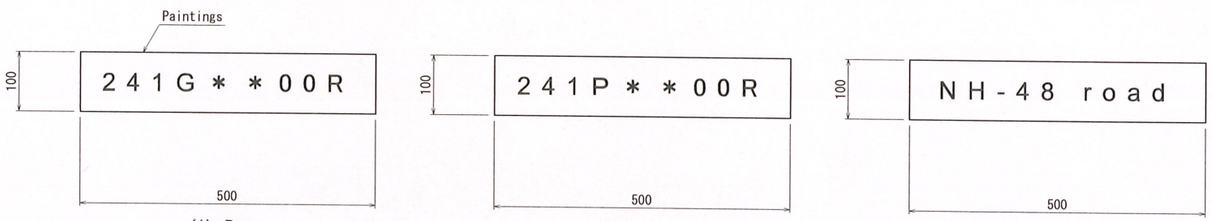
Location(side view)
Scale 1:600



Location(plan view)
Scale 1:600



TYP. Cross-section
Scale 1:50

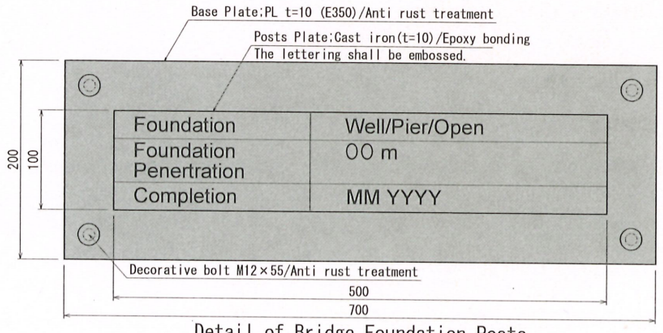


(1) Beam
"＊＊" SHALL BE SHOWN SERIAL NUMBER INSTRUCTED BY THE ENGINEER.

(2) Pier
"＊＊" SHALL BE SHOWN SERIAL NUMBER INSTRUCTED BY THE ENGINEER.

(3) Crossing

Detail of Paintings
Scale 1:5



Detail of Bridge Foundation Posts
Scale 1:3

Name Paintings & Posts Table

Item Name	Unit	Quantity
Paintings at Beam	Place	1.0
Paintings at Pier	Place	5.0
Paintings at Crossing	Place	2.0
Bridge Foundation Posts	Place	5.0

Notes : Paintings Area 0.05m^2

Bridge Foundation Posts Material Table per Place

Item Nme	Item type	Unit	Quantity	Remark
Posts Plate	Cast iron t=10	m^2	0.05	Epoxy bounding
Base Plate	PL t=10 (E350)	m^2	0.14	Anti rust treatment
Fastener	Stainless Steel Insert (M12×79)	Place	4.0	
Fastener	Decorative bolt M12×55/W	Place	4.0	Anti rust treatment

NOTES :
1. ALL DIMENSIONS ARE IN MM, EXCEPT LEVELS, WHICH ARE IN METRES, UNLESS OTHERWISE MENTIONED.
2. DETAILED DESCRIPTION SHALL BE APPROVED BY THE ENGINEER.
3. BRIDGE NAME PAINTING FOR PIER NAME SHOULD BE SHOWN AT HALF HEIGHT OF THE BRIDGE PIERS.
4. PAINTING LENGTH DEPENDS THE DETAILED DESCRIPTIONS ON THE DETAILED DESCRIPTIONS.
5. PAINTING COLOR SHOULD BE BLACK.

Adopted by: NHSRCL

Project
Construction of PSC Bridge No.GAD11 over National Highway (NH-48) at MAHSR Km. 241.640, Navsari district, Gujarat on Mumbai-Ahmedabad High Speed Railway Project
[Package No. MAHSR – P-3]

OWNER
NHSRCL NATIONAL HIGH SPEED RAIL CORPORATION LTD.

JICA Study Team
Japan International Consultants for Transportation
NIPPON KOEI
ORIENTAL CONSULTANTS GLOBAL

Revised		Date 16 DEC 2019
Prepared		
Checked		16 DEC 2019
Approved		16 DEC 2019

Title: GAD11 Bridge Name Paintings and Posts Drawing
Scale: 1:600 @ A3
Drawing No.: DD-JIC-C06-TDC-B06-BRD-B60-11732 001