



NATIONAL HIGHWAYS & INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED

Four Laning of Jhanjhi – Demow Section from Design km 490.800 To
km 534.800 of NH-37, Assam under SARDP on EPC Mode



Drawings

(Design Ch. 490.000–505.000)

- Minor Bridge @ 492.360
- Minor Bridge @ 498.782
- VUP @ 491.225
- VUP @ 500.963
- PUP @ 502.578
- CD Structure @ 496.538
- CD Structure @ 497.300

April 2016

Authority Engineer :



VOYANTS SOLUTIONS PVT LTD

Contractor :



CORSAN CORVIAM CONSTRUCTION S.A.

Consultant :



ISO 9001:2008

Proof Checking Consultant :



GIFFORD INDIA PVT. LTD.

Projects Consulting India (P) Ltd
(Formerly: Distinct Planning and Design Consult (P) Ltd.)
Engineers & Planners

New Delhi, India
Email: info@pciindia.co
www.pciindia.co



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Four Laning of Jhanjhi – Demow Section from Design km 490.800 To
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Date of Release : 12.04.2016
Prepared : KD/SPS
Checked : BKG/AS
Approved : RBS

DESIGN DIRECTOR

Corsan Corviam Construction S.A.

Authority Engineer :


VOYANTS SOLUTIONS PVT LTD

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ISO 9001:2008

FOUR LANING OF JHANJHI TO DEMOW SECTION FROM KM 491 +050 TO KM 535 +250 (DESIGN KM. 490+800 TO 534+800) IN THE STATE OF ASSAM UNDER EPC MODE
DRAWINGS
 • MINOR BRIDGE CH. - 492.360
 • MINOR BRIDGE CH. - 498.782

S. NO.	DRAWING NO	DRAWING TITLE	DRG. REVISION
	GAD BRIDGE CH.- 492.360	SHEET	
1	94-BR02-01-01	(SHEET 1 OF 2) GENERAL ARRANGEMENT DRAWING	R1
2	94-BR02-01-01	(SHEET 2 OF 2) GENERAL ARRANGEMENT DRAWING	R1
	GAD BRIDGE CH.- 498.782		
1	94-BR04-01-01	(SHEET 1 OF 2) GENERAL ARRANGEMENT DRAWING	R1
2	94-BR04-01-01	(SHEET 2 OF 2) GENERAL ARRANGEMENT DRAWING	R1
	REINF. - BOX (BRIDGE CH.- 492.360 & 498.782)		
	94-BR02-02-01	(SHEET 1 OF 2) REINFORCEMENT - BOX	R0
	94-BR02-02-01	(SHEET 2 OF 2) REINFORCEMENT - BOX	R0
	MISCELLANEOUS DETAILS		
1	94-BR02-03-01	(SHEET 1 OF 3) MISCELLANEOUS DETAILS	R0
2	94-BR02-03-01	(SHEET 2 OF 3) MISCELLANEOUS DETAILS	R0
3	94-BR02-03-01	(SHEET 3 OF 3) MISCELLANEOUS DETAILS	R0

DESIGN DIRECTOR
 Corsan Corviam Construction S.A.

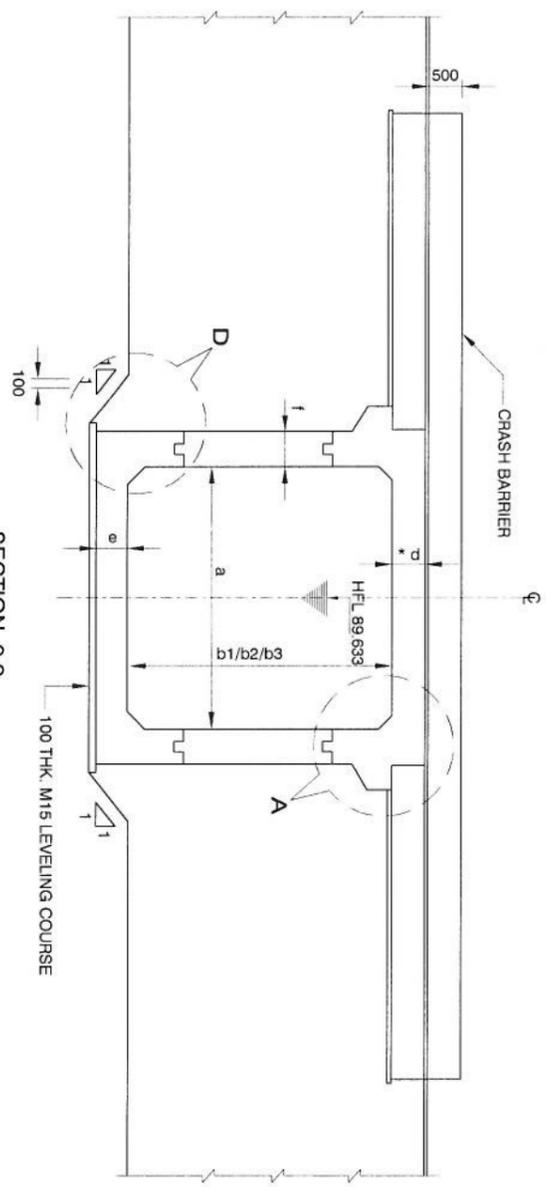
APPROVED:	CONSULTANT:	CLIENT:	PROOF-CHECKING CONSULTANT:	PROJECT:
RBS	PCI PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 61101/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Baran Office House No. 1, Panchsheel, Anand Nagar, Zoo Road, Guwahati - 24	Gifford	FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE
CHECKED:				
DESIGNED:				
DRAWN:	VOYANTIS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Valika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADRYALI & ASSOCIATES RZ-44, Bhawanji Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	TITLE: INDEX
REV	DATE	SCALE	SHEETS: SHEET:	DATE:
		NTS	A2 01	March 2016
				REV 0

- **Minor Bridge @ 492.360**
- **Minor Bridge @ 498.782**

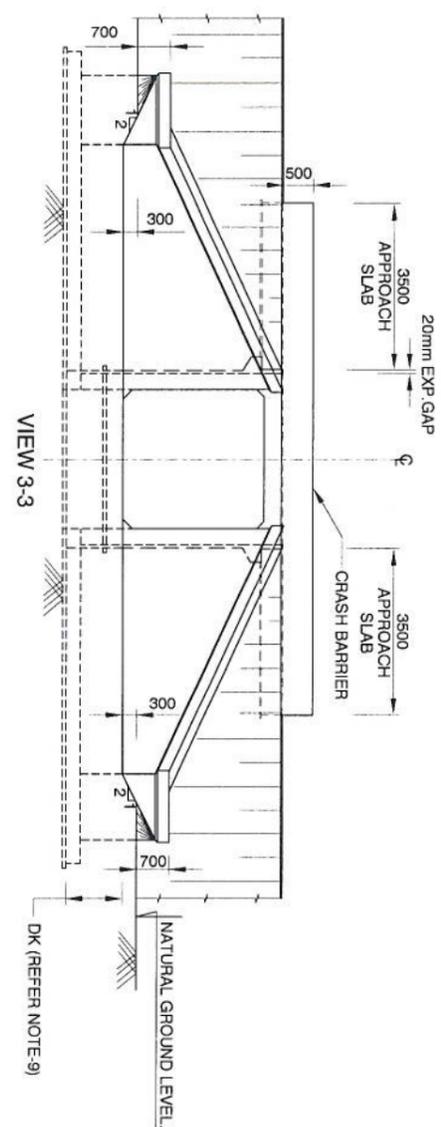
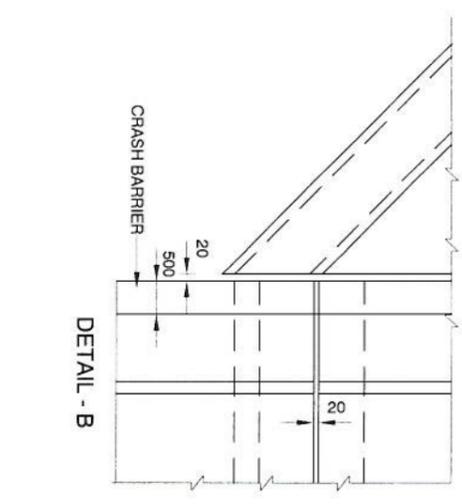
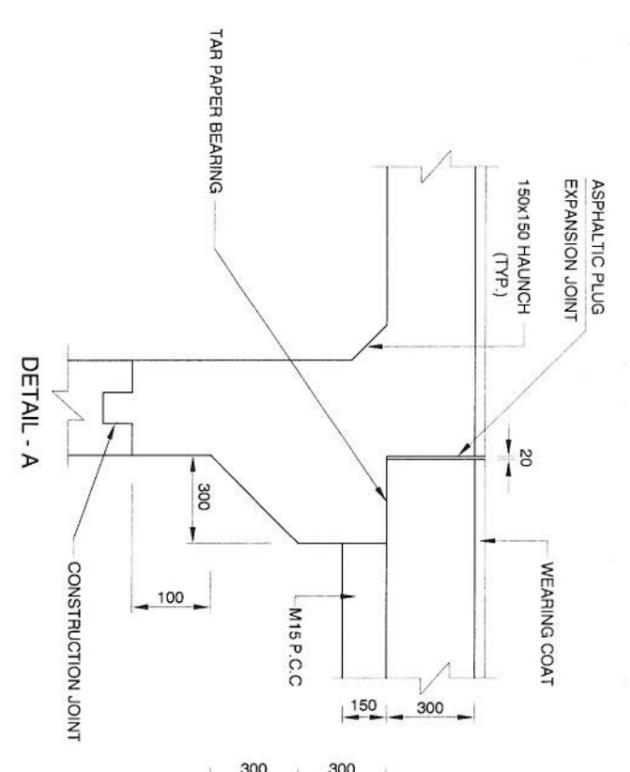


DESIGN DIRECTOR
[Signature]
Corsan Corvia Construction S.A.

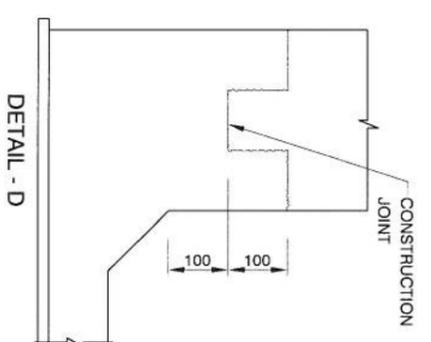




SECTION 2-2
*D DECK SLAB THICKNESS AT INNER EDGE OF KERB AS SHOWN IN SECTION 1-1



VIEW 3-3



DETAIL - D

S.no	Existing Chainage	Design Chainage	Proposed		Existing FRL	FRL at RME	FRL at LME	Invert level	Lowest bed Level	Span "a" (m)	clear height "b1" (m)	clear height "b2" (m)	clear height "b3" (m)	top slab 'd' thickness (m)	Bottom slab 'e' thickness (m)	Side wall 'r' thickness (m)	Direction of flow	
			Type of Structure Proposed	No. of Spans														No. of span x span arrangement
1	492.605	492.360	box	1	1x6	91.498	91.498	91.498	85.500	85.800	6	5.220	5.5	5.194	0.55	0.700	0.600	Right to Left

DESIGN DIRECTOR

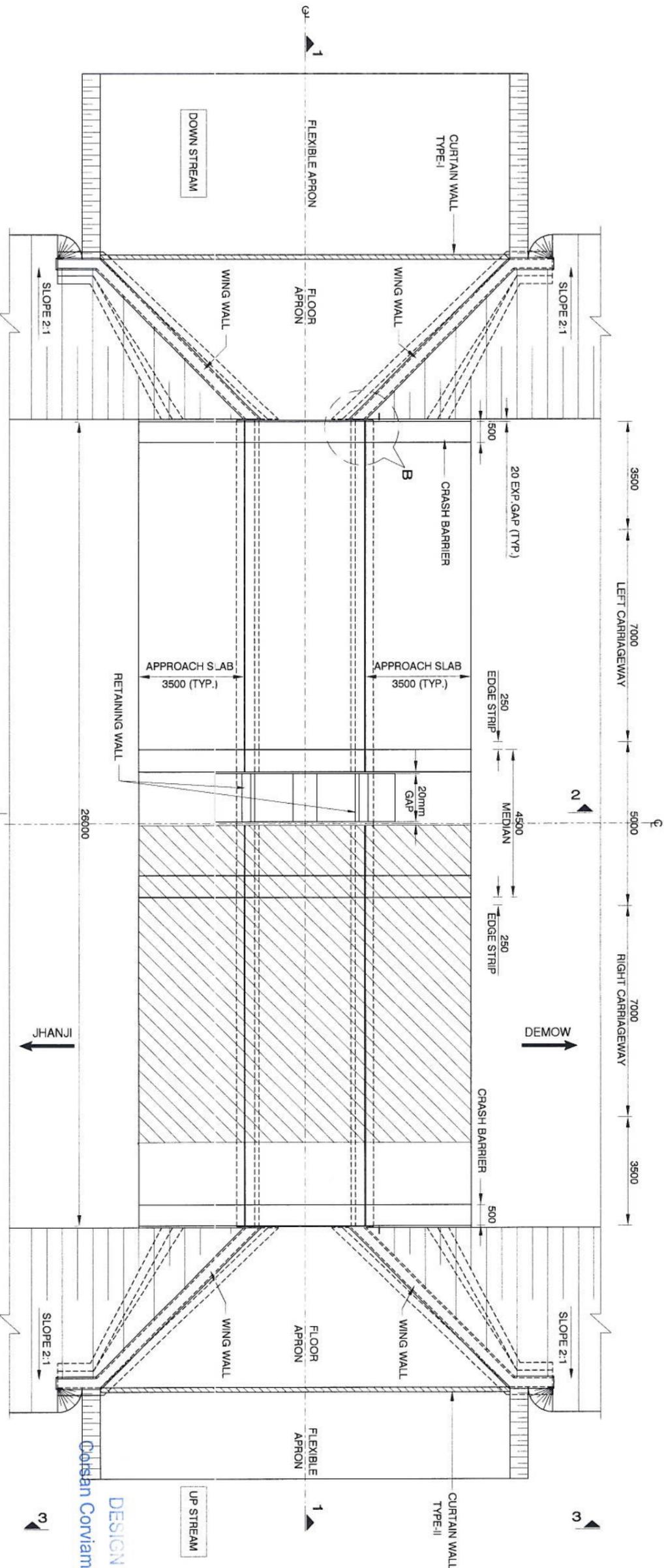
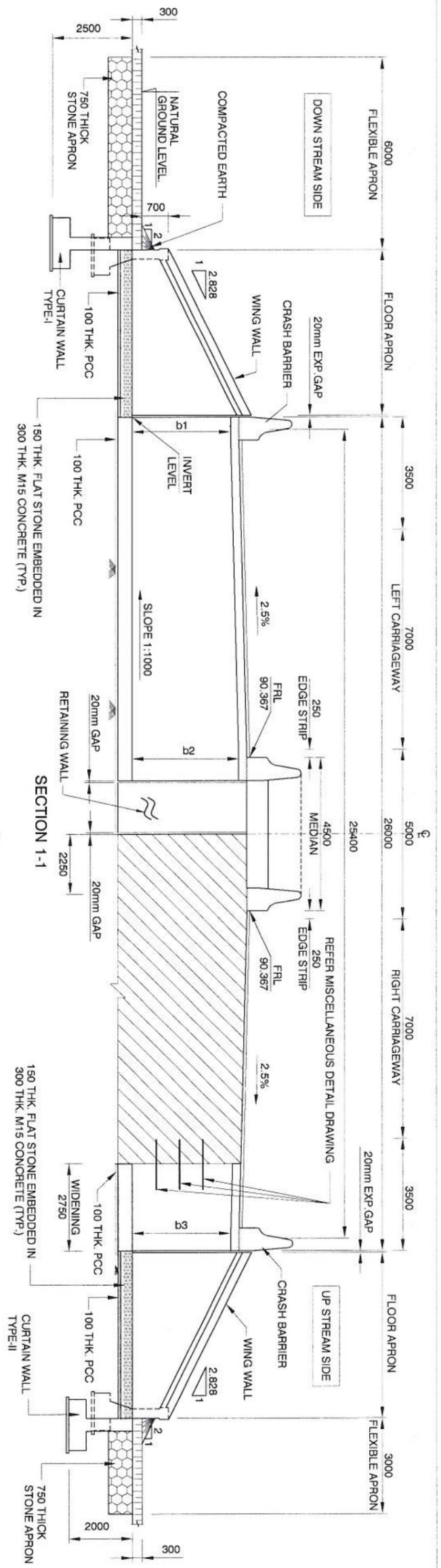
Corsan Corviam Construction S.A.

REV	DATE	COMPLIANCE TO THE COMMENTS	DESCRIPTION OF REVISIONS	APPROVED	DESIGNED	DRAWN	AV	CONSULTANT	CLIENT	CONTRACTOR	SAFETY CONSULTANT	PROF. CHECKING CONSULTANT	TITLE	DRAWING NO	SHEETS/NO. SHEET	SCALE	DATE	REV
R1	29-03-2016			RBS	BKS	KOS	AY	PCII PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110/2 Sector - D6, Vasanti Kunj New Delhi (India) 110070 AUTHORITY ENGINEER: VOYANT'S SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre, Sector -30, NH-8, Gurgaon, Haryana - 122001, India	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office : House No.1, Panchsri, Anandkaji Nagar, Zone Road, Gurgaon - 24	ISOLUX CORSAN CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vaidya Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	KALYANI L. R. KADRYAL & ASSOCIATES RZ-44, Bhawanij Kunj, Behind D-2 Vasanti Kunj, New Delhi 110 070	Gifford India Pvt. Ltd. (Part of Ramboll) The Empire Building No. 8, Tower 'B', Level 17, DLF Cyber City Phase-III, Gurgaon, Haryana 122002	GENERAL ARRANGEMENT DRAWING BRIDGE AT CH. 492.360	94-BR02-01-01	A2	02	March 2016	0

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBES AS FOLLOWS:

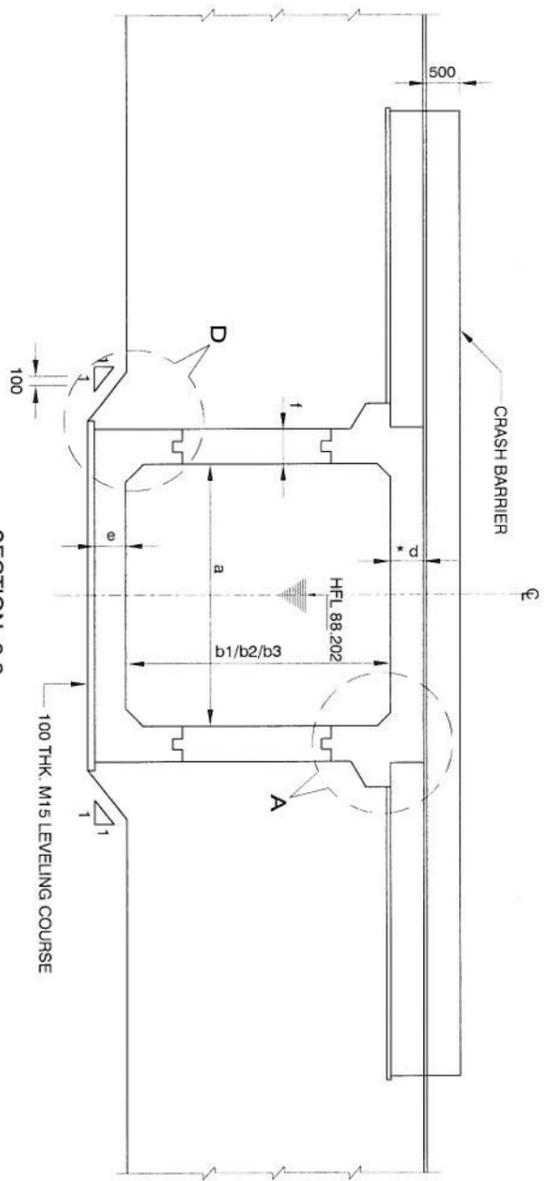
RCC BOX	M35
APPROACH SLAB	M30
LEVELLING COARSE	M15
PCC WING WALL	M20
CRASH BARRIER	M40
PCC CURTAIN WALL	M20
- THE REINFORCING STEEL SHALL BE CORROSION RESISTANT TMT HYSD BARS (GRADE DESIGNATION FE-500 CONFORMING TO IS: 1786-1985)
- DESIGNED FOR ONE LANE OF IRC CLASS 70R+ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF CLASS A LOADING WHICH EVER GOVERNS.
- BACKFILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 78-2014 HAVING PROPERTIES C=0, φ>30° & YD=20 KN/M³
- 65MM THK WEARING COURSE COMPRISING OF 40MM THK BITUMINOUS CONCRETE & 25MM THK ASPHALTIC SHALL BE PROVIDED
- NET SAFE BEARING CAPACITY AT FDN LEVEL 9.1 T/M²
- DESIGN DISCHARGE AS PER HYDROLOGY REPORT IS 33 CUM/SECS.
- GROUND IMPROVEMENT TO BE DONE WHERE BASE PRESSURE EXCEEDS ALLOWABLE SBC
- THE VARIOUS LEVELS (FRL, INVERT LEVELS) & SUPER ELEVATION SHOWN IN DRAWINGS SHALL BE VERIFIED PRIOR TO EXECUTION AT SITE AND IF ANY DISCREPANCY FOUND, SHALL BE INFORMED TO ENGINEER
- SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
- FOR REINFORCEMENT DETAILS REFER DRG NO. 94-BR02-02-01
- FOR RETAINING WALL/WING WALL, PARAPET WALL, CURTAIN WALL & GUARD STONE DETAILS REFER DRG NO. 94-BR02-03-01



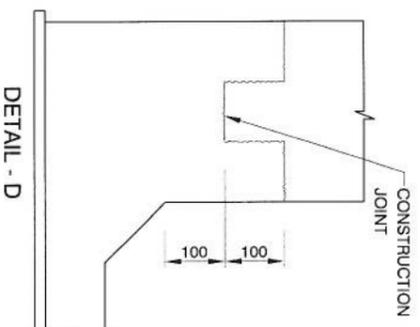
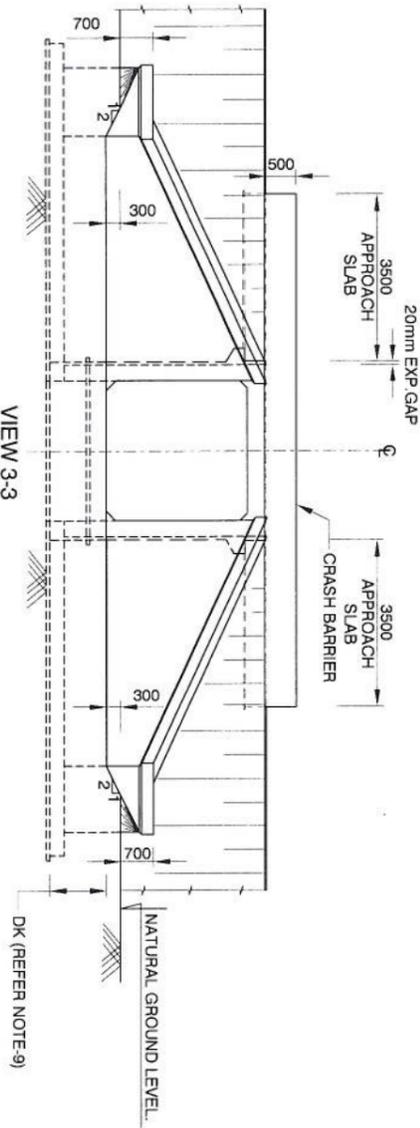
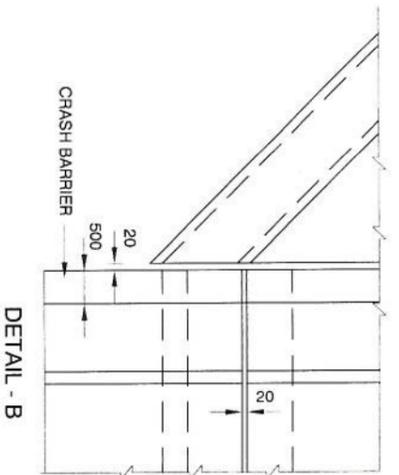
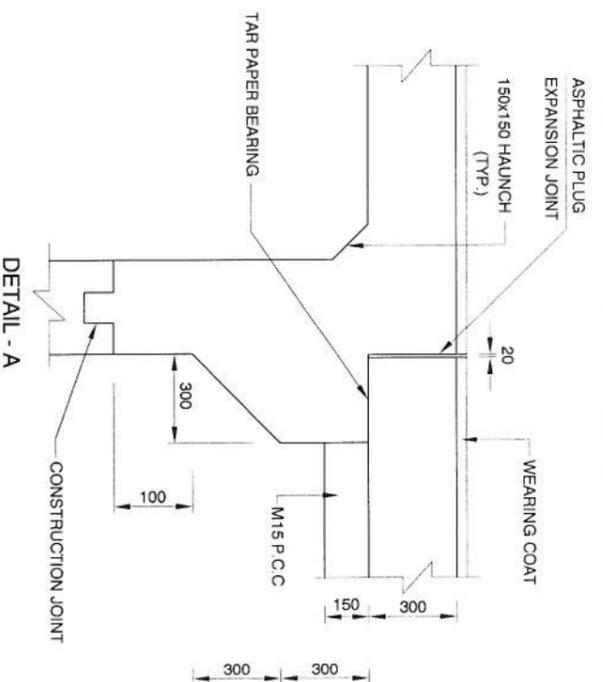
DESIGN DIRECTOR
Corisan Corviam Construction S.A.

[Signature]

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED:	CONSULTANT:	CLIENT:	PROOF CHECKING CONSULTANT:	PROJECT:	TITLE:	SHEET(S)/SIZE:	DATE:
R1	22/03/2016	COMPLIANCE TO IFC COMMENTS	RBS	PCI	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	Gifford	FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE	GENERAL ARRANGEMENT DRAWING	A2	01
REV	DATE	DESCRIPTION OF REVISIONS	CHECKED:	PROJECTS CONSULTING INDIA (P) LTD	Ministry of Road Transport & Highways, Government of India	L. R. KADIYALI & ASSOCIATES		BRIDGE AT CH. 498.792	SCALE:	REV
			DESIGNED:	Engineers and Planners	Branch Office - House No. 1, Panpara, Ambalga Nagar, Zoo Road, Guwahati - 78			94-BR04-01-01	1:100	0
			DRAWN:	61/10/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	CORSAN CORVIAM CONSTRUCTION S.A.					March 2016
			AY	VOYANTS SOLUTIONS PVT LTD.	02nd Floor, Block Two, Valika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001					



*D DECK SLAB THICKNESS AT INNER EDGE OF KERB AS SHOWN IN SECTION 1-1



Sno	Existing Chaining	Design Chaining	Proposed		Existing FRL	FRL at RME	FRL at LME	Invert level	Lowest bed level	Span "a" (m)	clear height "b1" (m)	clear height "b2" (m)	clear height "b3" (m)	top slab 'd' thickness (m)	Bottom slab 'e' thickness (m)	Side wall 'f' thickness (m)	Direction of flow
			Type of Structure	No. of Spans													
1	499.100	498.782	box	1	1x6	90.367	90.367	84.965	85.265	6	4.220	4.5	4.194	0.55	0.700	0.500	Right to Left

DESIGN DIRECTOR
Corisan Corviam Construction S.A.

APPROVED:	FBS	CONSULTANT	CLIENT	PROOF CHECKING CONSULTANT	SAFETY CONSULTANT	PROJECT
CHECKED:	BKS	PROJECTS CONSULTING INDIA (P) LTD	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	Gifford	L. R. KADIYALI & ASSOCIATES	FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE
DESIGNED:	KDS	6110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	Ministry of Road Transport & Highways, Government of India	Gifford India Pvt Ltd (Rajmohol)	RZ-44, Bhawanij Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	GENERAL ARRANGEMENT DRAWING
DRAWN:	AY	VOYANTS SOLUTIONS PVT LTD.	CORSAN CORVIAM CONSTRUCTION S.A.	L. R. KADIYALI & ASSOCIATES		BRIDGE AT CH. 498.782
COMPLIANCE TO CPC COMMENTS		403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	02nd Floor, Block Two, Vaidika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001			SCALE: NTS
DESCRIPTION OF REVISIONS						DATE: March 2016
REV	DATE					REV
						0

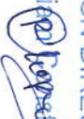
NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBES AS FOLLOWS:

RCC BOX	M35
APPROACH SLAB	M30
LEVELLING COARSE	M15
PCC WING WALL	M20
CRASH BARRIER	M40
PCC CURTAIN WALL	M20
- THE REINFORCING STEEL SHALL BE CORROSION RESISTANT TMT HYSD BARS (GRADE DESIGNATION FE-500 CONFORMING TO IS: 1786-1985)
- DESIGNED FOR ONE LANE OF IRC CLASS 70R+ ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF CLASS A LOADING WHICHEVER GOVERNS.
- BACKFILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 78-2014 HAVING PROPERTIES C=0, φ>30° & γD=20 KN/M³
- 65MM THK WEARING COURSE COMPRISING OF 40MM THK BITUMINOUS CONCRETE & 25MM THK ASPHALTIC SHALL BE PROVIDED
- NET SAFE BEARING CAPACITY AT FDN LEVEL 9.1 T/M²
- DESIGN DISCHARGE AS PER HYDROLOGY REPORT IS 24 CUM/SEC.
- GROUND IMPROVEMENT TO BE DONE WHERE BASE PRESSURE EXCEEDS ALLOWABLE SBC
- THE VARIOUS LEVELS (FRL, INVERT LEVELS) & SUPER ELEVATION SHOWN IN DRAWINGS SHALL BE VERIFIED PRIOR TO EXECUTION AT SITE AND IF ANY DISCREPANCY FOUND, SHALL BE INFORMED TO ENGINEER
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- FOR REINFORCEMENT DETAILS REFER DRG NO. 94- BR02-02-01
- FOR RETAINING WALL/WING WALL, PARAPET WALL, CURTAIN WALL & GUARD STONE DETAILS REFER DRG NO. 94- BR02-03-01

FOUR LANING OF JHANJHI TO DEMOW SECTION FROM KM 491 + 050 TO KM 535 + 250 (DESIGN KM. 490 + 800 TO 534+800) IN THE STATE OF ASSAM UNDER EPC MODE
DRAWING LIST UNDERPASS AND CD STRUCTURES (CH. 490+000 TO CH. 505+000)

S. NO.	DRAWING NO	SHEET	DRAWING TITLE	DRG. REVISION
	VUP CH. - 491.225	SHEET		
1	94-31-01	(SHEET 1 OF 2)	GENERAL ARRANGEMENT DRAWING - VEHICULAR UNDERPASS(CH. 491.225)	R1
2	94-31-01	(SHEET 2 OF 2)	GENERAL ARRANGEMENT DRAWING - VEHICULAR UNDERPASS(CH. 491.225)	R1
	VUP CH. - 500.963			
1	94-31-02	(SHEET 1 OF 2)	GENERAL ARRANGEMENT DRAWING - VEHICULAR UNDERPASS(CH. 500.963)	R1
2	94-31-02	(SHEET 2 OF 2)	GENERAL ARRANGEMENT DRAWING - VEHICULAR UNDERPASS(CH. 500.963)	R1
	REINFORCEMENT VUP			
1	94-31-03	(SHEET 1 OF 2)	REINFORCEMENT - VEHICULAR UNDERPASS	R0
2	94-31-03	(SHEET 2 OF 2)	REINFORCEMENT - VEHICULAR UNDERPASS	R0
	PUP CH. - 502.578			
1	94-31-04	(SHEET 1 OF 1)	GENERAL ARRANGEMENT DRAWING - PEDESTRIAN UNDERPASS(CH. 502.578)	R1
	REINFORCEMENT PUP			
1	94-31-05	(SHEET 1 OF 3)	REINFORCEMENT - PEDESTRAIN UNDERPASS	R1
2	94-31-05	(SHEET 2 OF 3)	REINFORCEMENT - PEDESTRAIN UNDERPASS	R0
3	94-31-05	(SHEET 3 OF 3)	REINFORCEMENT - PEDESTRAIN UNDERPASS	R0
	CD STRUCTURES			
1	94-32-00	(SHEET 1 OF 1)	SCHEDULE	R0
	CD STRUCTURES CH. -496.538			
1	94-32-01	(SHEET 1 OF 2)	GENERAL ARRANGEMENT DRAWING - RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH. -496.538)	R1
2	94-32-01	(SHEET 2 OF 2)	GENERAL ARRANGEMENT DRAWING - RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH. -496.538)	R1
	CD STRUCTURES CH. -497.300			
1	94-32-02	(SHEET 1 OF 2)	GENERAL ARRANGEMENT DRAWING - RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH. -497.300)	R1
2	94-32-02	(SHEET 2 OF 2)	GENERAL ARRANGEMENT DRAWING - RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH. -497.300)	R1
	REINFORCEMENT CD STRUCTURES			
1	94-32-03	(SHEET 1 OF 2)	REINFORCEMENT - SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT	R1
2	94-32-03	(SHEET 2 OF 2)	REINFORCEMENT - SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT	R1
	MISCELLANEOUS DETAILS			
1	94-33-01	(SHEET 1 OF 3)	MISCELLANEOUS DETAILS	R0
2	94-33-01	(SHEET 2 OF 3)	MISCELLANEOUS DETAILS	R0
3	94-33-01	(SHEET 3 OF 3)	MISCELLANEOUS DETAILS	R0

DESIGN DIRECTOR

Corsan Corviam Construction S.A.

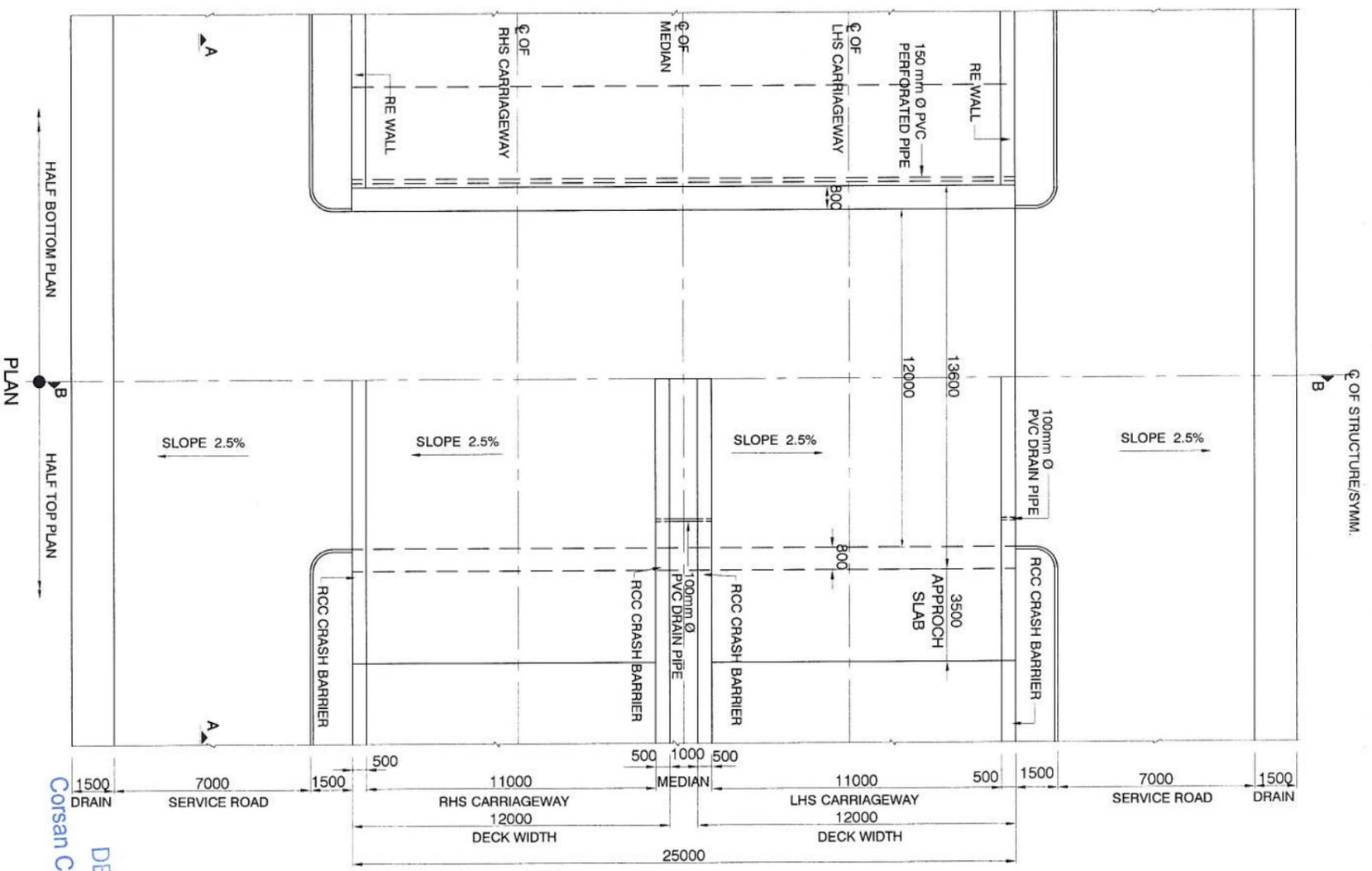
APPROVED	RBS	CONSULTANT	CLIENT	PROOF CHECKING CONSULTANT	PROJECT
CHECKED:	BKG	PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office : House No.1, Panchsara, Anandapuri Nagar, Zoo Road, Connaught Place - 24	Gifford India Pvt Ltd The Eminent, Building No. 6, Tower 'B', Level 12, DLF Cyber City Phase-III, Gurgaon, Haryana-122002	FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE
DESIGNED:	AS	VOYANTS SOLUTIONS PVT.LTD. AUTHORITY ENGINEER: 403, 4th Floor, GPTP Park Centre, Sector-30, NH-4, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 2nd Floor, Block 'Two', Vaidika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADIYALI & ASSOCIATES RZ-44, Bhawanij Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	INDEX
REV	DATE	DESCRIPTION OF REVISIONS			DRAWING NO. 94-00-00
					SCALE A3
					SHEET 01
					DATE March 2016
					REV 0

-
- VUP @ 491.225
 - VUP @ 500.963



DEVELOPERS
Corsan Corviam *Plus* Construcción S.A.

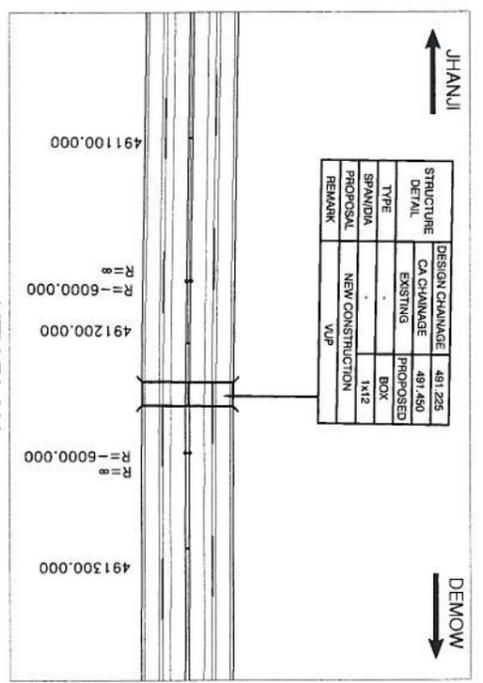
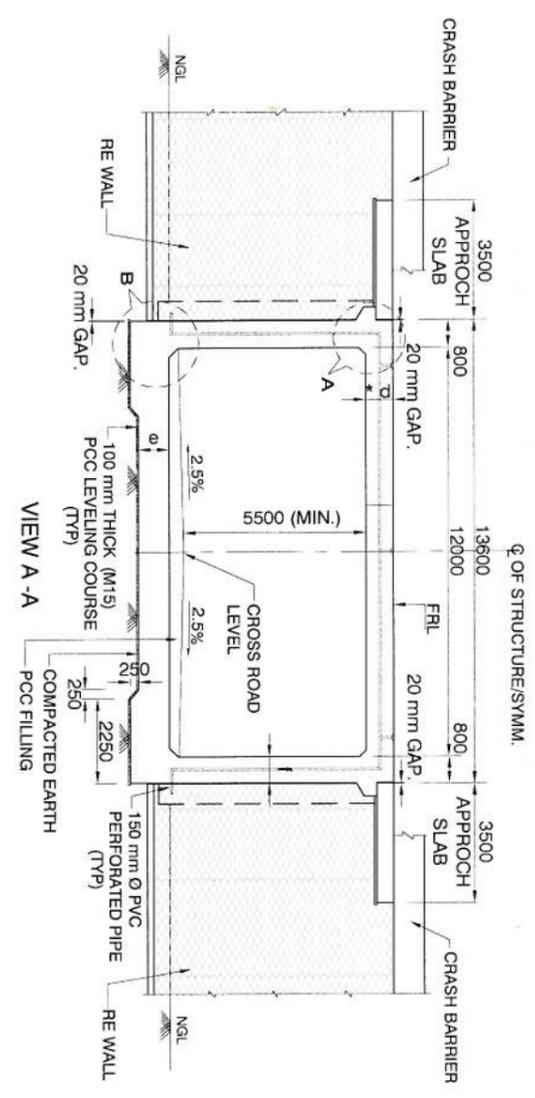




DESIGN DIRECTOR
 Corsan Corviam Construcción S.A.

DEPTH (m)	SOIL DESCRIPTION
0.00-0.50	FILLED-UP SOIL
0.50-1.50	BROWN SILTY CLAYEY WITH SAND OF HIGH PLASTICITY, LOW EXPANSIVE. (CH)
1.50-1.95	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
2.50-2.80	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
3.00-3.45	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
4.50-4.95	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
5.50-5.80	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
6.00-6.45	BROWN CLAYEY SILT WITH SAND OF MEDIUM PLASTICITY. (CI)
7.50-7.95	GREY SILTY CLAY OF HIGH PLASTICITY WITH TRACES OF SAND, MEDIUM EXPANSIVE. (CH)
8.50-8.80	GREY SILTY CLAY OF HIGH PLASTICITY WITH TRACES OF SAND, MEDIUM EXPANSIVE. (CH)
9.00-9.45	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
10.50-10.95	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
11.50-11.80	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
12.00-12.45	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
13.50-13.95	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
14.50-14.80	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)
15.00-15.45	BLACK CLAYEY SILT OF MEDIUM PLASTICITY WITH TRACES OF SAND. (CI)

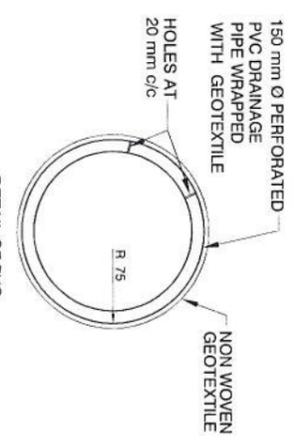
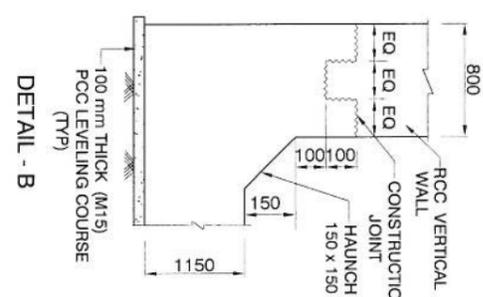
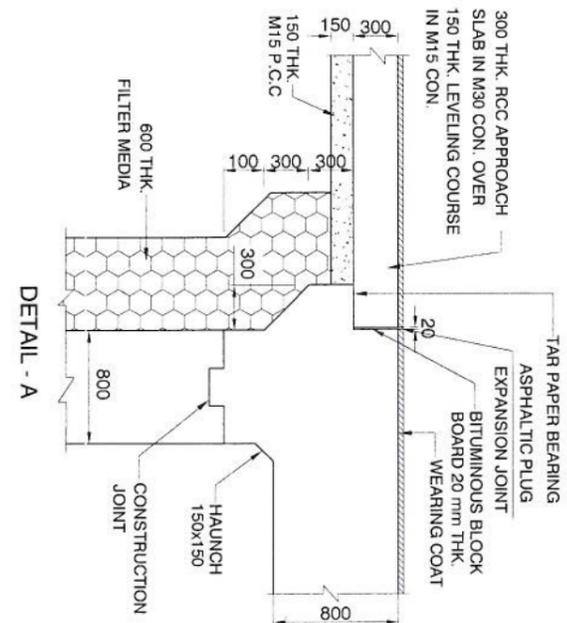
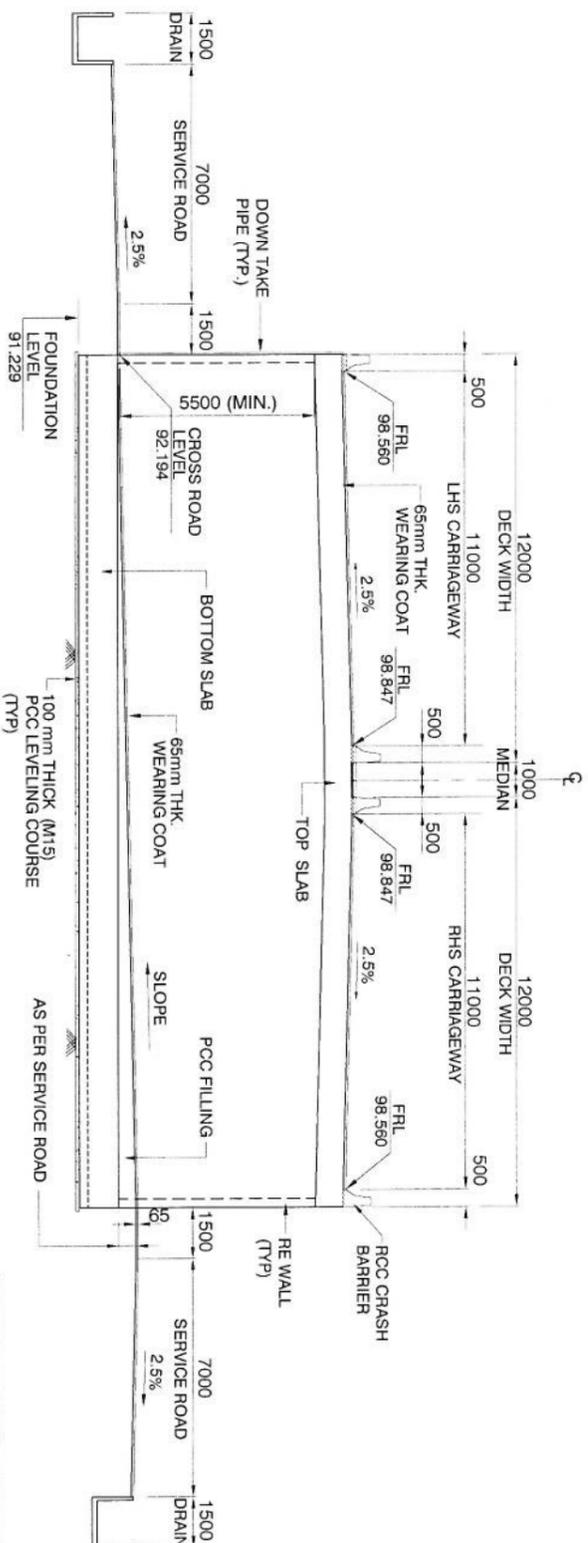
BORE HOLE DETAILS



NOTES:

- ALL DIMENSIONS ARE IN MM AND LEVELS IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE 3-LANE STRUCTURE IS DESIGNED FOR ONE LANE OF IRC CLASS 70R+ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF CLASS A LOADING WHICHEVER GOVERNS.
- BED LEVEL, CROSS ROAD LEVEL, FORMATION LEVEL AND SUPERELEVATION / CAMBER SHALL BE PROVIDED AS PER APPROVED PLAN AND PROFILE DRAWINGS AND IN CASE ANY DISCREPANCIES, IT SHALL BE BROUGHT INTO THE NOTICE OF THE DESIGN ENGINEER.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS:
 RCC BOX: M-35
 CRASH BARRIER: M-40
 APPROACH SLAB: M-30
 LEVELLING COURSE: M-15
- THE REINFORCING SHALL BE CORROSION RESISTANT TMT H.Y.S.D. BARS (GRADE DESIGNATION Fe-500 CONFORMING TO IS:1786 - 1985).
- 600 THK FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALLS.
- BACK FILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 7 - 2014 HAVING PROPERTIES $C=0$, 30° , $=20^\circ$ & $d=20$ KM / m^2
- 65 mm THE WEARING COURSE COMPRISING OF 40mm THK BITUMINOUS CONCRETE & 25mm THK MASTIC ASPHALT.
- NET SAFE BEARING CAPACITY AT FOUNDING LEVEL ASSUMED 11.54 T/m²

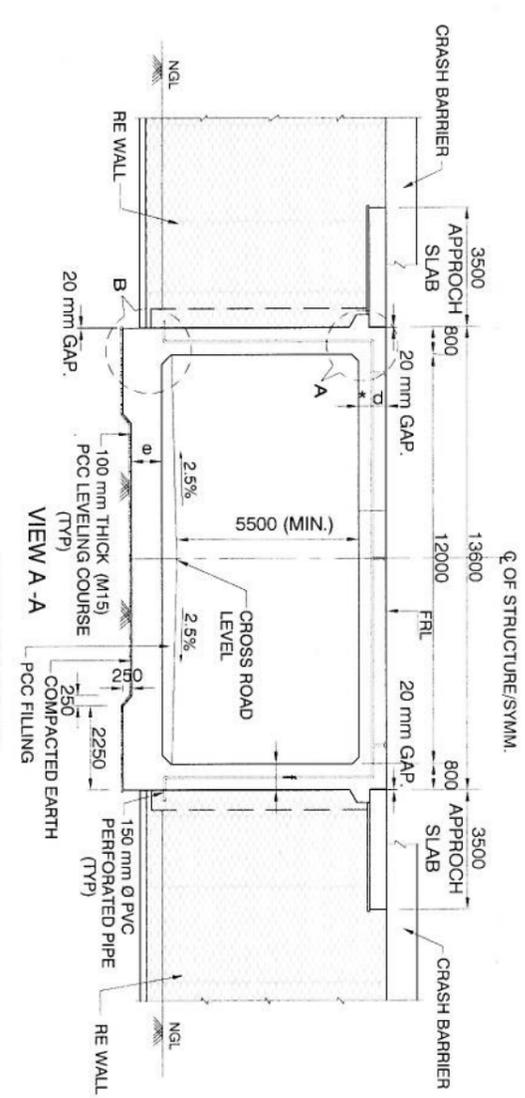
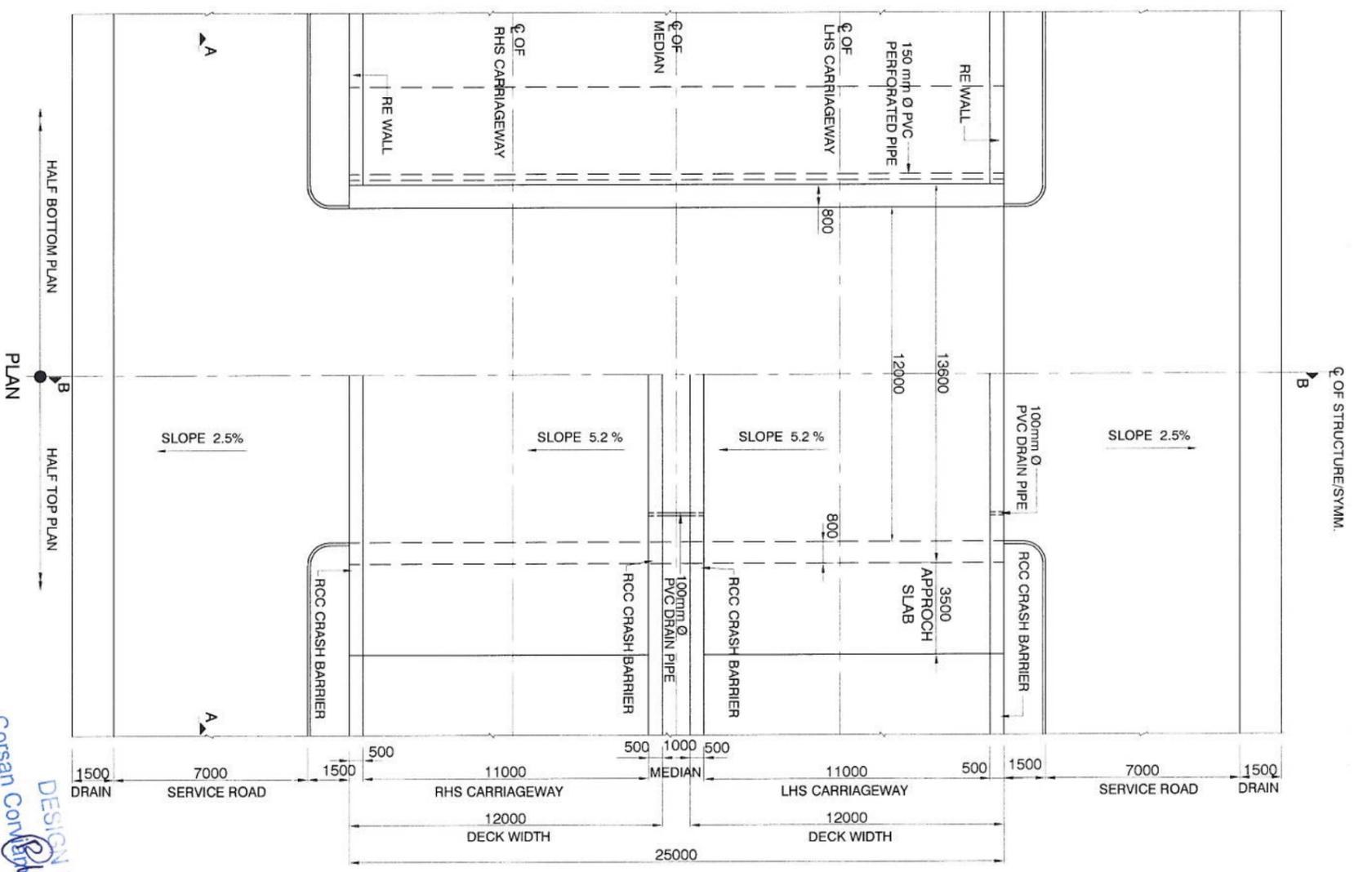
REV	DATE	DESCRIPTION OF REVISIONS	APPROVED	CONSULTANT	CLIENT	PROOF CHECKING CONSULTANT	SAFETY CONSULTANT	PROJECT	TITLE	SHEET/NO.	DATE
R1	29-03-2016	COMPLIANCE TO P.C COMMENTS	RBS	PROJECTS CONSULTING INDIA (P) LTD	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	Gifford	L. R. KADIYANI & ASSOCIATES	FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE	GENERAL ARRANGEMENT DRAWING	01	March 2016
			DESIGNED	VOYANTS SOLUTIONS PVT LTD	CORSAN CORVIAM CONSTRUCTION S.A.				VEHICULAR UNDERPASS (CH-491.225)		
			DRAWN								



Sno	Existing Chainage	Design Chainage	Proposed		Details of widening		FRL at RME	FRL at LME	Span "a" (m)	clear height "b" (m)	top slab thickness (m)	Bottom slab thickness (m)	Side wall thickness (m)	Design Base Pressure (KN/m ²)
			Type of Structure	No. of Spans	LHS	RHS								
1	491.450	491.225	Box	1	12	12	98.847	98.847	12	5.5	0.800	0.900	0.800	115.4

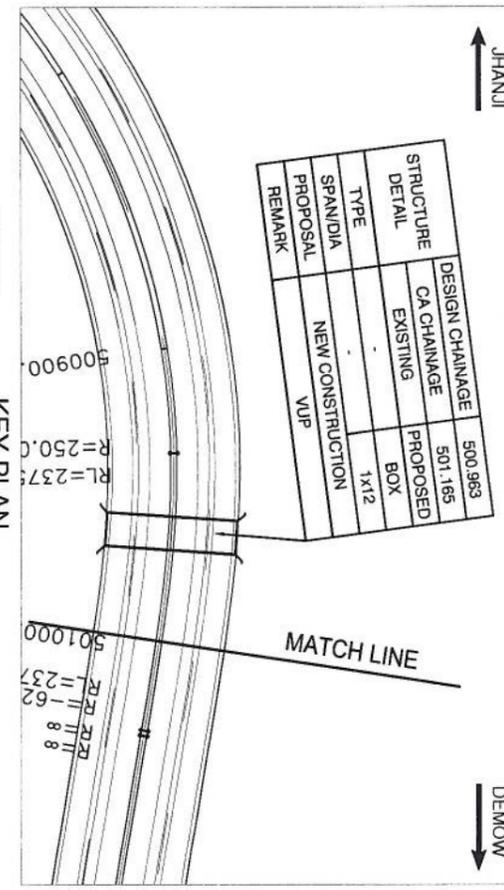
DESIGN DIRECTOR
 Corasan Corviam Construction S.A.

APPROVED:	CONSULTANT:	CLIENT:	PROOF CHECKING CONSULTANT:	SAFETY CONSULTANT:	PROJECT:
FBS	PROJECTS CONSULTING INDIA (P) LTD	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	Gifford	L. R. KADYALTI & ASSOCIATES	FOUR LANNING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE
CHECKED:	6110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	Ministry of Road Transport & Highways, Government of India			GENERAL ARRANGEMENT DRAWING
BKG	Engineers and Planners	Bench Office : House No. 1, Panchsati, Anandapuri, New Delhi - 110001			VEHICULAR UNDERPASS (CH-491.225)
DESIGNED:	VOYANTIS SOLUTIONS PVT LTD.	CORSAN CORVIAM CONSTRUCTION S.A.			SHEET SIZE: SHEET
AS	403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	02nd Floor, Block 'Two', Vastha Business Park, Sector -49, Sohna Road, Gurgaon, Haryana, India - 122001			A3
DRAWN:	KDS				02
DATE:	22-03-2016				DATE:
DESCRIPTION OF REVISIONS:					March 2016
					REV:
					0



BORE HOLE DETAILS

0.00-0.50	BROWN CLAYEY SILT OF LOW PLASTICITY WITH SAND & TRACES OF GRAVELS. (CL) 1.5m
0.50-1.50	
1.50-1.95	
2.50-2.80	
3.00-3.45	
4.50-4.95	
5.50-5.80	GREY CLAYEY SILT OF HIGH PLASTICITY WITH TRACES OF SAND. (CH)
6.00-6.45	
7.50-7.95	
8.50-8.80	
9.00-9.45	
10.00-10.45	



NOTES:

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE 3 - LANE STRUCTURE IS DESIGNED FOR ONE LANE OF IRC CLASS 70R+ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF CLASS A LOADING WHICHEVER GOVERNS.
- BED LEVEL, CROSS ROAD LEVEL, FORMATION LEVEL AND SUPERELEVATION / CAMBER SHALL BE PROVIDED AS PER APPROVED PLAN AND PROFILE DRAWINGS AND IN CASE ANY DISCREPANCIES, IT SHALL BE BROUGHT INTO THE NOTICE OF THE DESIGN ENGINEER.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS:-
 RCC BOX M - 35
 CRASH BARRIER M - 40
 APPROACH SLAB M - 30
 LEVELLING COURSE M - 15
- THE REINFORCING SHALL BE CORROSION RESISTANT TMT H.Y.S.D. BARS (GRADE DESIGNATION Fe - 500 CONFORMING TO IS-1786 - 1985)
- 600 THK FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALLS.
- BACK FILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 7 - 2014 HAVING PROPERTIES C = 0, 30°, 20° & d = 20 KM / m²
- 65 mm THE WEARING COURSE COMPRISING OF 40mm. THK. BITUMINOUS CONCRETE & 25mm THK. MASTIC ASPHALT.
- NET SAFE BEARING CAPACITY AT FOUNDING LEVEL ASSUMED 11.54 T/m²

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED:	DESIGNED:	DRAWN:
R1	22-03-2016	COMPLIANCE TO PC COMMENTS	RBS	BKG	AS
			CHECKED:		

CONSULTANT: PROJECTS CONSULTING INDIA (P) LTD
 Engineers and Planners
 6/110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070

CONTRACTOR: CORSAN CORVAM CONSTRUCTION S.A.
 02nd Floor, Block Two, Vatika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
 Ministry of Road Transport & Highways, Government of India
 Branch Office - House No. 1, Panchsheel, Ambalga Nagar, Zoo Road, Gwalior - 24

PROOF CHECKING CONSULTANT: Gifford
 The Epsilon Building, 106, Connaught Place, New Delhi - 110022

SAFETY CONSULTANT: L. R. KADIYALI & ASSOCIATES
 RZ-44, Bhawan Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070

TITLE: GENERAL ARRANGEMENT DRAWING VEHICULAR UNDERPASS (CH - 500 963)

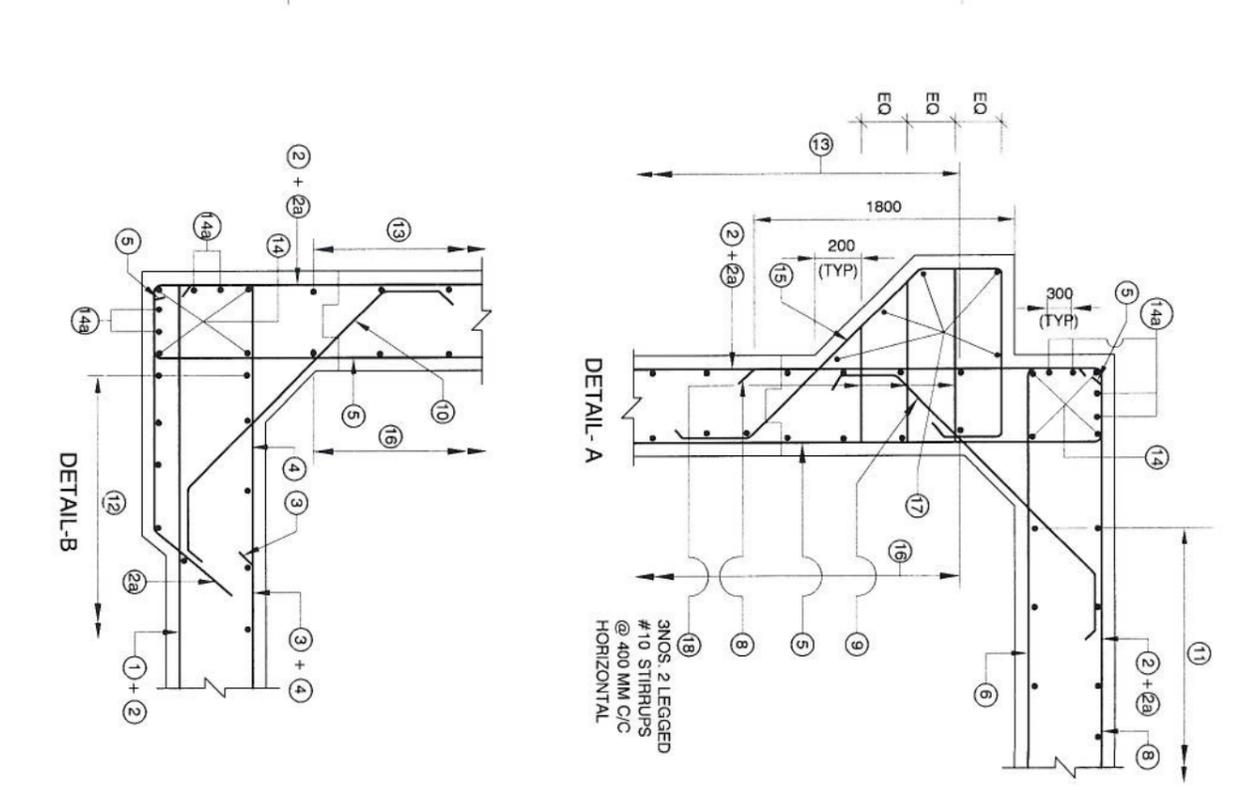
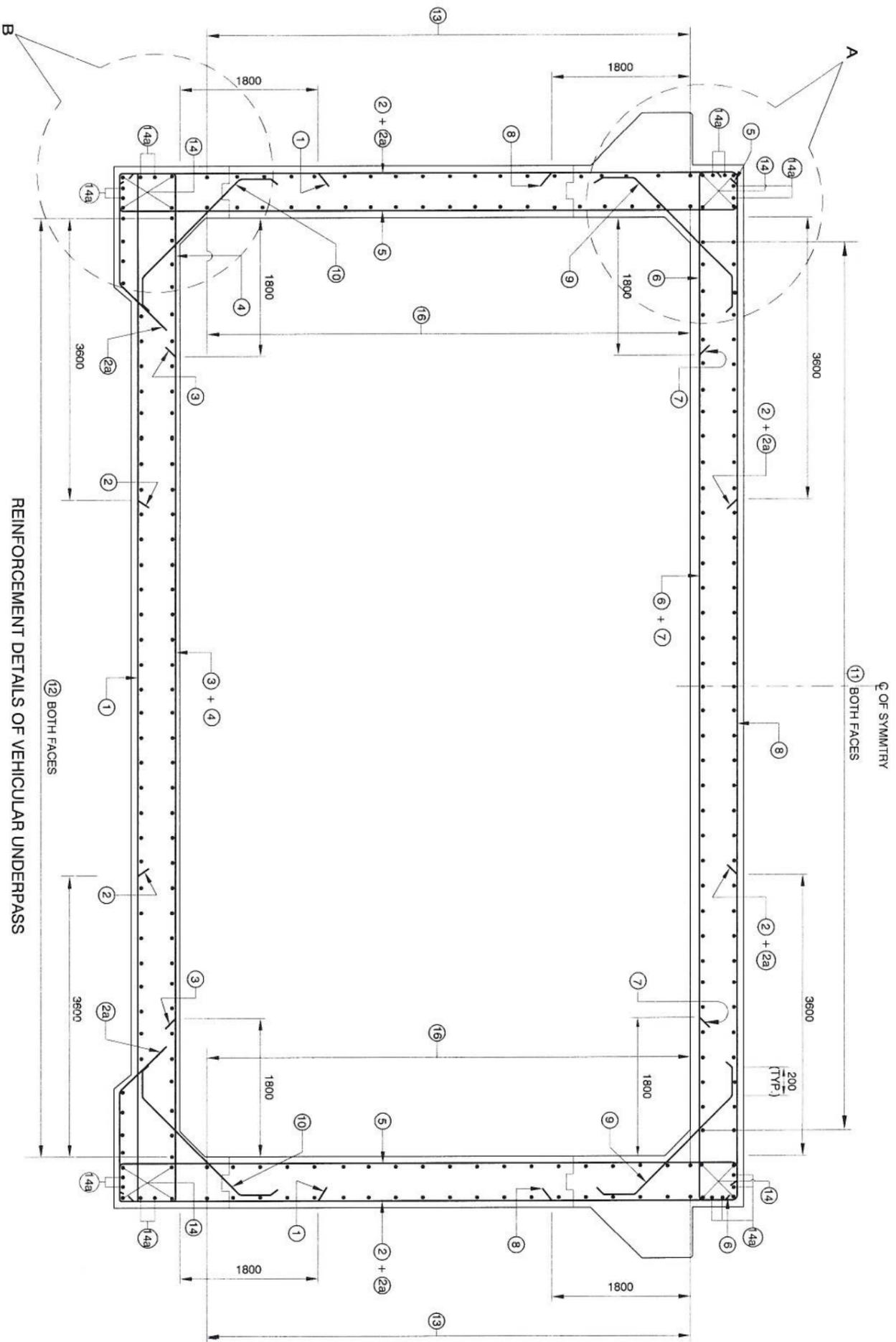
PROJECT: FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE

SHEET/SIZE: A3 / 01

SCALE: NTS

DATE: March 2016

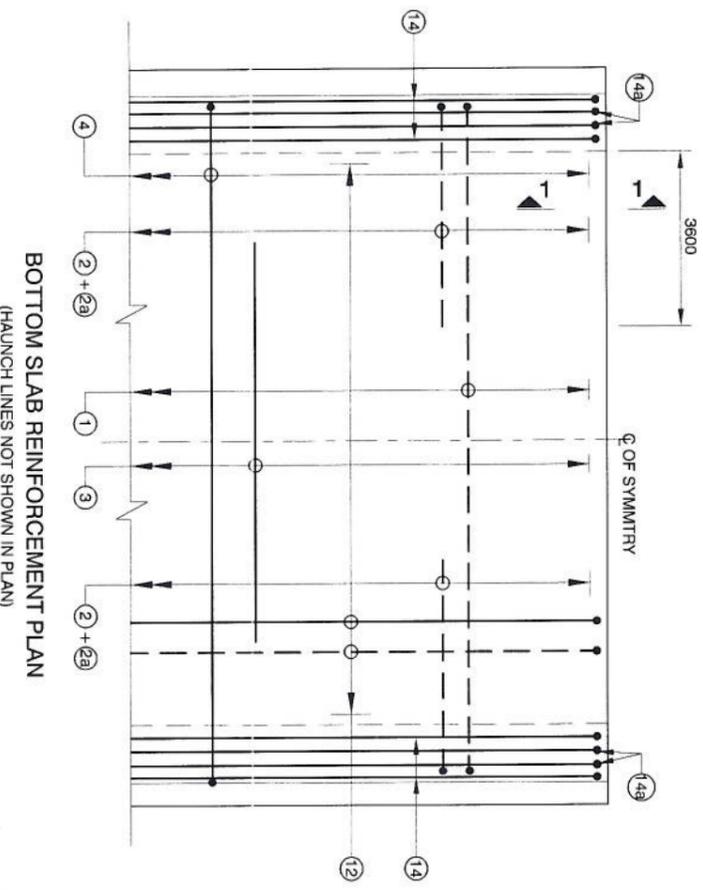
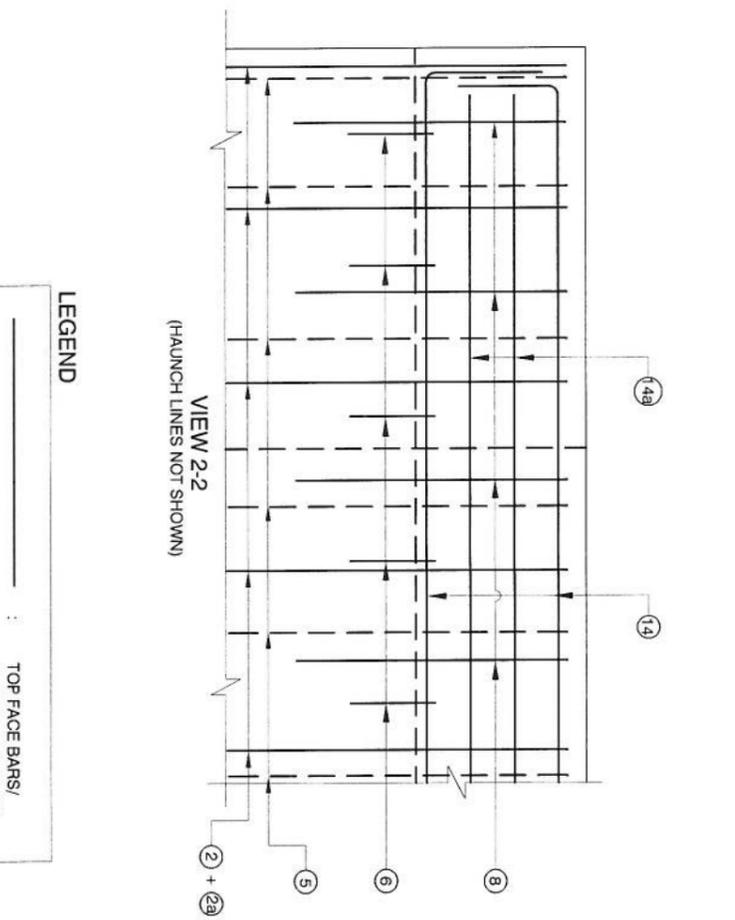
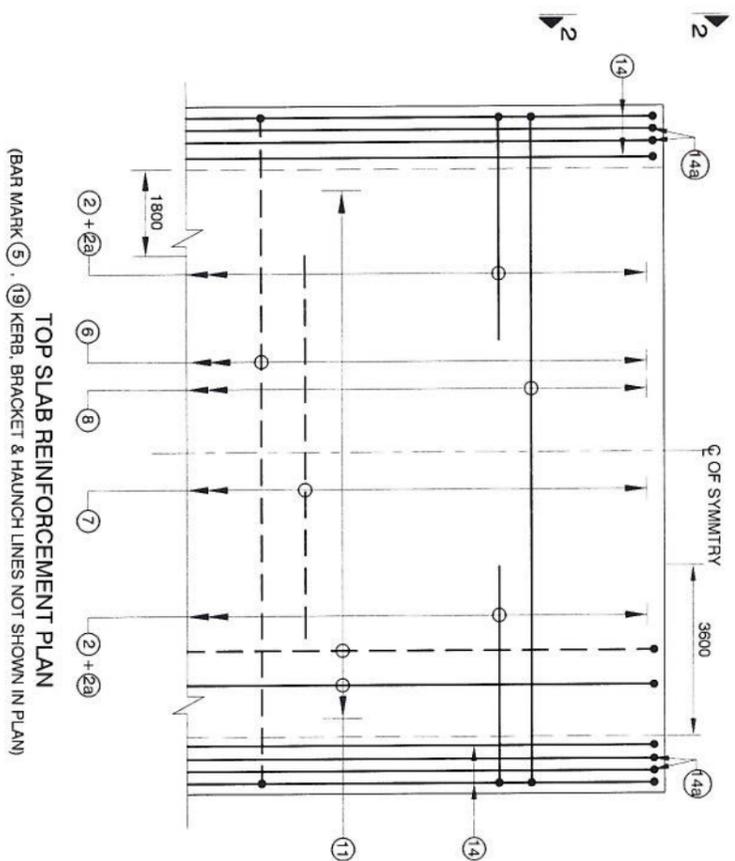
REV: 0



Corisan Corviam Construction S.A.

Signature

	APPROVED: RBS	CONSULTANT PCI PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 61101/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office - House No. 1, Panchsheel, Ambaligarh Nagar, 200 Road, Gwalior - 24	PROOF CHECKING CONSULTANT: Gifford	PROJECT: FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE
	CHECKED: BKG	AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vaikya Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADIVALI & ASSOCIATES RZ-44, Bhawanji Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	TITLE: REINFORCEMENT VEHICULAR UNDERPASS
	DESIGNED: AS				SHEETS/NO. SHEET: A3 01
	DRAWN: KDS				DATE: March 2016
REV	DATE	DESCRIPTION OF REVISIONS			SCALE: NTS
					REV 0



Corsan Corviam S.A.

- NOTES:**
- ALL DIMENSIONS ARE IN MM AND LEVELS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - DIMENSIONS SHALL NOT TO BE SCALED ONLY WRITTEN DIMENSIONS SHALL TO BE FOLLOWED.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
 - ALL REINFORCING STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED (CRS-TMT) BARS (GRADE - Fe 500). CONFORMING IS : 1786.
 - CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE FOLLOWS.
 - EARTH FACE - 75 mm
 - FOR OTHERS - 40 mm
 - MINIMUM ANCHORAGE LENGTH SHALL BE 42D, WHERE 'D' IS THE DIAMETER OF BAR WITH SUITABLE FACTOR AS SPECIFIED IN CLAUSE 304.6.2.1 OF IRC.21
 - LAP LENGTH SHALL BE PROVIDED AS PER BELOW - (FOR GRADE OF CONC. M35 AND ABOVE)

LAP LENGTH	% LAP AT ANY SECTION IS
76 d	BETWEEN 40 - 50%
68 d	BETWEEN 25 - 40%
60 d	- 25%
 - (WHERE 'd' IS THE DIAMETER OF THE BAR)
 - FOR UNFAVORABLE BOND CONDITIONS LAP LENGTH SHALL BE MULTIPLIED 1.4 AS PER IRC: 21-2000
 - ALL LAP SHALL BE SUITABLY STAGGERED AND MINIMUM DISTANCE BETWEEN THE ADJACENT LAPS SHALL BE 130 TIMES OF LAP LENGTH.

SCHEDULE OF REINFORCEMENT

BAR MARKS	BAR SHAPE	BAR DIA.	SPACING / NOS.	REMARKS
1	[Shape]	20	200	Lapping
2	[Shape]	20	200	Alternate + Lapping
2a	[Shape]	12	200	Alternate + Lapping
3	[Shape]	20	200	Alternate
4	[Shape]	20	200	Alternate
5	[Shape]	16	200	
6	[Shape]	16	200	Alternate
7	[Shape]	20	200	Alternate
8	[Shape]	16	200	Lapping
9	[Shape]	10	200	
10	[Shape]	10	200	
11	[Shape]	12	200	
12	[Shape]	12	150	
13	[Shape]	12	200	
14	[Shape]	10	4 x 4 Nos	
14a	[Shape]	12	4 x 4 Nos	
15	[Shape]	12	200	
16	[Shape]	12	200	
17	[Shape]	12	2 x 5 Nos	
18	[Shape]	10	3 LAYERS 2 LEGGED STIRRUPS @ 400 c/c	

REV	DATE	DESCRIPTION OF REVISIONS	DRAWN	AS	DESIGNED	BKG	CHECKED	RBS	APPROVED		
			KDS	AS	BKG	BKG		RBS			
PROJECT: FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE			CONSULTANT: PCI PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070			CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office - House No. 1, Panchsri, Anandapuri, Con. Road, Gurgaon - 122001			CONTRACTOR: CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vatika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001		
AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT LTD. 403, 4th Floor, BPT Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India			SAFETY CONSULTANT: L. R. KADIYALI & ASSOCIATES RZ-44, Bhawan Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070			PROOF CHECKING CONSULTANT: Gifford India Pvt. Ltd. (Part of Ramco) The Epitome Building D6-6, Vasant Kunj, Level - 11, India Cyber City Phase II, Gurgaon, Haryana-122002			INDIA PVT. LTD.		
TITLE: REINFORCEMENT VEHICULAR UNDERPASS			SHEET SIZE: A3			DATE: March 2016			SCALE: NTS		
DRAWING NO: 94-31-03			REVISIONS: 0								

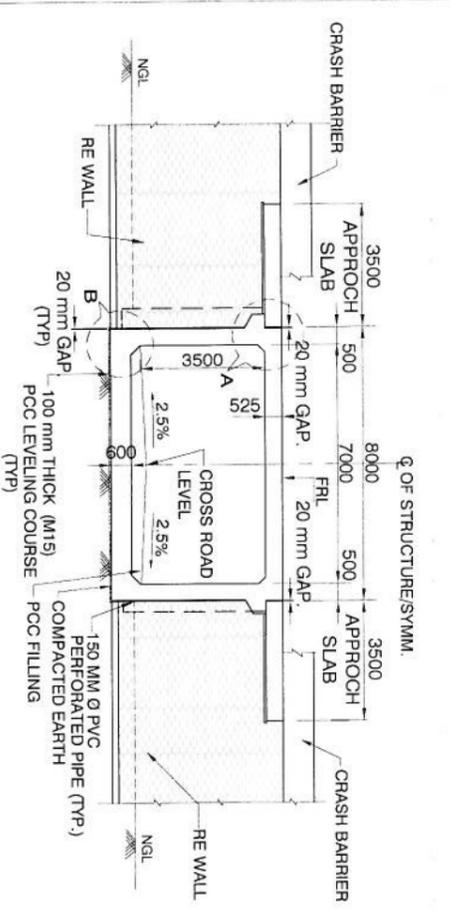
• PUP @ 502.578



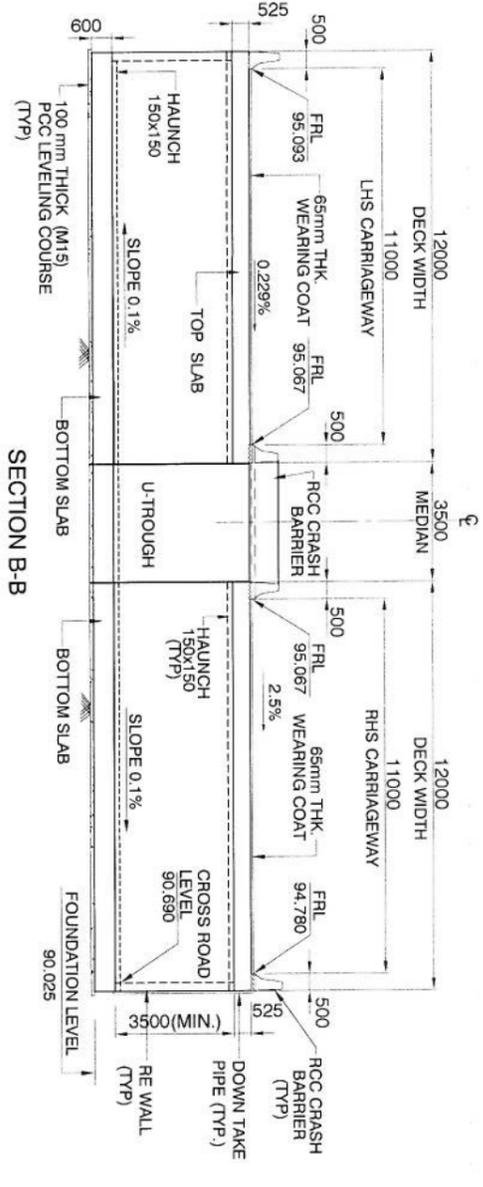
REGIONAL DIRECTOR
Corsan Corviam Construcción S.A.

A handwritten signature in blue ink, appearing to read "P. Lopez", written over the printed name.

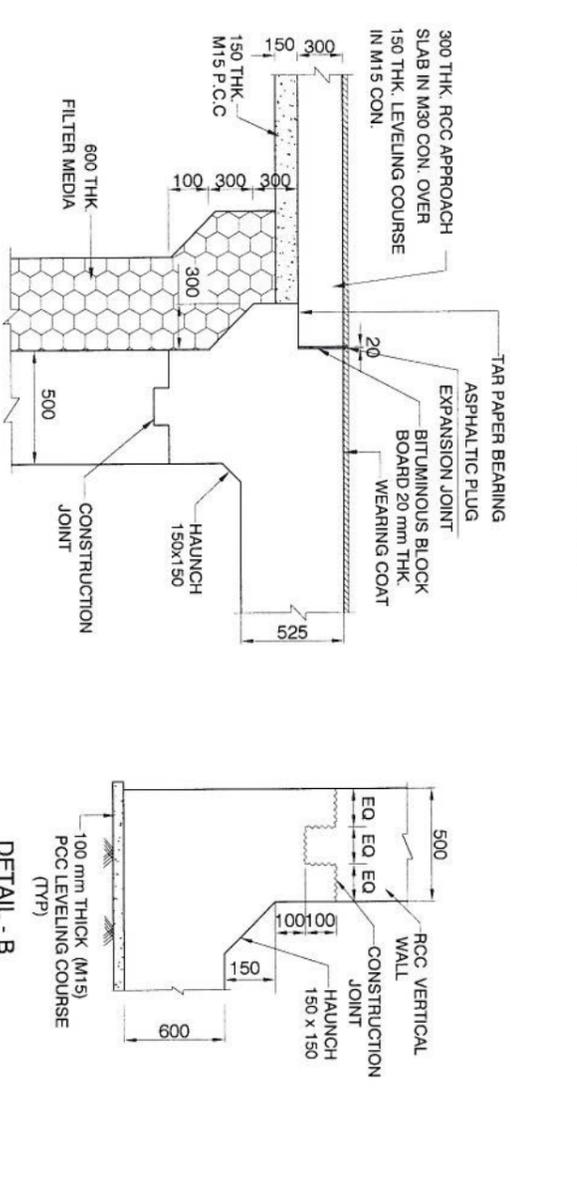




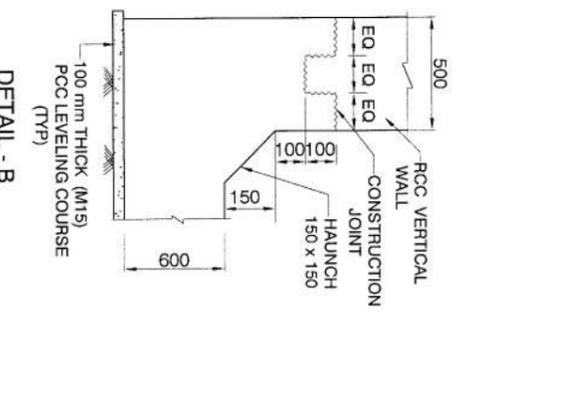
VIEW A - A
OF STRUCTURE/SYMM.



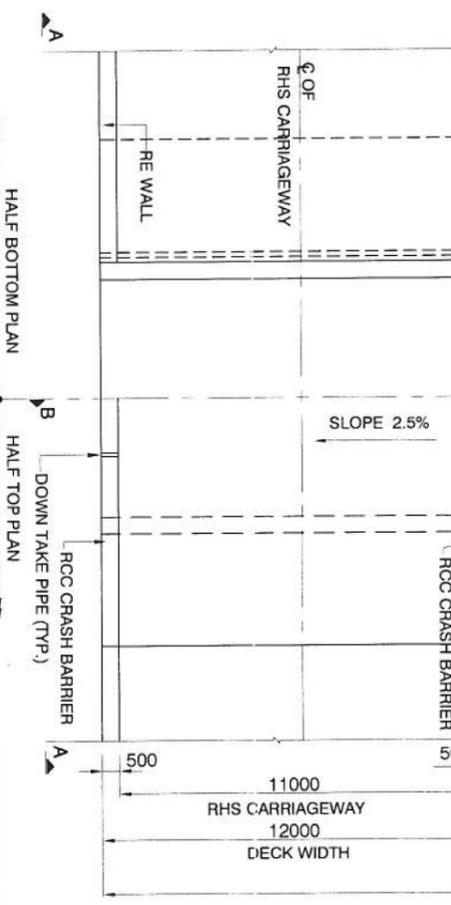
SECTION B-B



DETAIL - A



DETAIL - B



PLAN

Corsan Corviam Construction S.A.

Sno	Existing	Design	Proposed		Details of widening		FRL at RME	FRL at LME	span 'a' (m)	clear height 'b' (m)	top slab 'd' thickness (m)	Bottom slab 'e' thickness (m)	Side wall 'f' thickness (m)	Design Base Pressure (kN/m ²)
			Type of Structure	No. of Spans	Existing width	Widening								
1	502.910	502.578	Box	1	7	7	95.067	95.067	7	3.5	0.525	0.600	0.500	123.8

Soil Depth (m)	Soil Type
0.00-0.50	FILLED-UP SOIL
0.50-1.50	
1.50-1.95	
2.50-2.80	
3.00-3.45	
4.50-4.95	
5.50-5.80	GREY SILTY CLAY OF HIGH PLASTICITY WITH TRACES OF SAND. MEDIUM EXPANSIVE (CH)
6.00-6.45	
7.50-7.95	
8.50-8.80	
9.00-9.45	
10.00-10.45	

BORE HOLE DETAILS

NOTES:

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE 3-LANE STRUCTURE IS DESIGNED FOR ONE LANE OF IRC CLASS 70R+ ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF CLASS A LOADING WHICHEVER GOVERNS.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS:-
RCC BOX M - 35
CRASH BARRIER APPROACH SLAB M - 40
LEVELLING COURSE M - 15
- THE REINFORCING STEEL SHALL BE CORROSION RESISTANT TMT H.Y.S.D. BARS (GRADE DESIGNATION Fe - 500 CONFORMING TO IS:1786 - 1985).
- 600 THK. FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALLS.
- BACK FILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 7 - 2014 HAVING PROPERTIES C = 0, 30°, =20° & d = 20 KM / m²
- 65 mm THE WEARING COURSE COMPRISING OF 40mm THK BITUMINOUS CONCRETE & 25mm THK MASTIC ASPHALT.
- NET SAFE BEARING CAPACITY AT FOUNDING LEVEL ASSUMED 12 T/m².

APPROVED: RBS
CHECKED: BKG
DESIGNED: AS
DRAWN: KDS

CONSULTANT: PCI PROJECTS CONSULTING INDIA (P) LTD
Engineers and Planners
6110 / 2 Sector - 06, Vasant Kunj New Delhi (India) 110070
AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT LTD.
403, 4th Floor, GPRP Park Centre, Sector-30, NH-9, Gurgaon, Haryana - 122001, India

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
Ministry of Road Transport & Highways, Government of India
Branch Office - House No. 1, Panagani, Ambalga Highway, Zoo Road, Guwahati - 24

CONTRACTOR: CORSAN CORVIAM CONSTRUCTION S.A.
02nd Floor, Block Two, Vellia Business Park, Sector - 48, Scheme Road, Gurgaon, Haryana, India - 122001

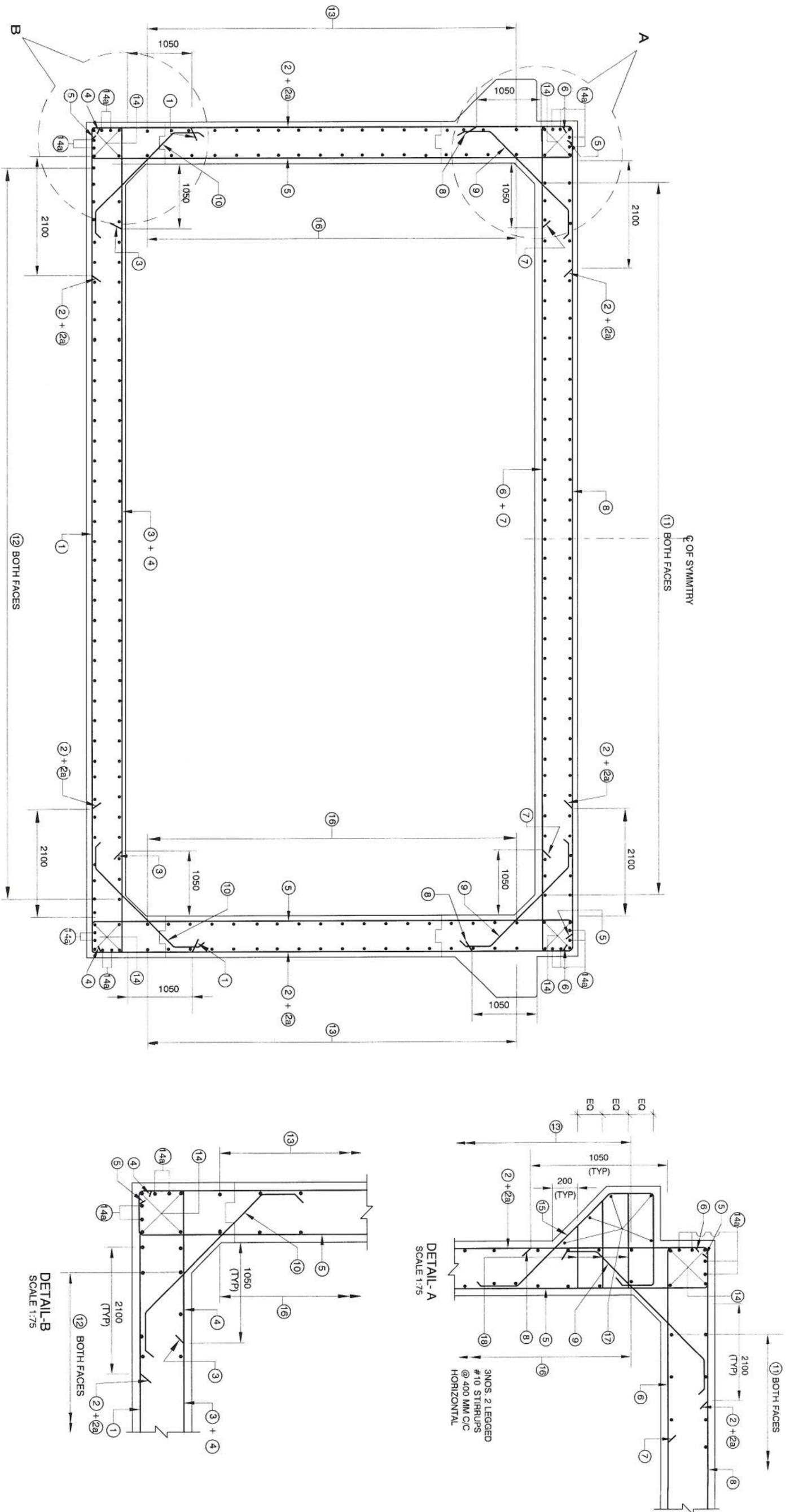
PROOF-CHECKING CONSULTANT: Gifford Gifford India Pvt. Ltd. (Part of Ramboll)
The 3rd Floor, Building No. 5, Tower 'B', Level - 12, VIT Cyber City Phase-III, Gurgaon, Haryana - 122002

SAFETY CONSULTANT: L. R. KADIVAL & ASSOCIATES
RZ-44, Bhawanij Kung, Behind D-2 Vasant Kunj, New Delhi 110 070

PROJECT: FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE

TITLE: GENERAL ARRANGEMENT DRAWING PEDESTRIAN UNDERPASS (CH-502.578)

SHEET/NO: A3 01
SCALE: NTS
DATE: March 2016
REV: 0



SECTION 1-1
SCALE 1:75

DETAIL-A
SCALE 1:75

DETAIL-B
SCALE 1:75

DESIGN DIRECTOR
Corasan Corviam Construction S.A.

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED	CONSULTANT	CLIENT	PROOF CHECKING CONSULTANT	PROJECT	TITLE	SHEET/NO	DATE	
R1	22-03-2016	COMPLIANCE TO CPC COMMENTS	RBS	PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110 / 2 Sector - D6, Vasant Kunj New Delhi (India) 110070	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office - Haryana No. 1, Panchsheel, Ambalgaon Road, 200 Road, Gurgaon - 24	Gifford	FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE	REINFORCEMENT DETAILS DRAWING PEDESTRIAN UNDERPASS	A3	01	March 2016
			AS	VOYANTS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vaikya Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADIVATI & ASSOCIATES RZ-44, Bhawanij Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070			AS SHOWN	REV	0
			KDS	PCI Engineers and Planners 6110 / 2 Sector - D6, Vasant Kunj New Delhi (India) 110070	ISOLUX CORSAN 02nd Floor, Block Two, Vaikya Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001						

SCHEDULE OF REINFORCEMENT

BAR MARKS	BAR SHAPE	BAR DIA.	SPACING / NOS.	REMARKS
1		12	200	Lapping
2		16	200	Alternate + Lapping
2a		12	200	Alternate + Lapping
3		20	200	Alternate
4		16	200	Alternate
5		16	200	Alternate
6		16	200	Alternate
7		12	200	Alternate
8		12	200	Lapping
9		10	200	
10		10	200	
11		10	200	
12		12	250	
13		12	200	
14		10	4 x 4 Nos	
14a		10	4 x 4 Nos	
15		12	200	
16		10	200	
17		12	2 x 5 Nos	
18		10	3 LAYERS 2 LEGGED STRIRUPS @ 400 c/c	
19		20	200	

SCHEDULE OF REINFORCEMENT

BAR MARKS	BAR SHAPE	BAR DIA.	SPACING / NOS.	REMARKS
20		20	200	
21		20	200	
22		16	200	
23		10	100	
24		10	100	
25		10	200	
26		10	2x4 Nos.	
26a		12	2x4 Nos.	
27		12	150	

DESIGN DIVISION
Corasan Corviam Construction S.A.

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED:	CONSULTANT	CLIENT	PROOF CHECKING CONSULTANT	PROJECT	TITLE	SHEET/NO	SHEET/NO	DATE
			RBS	PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110 / 2 Sector - D6, Vasant Kunj New Delhi (India) 110070	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office : Sector No. 1, Pragati, Vasant Vihar, 200 Road, Connaught Place - 28	Gifford	FOUR LAINING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE	REINFORCEMENT DETAILS DRAWING PEDESTRIAN UNDERPASS	A3	03	March 2016
			BKG	VOYANTS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vatika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADYAL & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070					
			AS								
			KOS								

SCALE:	NTS
DATE:	0

-
- **CD Structure @ 496.538**
 - **CD Structure @ 497.300**

Corsan Corvia  Construcción S.A.



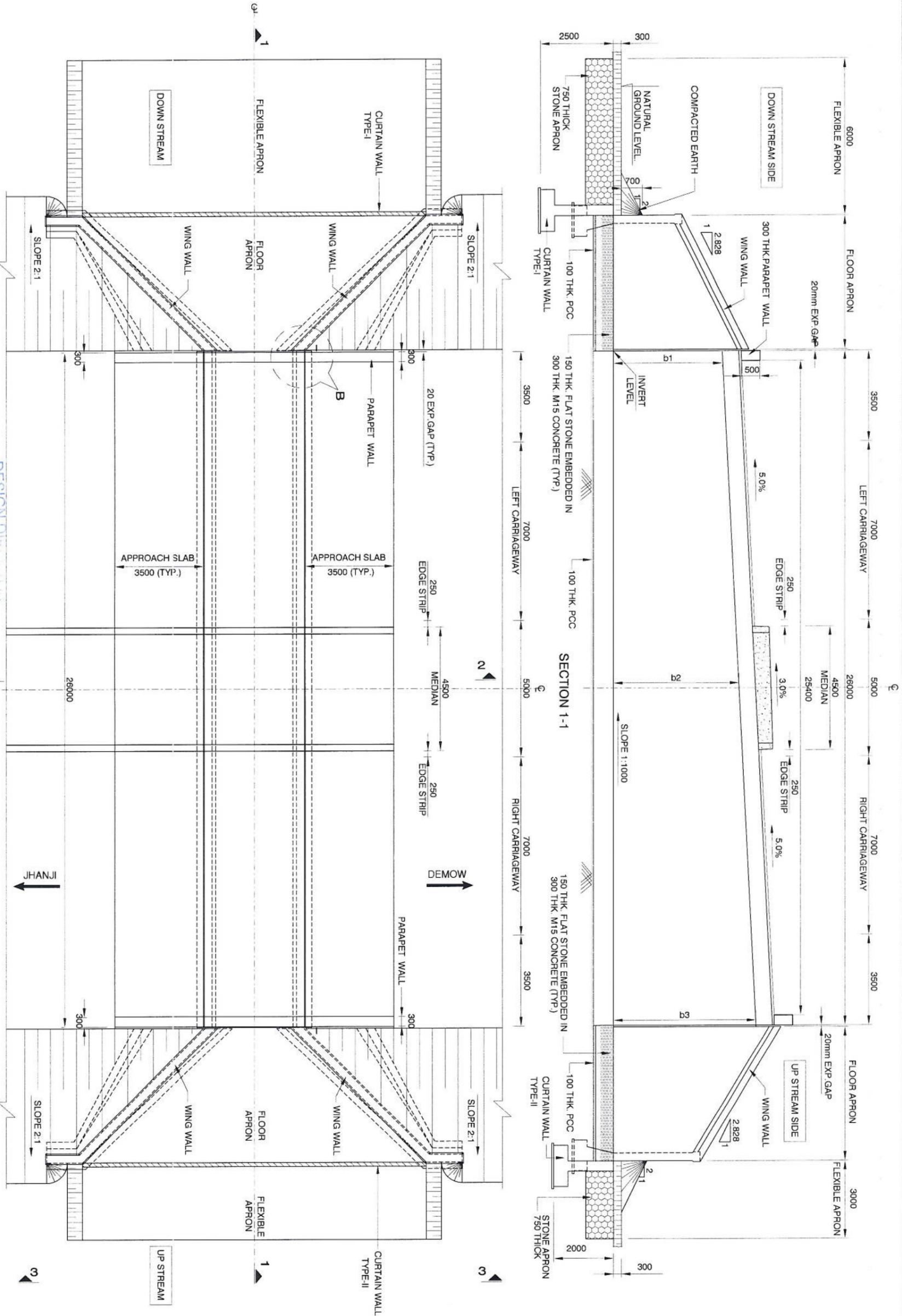
SCHEDULE OF CD WORKS

S.no	Existing CD No	Proposed CD No	Existing Chainage	Proposed Chainage	Invert Level	HFL	Lowest bed level	Detail of Widening			Length Of culvert	FRL at RME	FRL at LME	Existing FRL	Existing Detail			Proposed Details			Ref. Dwg No.
								LHS Widening (A)	RHS Widening (B)	Existing width (E)					RFP opening	Type of Proposal	No. of Spans	Proposal	Type of Structure	Opening Proposal (MAX)	
1	497/1	497/1	496.863	496.538	85.577	87.750	85.877	11.5	-	-	26	89.630	89.630	89.630	1x4.5x3	BOX	1	Reconstruction	BOX	1x4.5x4.326	94-32-01
2	498/1	498/1	497.641	497.300	86.945	87.653	87.245	11.5	-	-	26	89.998	89.998	89.998	1x4.5x2	BOX	1	Reconstruction	BOX	1x4.5x3.326	94-32-02

* Refers to maximum culvert opening height

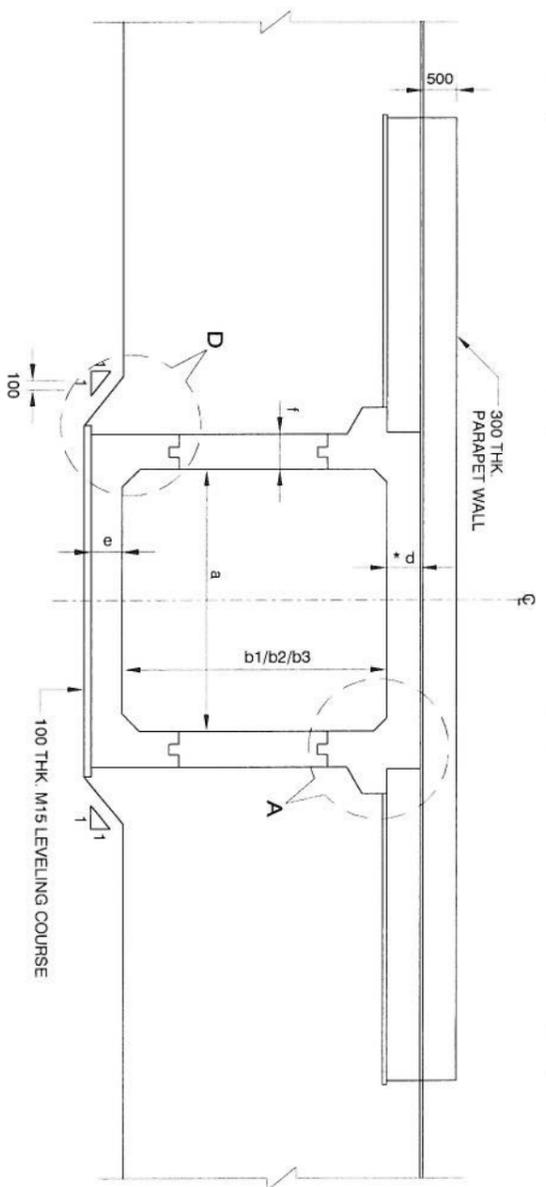
Corsan Corviam Construction S.A.

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED:	CONSULTANT	CLIENT:	PROOF CHECKING CONSULTANT:	PROJECT:	TITLE:	SHEET/NO	DATE:
			RBS	PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6/110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office: Hasan No. 1, Pampasa, Andhra Pradesh, 520 001, Guntur - 24	Gifford India Pvt Ltd The Pinnacle Building No. 1, Sector - 18, Level - 12, DLF Cyber City Phase-III, Gurgaon, Haryana-122002	FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE	CD STRUCTURES (CH. - 490.00 TO 505.00)	A3	March 2016
			BKG	VOYANTS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Valtia Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	L. R. KADIYAN & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070			01	
			AS						NTS	
			KDS							0



DESIGN DIRECTOR
Corasan Construction S.A.

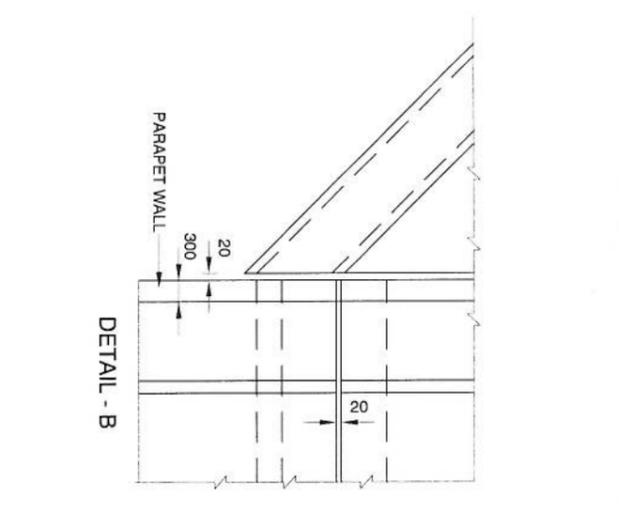
REV	DATE	DESCRIPTION OF REVISIONS	DRAWN:	KDS
H1	22-03-2016	COMPLIANCE TO EPC COMMENTS	DESIGNED:	AS
			CHECKED:	BKG
			APPROVED:	RSS
PROJECT: FOUR LANNING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE			CONSULTANT	
TITLE: GENERAL ARRANGEMENT DRAWING RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH:496.538)			PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070	
PROJECT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India. Branch Office - House No. 1, Panchsri, Ambabagh Nagar, Zoo Road, Guwahati - 24			CLIENT	
DRAWING NO: 94-32-01			CONTRACTOR	
SHEETS: SHEET: 01			CORASAN CORVAM CONSTRUCTION S.A. 02nd Floor, Block Two, Vastika Business Park, Sector - 49, Sohna Road, Gurugram, Haryana, India - 122001	
DATE: March 2016			SAFETY CONSULTANT:	
REV: 0			L. R. KADIYALL & ASSOCIATES R2-44, Bhawanji Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	
PROOF CHECKING CONSULTANT:			Gifford India Pvt Ltd, (Part of Bamhoil) The Ecoms, Building No. 2, Tower 'B', Level - 17, DLF Cyber City Phase-III, Gurugram, Haryana 122002	
Gifford			INDIA PVT. LTD.	



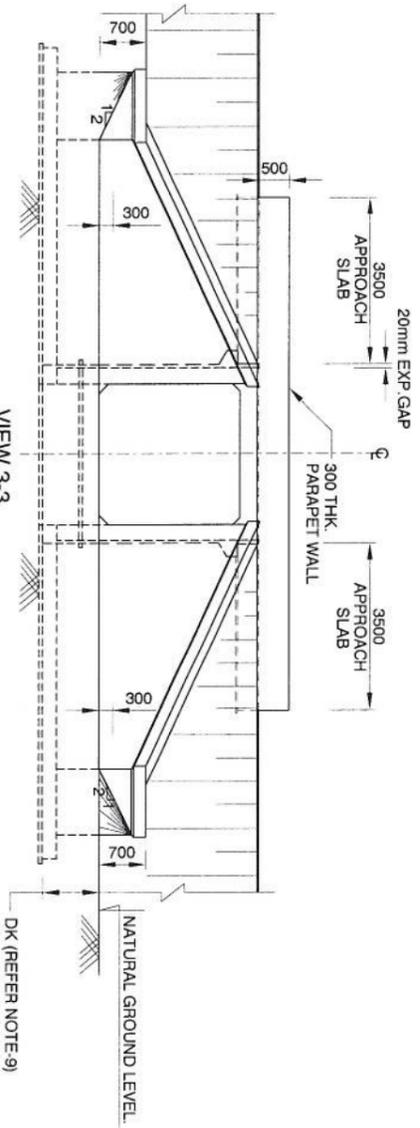
*D DECK SLAB THICKNESS AT INNER EDGE OF KERB AS SHOWN IN SECTION 1-1

SECTION 2-2

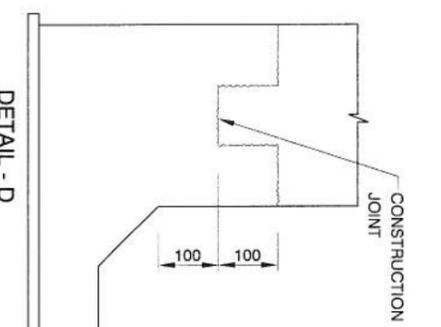
DETAIL - A



DETAIL - B



VIEW 3-3



DETAIL - D

S.no	Existing Chainage	Design Chainage	Proposed		Details of widening					Direction of flow											
			Type of Structure Proposed	No. of Spans	No. of span x span arrangement	Existing FRL	Existing width	LHS Widening	RHS Widening		FRL at R/W	FRL at L/W									
1	496.853	496.538	BOX	1.000	1x4.5x4.326	89.630	11.5	-	89.630	89.630	85.577	85.877	4.500	3.000	3.663	4.326	0.450	0.550	0.475	76	Right to Left

DESIGN DIRECTOR

Corsan Corviam Construction S.A.

APPROVED: RBS
 CHECKED: BKG
 DESIGNED: AS
 DRAWN: KDS

CONSULTANT: **PCI** PROJECTS CONSULTING INDIA (P) LTD
 Engineers and Planners
 6110/2 Sector - 06, Vasant Kunj New Delhi (India) 110070

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
 Ministry of Road Transport & Highways, Government of India
 Branch Office - House No. 1, Punjeh, Anandapuri, New Delhi - 110017

CONTRACTOR: **CORSAN CORVIAM CONSTRUCTION S.A.**
 02nd Floor, Block Two, Vastika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001

PROOF CHECKING CONSULTANT: **Gifford India Pvt Ltd**
 The Empire, Building No 5, Tower 'B', Level 3, Cyber City Phase-III, Gurgaon, Haryana-122002

SAFETY CONSULTANT: **L. R. KADIYAL & ASSOCIATES**
 RZ-44, Bhawanij Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070

PROJECT: FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE

TITLE: GENERAL ARRANGEMENT DRAWING RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH:496.538)

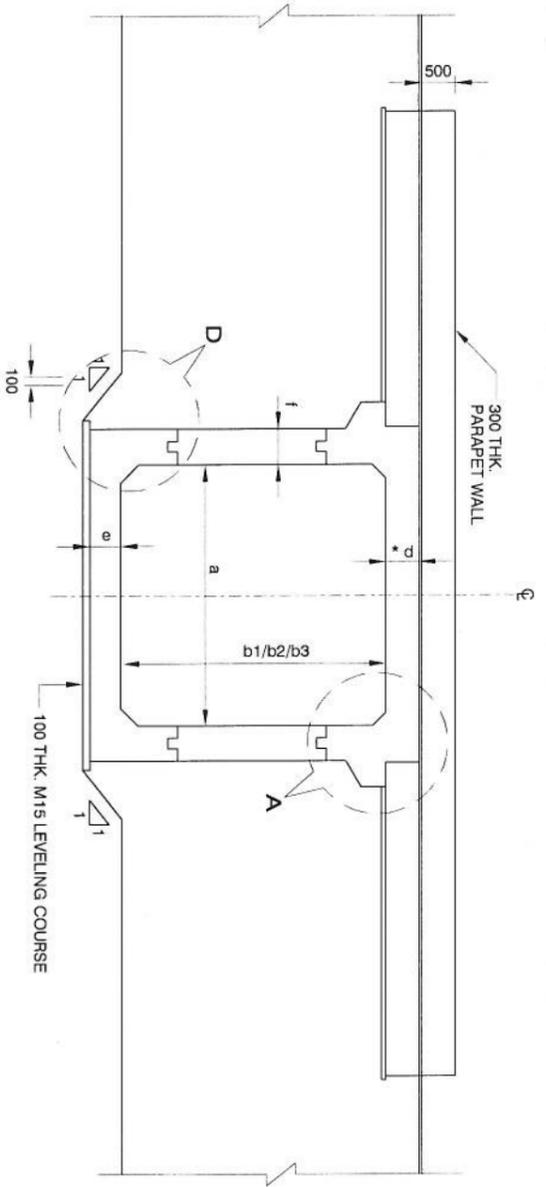
DRAWING NO: 94-32-01

SHEET/SIZE: A3 SHEET: 02 DATE: March 2016

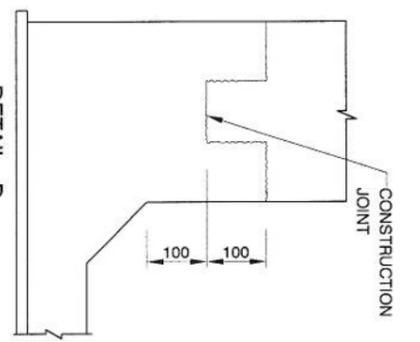
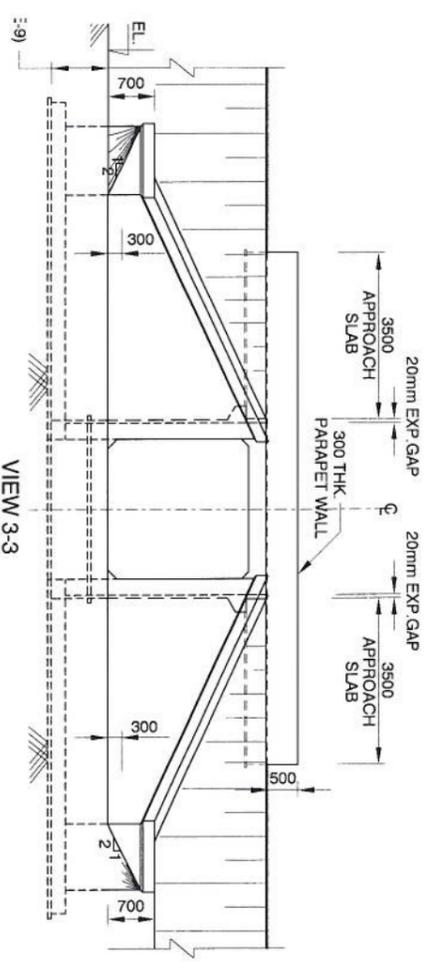
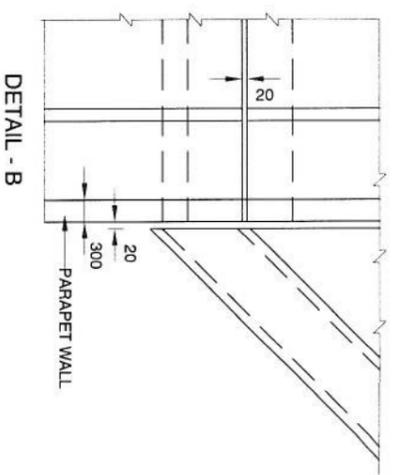
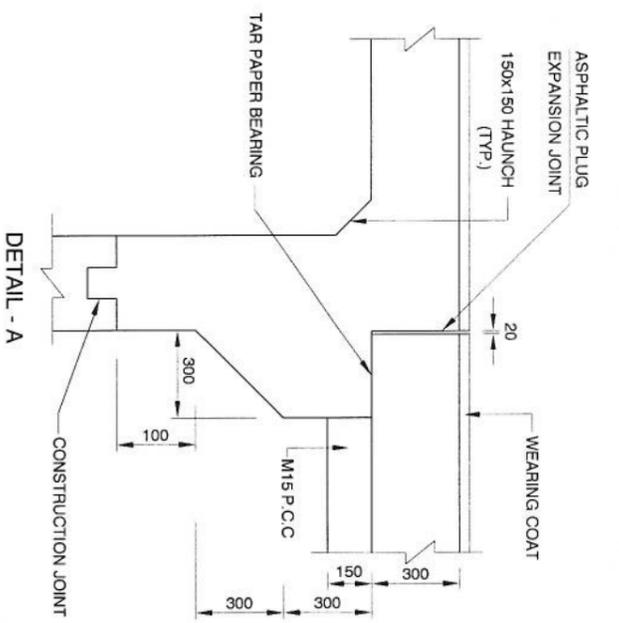
SCALE: NTS REV: 0

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBES AS FOLLOWS:-
 RCC BOX M-30
 APPROACH SLAB M-30
 LEVELLING COARSE M15
 PCC WING WALL M20
 PARAPET WALL M-30
 PCC CURTAIN WALL M-20
- THE REINFORCING STEEL SHALL BE CORROSION RESISTANT TMT HYSD BARS (GRADE DESIGNATION FE-500 CONFORMING TO IS:1786-1985)
- PROPOSED CULVERT IS DESIGNED FOR ONE LANE OF IRC CLASS 70R TRACKED & 40 BOGIE LOAD WHICHEVER IS GOVERNING.
- BACKFILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 78:2014 HAVING PROPERTIES C=0, φ>30° & YD=20 KN/M³
- 65MM THK WEARING COURSE COMPRISING OF 40MM THK BITUMINOUS CONCRETE & 25MM THK ASPHALTIC SHALL BE PROVIDED
- NET SAFE BEARING CAPACITY AT FDN LEVEL ASSUMED 7.6 T/M²
- GROUND IMPROVEMENT TO BE DONE WHERE BASE PRESSURE EXCEEDS ALLOWABLE SBC
- THE VARIOUS LEVELS (FRL/INVERT LEVELS) & SUPER ELEVATION SHOWN IN DRAWINGS SHALL BE VERIFIED PRIOR TO EXECUTION AT SITE AND IF ANY DISCREPANCY FOUND SHALL BE INFORM TO ENGINEER
- SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
- FOR REINFORCEMENT DETAILS REFER DRG NO. 94-32-03
- FOR RETAINING WALL/WING WALL, PARAPET WALL, CURTAIN WALL & GUARD STONE DETAILS REFER DRG NO. 94-33-01



SECTION 2-2
* D DECK SLAB THICKNESS AT INNER EDGE OF KERB AS SHOWN IN SECTION 1-1



Sno	Existing Chagnage	Design Chagnage	Proposed			Details of widening																
			Type of Structure Proposed	No. of Spans	No. of span x span arrangement	Existing FRL	Existing width	LHS Widening	RHS Widening	FRL at RME	FRL at LME	Invert level	Lowest Bed Level	Span "a" (m)	clear height "b1" (m)	clear height "b2" (m)	clear height "b3" (m)	top slab 'd' thickness (m)	Bottom slab 'e' thickness (m)	Side wall 'f' thickness (m)	Design Base Pressure (kN/m ²)	Direction of flow
1	497.641	497.300	BOX	1	1x4.5x3.326	89.998	11.5	-	-	89.998	89.998	86.945	87.245	4.500	2.000	2.663	3.326	0.425	0.525	0.450	70	Right to Left

DESIGN DIRECTOR

Corisan Corviam Construction S.A.

APPROVED: RBS
CHECKED: BKG
DESIGNED: AS
DRAWN: KDS

CONSULTANT: PROJECTS CONSULTING INDIA (P) LTD
Engineers and Planners
6/110/2 Sector - D6, Vasant Kunj New Delhi (India) 110070

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
Ministry of Road Transport & Highways, Government of India
Branch Office - House No. 1, Park Road, Ambalga Nagar, 200 Road, Gwalior - 24

CONTRACTOR: CORSAN CORVIAM CONSTRUCTION S.A.
02nd Floor, Block Two, Vaidya Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001

PROOF CHECKING CONSULTANT: Gifford India Pvt Ltd. (Part of Ramboll)
The Building, Building No. 5, Road 'B', Level '2', DLF Cyber City Phase-III, Gurgaon, Haryana-122002

SAFETY CONSULTANT: L. R. KADIVALI & ASSOCIATES
RZ-44, Bhawan Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070

PROJECT: FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE

TITLE: GENERAL ARRANGEMENT DRAWING RECONSTRUCTION SINGLE CELL RCC BOX CULVERT FOR WIDENING OF BOX CULVERT (CH.497.300)

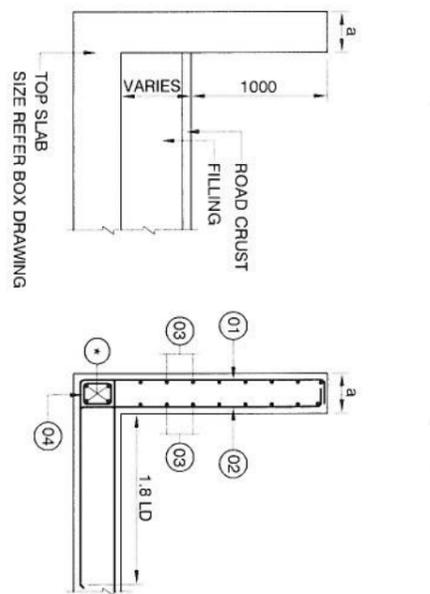
DRAWING NO: 94-32-02

SHEET SIZE: A3
SHEET: 02
DATE: March 2016

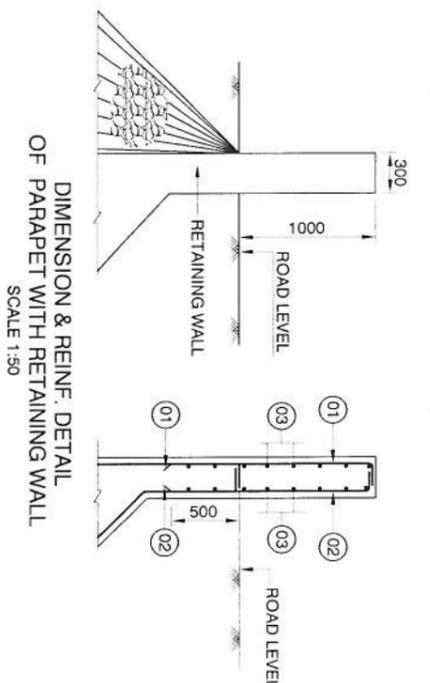
SCALE: NTS
REV: 0

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBES AS FOLLOWS:-
RCC BOX M-30
APPROACH SLAB M-30
LEVELLING COARSE M15
PCC WING WALL M20
PARAPET WALL M-30
PCC CURTAIN WALL M-20
- THE REINFORCING STEEL SHALL BE CORROSION RESISTANT TMT HYSD BARS (GRADE DESIGNATION FE-500 CONFORMING TO IS-1786-1985)
- PROPOSED CULVERT IS DESIGNED FOR ONE LANE OF IRC CLASS 70R TRACKED & 40 BOGIE LOAD WHICHEVER IS GOVERNING.
- BACKFILLING BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC 78-2014 HAVING PROPERTIES C=0, φ>30° & γD=20 KN/M³
- 65MM THK WEARING COURSE COMPRISING OF 40MM THK BITUMINOUS CONCRETE & 25MM THK ASPHALTIC SHALL BE PROVIDED
- NET SAFE BEARING CAPACITY AT FDN LEVEL ASSUMED 7.0 T/M²
- GROUND IMPROVEMENT TO BE DONE WHERE BASE PRESSURE EXCEEDS ALLOWABLE SBC
- THE VARIOUS LEVELS (FRL, INVERT LEVELS) & SUPER ELEVATION SHOWN IN DRAWINGS SHALL BE VERIFIED PRIOR TO EXECUTION AT SITE AND IF ANY DISCREPANCY FOUND SHALL BE INFORM TO ENGINEER
- SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
- FOR REINFORCEMENT DETAILS REFER DRG NO. 94-32-03
- FOR RETAINING WALL/WING WALL, PARAPET WALL, CURTAIN WALL & GUARD STONE DETAILS REFER DRG NO. 94-33-01



DIMENSION & REINF. DETAIL OF PARAPET WITH BOX
 * (BAR MARK NO. REFER REINFORCEMENT DRAWING OF BOX)
 SCALE 1:50



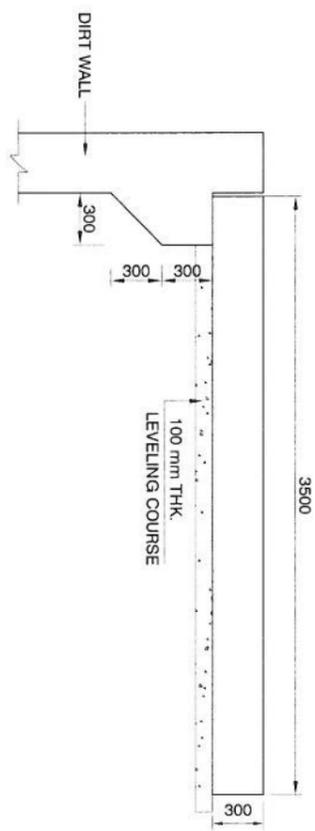
DIMENSION & REINF. DETAIL OF PARAPET WITH RETAINING WALL
 SCALE 1:50

DIMENSION OF PARAPET WALL

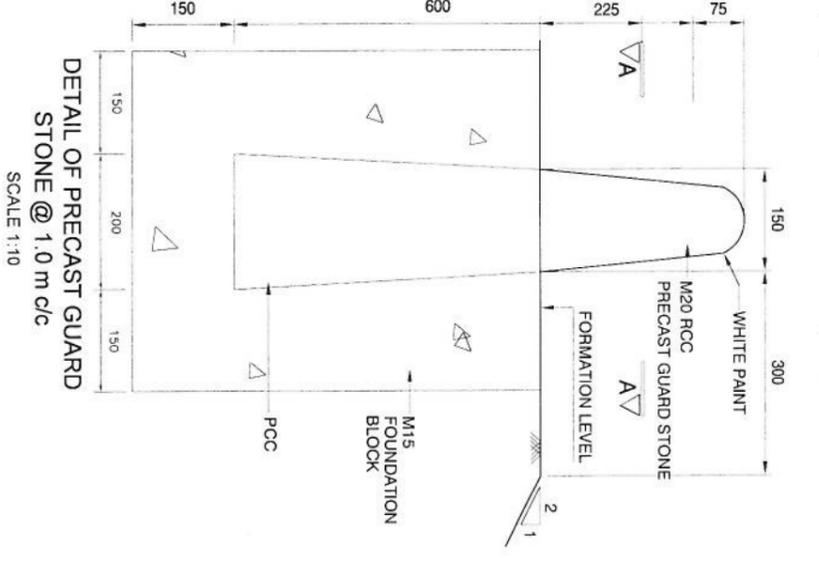
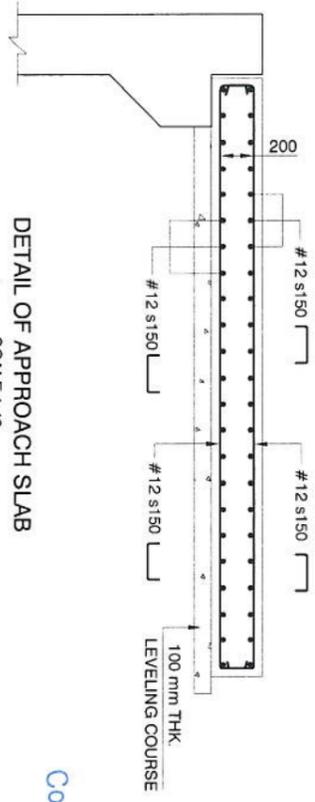
HEIGHT	1.0m	1.5m	2.0m	2.5m
300	300	300	300	300

REINFORCEMENT SCHEDULE FOR PARAPET WALL

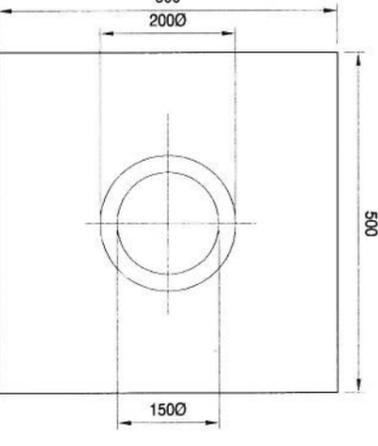
BAR MARK	SHAPE OF BARS	1.0m		1.5m		2.0m		2.5m	
		DIA #	NOS / SPACING	DIA #	NOS / SPACING	DIA #	NOS / SPACING	DIA #	NOS / SPACING
1		10	150 c/c	10	150 c/c	10	150 c/c	10	150 c/c
2		10	150 c/c	10	150 c/c	12	150 c/c	12	100 c/c
3		10	250 c/c	10	250 c/c	10	250 c/c	10	250 c/c
4		NOT IN USE		NOT IN USE		10	200 c/c	10	200 c/c



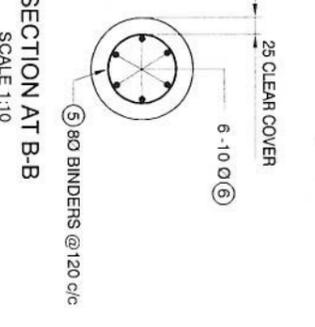
DETAIL OF APPROACH SLAB
 SCALE 1:40



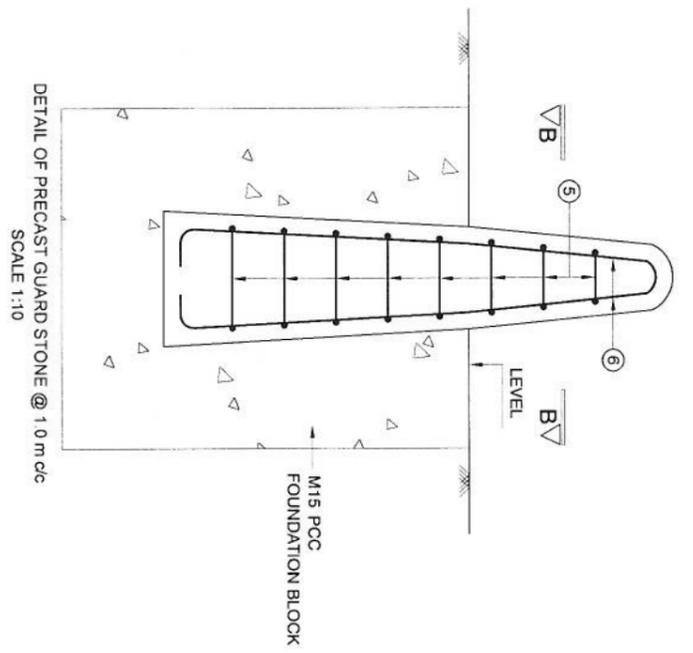
DETAIL OF PRECAST GUARD STONE @ 1.0 m c/c
 SCALE 1:10



SECTION AT A-A
 SCALE 1:10



SECTION AT B-B
 SCALE 1:10

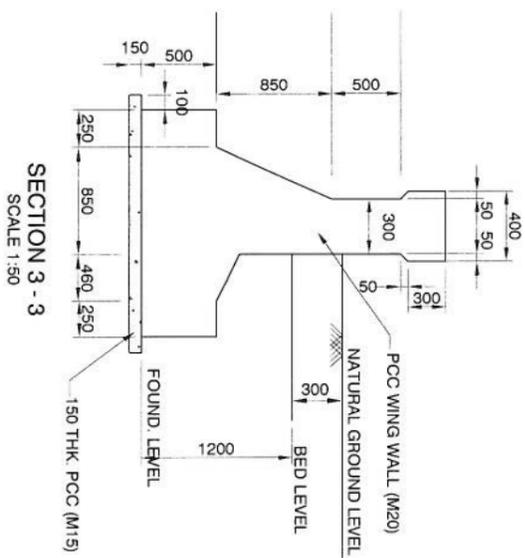
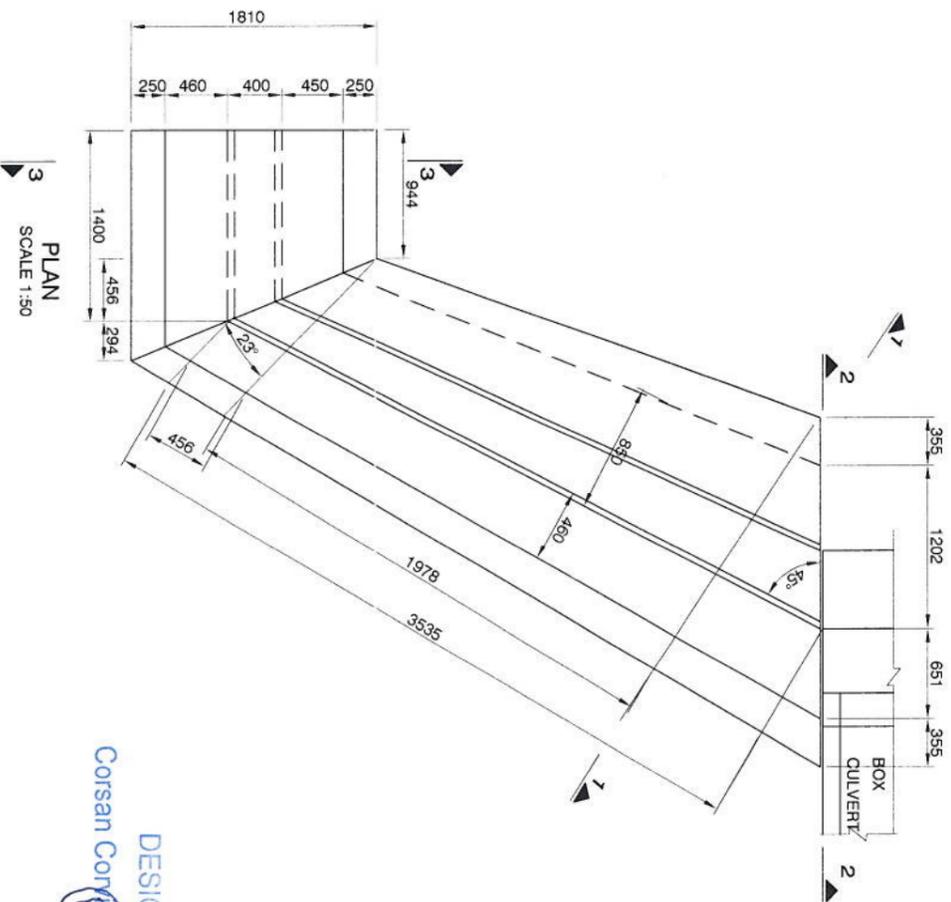
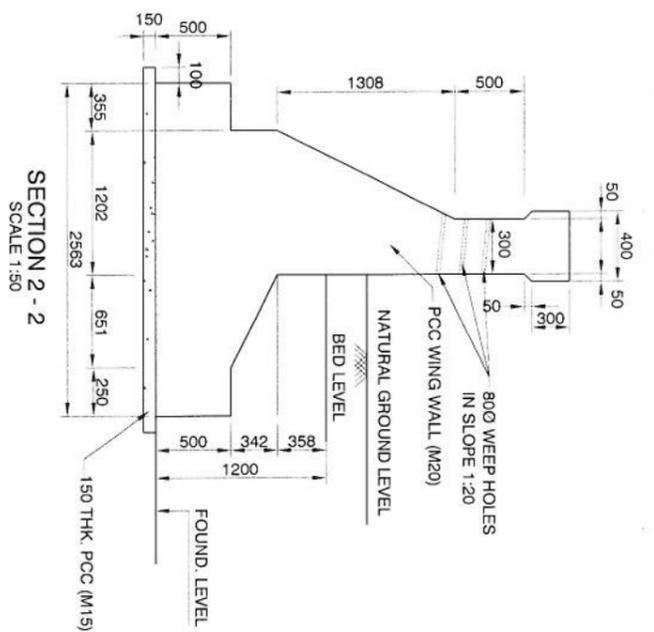
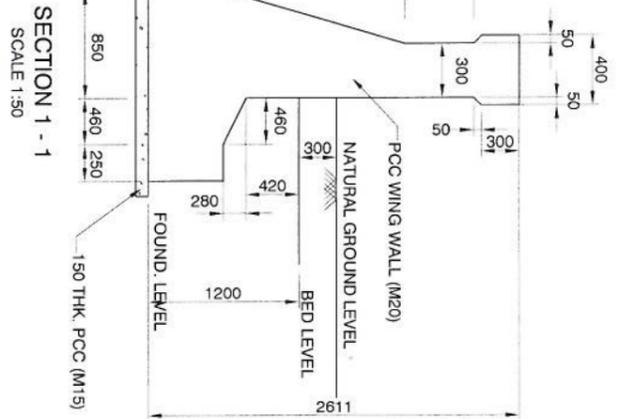
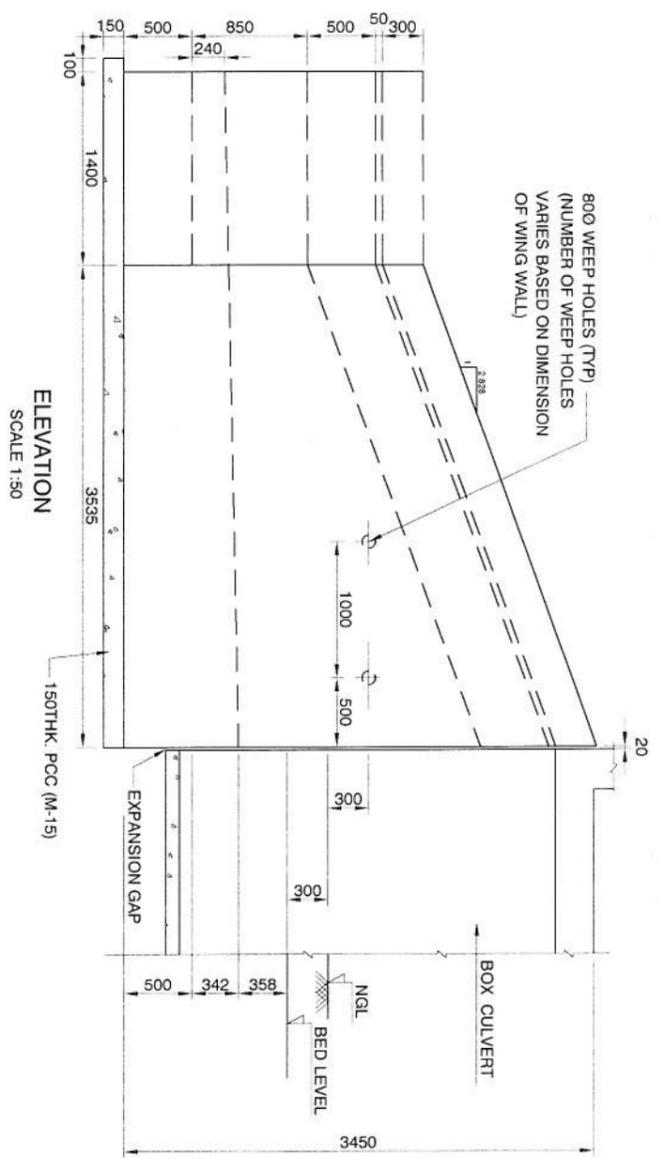


DETAIL OF PRECAST GUARD STONE @ 1.0 m c/c
 SCALE 1:10

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- ALL REINFORCEMENT SHOWN IN THIS DRAWING ARE OF HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS-1786 GRADE OF STEEL - 500 (T.M.T BARS)
- MINIMUM DEVELOPMENT LENGTH LD SHALL BE 42 TIMES DIA OF THE BAR MINIMUM LAP LENGTH SHALL BE 18 TIMES LD WHERE 'D' IS DIA OF BAR NOT MORE THAN 50% BARS TO BE LAPPED AT ONE LOCATION.
- CLEAR COVER
 WALL EARTH FACE 50MM
 WALL NON EARTH FACE 40MM
- ADEQUATE LINKS / SPACER BARS SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.

REV	DATE	DESCRIPTION OF REVISIONS	APPROVED:	CONSULTANT:	CLIENT:	PROOF CHECKING CONSULTANT:	TITLE:
			RBS	PROJECTS CONSULTING INDIA (P) LTD	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	Gifford	MISCELLANEOUS DETAILS
			CHECKED:	6110 / 2 Sector - D6, Vasant Kunj New Delhi (India) 110070	Ministry of Road Transport & Highways, Government of India		SCALE: A3
			DESIGNED:	VOYANT'S SOLUTIONS PVT LTD.	CORSAN CORVIAM CONSTRUCTION S.A.	L. R. KADIYALI & ASSOCIATES	SHEET: 02
			DRAWN:	403, 4th Floor, BTP Park Centre, Sector-30, NH-8, Gurgaon, Haryana - 122001, India	02nd Floor, Block Two, Vatika Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001		DATE: March 2016
							REV: 0



PLAN
SCALE 1:50

DESIGN DIRECTOR
Corasan Construction S.A.

NOTES

1. SURFACE REINFORCEMENT AT THE RATE OF 2.5 kg/m² SHALL BE PROVIDED IN EACH DIRECTION, I.E. BOTH HORIZONTALLY AND VERTICALLY SPACING SHALL NOT EXCEED 200MM.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE MENTIONED. DIMENSIONS ARE NOT TO BE SCALED.
3. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
4. IF THERE IS ANY LEVEL DIFFERENCE IN FOUNDING LEVEL OF WING WALL AND DOWNWARD PROTECTION
5. AT THE ADJACENT EDGE OF BOX STRUCTURE, PROPER GRANULAR PROTECTION IS TO BE PROVIDED IN THIS AREA TO COMPENSATE THE LEVEL DIFFERENCE

PROJECT: FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM DESIGN CH. KM 490+800 TO KM 534+800 IN THE STATE OF ASSAM UNDER EPC MODE

APPROVED:	RBS	CONSULTANT:	PROJECTS CONSULTING INDIA (P) LTD Engineers and Planners 6110 / 2 Sector - D6, Vasant Kunj New Delhi (India) 110070 AUTHORITY ENGINEER:	CLIENT:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch Office : Road No. 1, Panchsati, Anandapuri Nagar, 220 Road, Ghaziabad - 24	PROOF CHECKING CONSULTANT:	Gifford	SAFETY CONSULTANT:	L. R. KADIYALI & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	TITLE:	MISCELLANEOUS DETAILS	SHEET/NO.:	AS3	DATE:	March 2016
CHECKED:	BKG	CONTRACTOR:	VOYANTIS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CONTRACTOR:	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Varaha Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	SAFETY CONSULTANT:	KADIYALI	SAFETY CONSULTANT:	L. R. KADIYALI & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	DRAWING NO.:	94-33-01	SCALE:	AS SHOWN	REV:	0
DESIGNED:	AS	DESIGNED:	VOYANTIS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CONTRACTOR:	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Varaha Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	SAFETY CONSULTANT:	KADIYALI	SAFETY CONSULTANT:	L. R. KADIYALI & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	DATE:	March 2016	REV:	0		
DRAWN:	KDS	DESIGNED:	VOYANTIS SOLUTIONS PVT LTD. 403, 4th Floor, BPTP Park Centre Sector-30, NH-8, Gurgaon, Haryana - 122001, India	CONTRACTOR:	CORSAN CORVIAM CONSTRUCTION S.A. 02nd Floor, Block Two, Varaha Business Park, Sector - 49, Sohna Road, Gurgaon, Haryana, India - 122001	SAFETY CONSULTANT:	KADIYALI	SAFETY CONSULTANT:	L. R. KADIYALI & ASSOCIATES RZ-44, Bhawani Kunj, Behind D-2 Vasant Kunj, New Delhi 110 070	DATE:	March 2016	REV:	0		
DESCRIPTION OF REVISIONS:		DESCRIPTION OF REVISIONS:		DESCRIPTION OF REVISIONS:		DESCRIPTION OF REVISIONS:		DESCRIPTION OF REVISIONS:		DATE:	March 2016	REV:	0		