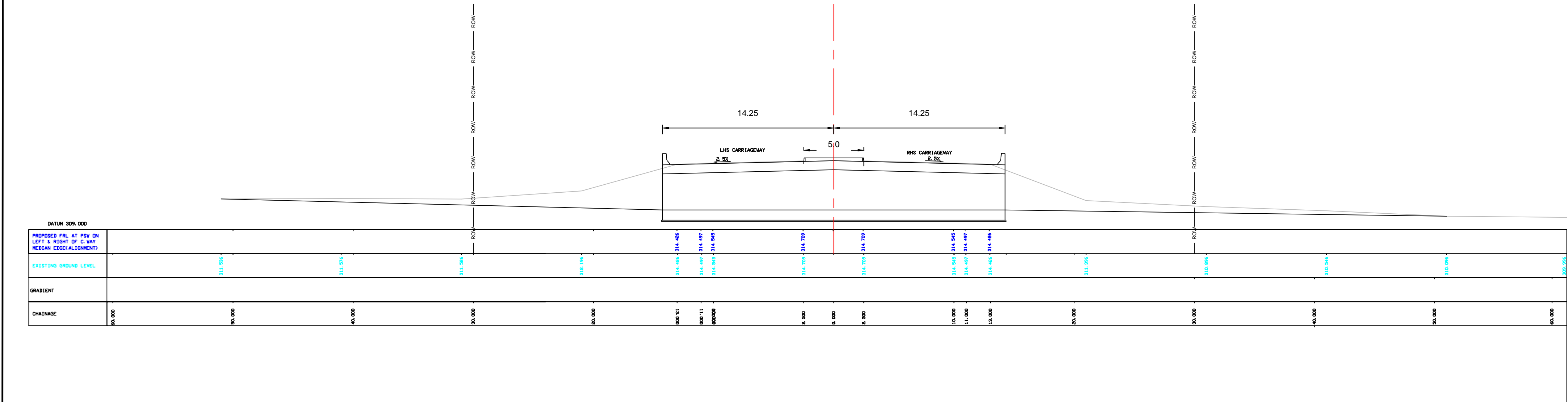
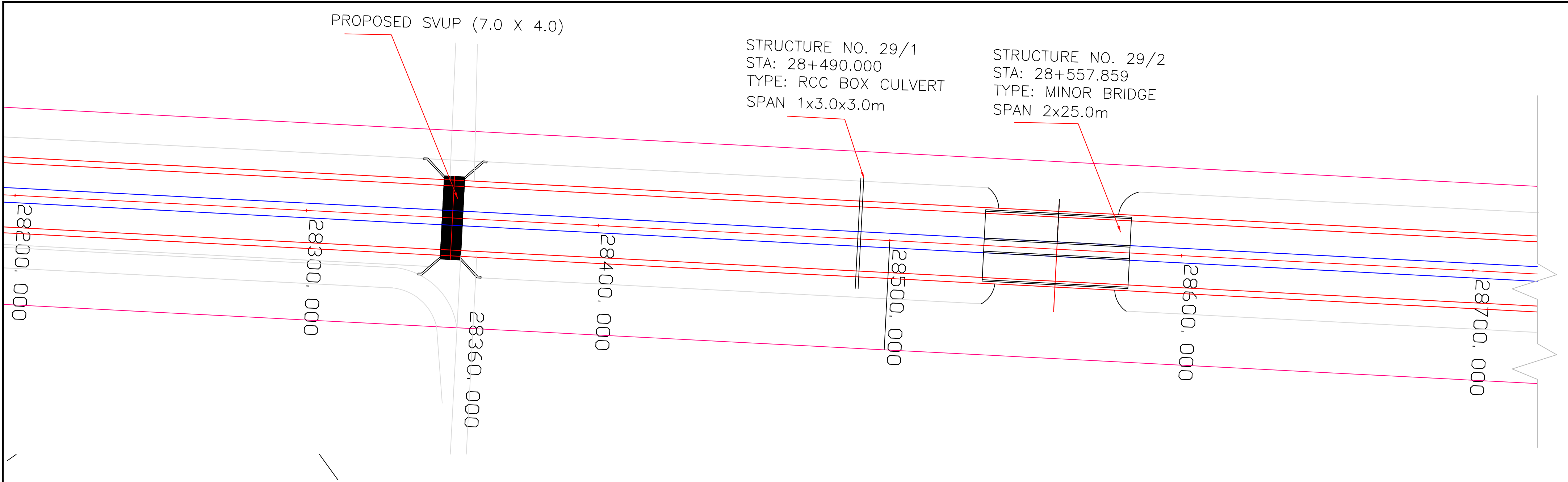


# **DRAWINGS**

## **Salem to Ulunderpet Section of NH-79**

1.Muthampatti @ Km 28+350



DATUM 309.000	
PROPOSED FRL AT PSV ON LEFT & RIGHT OF C.WAY MEDIAN EDGE ALIGNMENT	
EXISTING GROUND LEVEL	
GRADIENT	
CHAINAGE	

CLIENT:



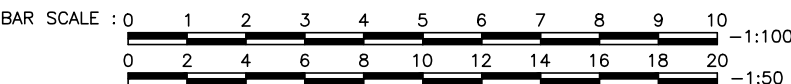
NATIONAL HIGHWAY AUTHORITY OF INDIA  
G-5 & G-6 DWARAKA  
NEW DELHI

INDEPENDANT ENGINEER:

SA INREATRUCTURE CONSULTANT PVT. LTD  
IN JOINT VENTURE WITH  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

PROJECT:

4/6 LANING OF SALEM - ULUNDURPET SECTION FROM  
KM 0+313 TO KM 136+670.516 OF NH-79



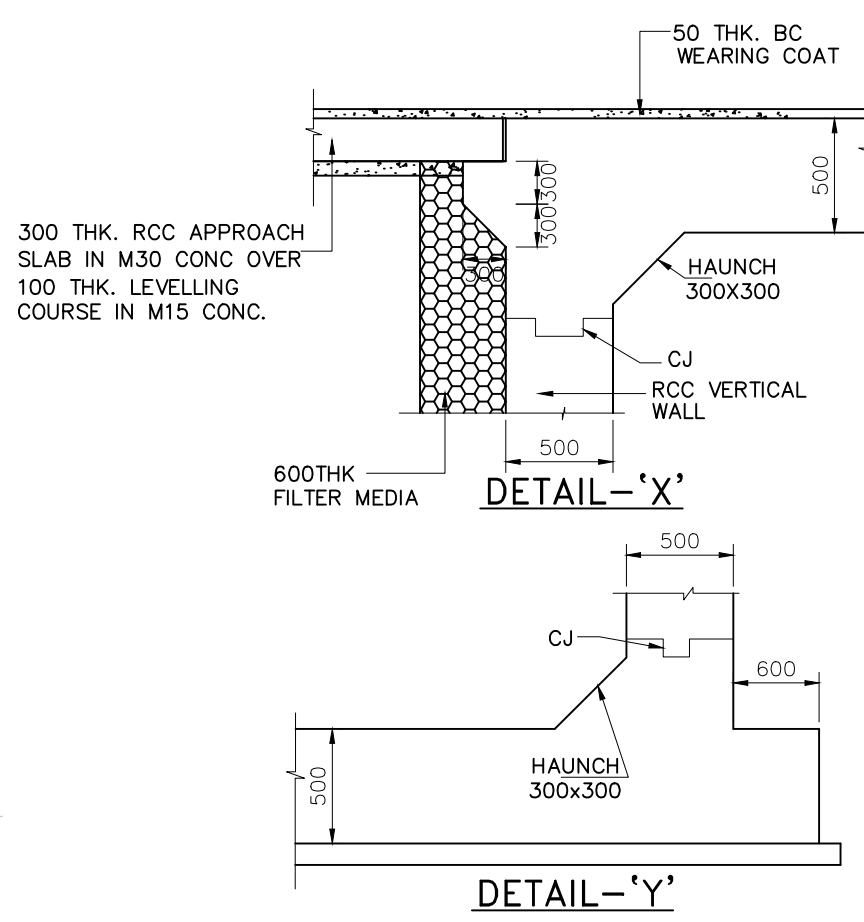
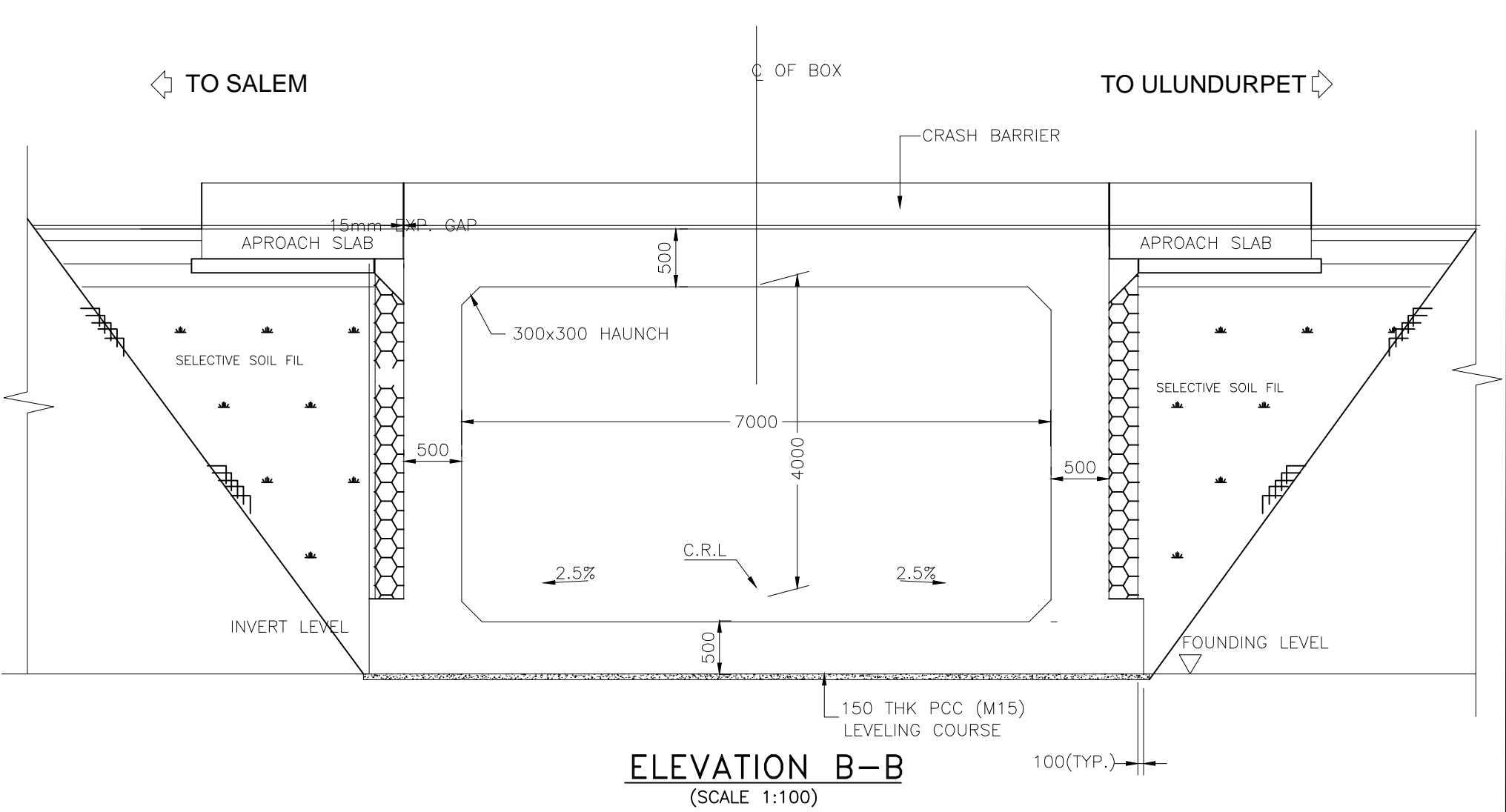
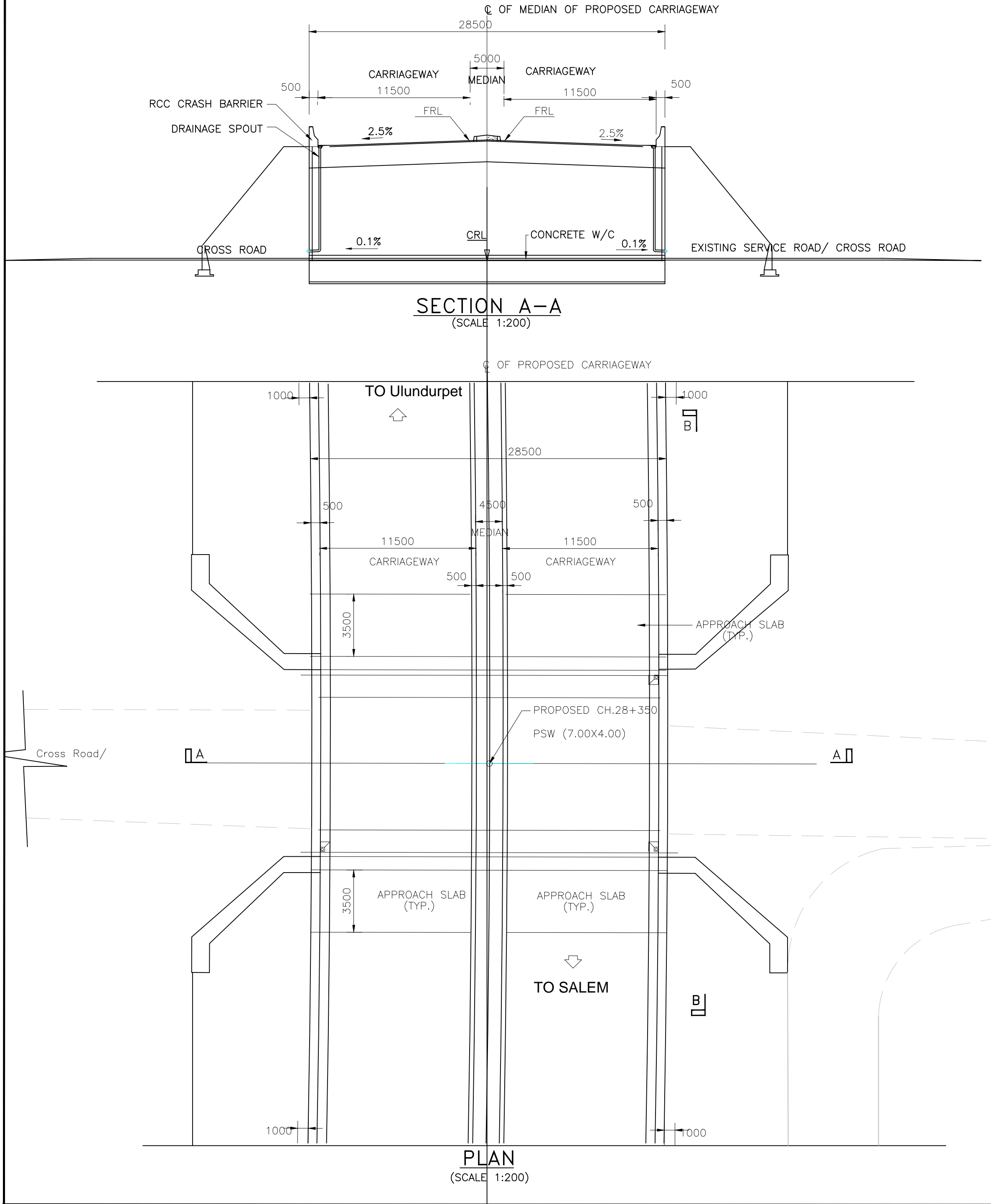
Plan & Profile of Proposed SVUP

TITLE:- SVUP at Km. 28+350

APPROVED BY :

Drawing NoSU/NH-68/SVUP/ P&P/1 AT 28/350- 00




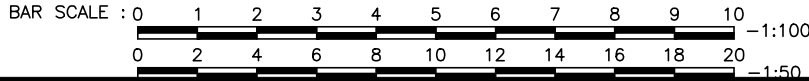


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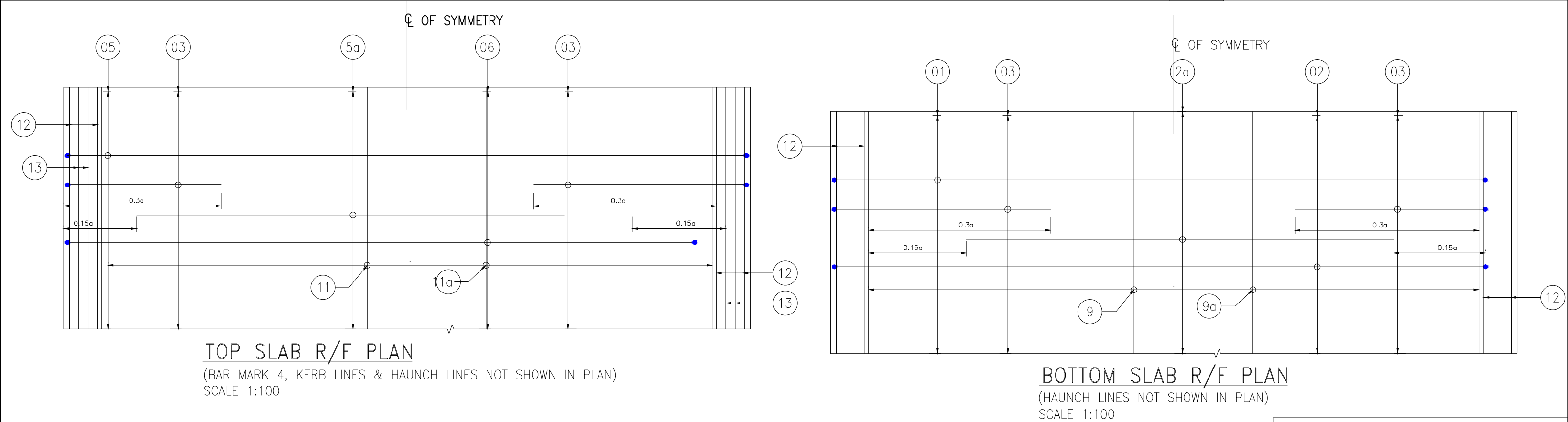
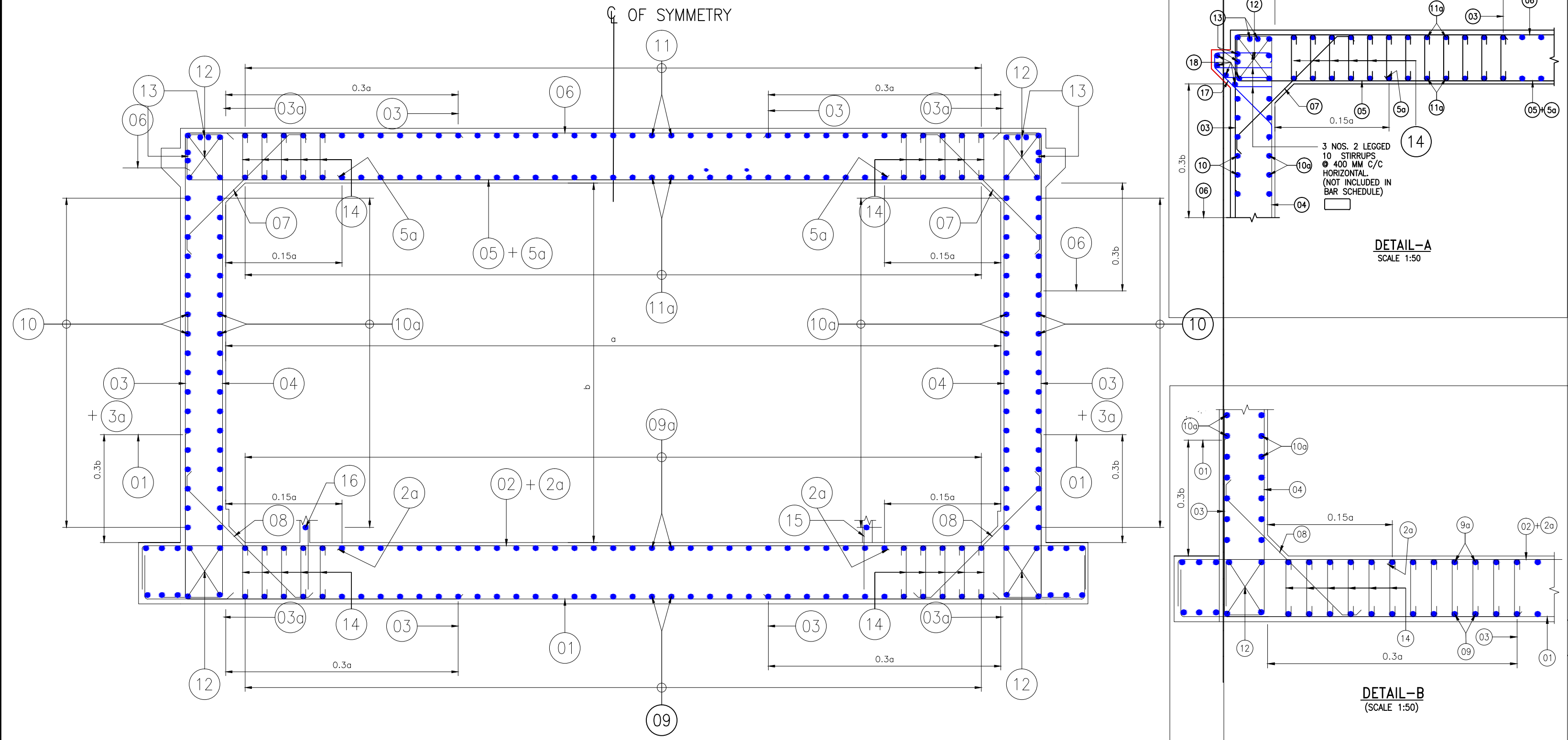
- FRL : FINISH ROAD LEVEL
- CW : CARRIAGEWAY
- OGL : ORIGINAL GROUND LEVEL
- LVL. : LEVEL
- FX : FIXED BEARING END
- RCC : REINFORCED CEMENT CONCRETE
- PCC : PLAIN CEMENT CONCRETE
- FR : FREE BEARING END
- FP : FOOTPATH
- CB : CRASH BARRIER
- CJ : CONSTRUCTION JOINT
- EJ : EXPANSION JOINT
- TYP. : TYPICAL
- No. (No's) : NUMBER
- CL : CENTRE LINE
- RL : RAILING
- SK : SKEW LENGTH

Notes:

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED FOR 3 LANES OF IRC CLASS A OR 1 LANE OF IRC CLASS 70R LOADING OR 1 LANE OF IRC CLASS 70R & 1 LANE OF IRC CLASS A WHICHEVER GOVERNS.
- CONCRETE SHALL BE DESIGN MIX WITH MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BOX.
- GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO IS : 1786 WITHE LATEST AMENDMENTS.
- 50mm THK. WEARING COAT SHALL CONSIST OF MASTIC ASPHALT 25mm THK. AND ONE LAYERS OF ASPHALTIC CONC. 25mm AS PER MORTH STANDARD.
- FILLER TYPE EXPANSION JOINTS OF PROVEN QUALITY SHALL BE PROVIDED AS PER IRC : SP:69-2005.
- THE MATERIAL SPECIFICATIONS OF THE FILLER JOINTS SHALL BE IN ACCORDANCE WITH SECTION 2605 OF MORTH SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOURTH REVISION.
- BACK FILLING SHALL CONSIST OF SELECTED EARTH, CONFORMING TO APPENDIX : 6 OF IRC : 78-2000 HAVING PROPERTIES  $C=0, \phi > 30^\circ, \approx 20^\circ, d \approx 18 \text{ kN/m}$ .
- BACK FILLING SHALL BE DONE SIMOULTANEOUSLY ON BOTH SIDES AFTER THE CASTING OF TOP SLAB OF THE BOX AND THE DIFFERENCE IN LEVELS ON BOTH SIDES SHALL NOT BE MORE THAN 1.0 M.
- WATER TO BE USED IN CONCRETING AND CURING SHALL BE CONFIRMING TO CLAUSE 302.4 OF IRC 21.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH FINAL HIGHWAY PLAN AND PROFILE DRAWINGS, ALL LEVELS GIVEN IN DRAWING SHALL BE VERIFIED BEFORE EXECUTION AT SITE.
- NET BEARING CAPACITY AT FOUNDING LEVEL AS PER GEOTECH REPORT AT BOX 15 t/m<sup>2</sup>
- SBC AT FOUNDING LEVEL TO BE CONFIRMED BEFORE LAYING OF FOUNDATION.
- 600 mm THICK FILTER MEDIA SHALL BE PROVIDED BEHIND SIDE WALLS

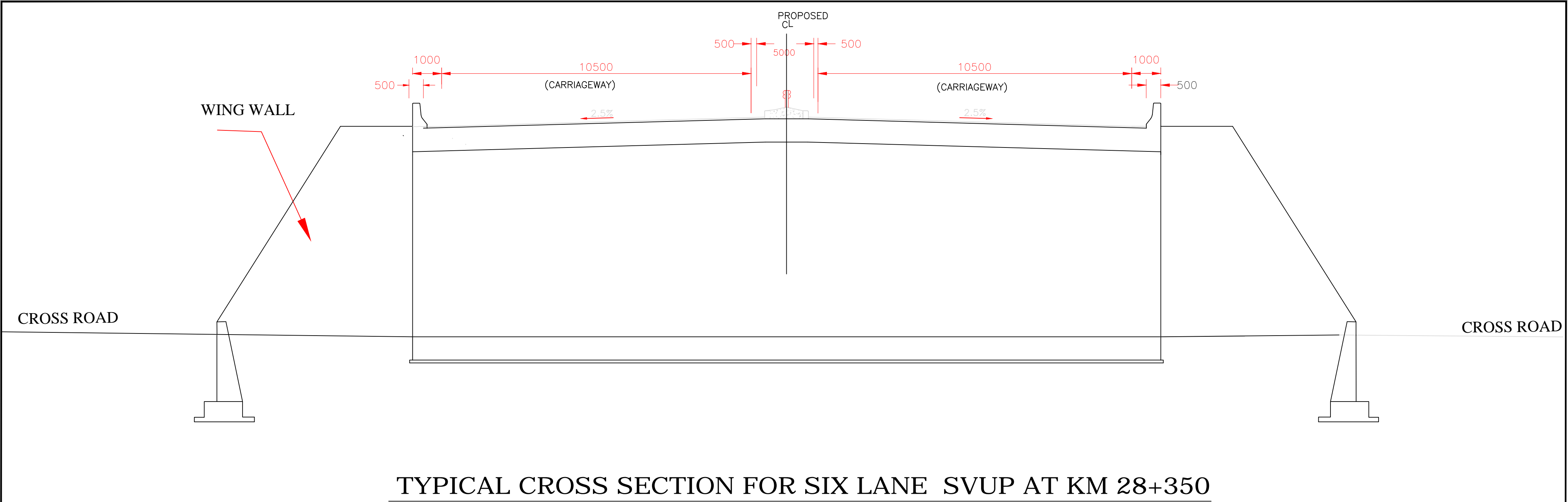
CLIENT:  NATIONAL HIGHWAY AUTHORITY OF INDIA G-5 & G-6 DWARAKA NEW DELHI	INDEPENDANT ENGINEER: SA INREATRUCTURE CONSULTANT PVT. LTD IN JOINT VENTURE WITH QUEST ENGINEERS & CONSULTANTS PVT LTD. 1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India	PROJECT: 4/6 LANING OF SALEM - ULUNDURPET SECTION FROM KM 0+313 TO KM 136+670.516 OF NH-79 	SVUP General Arangement Drg. TITLE:- SVUP at Km. 28+350	APPROVED BY :	Drawing No: SU/NH-68/SVUP/ GAD- 28/350 - 00
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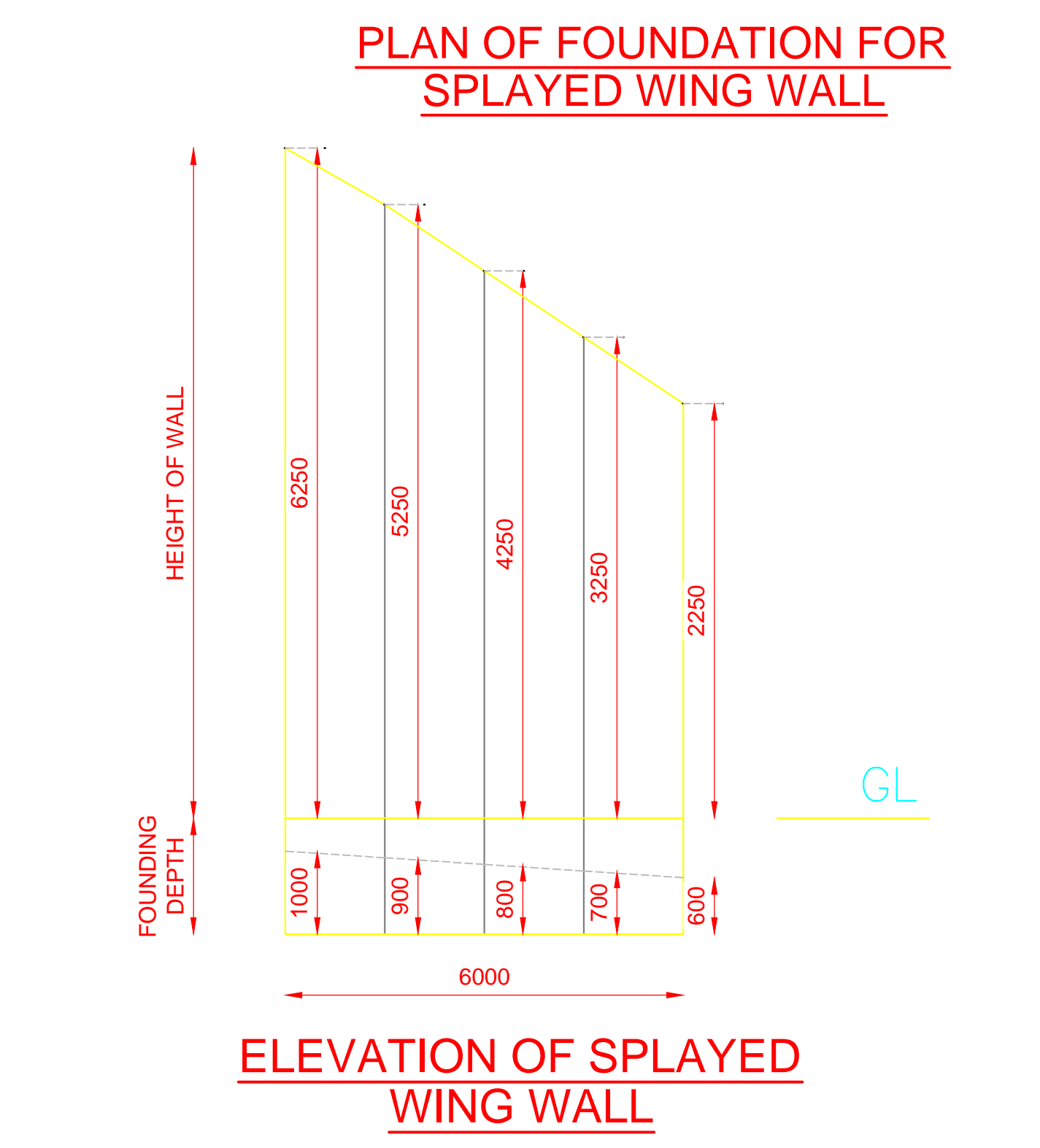
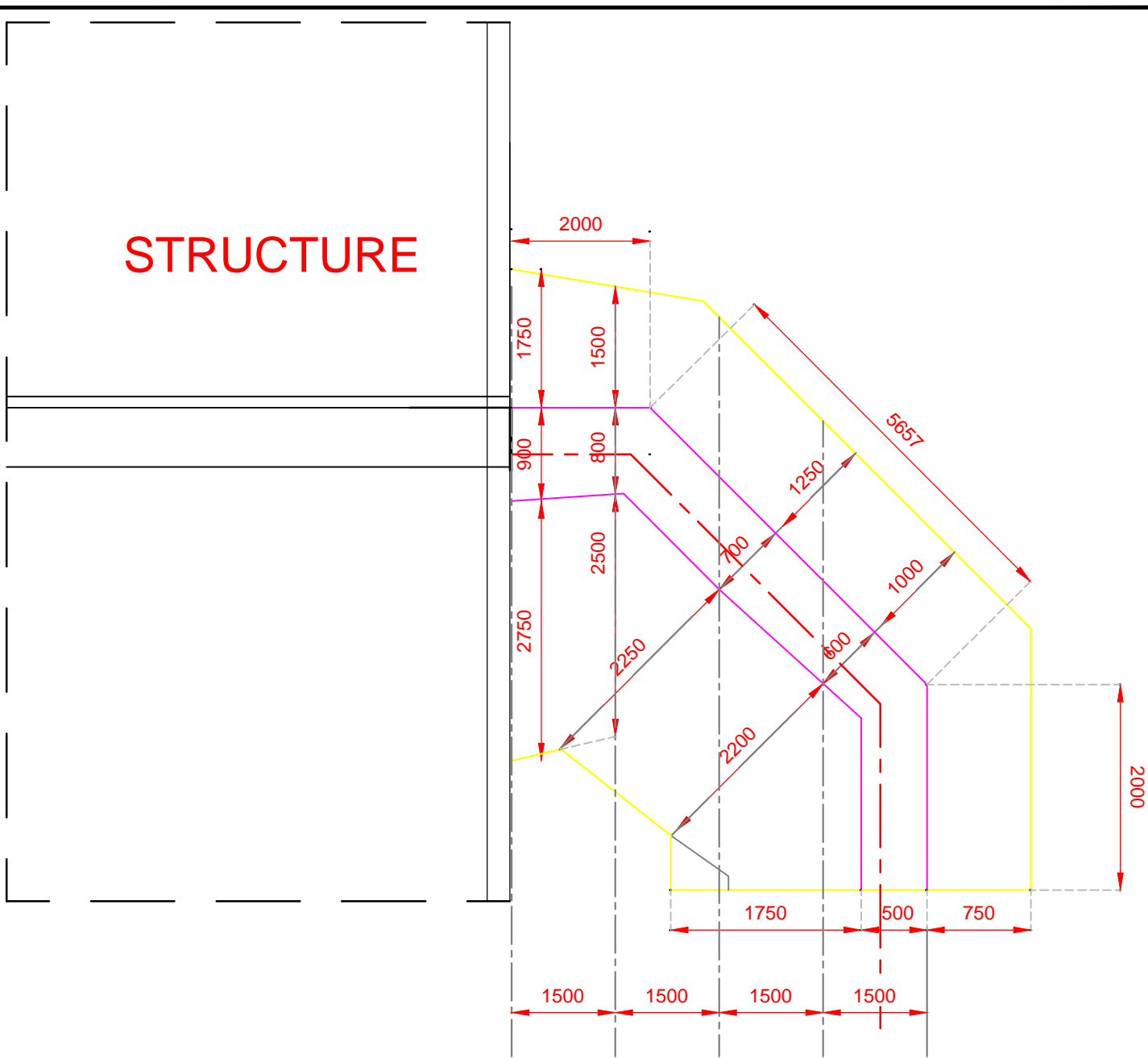
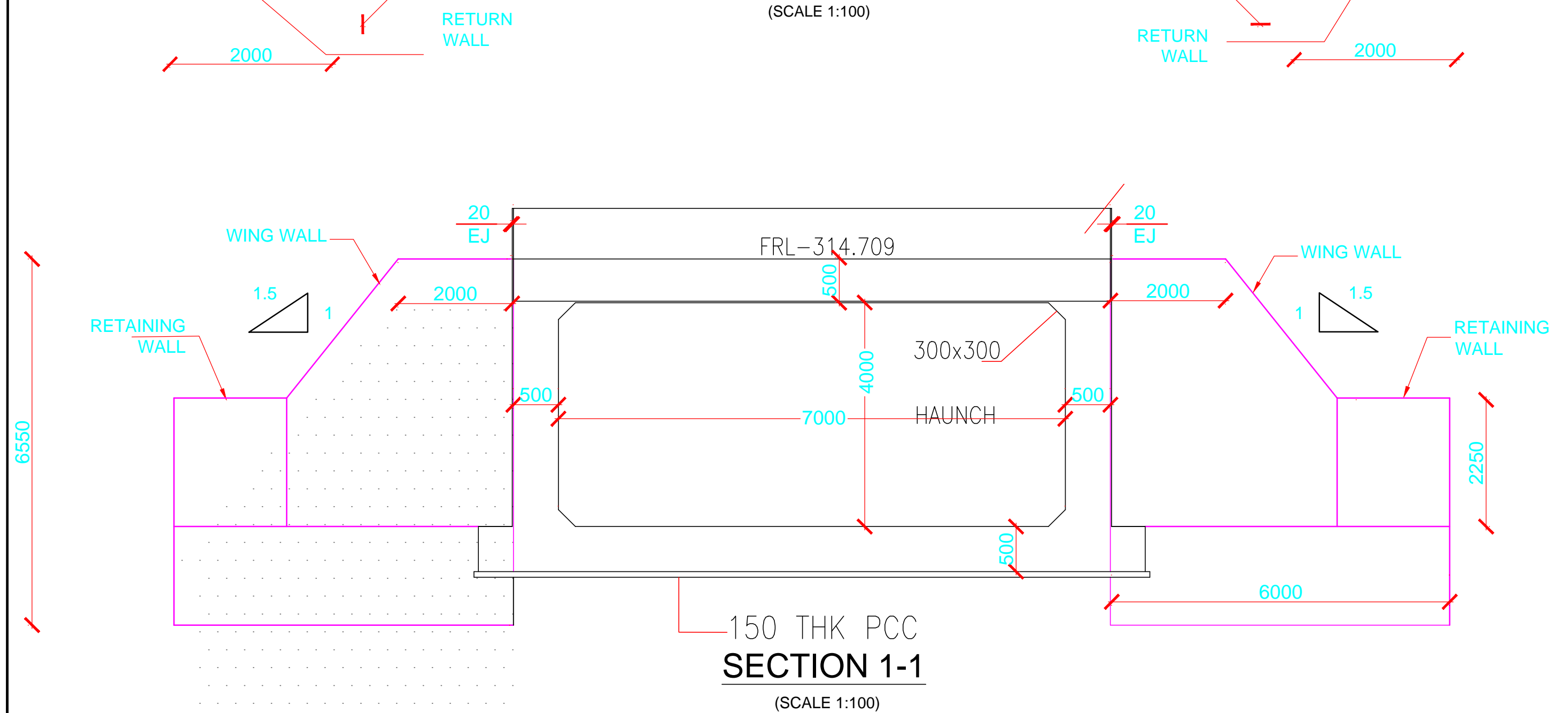
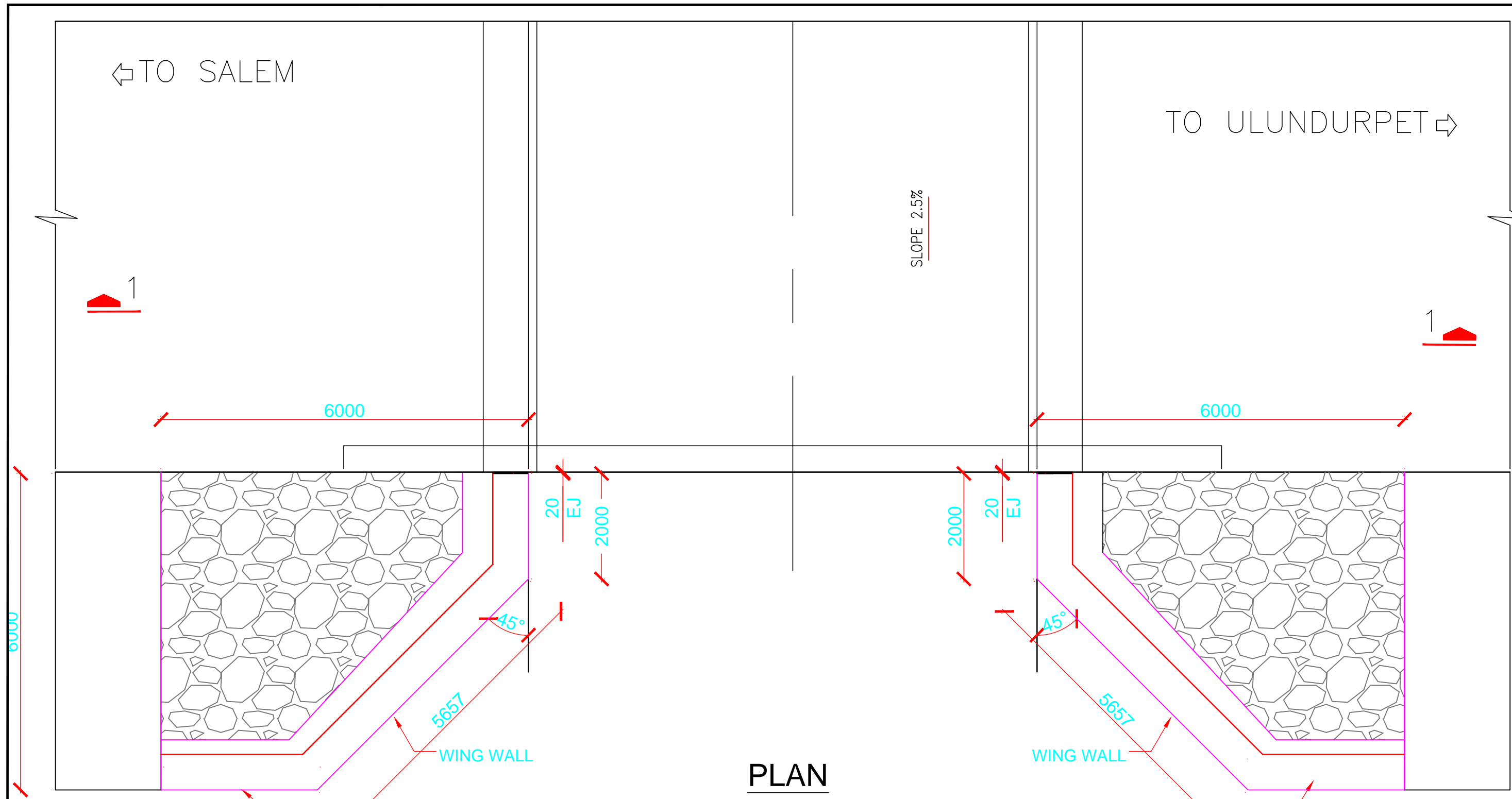
REINFORCEMENT DETAILS OF PROPOSED SVUP AT KM 28+350




REINFORCEMENT DETAILS OF UNDERPASS  
SCALE 1:100

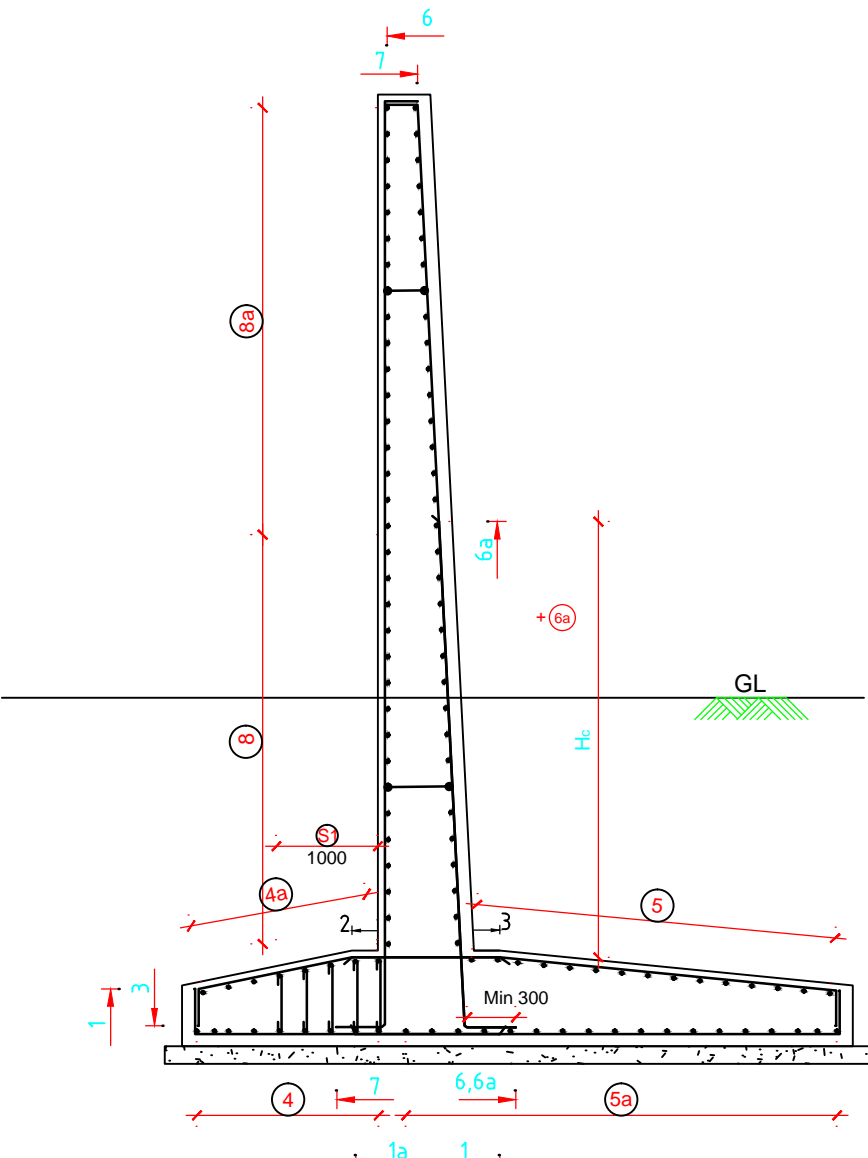
SCHEDULE OF REINFORCEMENT			
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING IN mm /NOS
01		20	200
02		25	200
2a		25	200
03		20	200
3a		25	200
04		20	200
05		20	200
5a		20	200
06		20	200
07		12	200
08		12	200
09		16	200
9a		16	200
10		16	200
10a		10	200
11		16	200
11a		16	200
12		10	16 NoS.
13		10	2x4 NoS.
14		8Ø LINKS @160C/C IN T-T DIRECTION & 160C/C IN L-L DIRECTION	
15		10	200
16		10	200
17		12	200
18		10	200
19	MESH AS SHOWN		





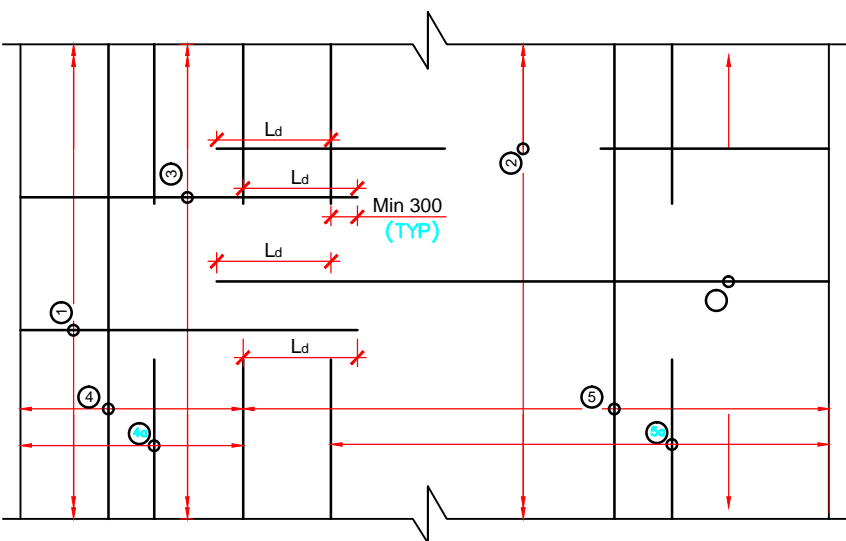
<div>CLIENT:</div> <div><div>NATIONAL HIGHWAY AUTHORITY OF INDIA G-5 &amp; G-6 DWARAKA NEW DELHI</div></div>	<div>INDEPENDANT ENGINEER:</div> <div>SA INREATRUCTURE CONSULTANT PVT. LTD IN JOINT VENTURE WITH QUEST ENGINEERS &amp; CONSULTANTS PVT LTD. 1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India</div>	<div>PROJECT:</div> <div>4/6 LANING OF SALEM - ULUNDURPET SECTION FROM KM 0+313 TO KM 136+670.516 OF NH-79</div> <div><div>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 0 2 4 6 8 10 12 14 16 18 20</div><div>-1:100 -1:50</div></div>	Dimension Details of Wing wall	APPROVED BY :	Drawing No: SU/NH-68/Wing Detail-28/350 - 00
			TITLE:- LVUP at Km. 28+350		





## REINFORCEMENT DETAIL OF RETAINING WALL



SCALE (1:40)



## PLAN-TYP REINFORCEMENT DETAIL OF WALL

SCALE (1: 40)

S.NO.	H (m)	D <sub>F</sub> (m)	B (m)	B <sub>H</sub> (m)	B <sub>T</sub> (m)	S <sub>1</sub> (m)	S <sub>2</sub> (m)	T <sub>1</sub> (m)	T <sub>2</sub> (m)	E <sub>1</sub> (m)	E <sub>2</sub> (m)	SBC (t/mm <sup>2</sup> )
1.	10.25	1.75	7.10	3.75	2.00	0.45	1.35	0.6	1.25	0.6	1.25	350
2.	9.25	1.75	6.50	3.50	1.75	0.45	1.25	0.6	1.15	0.6	1.15	350
3.	8.25	1.75	5.90	3.25	1.50	0.45	1.15	0.6	1.05	0.6	1.05	350
4.	7.25	1.75	5.55	3.00	1.50	0.45	1.05	0.6	0.95	0.6	0.95	350
5.	6.25	1.75	5.20	2.75	1.50	0.45	0.95	0.45	0.85	0.45	0.85	350

	BOTTOM REINFORCEMENT
	TOP REINFORCEMENT
FRL	-FINISHED ROAD LEVEL
$l_d$	-LAP LENGTH
$l_d$	-DEVELOPMENT LENGTH
EGL	-EXISTING GROUND LEVEL
$\phi$	-ANGLE OF INTERNAL FRICTION
TYP.	-TYPICAL
Hc.	-HEIGHT OF CURTAILMENT
	-FILTER MEDIA

ITEM	GRADE OF CONCRETE	DEVELOPMENT LENGTH ( $l_d$ )	LAP LENGTH ( $l_l$ )
FOUNDATION & STEM	M30	40D	56D

WHERE D IS DIAMETRE OF MAXIMUM BAR THAT IS ANCHORED / LAPPED.

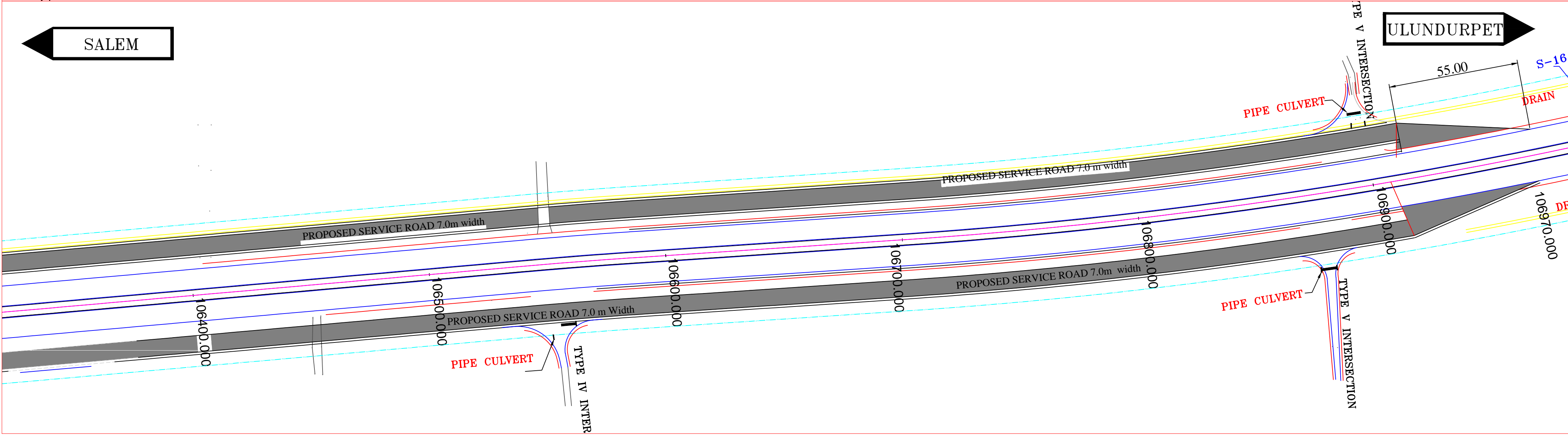
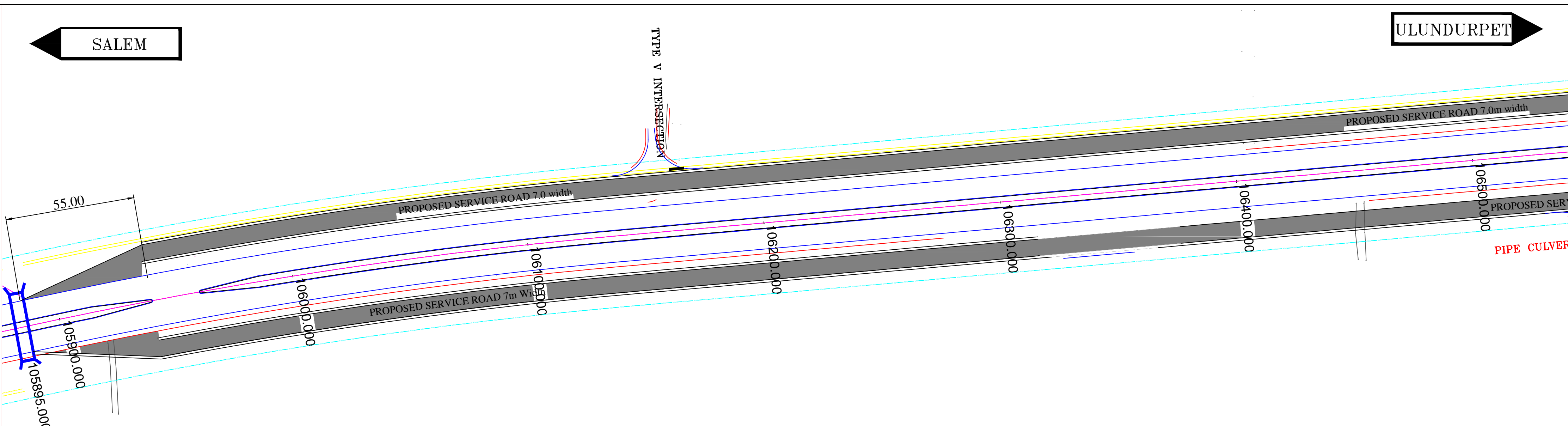
Height-H (in m).	BAR NUMBER WITH DIA AND SPACING														
	1	1a	2	3	4	4a	5	5a	6	6a	7	8	8a	S1	S2
10.25	20mm@200 mm c/c +16mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	20mm@200 mm c/c +20mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	10mm@150 mm c/c	8mm@150 mm c/c	12mm@150 mm c/c	8mm@150 mm c/c	25mm@200 mm c/c	25mm@200 mm c/c	16mm@200 mm c/c +12mm@200mm c/c	16mm@150 mm c/c	12mm@150 mm c/c	1L-8mm@200x200 c/c	-
9.25	20mm@200 mm c/c +16mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	20mm@200 mm c/c +20mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	10mm@150 mm c/c	8mm@150 mm c/c	12mm@150 mm c/c	8mm@150 mm c/c	25mm@200 mm c/c	25mm@200 mm c/c	16mm@200 mm c/c +12mm@200mm c/c	16mm@150 mm c/c	12mm@150 mm c/c	1L-8mm@200x200 c/c	-
8.25	16mm@200 mm c/c +16mm@200mm c/c	16mm@200 mm c/c +10mm@200mm c/c	20mm@200 mm c/c +20mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	10mm@150 mm c/c	8mm@150 mm c/c	12mm@150 mm c/c	8mm@150 mm c/c	25mm@200 mm c/c	20mm@200 mm c/c	16mm@200 mm c/c +12mm@200mm c/c	16mm@150 mm c/c	12mm@150 mm c/c	1L-8mm@200x200 c/c	-
7.25	16mm@200 mm c/c +16mm@200mm c/c	12mm@200 mm c/c +12mm@200mm c/c	20mm@200 mm c/c +20mm@200mm c/c	16mm@200 mm c/c +12mm@200mm c/c	10mm@150 mm c/c	8mm@150 mm c/c	12mm@150 mm c/c	8mm@150 mm c/c	25mm@200 mm c/c	20mm@200 mm c/c	16mm@200 mm c/c +12mm@200mm c/c	16mm@150 mm c/c	12mm@150 mm c/c	1L-8mm@200x200 c/c	-
6.25	16mm@200 mm c/c +16mm@200mm c/c	12mm@200 mm c/c +12mm@200mm c/c	20mm@200 mm c/c +20mm@200mm c/c	12mm@200 mm c/c +12mm@200mm c/c	10mm@150 mm c/c	8mm@150 mm c/c	12mm@150 mm c/c	8mm@150 mm c/c	20mm@200 mm c/c	20mm@200 mm c/c	16mm@200 mm c/c	16mm@150 mm c/c	10mm@150 mm c/c	1L-8mm@200x200 c/c	-

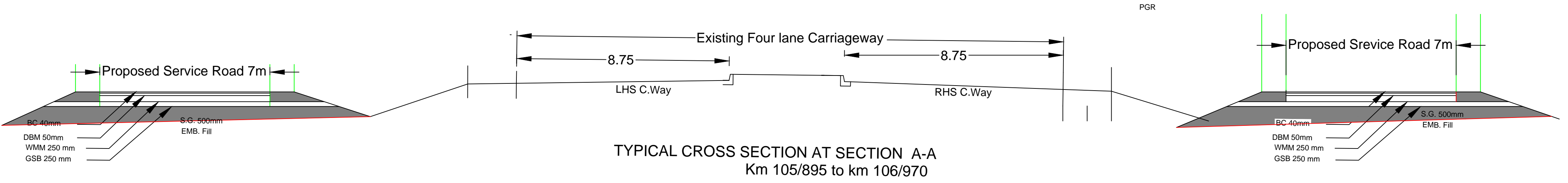
Drawing No: SU/NH-68/Typ. Wing Rft-28/350 - 00


# DRAWINGS

## Salem to Ulunderpet Section of NH-79

2.Madur@ Km 106+000





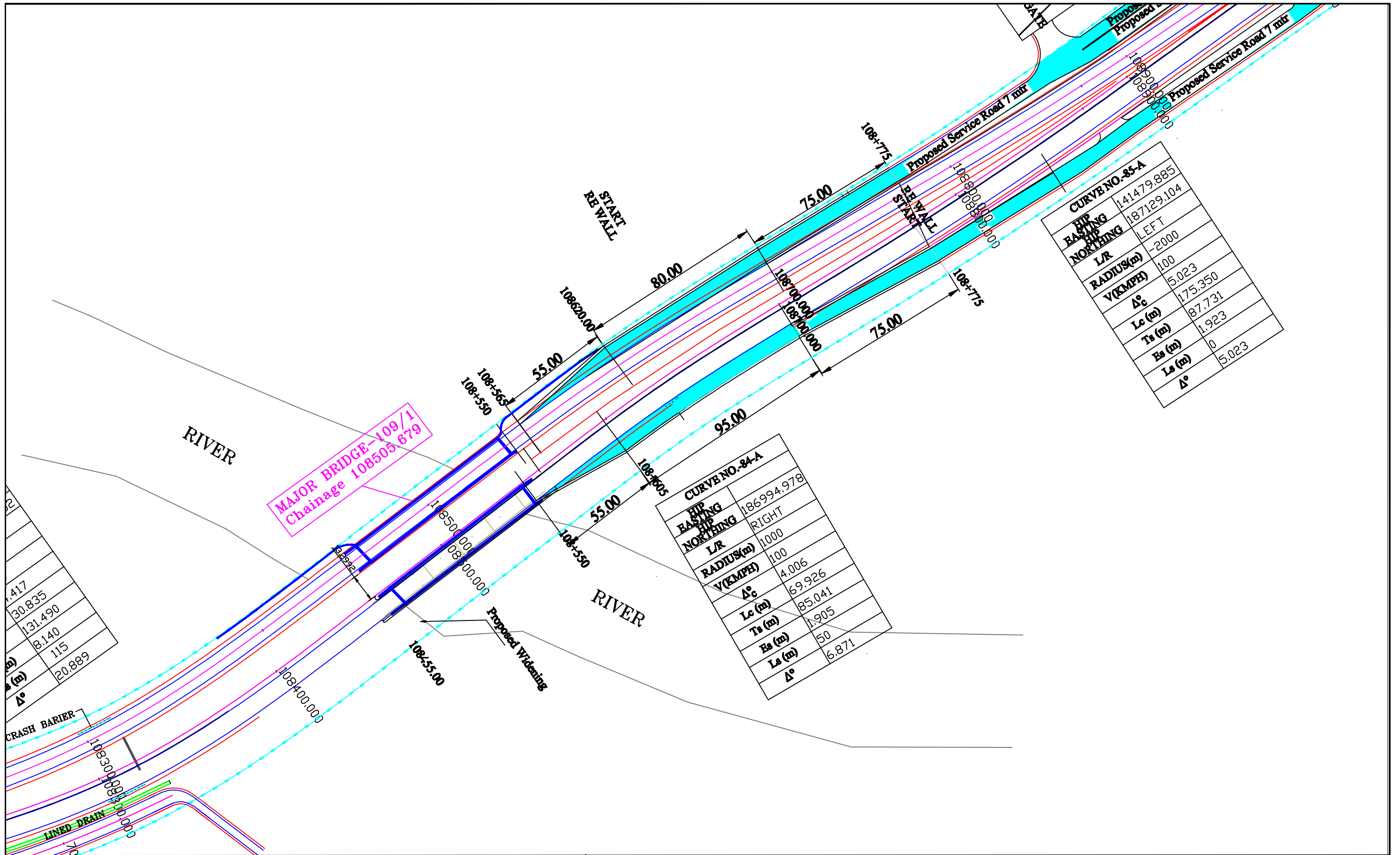
 NATIONAL HIGHWAY AUTHORITY OF INDIA G-5 & G-6 DWARAKA NEW DELHI	CONCESSIONARE : <b>SU Toll Road Private Ltd.</b> REGD.OFF: H BLOCK, 1st FLOOR, DHIRUBHAI AMBANI KNOWLEDGE CITY, NEVI MUMBAI-400710	INDEPENDANT ENGINEER: <b>SA INFRASTRUCTURE CONSULTANT PVT LTD</b> <small>IN JOINT VENTURE WITH</small> <b>QUEST ENGINEERS &amp; CONSULTANTS PVT LTD.</b> 1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India	PROJECT: <b>4/6 LANING OF SALEM - ULUNDURPET SECTION FROM KM 0+313 TO KM 136+670.516 OF NH-79</b>  BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 0 2 4 6 8 10 12 14 16 18 20 -1:100	PLAN OF SERVICE ROAD Drawing	APPROVED BY :	DRAWING NUMBER  SU/NH-68/Hot.Sp/23-24/km.106.40-1
				TITLE:- S.ROAD From Km.105+895 to Km.106.969		

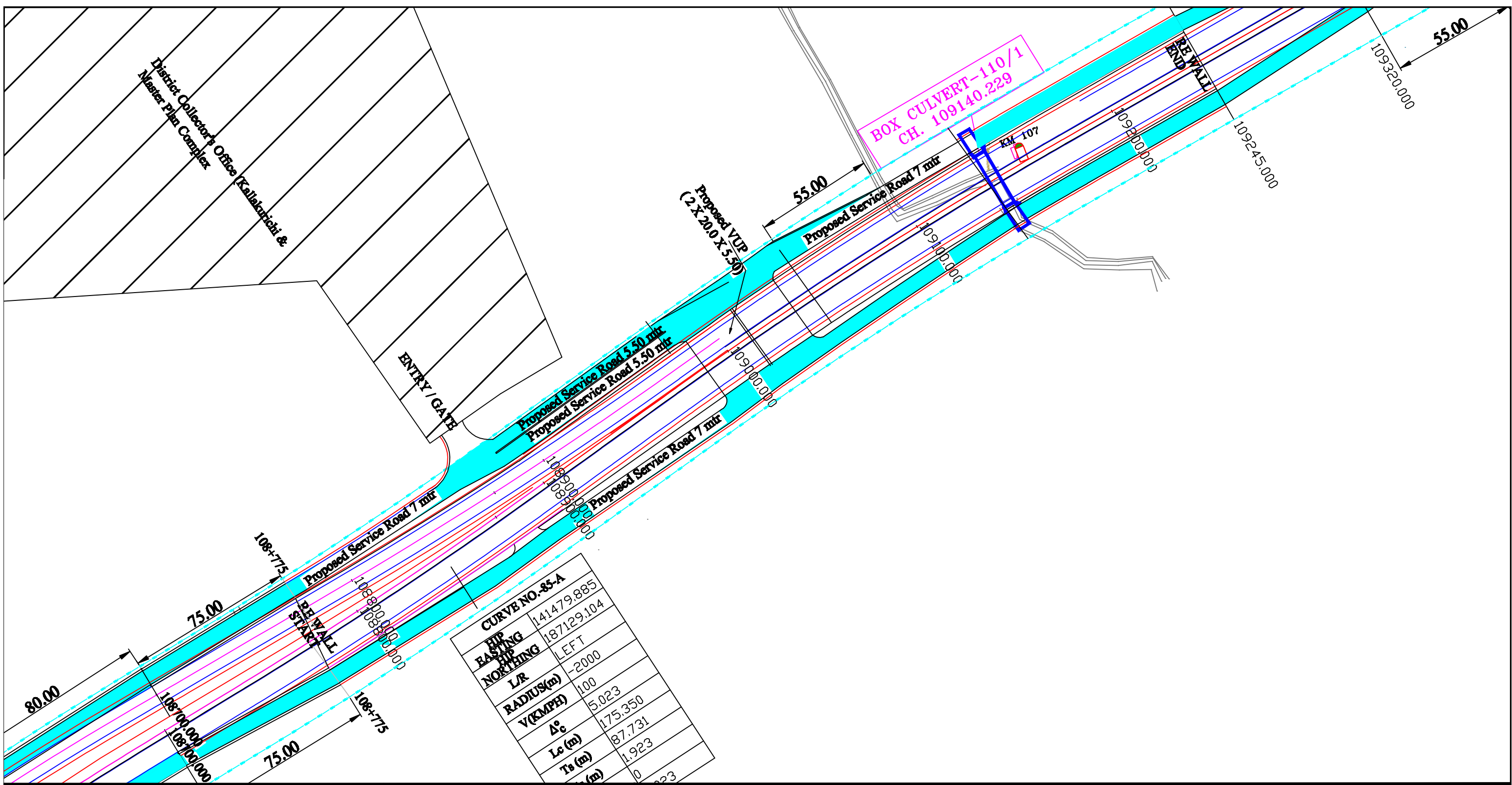


# **DRAWINGS**


## **Salem to Ulunderpet Section of NH-79**

3. Kallakurichi Master Complex@ Km 109+000





CURVE NO.-85-A	
PIR	141479.885
EASTING	187129.104
NORTHING	LEFT
L/R	-2000
RADIUS(m)	100
V(KMPH)	5.023
Δc	175.350
Lc (m)	87.731
Ts (m)	1.923
Ms (m)	0.023



**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

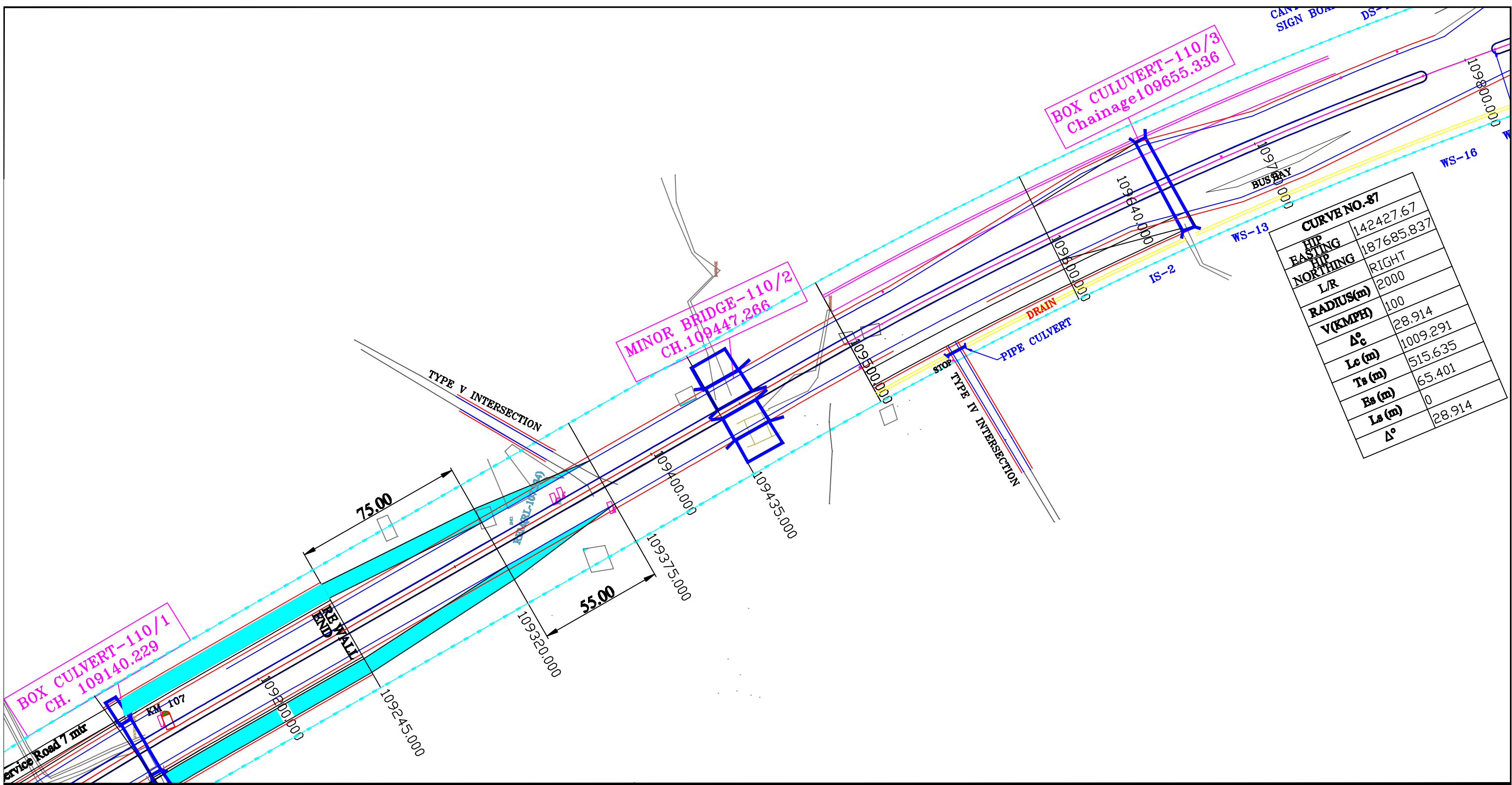
**INDEPENDANT ENGINEER:**  
SA INFRASTRUCTURE CONSULTANTS PVT LTD  
BY JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**Plan and Profile of VUP & SVUP**  
**With Service Road on Both side**  
**TITLE:-** VUP at Km. 109+009


**PROJECT:**  
Construction of VUP at Km.109+009 for the Access of the New  
Administrative Buildings - Kalakurichi District in the project of Salem -  
Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu  
on EPC mode

**CLIENT:**  
NATIONAL HIGHWAY AUTHORITY OF INDIA  
(Ministry of Road Transport & Highways)  
Government of India.

**BAR SCALE :**  
0 1 2 3 4 5 6 7 8 9 10  
0 2 4 6 8 10 12 14 16 18 20  
-1:100  
-1:50



CURVE NO.-87	
HIP EASTING	142427.67
HIP NORTHING	187685.837
L/R	RIGHT
RADIUS(m)	2000
V(KMPH)	100
$\Delta^{\circ}$	28.914
Lc (m)	1009.291
Ts (m)	515.635
Es (m)	65.401
Ls (m)	0
$\Delta^{\circ}$	28.914

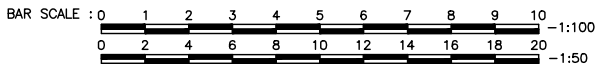


**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

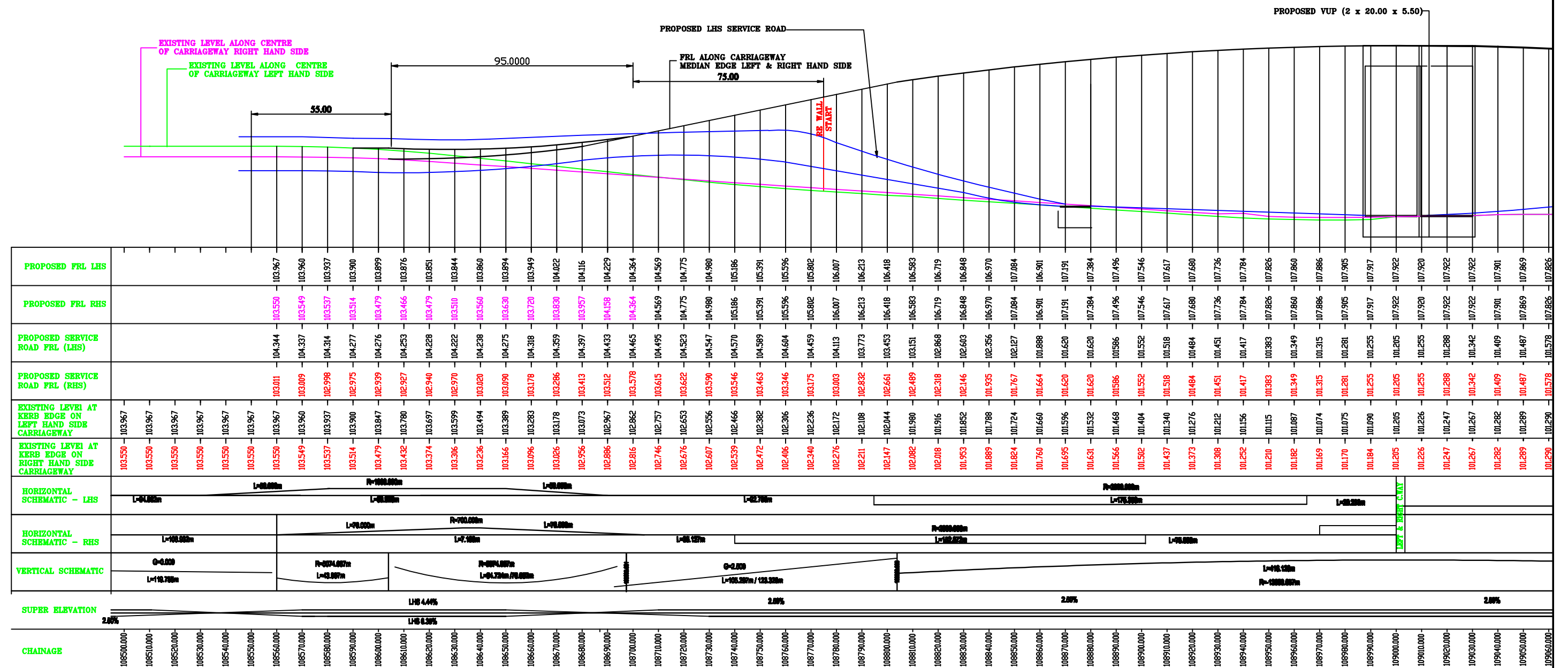
**INDEPENDANT ENGINEER:**  
SA INFRASTRUCTURE CONSULTANTS PVT LTD  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**Plan and Profile of VUP & SVUP  
With Service Road on Both side**  
**TITLE:-** VUP at Km. 109+009

**PROJECT:**  
Construction of a VUP at Km.109+009 for the Access of the New  
Administrative Buildings - Kallakurichi District in the project of Salem -  
Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu  
on EPC mode



PROPOSED VUP (2 x 20.00 x 5.50)  
(R-3)



**CLIENT:**



**NATIONAL HIGHWAY AUTHORITY OF INDIA**

(Ministry of Road Transport & Highways)  
Government of India.

**INDEPENDANT ENGINEER:**

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
**IN JOINT VENTURE WITH**  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
 1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
 Plot No:7A/1, Sector-142,  
 Noida - 201 301, India

BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100  
0 2 4 6 8 10 12 14 16 18 20 -1:50

### Plan and Profile of VUP & SVUP With Service Road on Both side

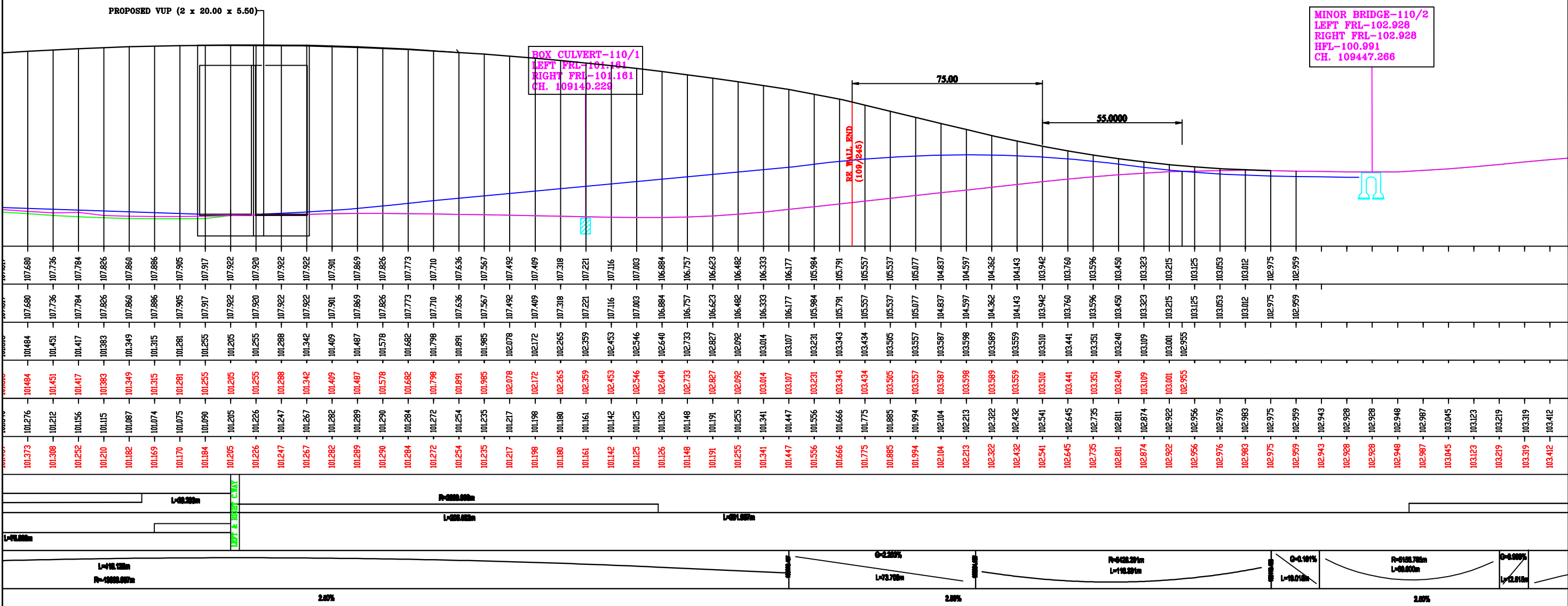
<b>TITLE:-</b>	<b>VUP at Km. 109+009</b>
----------------	---------------------------

**PROJECT:**

**Construction of a VUP at Km.109+000 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**



PROPOSED VUP (2 x 20.00 x 5.50)  
(R-3)



CLIENT:

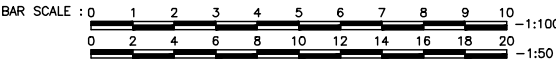


NATIONAL HIGHWAY AUTHORITY OF INDIA

(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
IN JOINT VENTURE WITH  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

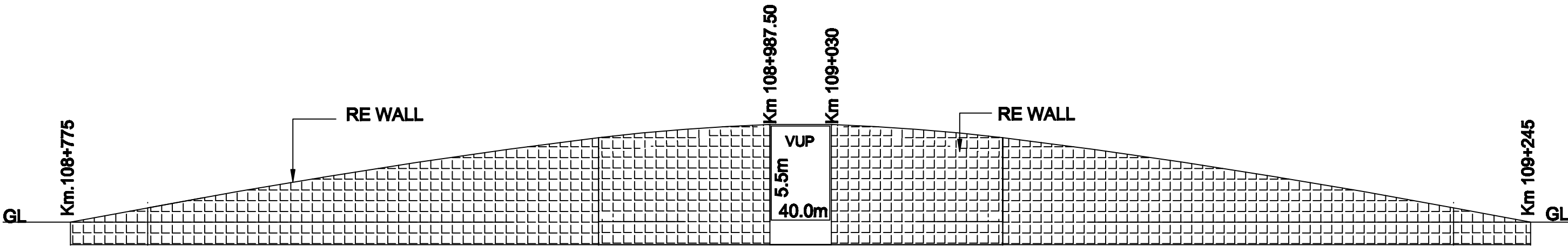


Plan and Profile of VUP & SVUP  
With Service Road on Both side


TITLE:- VUP at Km. 109+009

PROJECT:

Construction of a VUP at Km.109+009 for the Access of the New  
Administrative Buildings - Kallakurichi District in the project of Salem -  
Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu  
on EPC mode

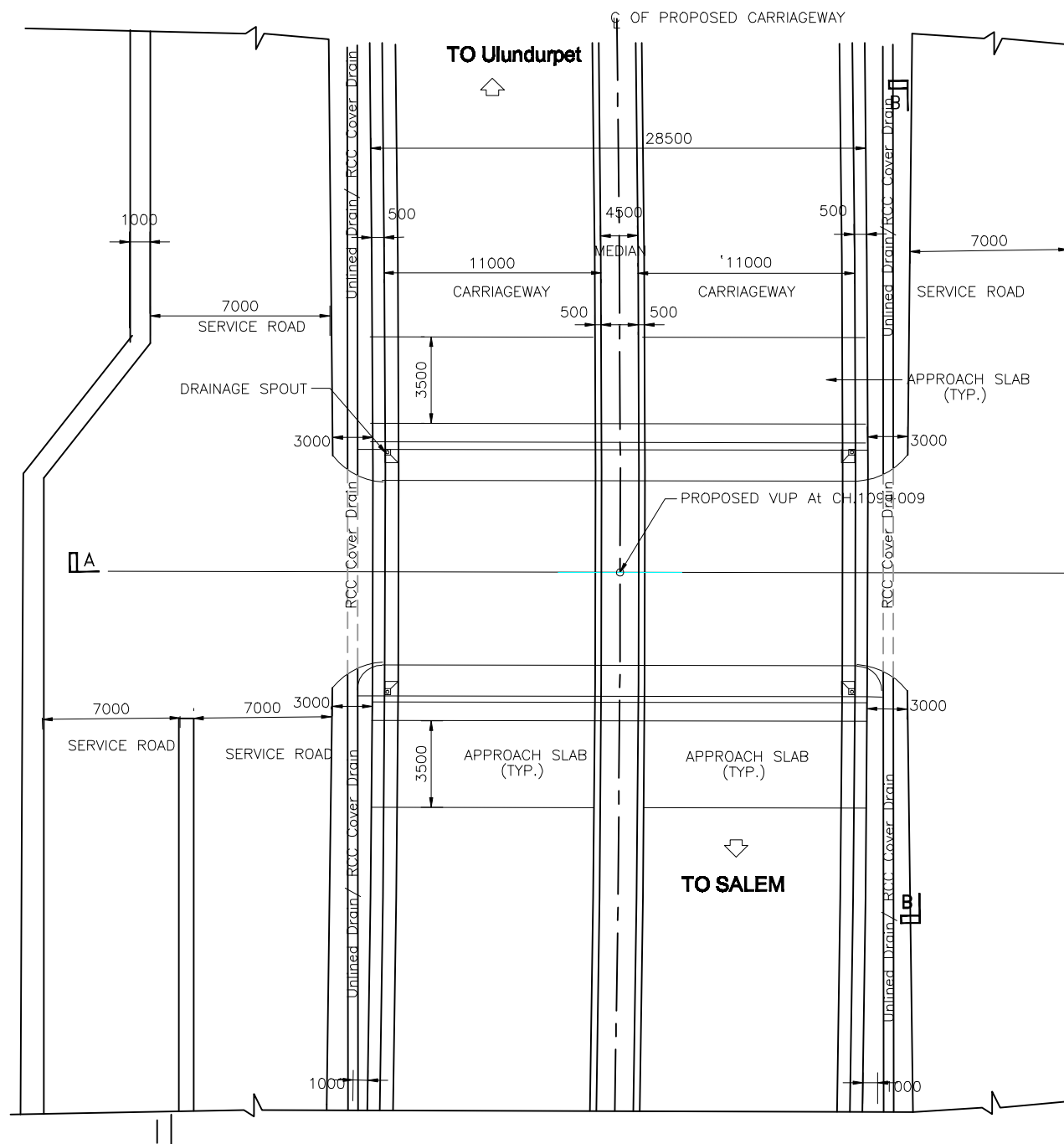


DRAWING SHOWING SIDE ELEVATION OF VUP CUM VUP RE WALL APPROACHES

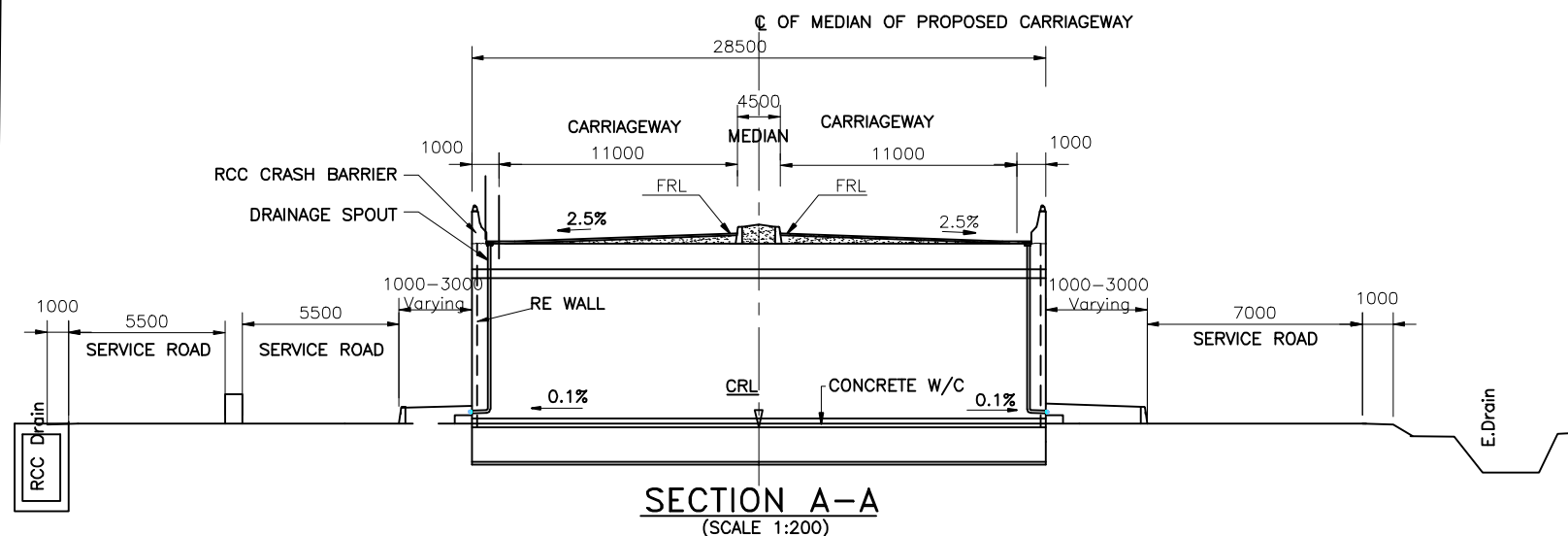
<div>CLIENT:</div> <div></div> <div>NATIONAL HIGHWAY AUTHORITY OF INDIA</div> <div>(Ministry of Road Transport &amp; Highways) Government of India.</div>	<div>INDEPENDANT ENGINEER:</div> <div>SA INFRASTRUCTURE CONSULTANTS PVT LTD</div> <div>IN JOINT VENTURE WITH</div> <div>QUEST ENGINEERS &amp; CONSULTANTS PVT LTD.</div> <div>1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India</div>	<div>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100</div> <div>0 2 4 6 8 10 12 14 16 18 20 -1:50</div>	<div>RE Wall Longitudinal Section</div> <div>TITLE:-</div> <div>SUP at Km. 109+009</div>	<div>PROJECT:</div> <div>Construction of a VUP at Km.109+009 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode</div>
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**PLAN**  
(SCALE 1:200)



## NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR LOCATION OF THE UNDERPASS REFER HIGHWAY DRAWING.
4. THE PROPOSED ADDITIONAL 4-LANE BRIDGE TO BE DESIGNED FOR ONE LANE OF IRC 70R LOADING. OR 2-LANE OF IRC CLASS A.
5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
  - BOX STRUCTURE.....M30
  - CRASH BARRIER.....M40
  - APPROACH SLAB.....M30
6. GRADE OF UNTENSIONED STEEL SHALL BE S-415 CONFORMING TO IS:1786.
7. 65 THICK WEARING COURSE COMPRISING OF 2 LAYERS OF 20mm THICK ASPHALTIC CONCRETE AND 1 LAYER OF 25mm THICK MASTIC ASPHALT.
8. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15 t/m<sup>2</sup>

CLIENT:



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(Ministry of Road Transport & Highways)  
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INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

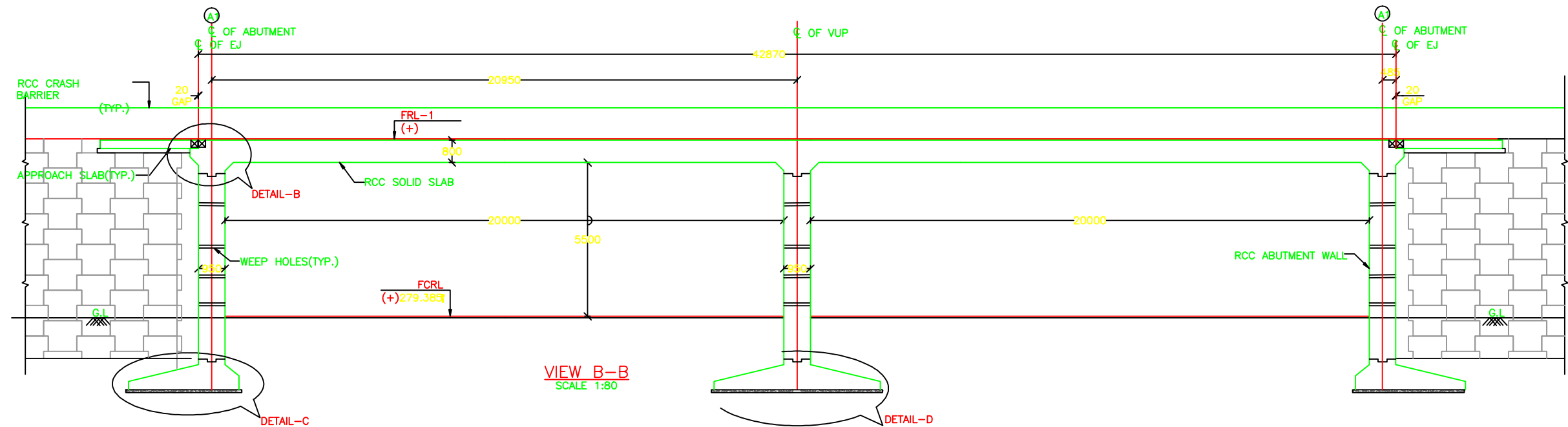
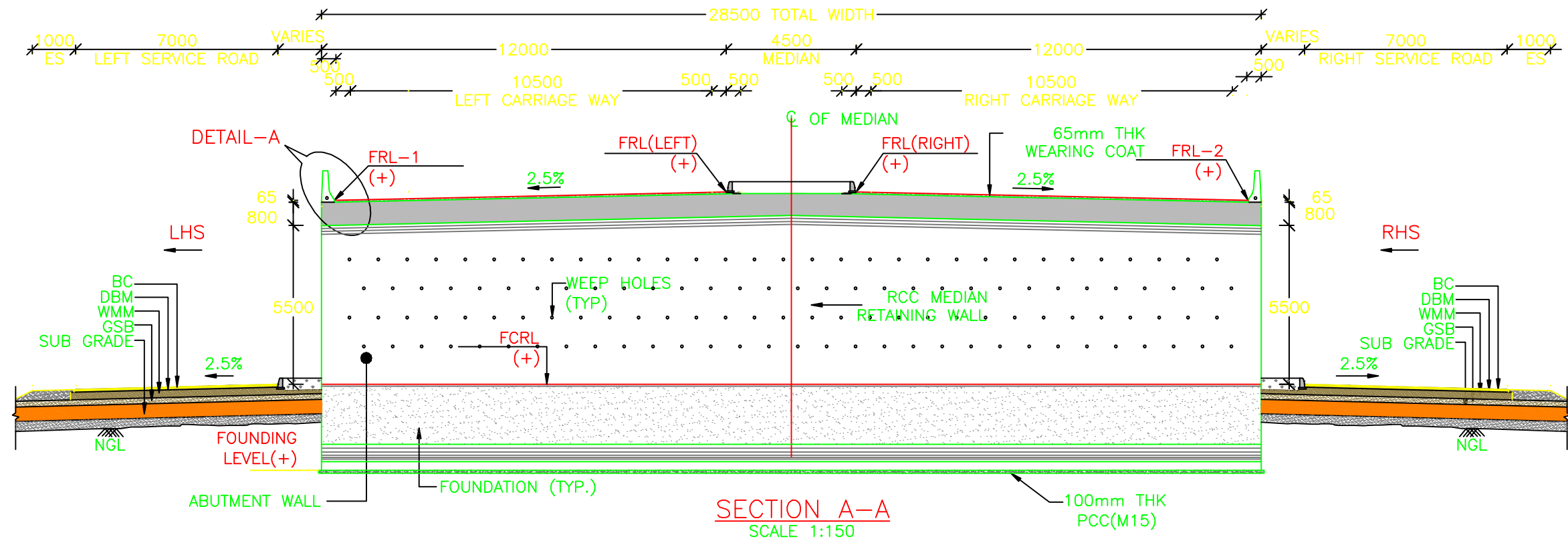
BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100  
0 2 4 6 8 10 12 14 16 18 20 -1:50

**VUP GAD**

**TITLE:- VUP at Km. 109+009**

PROJECT:

Construction of a VUP at Km.109+009 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



CLIENT:

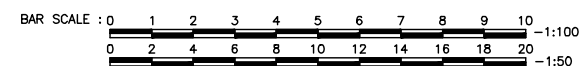


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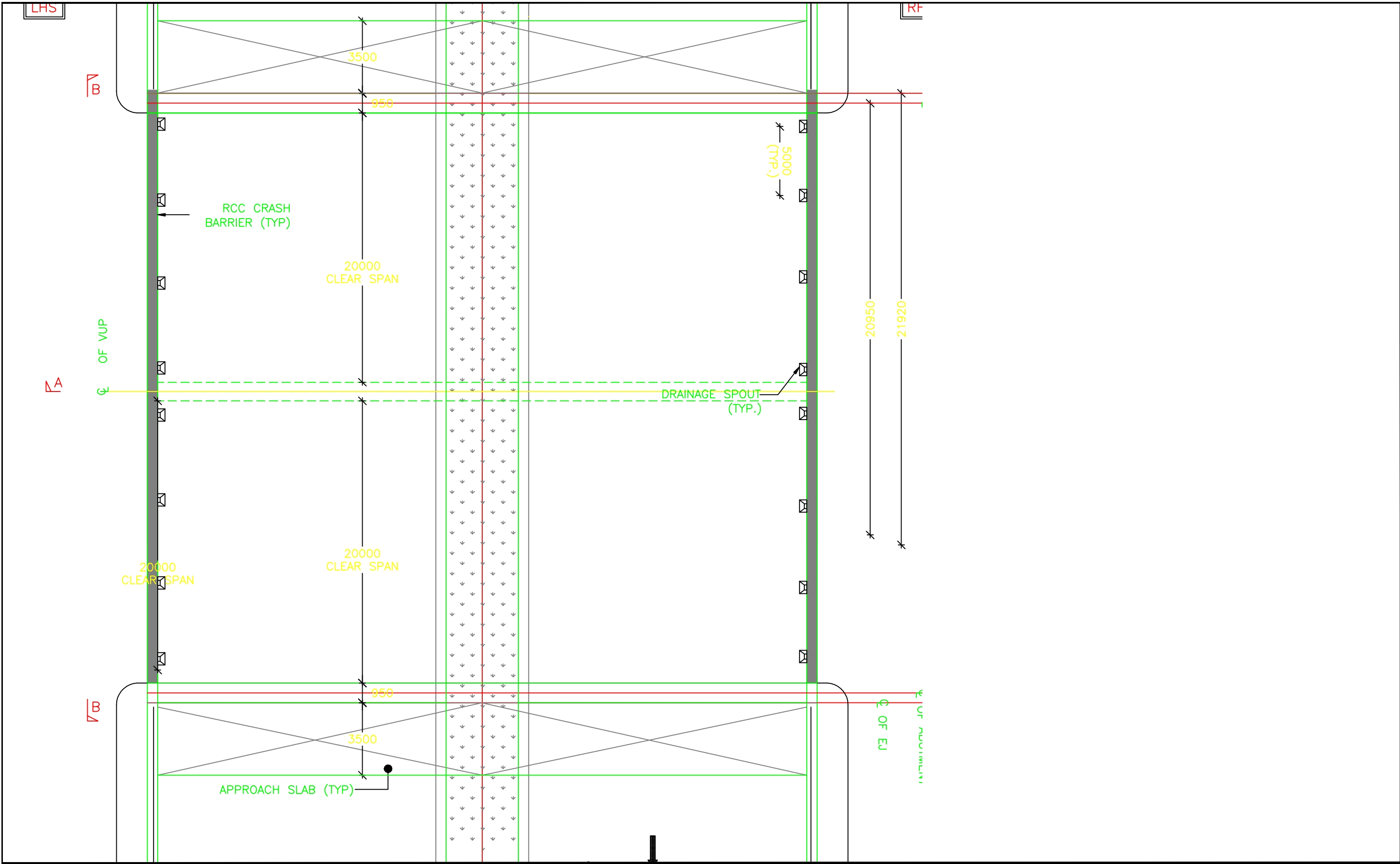


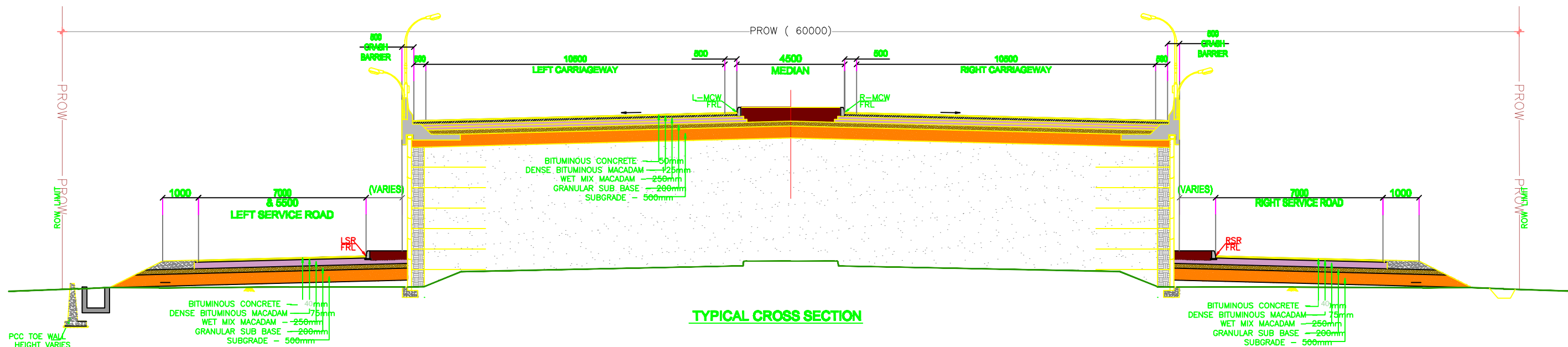
VUP GAD

TITLE:- VUP at Km. 109+009

PROJECT:

Construction of a VUP at Km.109+009 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode





CLIENT:



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**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

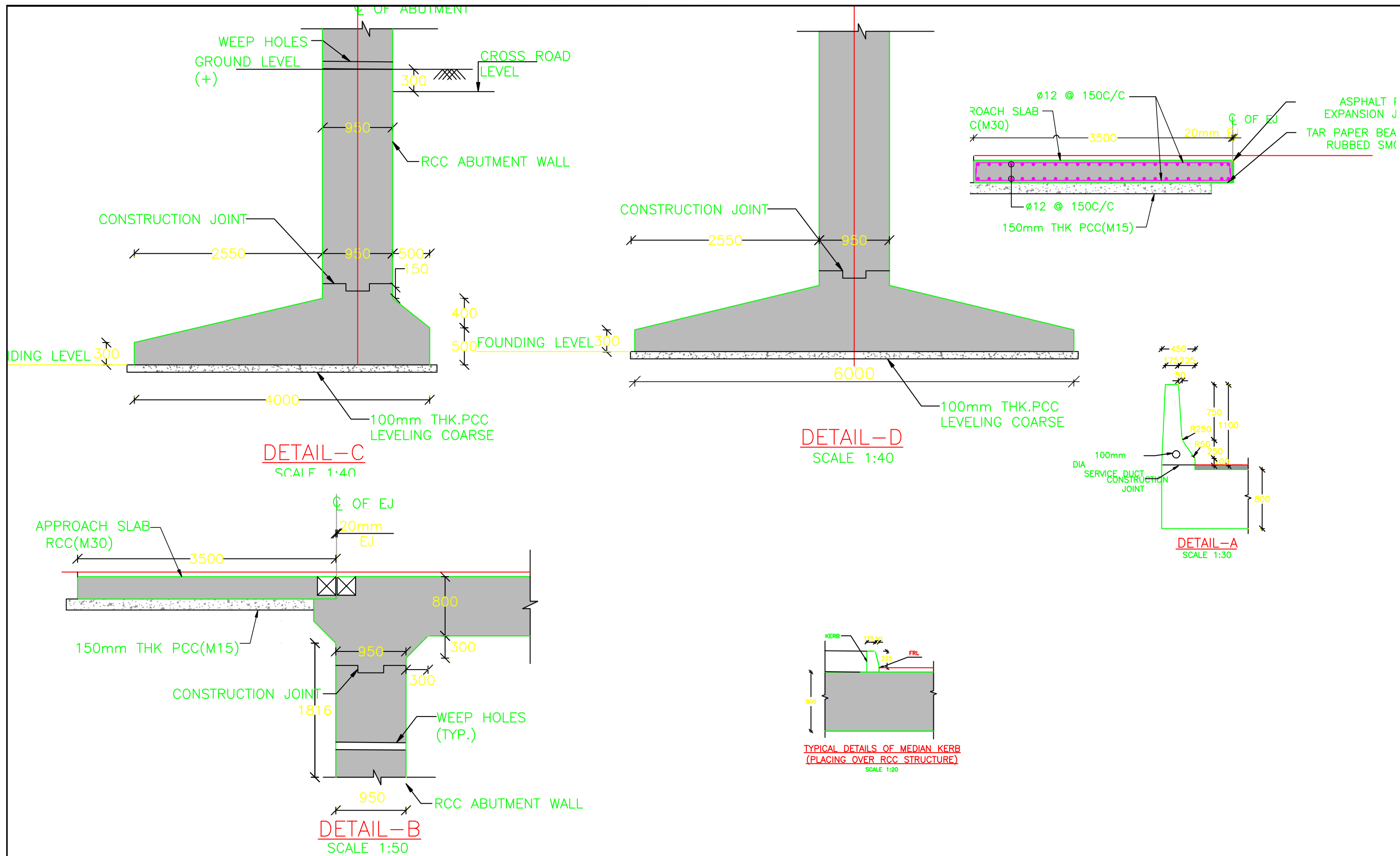
BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 — 1:100  
0 2 4 6 8 10 12 14 16 18 20 — 1:50


VUP GAD

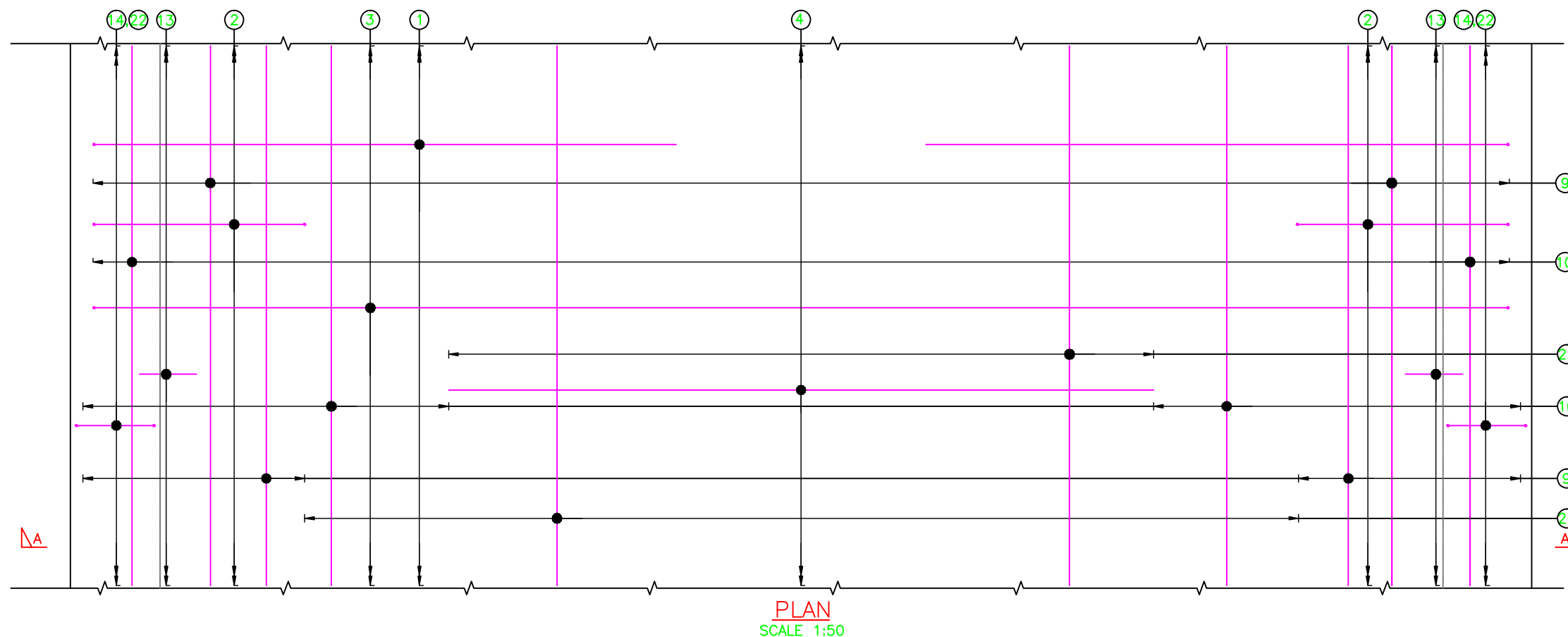
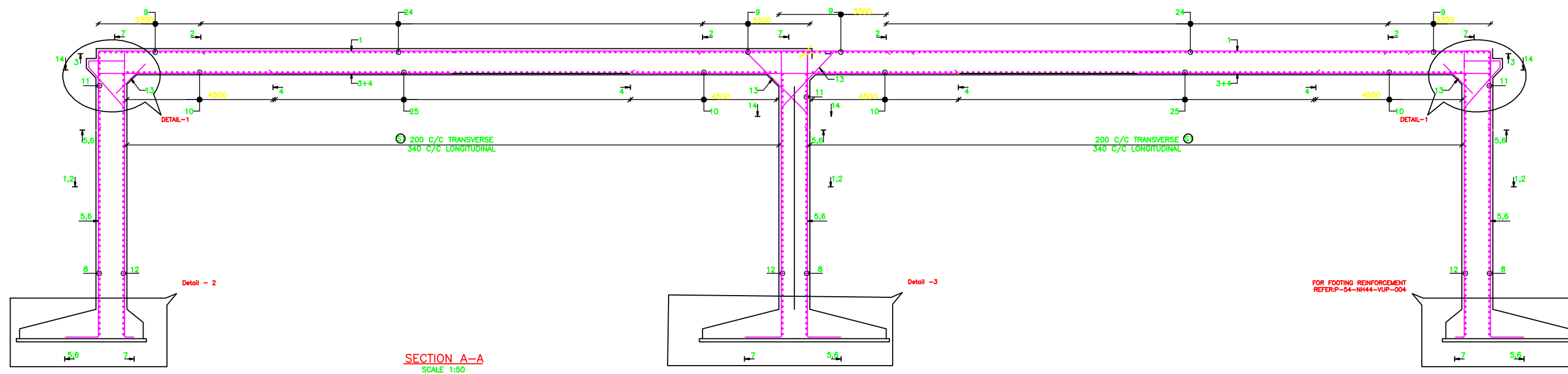
TITLE:- VUP at Km. 109+009

PROJECT:

Construction of a VUP at Km.109+009 for the Access of the New  
Administrative Buildings - Kallakurichi District in the project of Salem -  
Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu  
on EPC mode



<p><b>CLIENT:</b></p>  <p><b>NATIONAL HIGHWAY AUTHORITY OF INDIA</b> (Ministry of Road Transport &amp; Highways) Government of India.</p>	<p><b>INDEPENDANT ENGINEER:</b> SA INFRASTRUCTURE CONSULTANTS PVT LTD IN JOINT VENTURE WITH <b>QUEST ENGINEERS &amp; CONSULTANTS PVT LTD.</b> 1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India</p>	<p>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100 0 2 4 6 8 10 12 14 16 18 20 -1:50</p>	<p><b>VUP GAD</b></p> <p><b>TITLE:-</b> VUP at Km. 109+009</p>	<p><b>PROJECT:</b> Construction of a VUP at Km.109+009 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode</p>
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CLIENT:



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INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
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1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
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Noida - 201 301, India

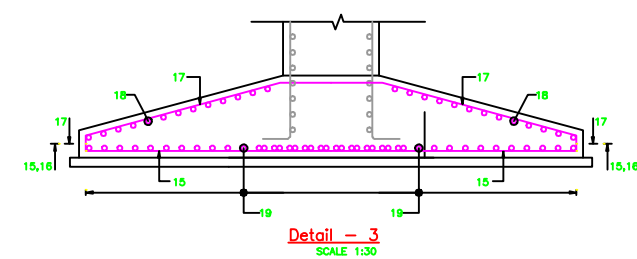
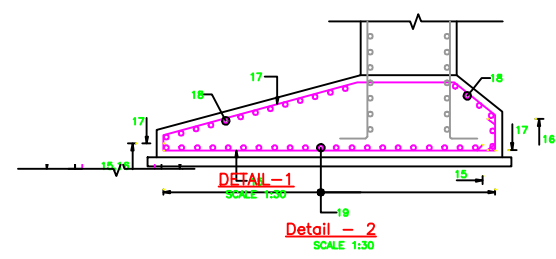
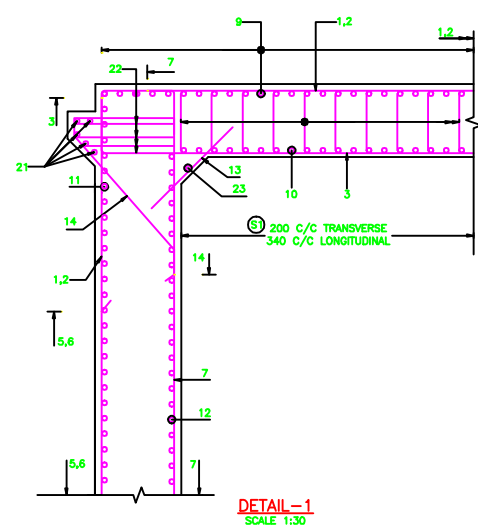
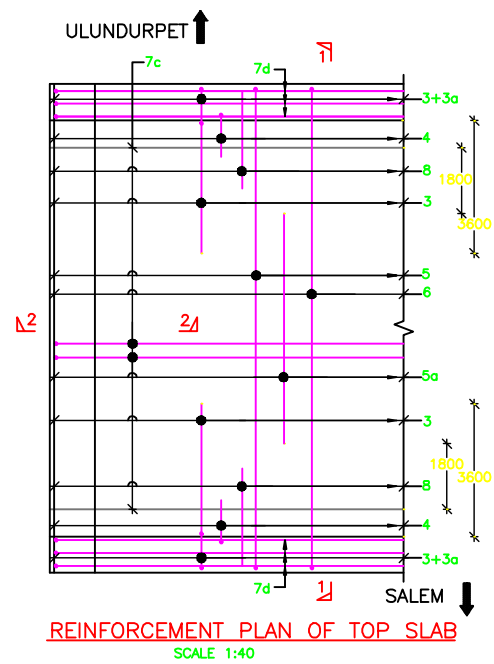
BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100  
0 2 4 6 8 10 12 14 16 18 20 -1:50

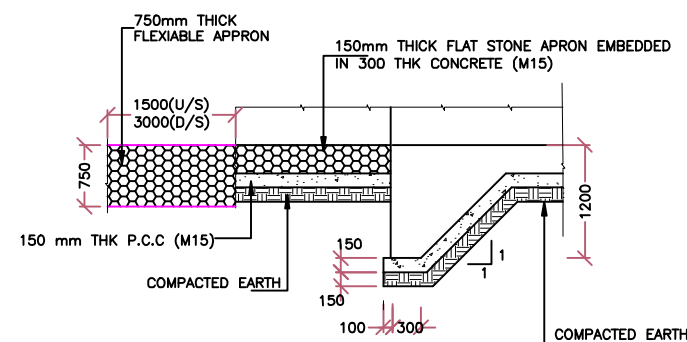
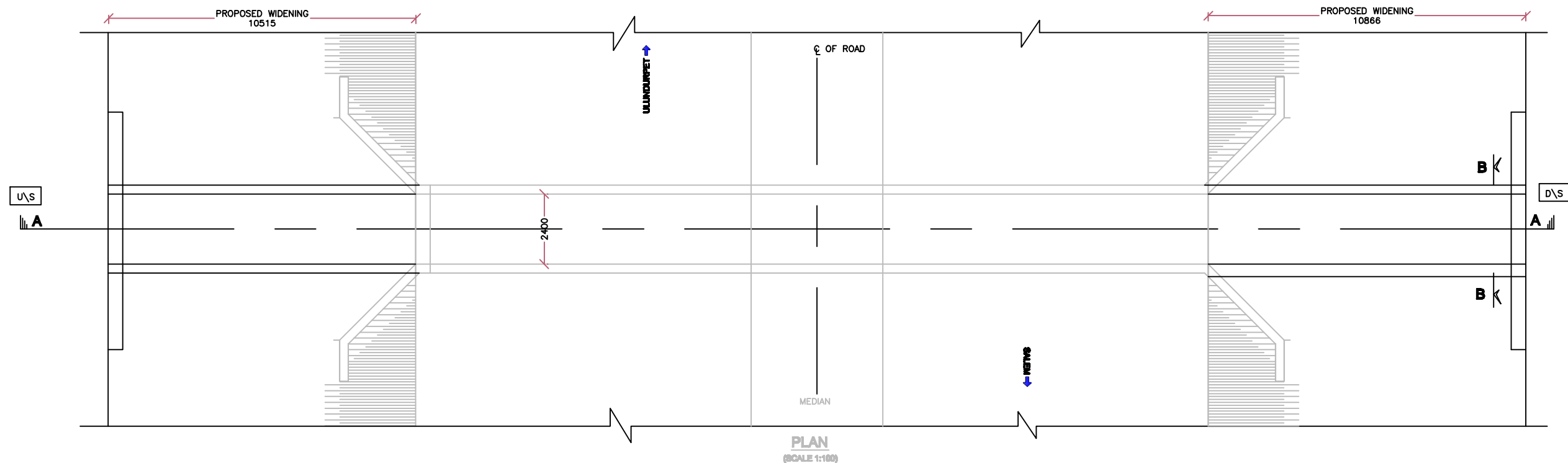
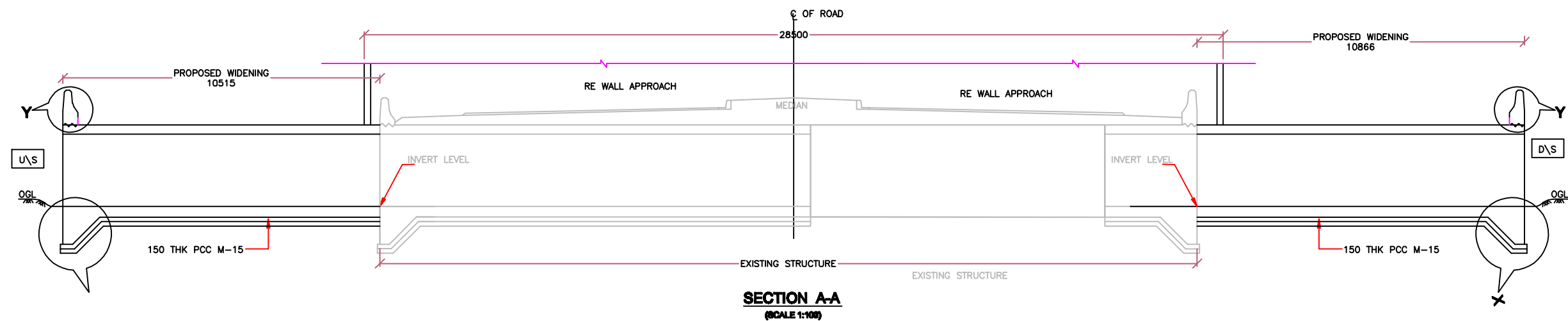
VUP GAD

TITLE:- VUP at Km. 109+009

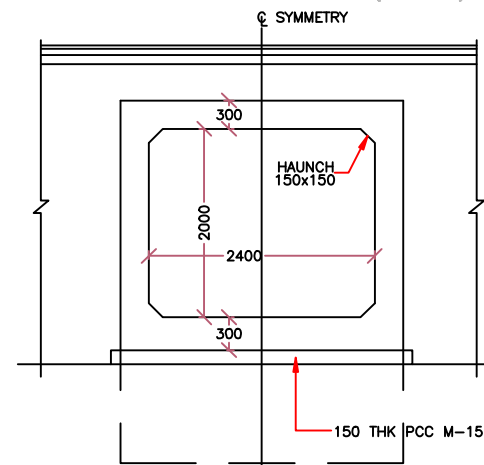
PROJECT:

Construction of a VUP at Km.109+009 for the Access of the New  
Administrative Buildings - Kallakurichi District in the project of Salem -  
Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu  
on EPC mode

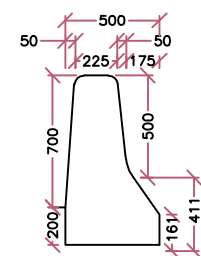




DETAIL AT-X  
(SCALE 1:20)



SECTION B-B  
(SCALE 1:20)



DETAIL -Y  
CRASH BARRIER  
(SCALE 1:20)

**NOTES:-**

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
2. ALL DIMENSIONS ARE SCALED.
3. LOOSE/UNSUTABLE SOIL BELOW BOX CULVERT IS REPLACED WITH SUTABLEGRANULAR MATERIAL AS PER SP-13.
4. CHAINAGE/FORMATION LEVEL IS PROVIDED AS PER APPROVED PLAN & PROFILE DRAWINGS.
5. MINIMUM 'SBC' OF SOIL IS 8 TON/M<sup>2</sup>
6. A CONSTRUCTION JOINT (20MM) IS PROVIDED FOR JOINING THE EXISTING & NEW CULVERT AND FILLED UP BY SHEALTEX BOARD.

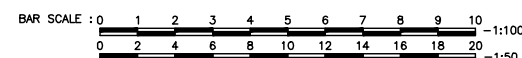
CLIENT:



**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
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INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
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Noida - 201 301, India



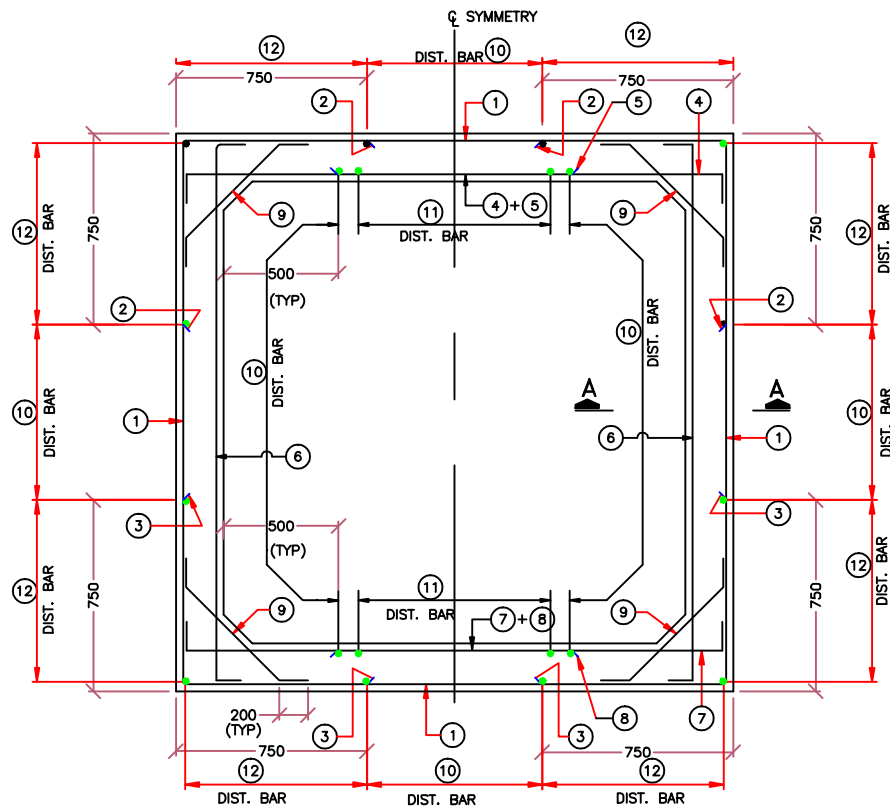
**BOX CULVERT G.A. Drawing**

**TITLE:-** Box at Km. 109+140

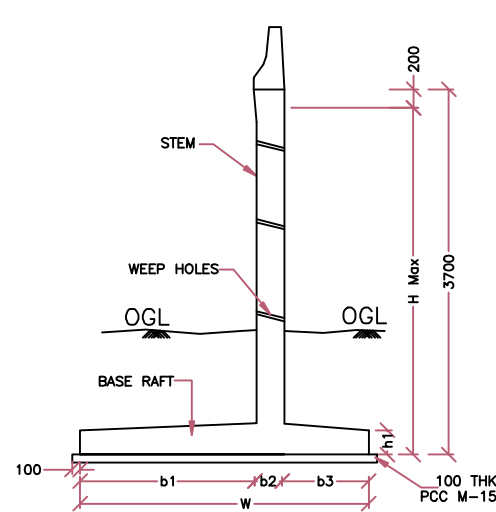
FROM:

Construction of a SVUP (7m x 4.6m) at Km 109+784 & VUP at Km.109+000 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-66) in the State of Tamil Nadu on EPC mode

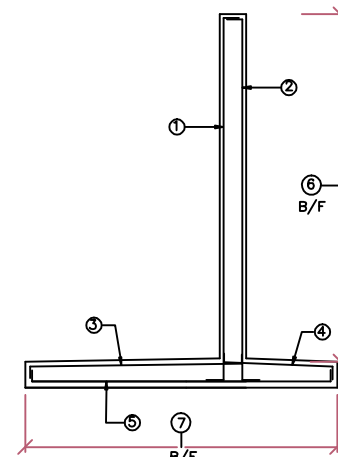




**REINFORCEMENT DETAILS**  
(SCALE 1:25)



**CROSS SECTION**  
(SCALE 1:50)



**REINFORCEMENT DETAILS**  
**CATEGORY- D**  
(SCALE 1:50)

**DIMENSIONAL DETAILS**

Category	H max	W	h1	h2	b1	b2	b3
Category-D	3600	2800	300	100	1800	300	700

**REINFORCEMENT DETAILS**

Bar No.	①	②	③	④	⑤	⑥	⑦
Bar Shape							
Category-D	20# @ 170/c	10# @ 200/c	12# @ 100/c	10# @ 200/c	10# @ 130/c	10# @ 200/c	10# @ 200/c

**NOTES FOR WING WALL:-**

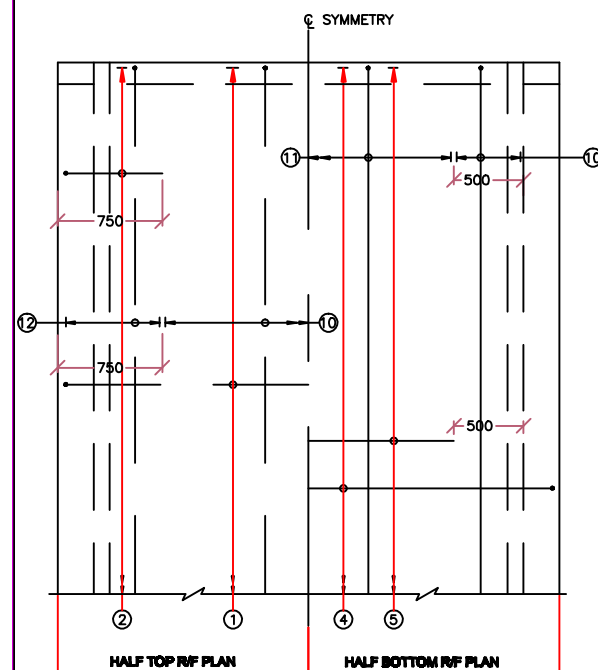
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- LAPPING IS STAGGERED AND NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION .MINIMUM LAP LENGTH IS 30 TIMES DIA OF BAR FOR BAR MARK 9 & 10 AND 72 TIMES DIA OF BAR FOR OTHER BARS.
- WEEP HOLES ARE PROVIDED STARTING 150MM ABOVE GROUND LEVEL, AND SPACED 1000MM C/C ON STAGGERED DIRECTION. SLOPE OF 1:20 IS PROVIDED TOWARDS THE DRAINING FACE.
- 600MM THICK FILTER MEDIA IS PROVIDED BEHIND RETAINING WALL UP TO TOP OF EMBANKMENT.

**REINFORCEMENT DETAILS :-**

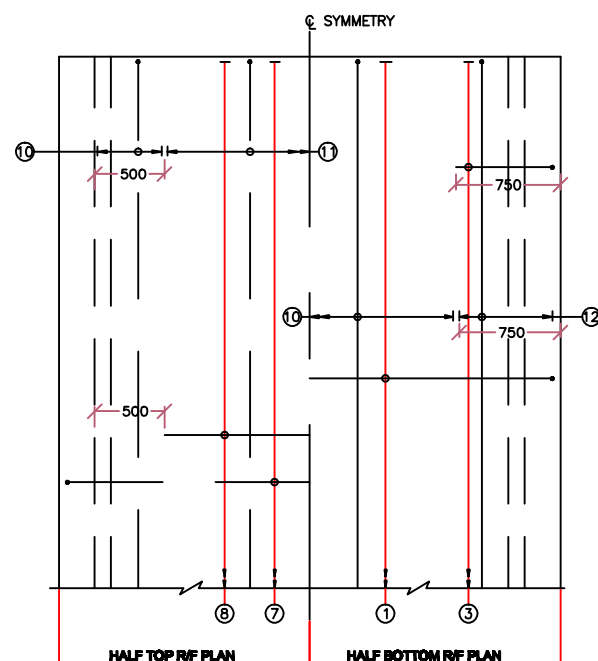
BAR MKD.	BAR DIA.	SPACING	SHAPE
1	12	200 C/C	
2	12	200 C/C	
3	12	200 C/C	
4	12	200 C/C	
5	12	200 C/C	
6	12	200 C/C	
7	12	200 C/C	
8	10	200 C/C	
9	10	200 C/C	
10	10	300 C/C	
11	10	200 C/C	
12	10	200 C/C	

**NOTES FOR BOX:-**

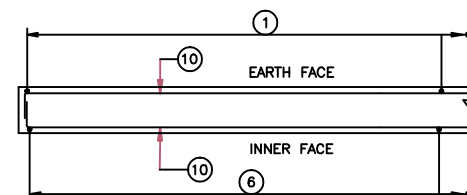
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- GRADE OF REINFORCEMENT STEEL IS HYSD BARS CONFORMING TO IS 1786 WITH Fe 415
- NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION AND LAPPING IS STAGGERED LAP LENGTH = 72 X DIA. OF THE BAR FOR MAIN & 30 TIMES DIA OF BAR FOR DISTRIBUTION BARS (BAR MARKED ⑩, ⑪, ⑫)



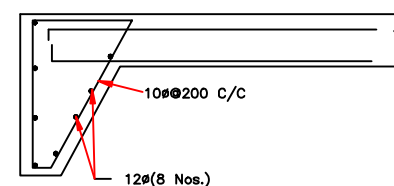
**TOP SLAB R/F PLAN**  
(SCALE 1:25)



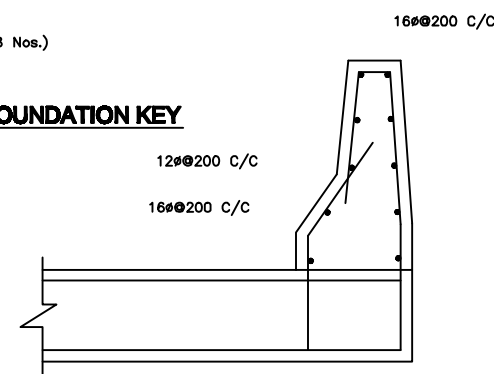
**BOTTOM SLAB R/F PLAN**  
(SCALE 1:25)



**SECTION A-A**



**DETAIL OF FOUNDATION KEY**



**DETAIL OF CRASH BARRIER**

CLIENT:

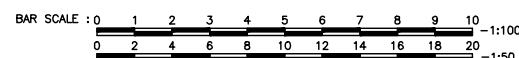


**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
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CONSTRUCTION CONTRACTOR:

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India



**BOX CULVERT REINFORCEMENT DRG**

**TITLE:-** Box at Km. 109+140

FROM:

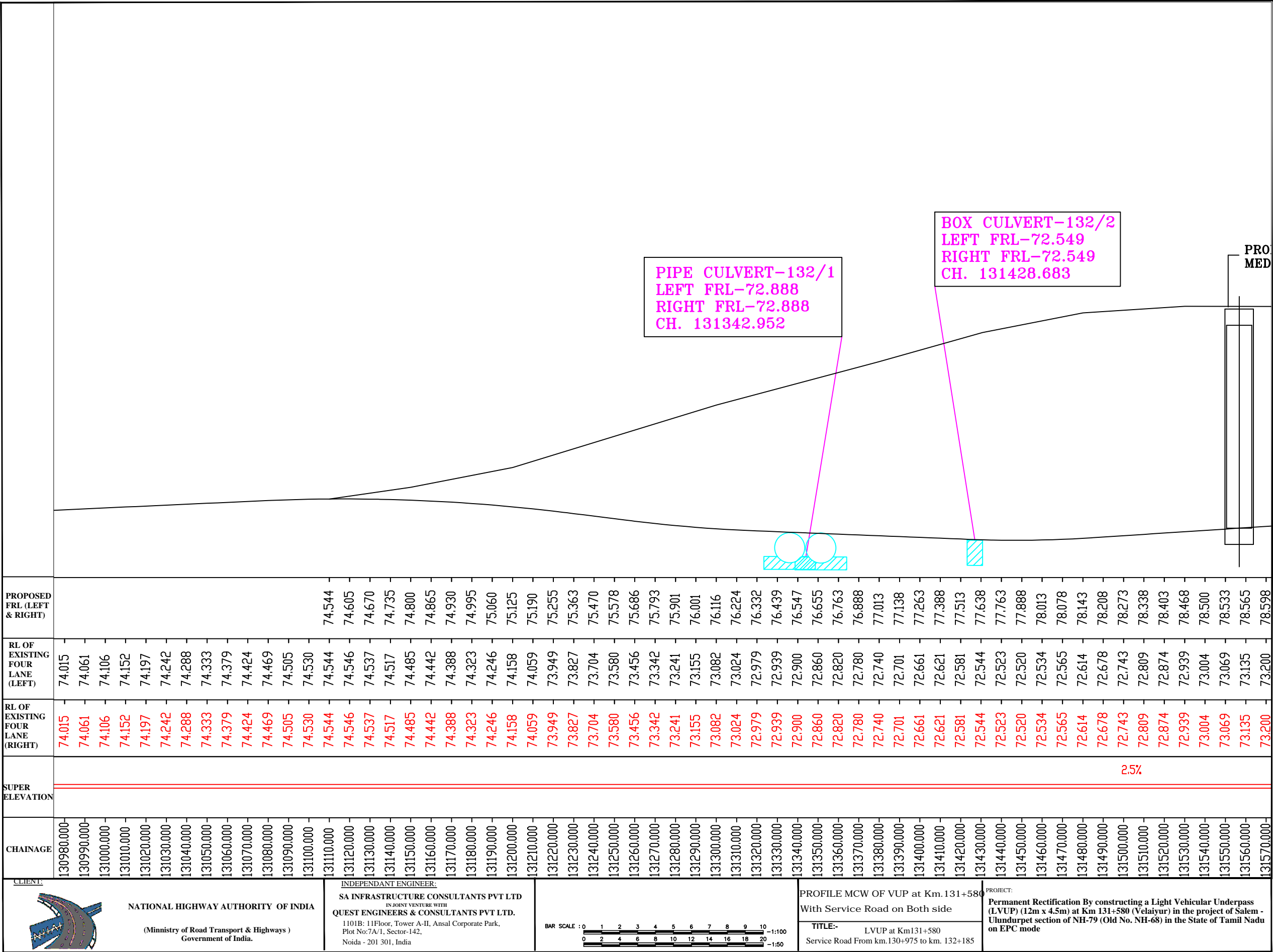
Construction of a SVUP (7m x4.6m) at Km 109+784 & VUP at Km.109+000 for the Access of the New Administrative Buildings - Kallakurichi District in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-66) in the State of Tamil Nadu on EPC mode

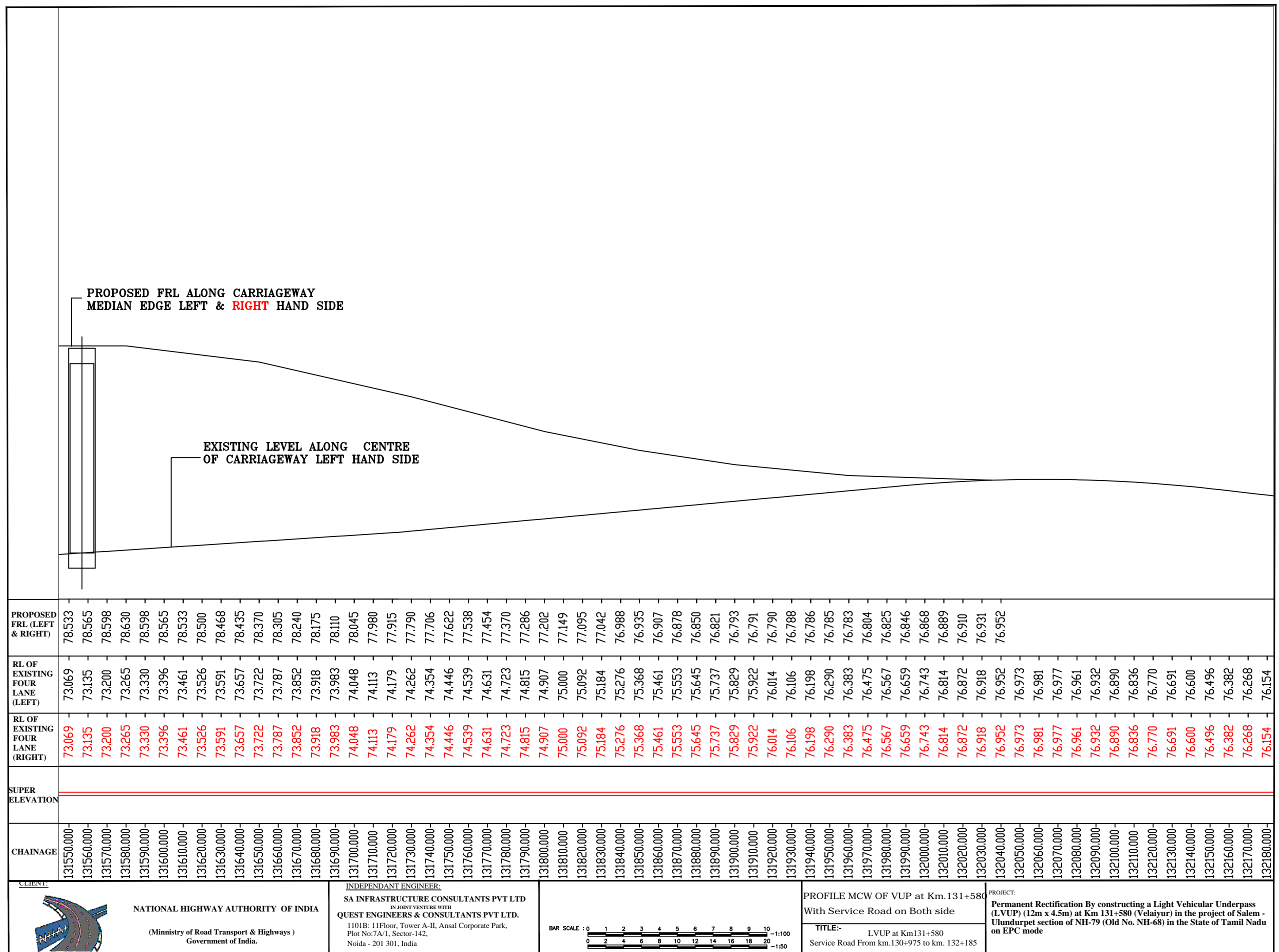
# DRAWINGS

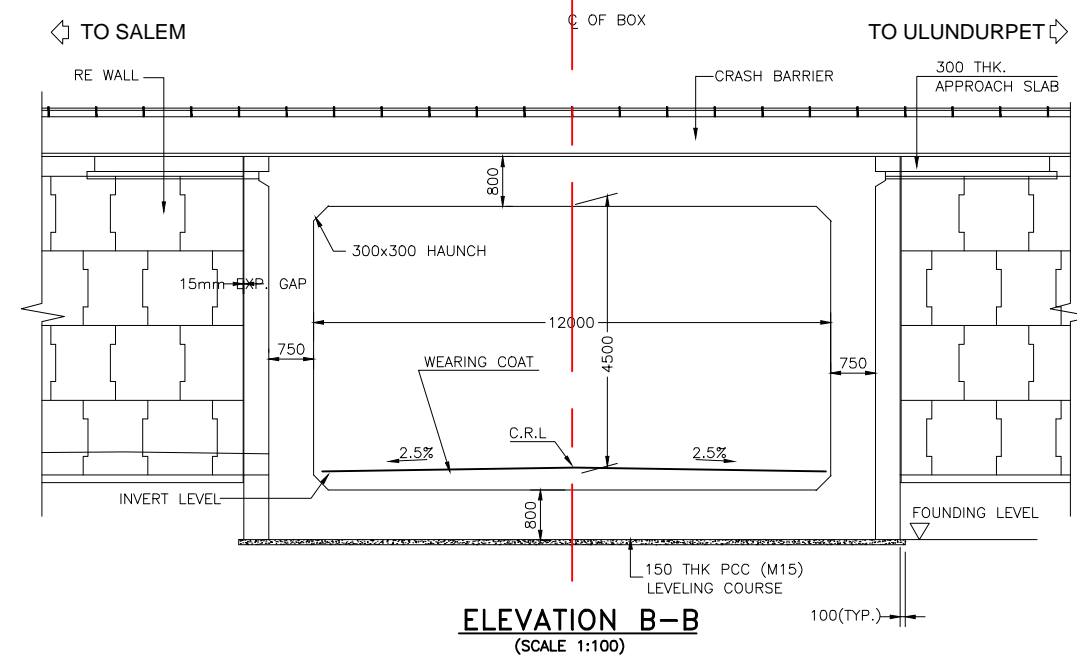
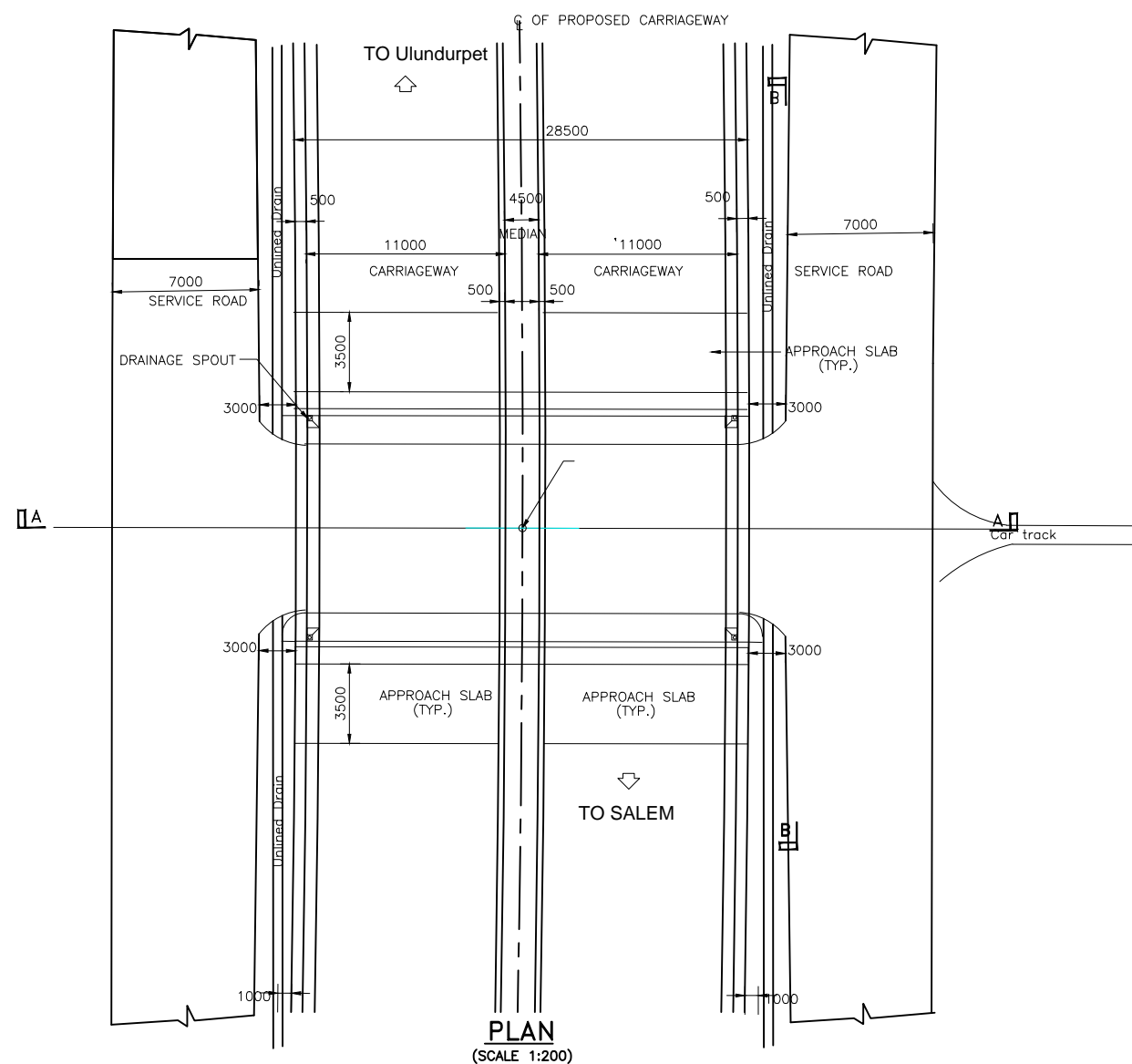
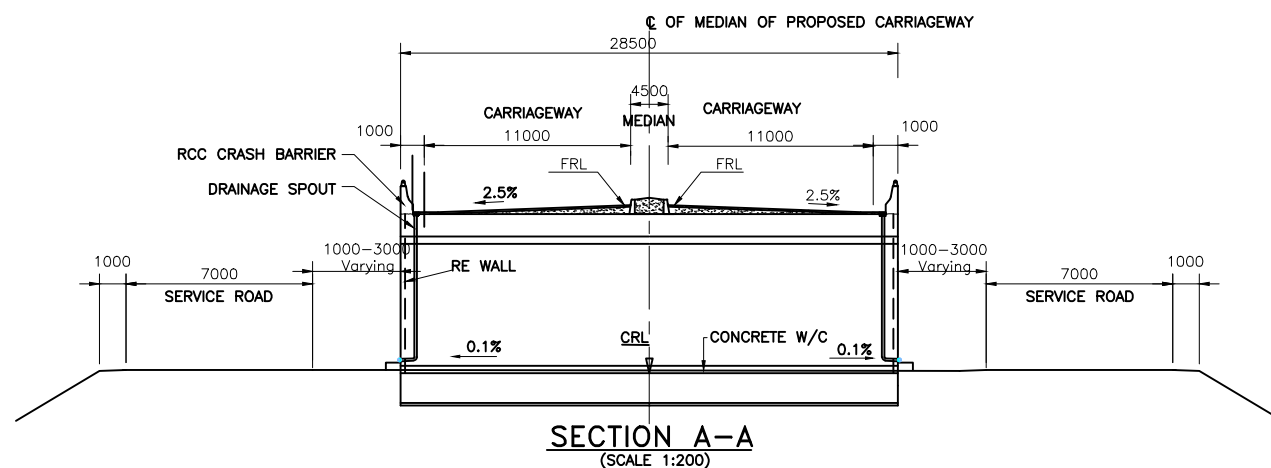
## Salem to Ulunderpet Section of NH-79

4. Vellaiyur@ Km 131+580









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5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
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  - CRASH BARRIER.....M40
  - APPROACH SLAB.....M30
6. GRADE OF UNTENSIONED STEEL SHALL BE S-415 CONFORMING TO IS:1786.
7. 65 THICK WEARING COURSE COMPRISING OF 2 LAYERS OF 20mm THICK ASPHALTIC CONCRETE AND 1 LAYER OF 25mm THICK MASTIC ASPHALT.
8. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15 t/m<sup>2</sup>

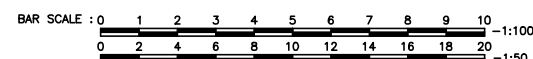
CLIENT:



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Government of India.

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India



General Arrangement Drawing.  
LVUP at Km.131+580

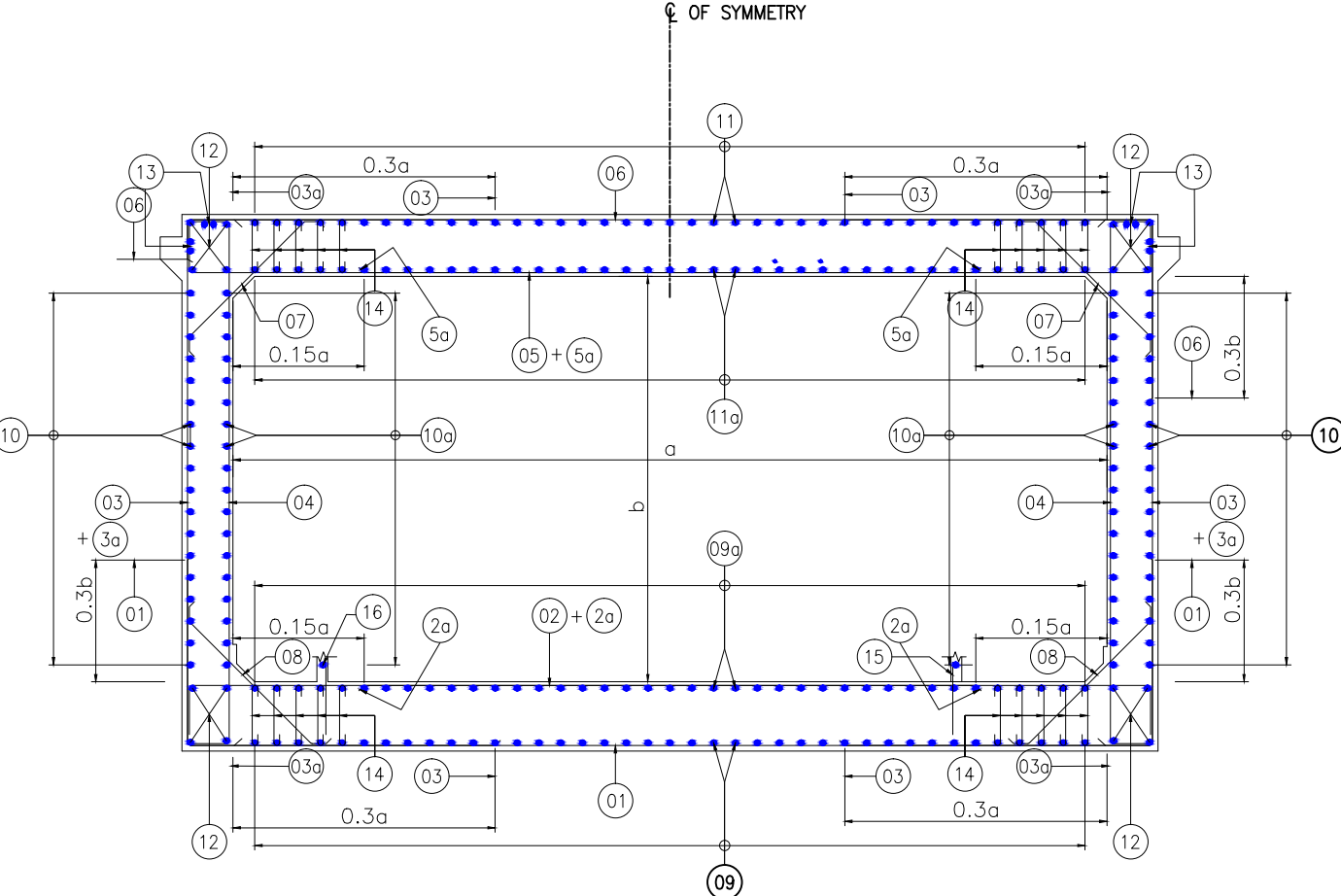
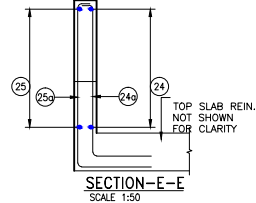
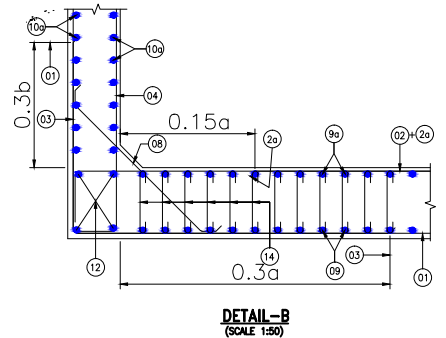
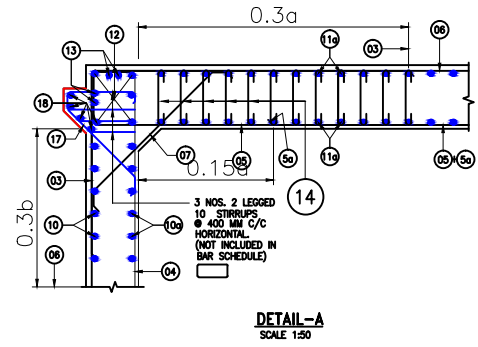
**TITLE:-** LVUP at Km.131+580  
(From km.131+200 to km.131+960)

PROJECT:

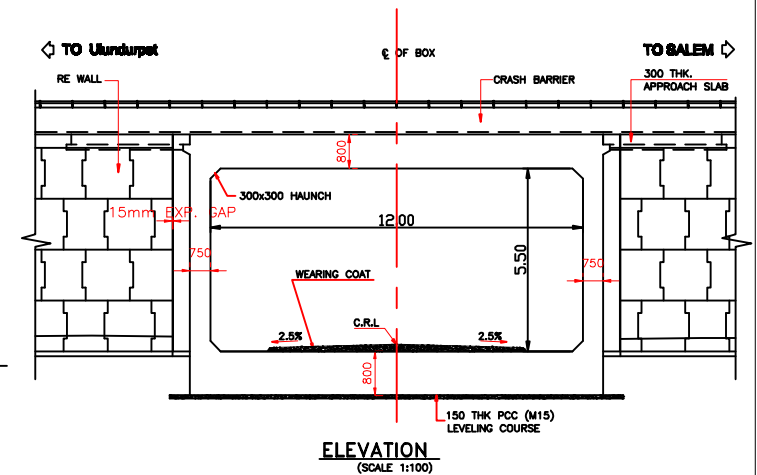
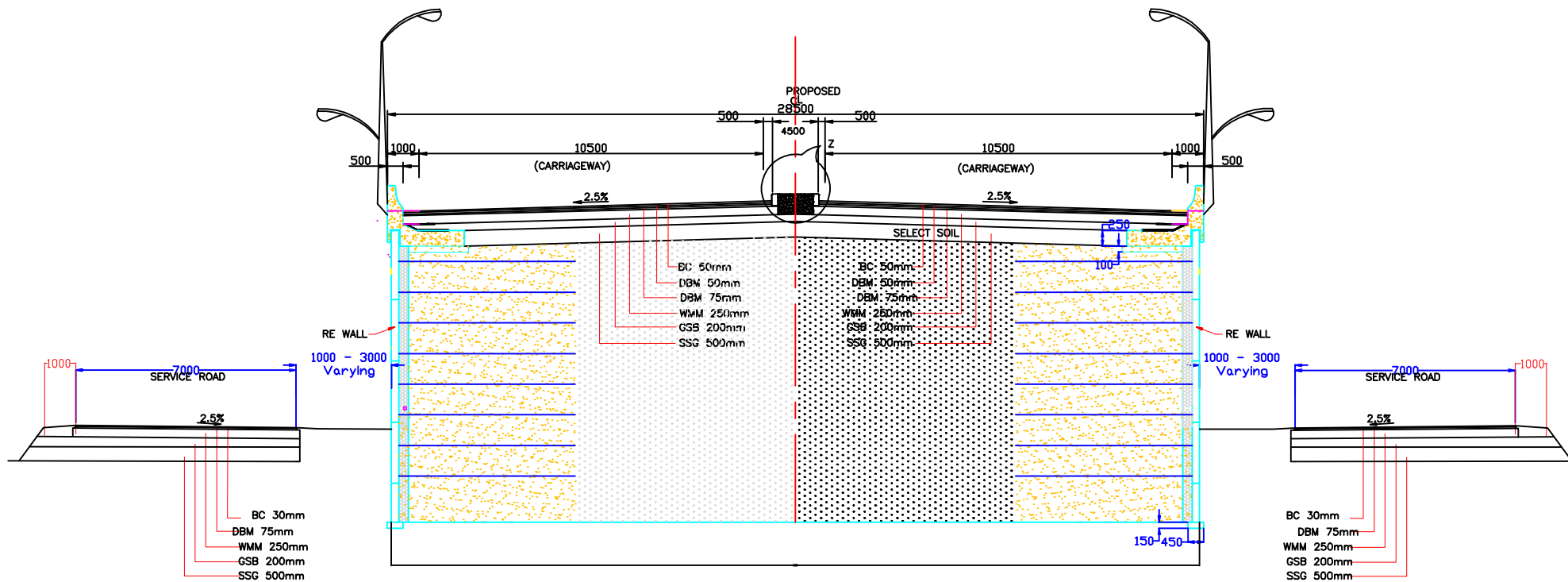
**Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velaipur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**



REINFORCEMENT DETAILS OF PROPOSED LVUP AT KM 131+580



SCHEDULE OF REINFORCEMENT			
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING IN mm /NOS
01		20	200
02		25	200
03		25	200
04		20	200
05		25	200
06		20	200
07		20	200
08		20	200
09		20	200
10		20	200
11		20	200
12		20	200
13		20	200
14		20	200
15		20	200
16		20	200
17		20	200
18		20	200
19		20	200
20		20	200
21		20	200
22		20	200
23		20	200
24		20	200
25		20	200
26		20	200
27		20	200
28		20	200
29		20	200
30		20	200
31		20	200
32		20	200
33		20	200
34		20	200
35		20	200
36		20	200
37		20	200
38		20	200
39		20	200
40		20	200
41		20	200
42		20	200
43		20	200
44		20	200
45		20	200
46		20	200
47		20	200
48		20	200
49		20	200
50		20	200
51		20	200
52		20	200
53		20	200
54		20	200
55		20	200
56		20	200
57		20	200
58		20	200
59		20	200
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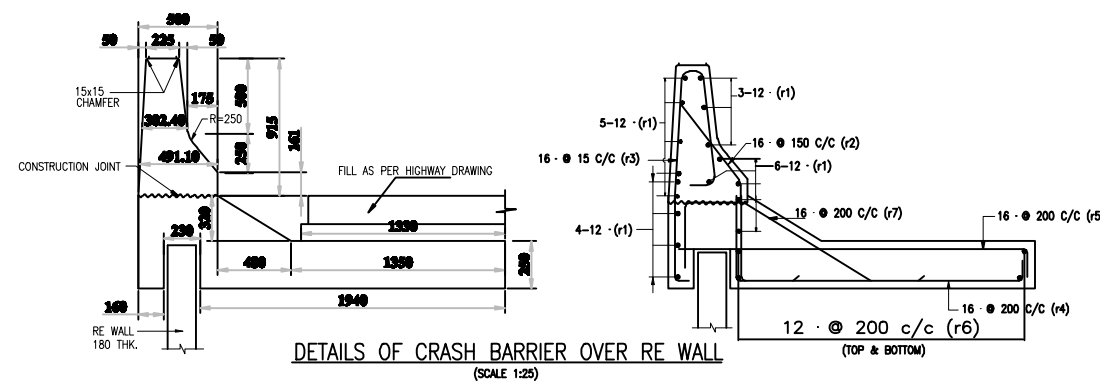
**TYPICAL CROSS SECTION FOR SIX LANE LIGHT VEHICULAR UNDERPASS AT KM 131+500**

**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR LOCATION OF THE UNDERPASS REFER HIGHWAY DRAWING.
4. THE PROPOSED ADDITIONAL 4-LANE BRIDGE TO BE DESIGNED FOR ONE LANE OF IRC 70R LOADING, OR 2-LANE OF IRC CLASS A.
5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:  
• BOX STRUCTURE.....M30  
• CRASH BARRIER.....M40  
• APPROACH SLAB.....M30
6. GRADE OF UNTENSIONED STEEL SHALL BE S-415 CONFORMING TO IS:1786.
7. 62 THICK WEARING COURSE MASTIC ASPHALT.
8. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15 t/m<sup>2</sup>

**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR LOCATION OF THE UNDERPASS REFER HIGHWAY DRAWING.
4. THE PROPOSED ADDITIONAL 4-LANE BRIDGE TO BE DESIGNED FOR ONE LANE OF IRC 70R LOADING, OR 2-LANE OF IRC CLASS A.
5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:  
• BOX STRUCTURE.....M30  
• CRASH BARRIER.....M40  
• APPROACH SLAB.....M30
6. GRADE OF UNTENSIONED STEEL SHALL BE S-415 CONFORMING TO IS:1786.
7. 62 THICK WEARING COURSE MASTIC ASPHALT.
8. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15 t/m<sup>2</sup>



**DETAILS OF CRASH BARRIER OVER RE WALL**  
(SCALE 1:25)

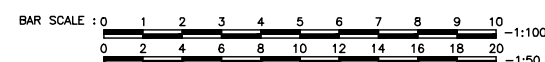
CLIENT:



**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India



**Typ. C-Section of RE wall Org.**  
**LVUP at Km.131+500**

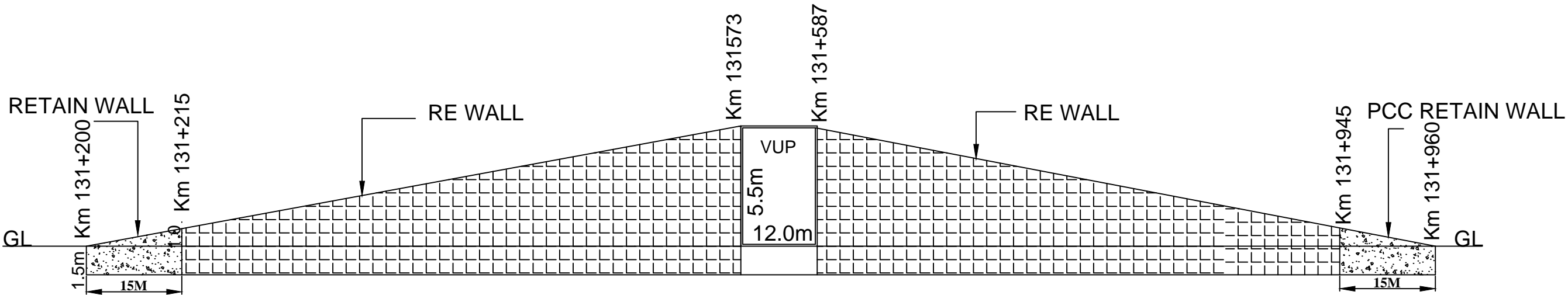
**TITLE:-**  
**LVUP at Km.131+500**  
**(RE wall From km.131+200 to km.131+960)**


PROJECT:

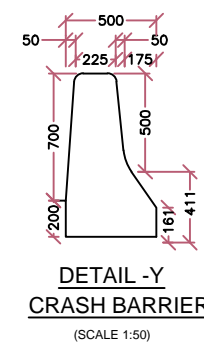
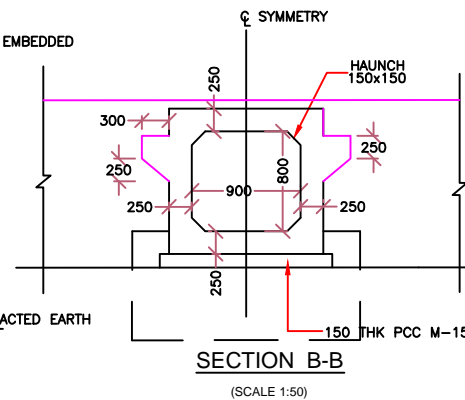
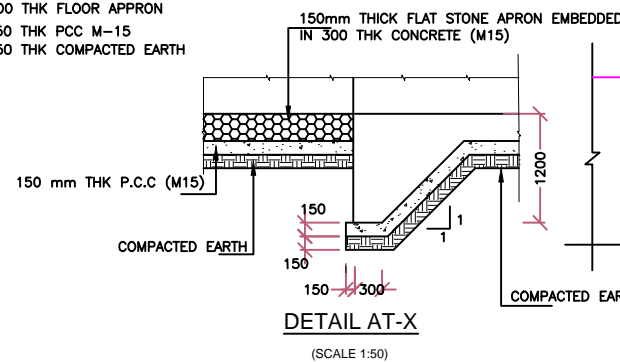
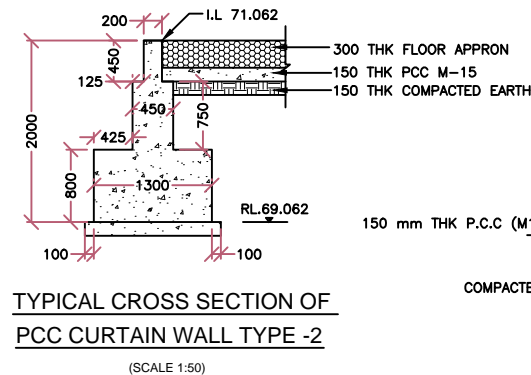
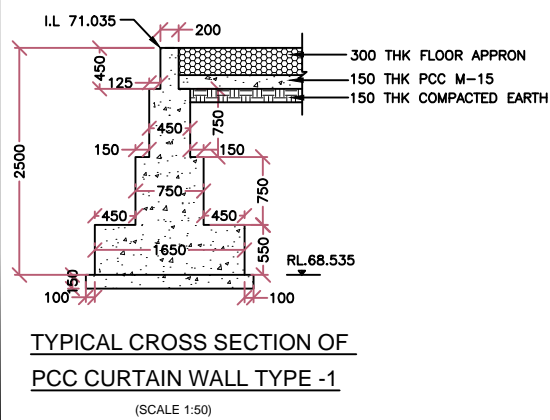
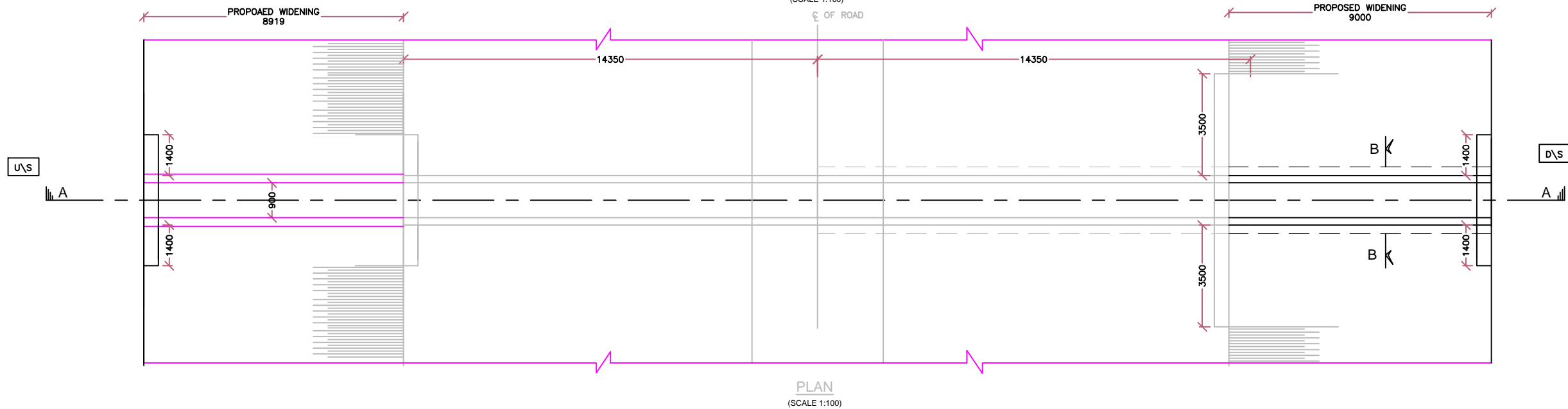
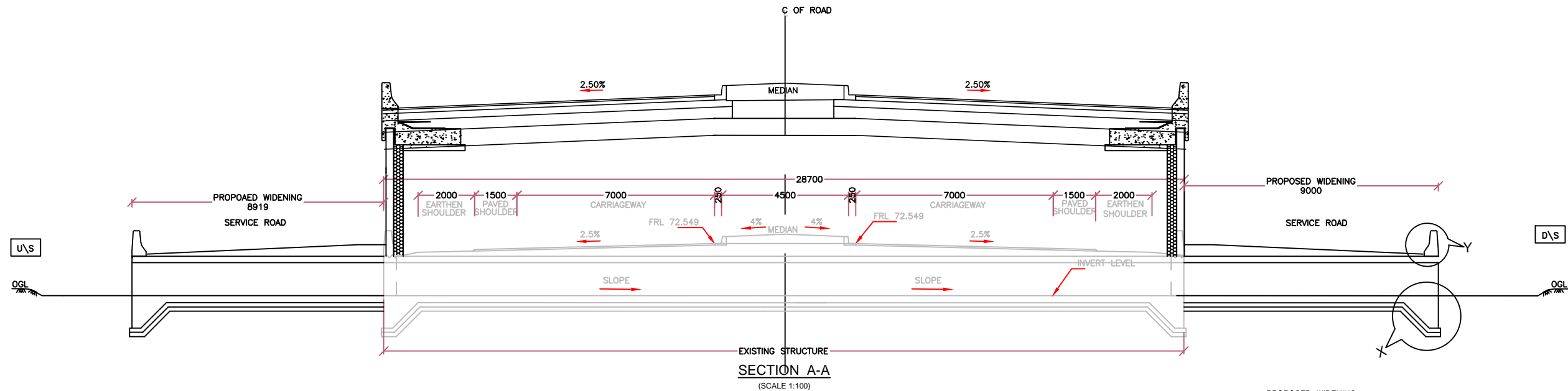
**Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+500 (Velatyar) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**



DRAWING SHOWING SIDE ELEVATION OF VUP RE WALL APPROACHES



<p>CLIENT:</p>  <p>NATIONAL HIGHWAY AUTHORITY OF INDIA (Ministry of Road Transport &amp; Highways ) Government of India.</p>	<p>INDEPENDANT ENGINEER:</p> <p>SA INFRASTRUCTURE CONSULTANTS PVT LTD IN JOINT VENTURE WITH QUEST ENGINEERS &amp; CONSULTANTS PVT LTD. 1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India</p>	<p>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100 0 2 4 6 8 10 12 14 16 18 20 -1:50</p>	<p>RE WALL ELEVATION DRAWING. LVUP at Km.131+580</p> <p>TITLE:- LVUP at Km.131+580 (From km.131+200 to km.131+9600)</p>	<p>PROJECT:</p> <p>Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velaiyur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode</p>
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NET CUSSION AT END OF UNPAVED SHOULDER	
LEFT SIDE (MM)	RIGHT SIDE (MM)
148	180

- NOTES:-
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
  - ALL DIMENSIONS ARE SCALED.
  - LOOSE/UNSTABLE SOIL BELOW BOX CULVERT IS REPLACED WITH SUITABLE GRANULAR MATERIAL AS PER SP-13.
  - CHAINAGE/FORMATION LEVEL IS PROVIDED AS PER APPROVED PLAN & PROFILE DRAWINGS.
  - MINIMUM 'SBC' OF SOIL IS 8 TON/M<sup>2</sup>.
  - A CONSTRUCTION JOINT (20MM) IS PROVIDED FOR JOINING THE EXISTING & NEW CULVERT AND FILLED UP BY SHEALTEX BOARD.

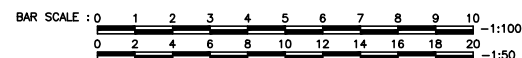
CLIENT:



**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B, 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

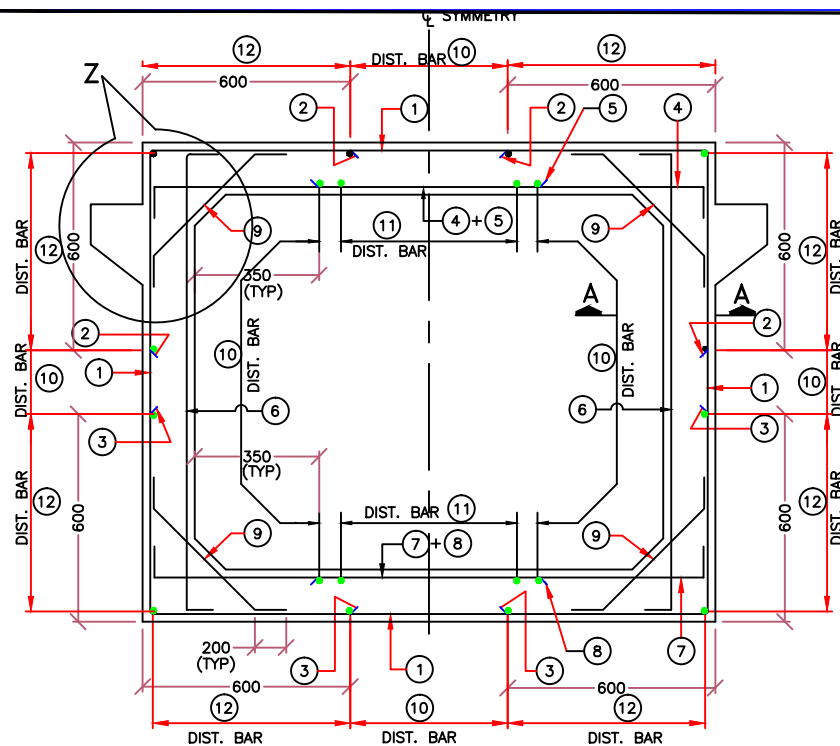


BOX CULVERT DRAWING

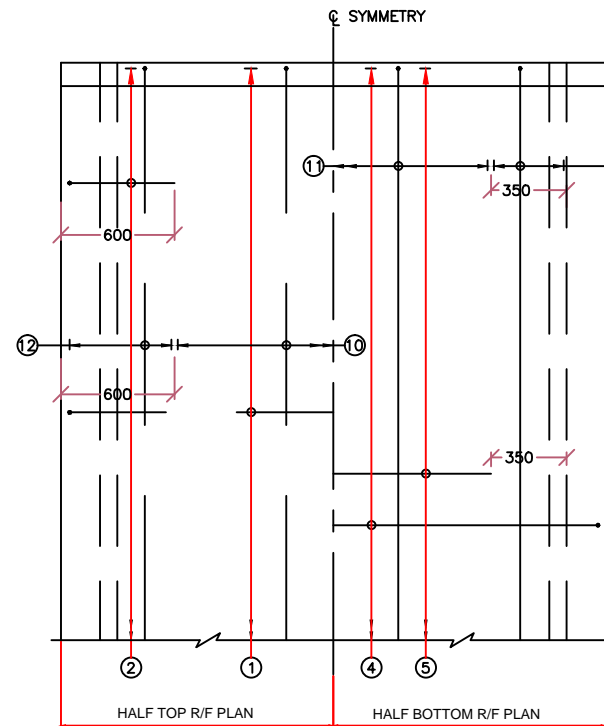
TITLE:-  
box Culvert Widening at Km131+428

PROJECT:

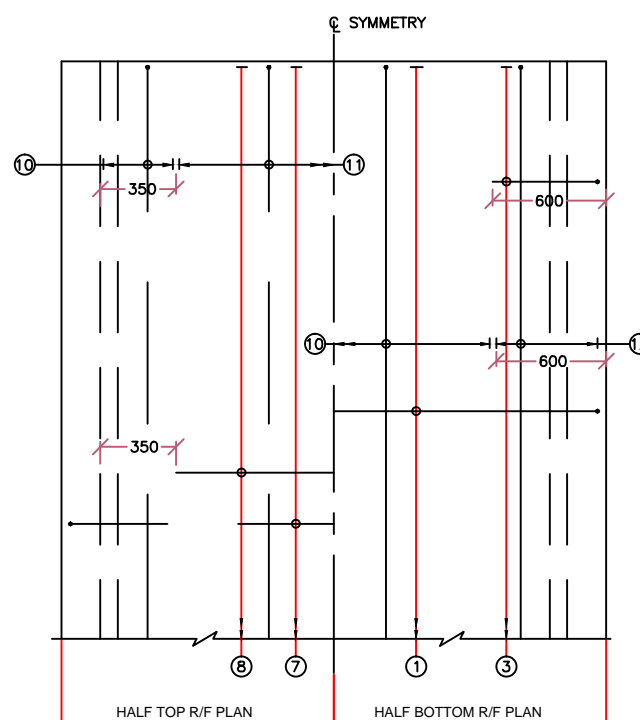
Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velaiyur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



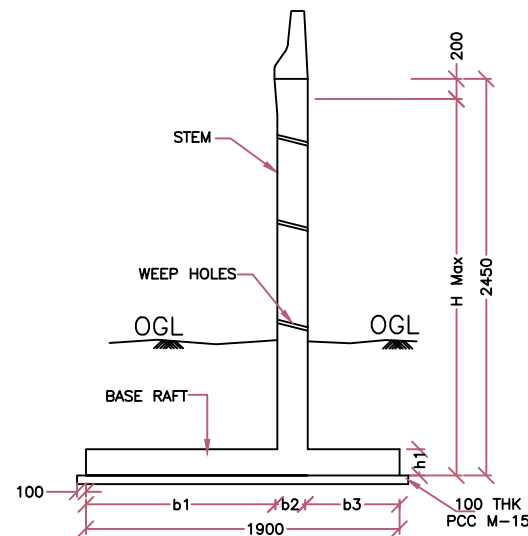
REINFORCEMENT DETAILS  
(SCALE 1:25)



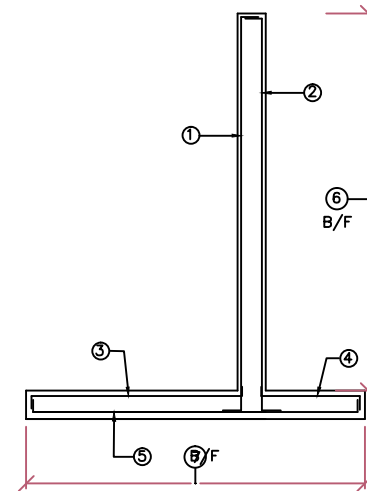
TOP SLAB R/F PLAN  
(SCALE 1:25)



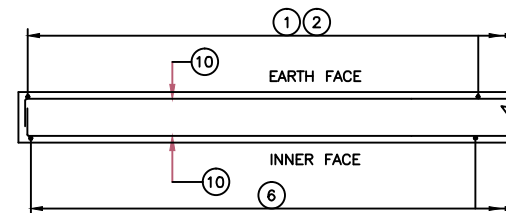
BOTTOM SLAB R/F PLAN  
(SCALE 1:25)



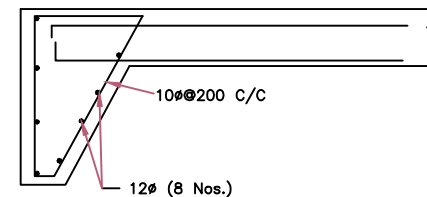
CROSS SECTION  
(SCALE 1:50)



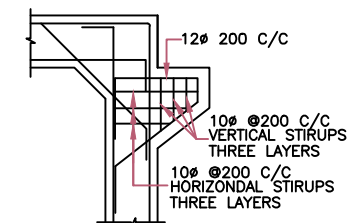
REINFORCEMENT DETAILS  
CATEGORY- A  
(SCALE 1:50)



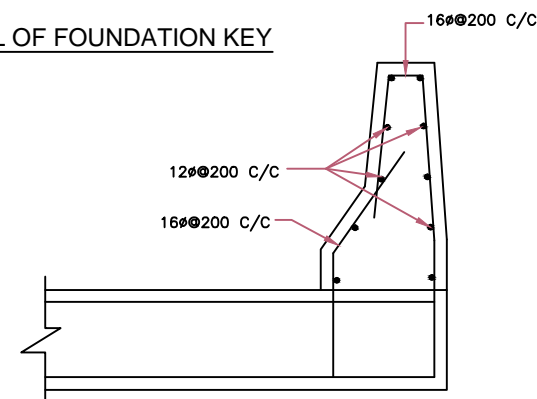
SECTION A-A



DETAIL OF FOUNDATION KEY



DETAILS -Z



DETAIL OF CRASH BARRIER

#### DIMENSIONAL DETAILS

Category	H max	W	h1	h2	b1	b2	b3
Category-A	2400	1900	300	0	950	450	500

#### REINFORCEMENT DETAILS

Bar No.	1	2	3	4	5	6	7
Bar Shape	150	150	150	300	150	150	150
Category-A	8# @ 80c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c

#### NOTES FOR RETAINING WALL:-

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- LAPPING IS STAGGERED AND NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION. MINIMUM LAP LENGTH IS 30 TIMES DIA OF BAR FOR BAR MARK 9 & 10 AND 72 TIMES DIA OF BAR FOR OTHER BARS.
- WEEP HOLES ARE PROVIDED STARTING 150MM ABOVE GROUND LEVEL. AND SPACED 1000MM C/C ON STAGGERED DIRECTION. SLOPE OF 1:20 IS PROVIDED TOWARDS THE DRAINING FACE.
- 600MM THICK FILTER MEDIA IS PROVIDED BEHIND RETAINING WALL UP TO TOP OF EMBANKMENT.

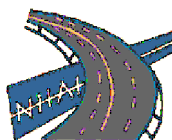
#### REINFORCEMENT DETAILS :-

BAR MKD.	BAR DIA.	SPACING	SHAPE
1	12	200 C/C	
2	12	200 C/C	
3	12	200 C/C	
4	12	200 C/C	200
5	10	200 C/C	
6	12	200 C/C	200
7	12	200 C/C	200
8	10	200 C/C	
9	10	200 C/C	150
10	10	300 C/C	150
11	10	200 C/C	150
12	10	200 C/C	150

#### NOTES FOR BOX :-

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- GRADE OF REINFORCEMENT STEEL IS HYSD BARS CONFORMING TO IS 1786 WITH Fe 415
- NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION AND LAPPING IS STAGGERED LAP LENGTH = 72 X DIA. OF THE BAR FOR MAIN & 30 TIMES DIA OF BAR FOR DISTRIBUTION BARS (BAR MARKED 10, 11, 12)

CLIENT:



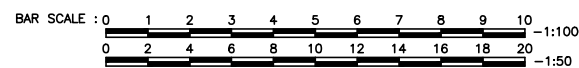
NATIONAL HIGHWAY AUTHORITY OF INDIA

(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
IN JOINT VENTURE WITH  
QUEST ENGINEERS & CONSULTANTS PVT LTD.

1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India



BOX CULVERT RFT DRAWING

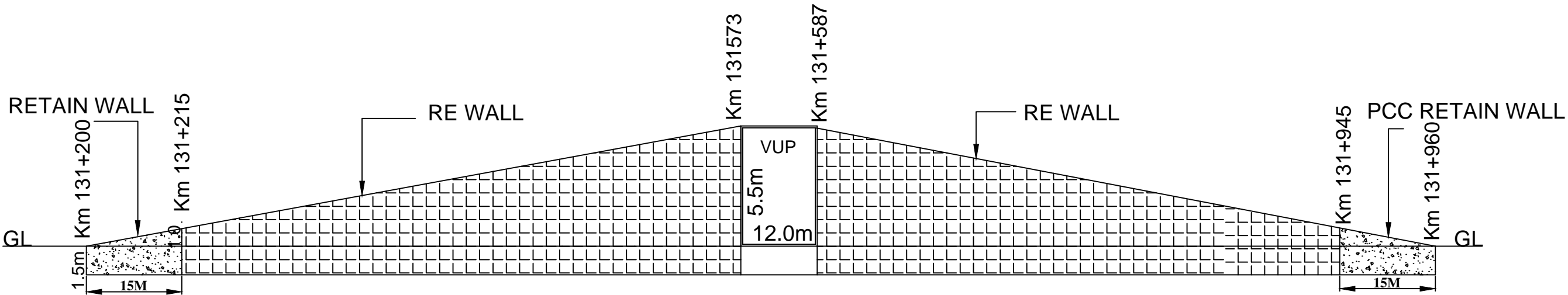
TITLE:-

Box Culvert Widening at Km131+428

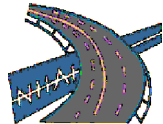
PROJECT:

Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velaipur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode

DRAWING SHOWING SIDE ELEVATION OF VUP RE WALL APPROACHES



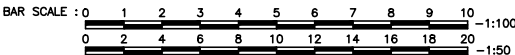
CLIENT:



NATIONAL HIGHWAY AUTHORITY OF INDIA  
(Ministry of Road Transport & Highways )  
Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
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1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

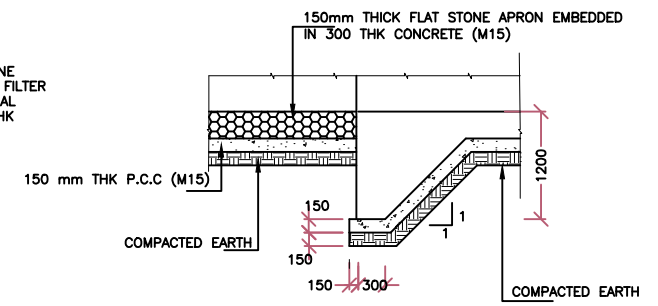
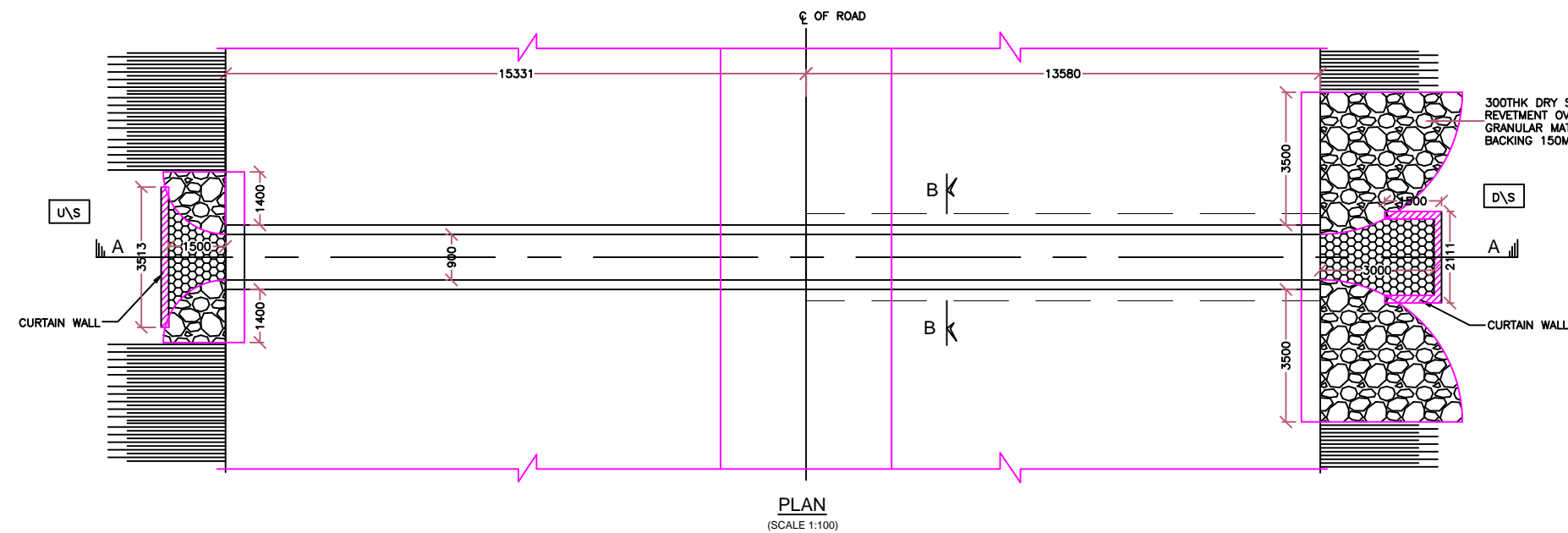
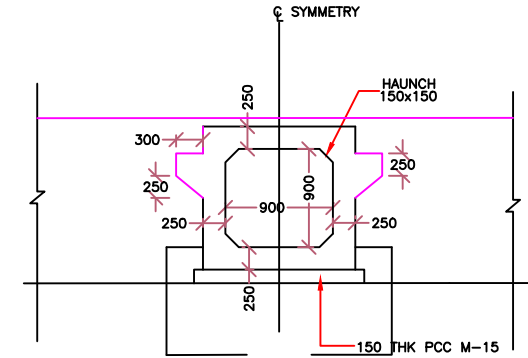
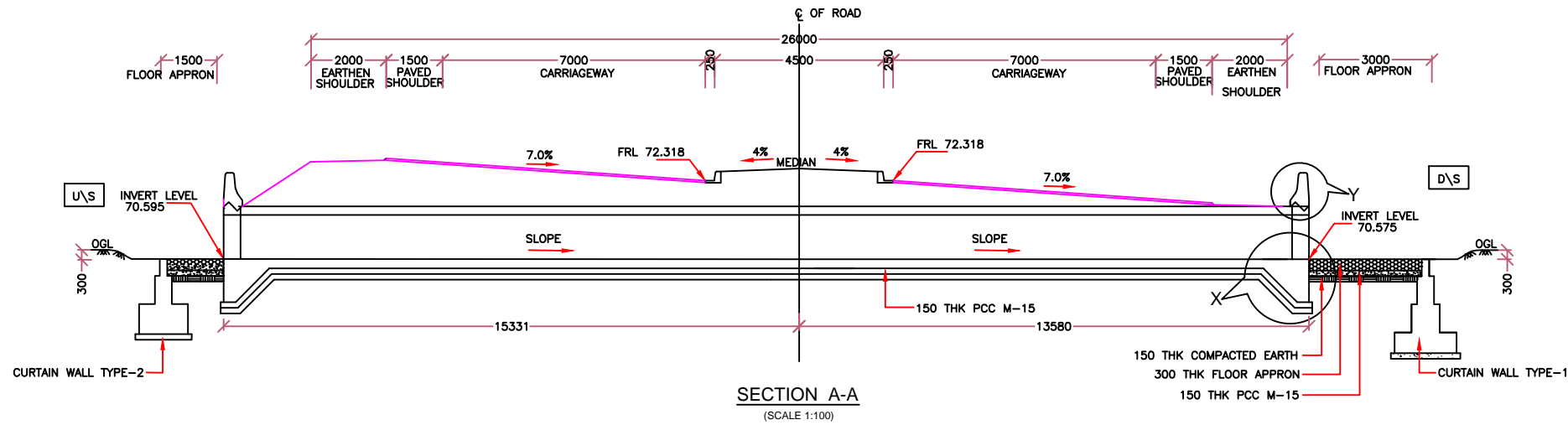


RE WALL ELEVATION DRAWING.  
LVUP at Km.131+580

TITLE:-  
LVUP at Km.131+580  
(From km.131+200 to km.131+9600)

PROJECT:

Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velaiyur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



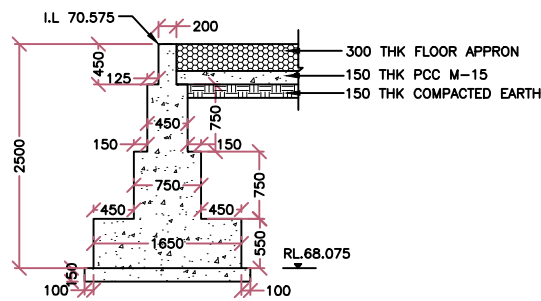
NET CUSSION AT END OF UNPAVED SHOULDER	
LEFT SIDE (MM)	RIGHT SIDE (MM)
1183	65

#### NOTES:-

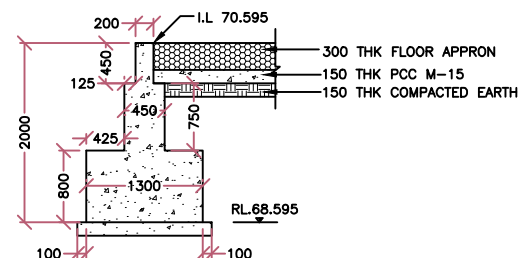
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- ALL DIMENSIONS ARE SCALED.
- LOOSE/UNSTABLE SOIL BELOW BOX CULVERT IS REPLACED WITH SUTABLEGRANULAR MATERIAL AS PER SP-13.
- CHAINAGE/FORMATION LEVEL IS PROVIDED AS PER APPROVED PLAN & PROFILE DRAWINGS.
- MINIMUM 'SBC' OF SOIL IS 8 TON/M<sup>2</sup>
- A CONSTRUCTION JOINT (20MM) IS PROVIDED FOR JOINING THE EXISTING & NEW CULVERT AND FILLED UP BY SHEALTEX BOARD.

#### REFERENCE DRAWINGS:-

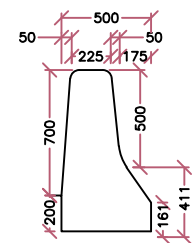
- 206/S-U/STR/RETAINING WALL/01
- 206/S-U/STR/MISC/APPROACH SLAB AND BRACKET
- 206/S-U/STR/PARAPET WALL/E-01
- 206/S-U/STR/MISC/CURTAIN WALL
- 206/S-U/STR/BOX CUL/G-01 (SHEET 1 OF 2)
- 206/S-U/STR/BOX CUL/G-01 (SHEET 2 OF 2)
- 206/S-U/STR/BOX CUL/E-01



TYPICAL CROSS SECTION OF  
PCC CURTAIN WALL TYPE -1  
(SCALE 1:50)



TYPICAL CROSS SECTION OF  
PCC CURTAIN WALL TYPE -2  
(SCALE 1:50)



DETAIL -Y  
CRASH BARRIER

CLIENT:  
**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
G-5 & G-6 DWARAKA  
NEW DELHI

CONCESSIONARE:  
**SU Toll Road Private Ltd.**  
3rd Floor, Reliance Energy Centre, Santa Cruz(East)  
Mumbai-400 055  
Ph : 022-3009 6999, Facsimile : 022-30094111

EPC CONTRACTOR:  
**Utility Energytech And Engineers Private Limited**  
3rd Floor, Reliance Energy Centre, Santa Cruz(East)  
Mumbai-400 055  
Ph : 022-3009 6999, Facsimile : 022-30096999

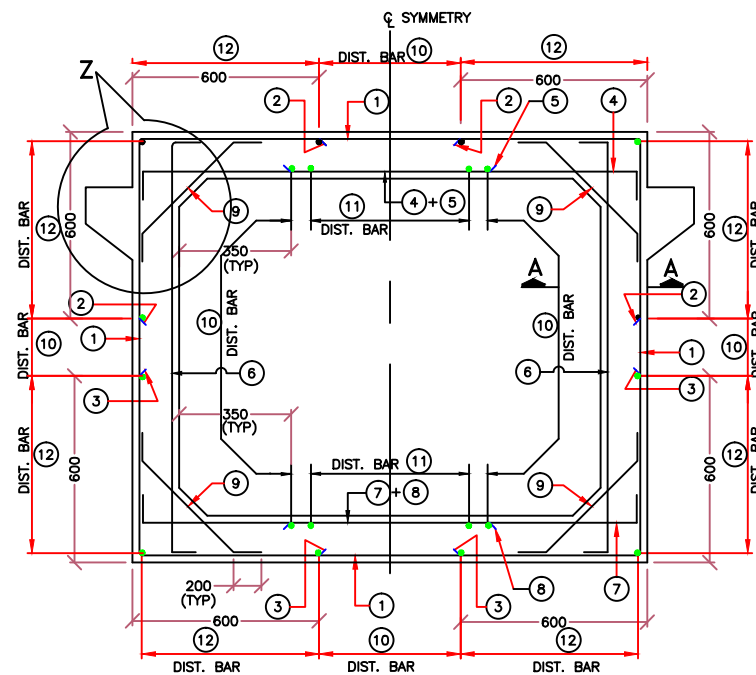
CONSTRUCTION CONTRACTOR:  
**Oriental Structural Engineers Private Limited**  
21, Commercial Complex, Malcha Marg,  
Diplomatic Enclave, New Delhi- 110 021  
Ph : 011-51680224, Fax : 011-51680211

PROJECT:  
**4/6 LANING OF SALEM - ULUNDURPET SECTION FROM KM 0+313 TO KM 136+670.516 OF NH-68 (SECTION II -FROM KM-62+000 TO KM 136+670.516)**

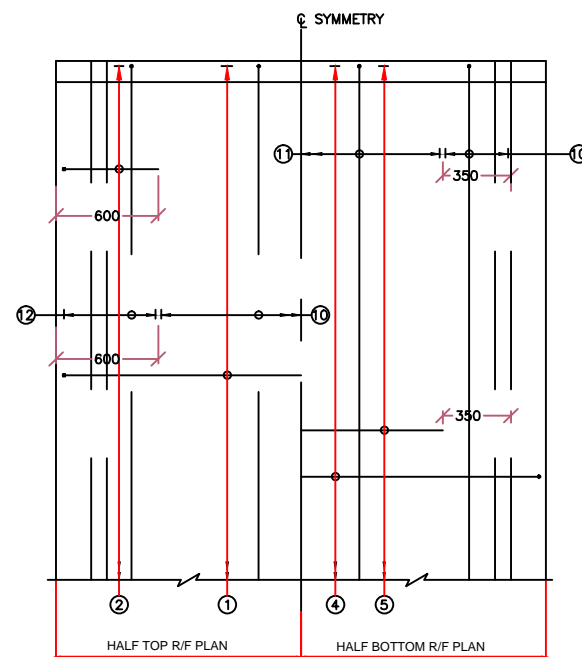
AS BUILT DRAWING  
TITLE:-  
**GAD AND DIMENTION DETAILS OF SINGLE CELL BOX CULVERT**  
LOCATION : **132+508.639**

PREPARED & SUBMITTED BY :  
CHECKED BY : IC  
APPROVED BY : IC (TEAM LEADER)

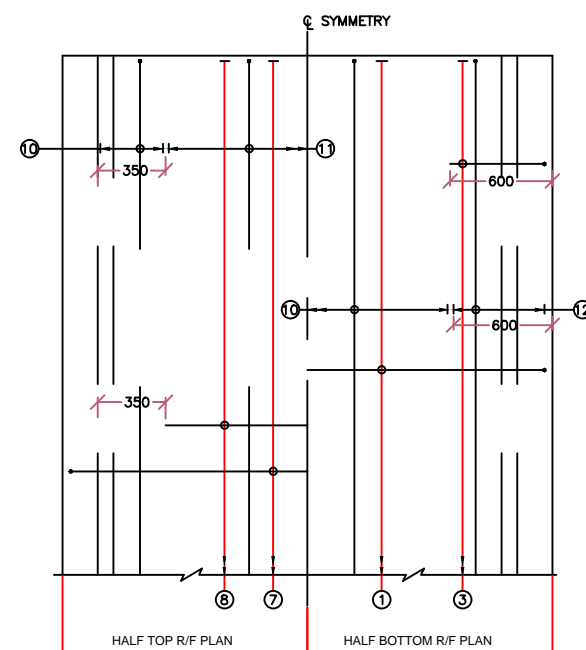
DRAWING NUMBER  
**206/S-U/STR/BOX CUL/133-1 ( SHEET 1 OF 2 )**  
DATE :- MAY 2012



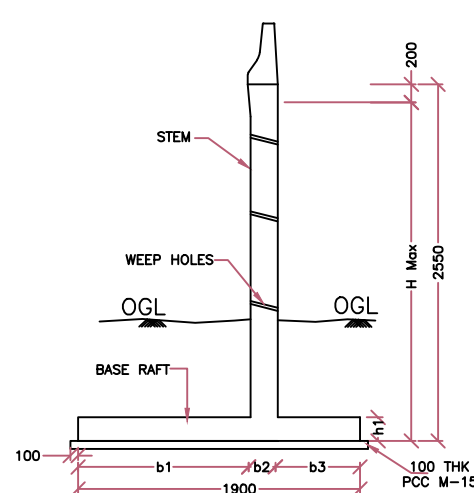
REINFORCEMENT DETAILS  
(SCALE 1:25)



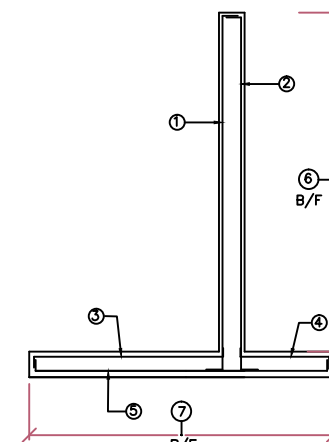
TOP SLAB R/F PLAN  
(SCALE 1:25)



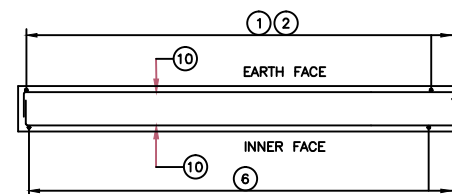
BOTTOM SLAB R/F PLAN  
(SCALE 1:25)



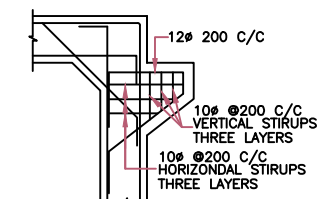
CROSS SECTION  
(SCALE 1:50)



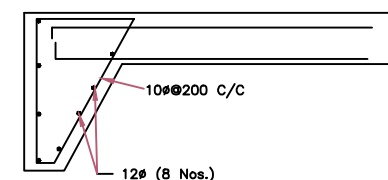
REINFORCEMENT DETAILS  
CATEGORY- A  
(SCALE 1:50)



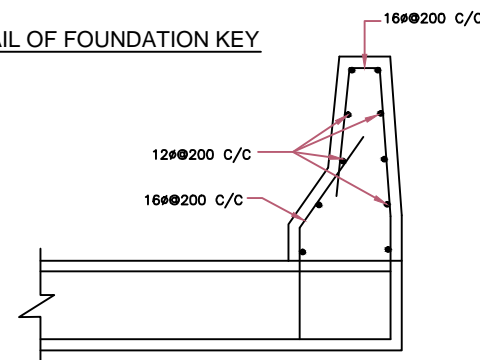
SECTION A-A



DETAILS -Z



DETAIL OF FOUNDATION KEY



DETAIL OF CRASH BARRIER

#### DIMENSIONAL DETAILS

Category	H max	W	b1	b2	b1	b2	b3
Category-A	2400	1900	300	0	950	450	500

#### REINFORCEMENT DETAILS

Bar No.	1	2	3	4	5	6	7
Bar Shape	150	150	150	150	150	150	150
Category-A	8# @ 80c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c	8# @ 120c/c

#### NOTES FOR RETAINING WALL:-

- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- LAPPING IS STAGGERED AND NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION .MINIMUM LAP LENGTH IS 30 TIMES DIA OF BAR FOR BAR MARK 9 & 10 AND 72 TIMES DIA OF BAR FOR OTHER BARS.
- WEEP HOLES ARE PROVIDED STARTING 150MM ABOVE GROUND LEVEL. AND SPACED 1000MM C/C ON STAGGERED DIRECTION. SLOPE OF 1:20 IS PROVIDED TOWARDS THE DRAINING FACE.
- 600MM THICK FILTER MEDIA IS PROVIDED BEHIND RETAINING WALL UP TO TOP OF EMBANKMENT.

#### REINFORCEMENT DETAILS :-



BAR MKD.	BAR DIA	SPACING	SHAPE
1	12	200 C/C	
2	12	200 C/C	
3	12	200 C/C	
4	12	200 C/C	200
5	10	200 C/C	
6	12	200 C/C	200
7	12	200 C/C	200
8	10	200 C/C	
9	10	200 C/C	150
10	10	300 C/C	150
11	10	200 C/C	150
12	10	200 C/C	150

#### NOTES FOR BOX :-

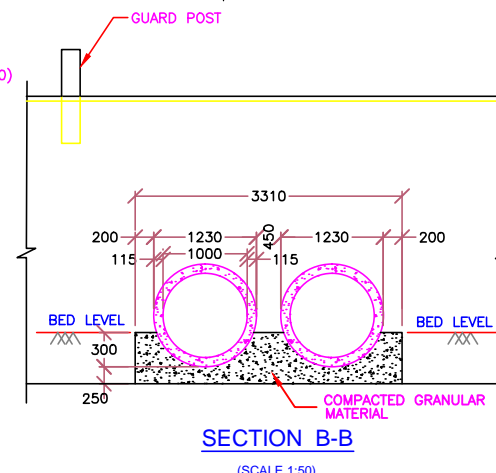
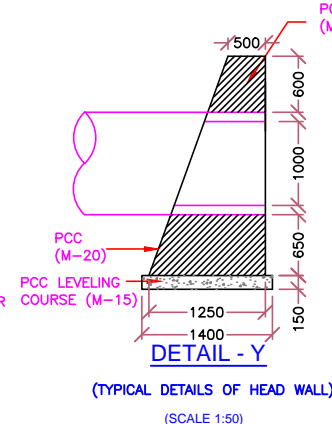
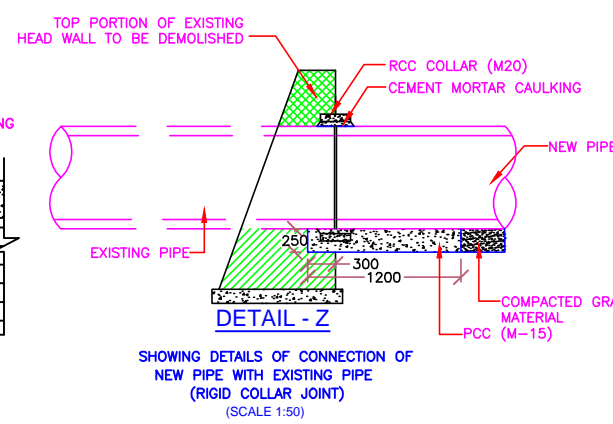
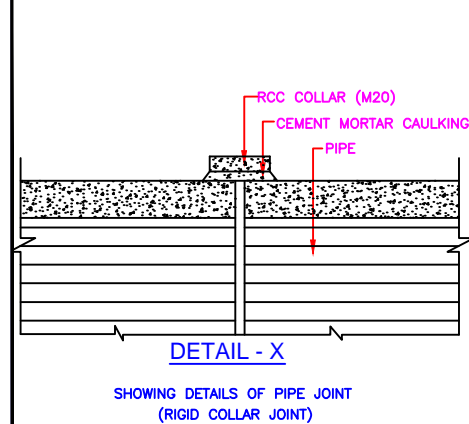
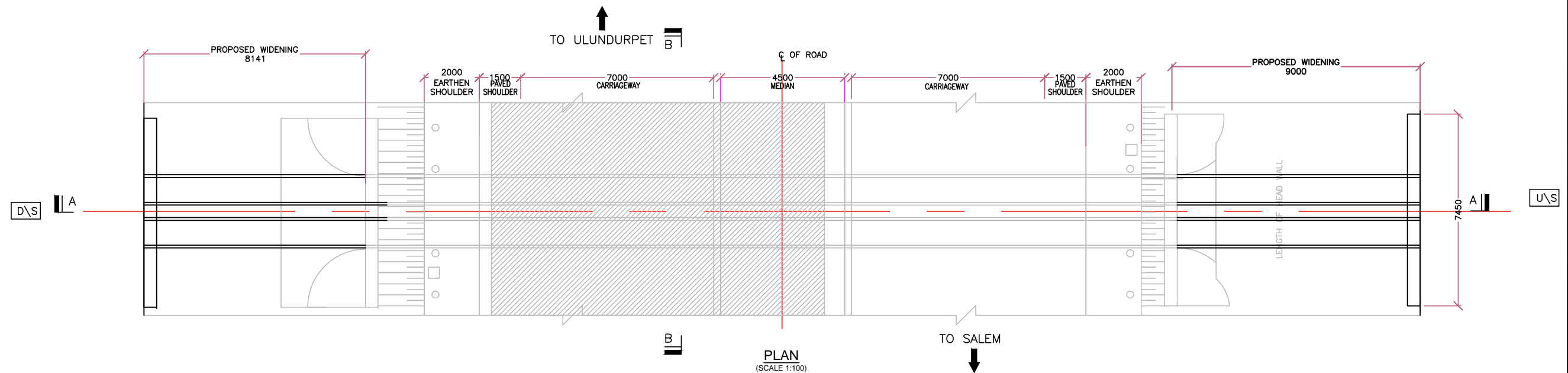
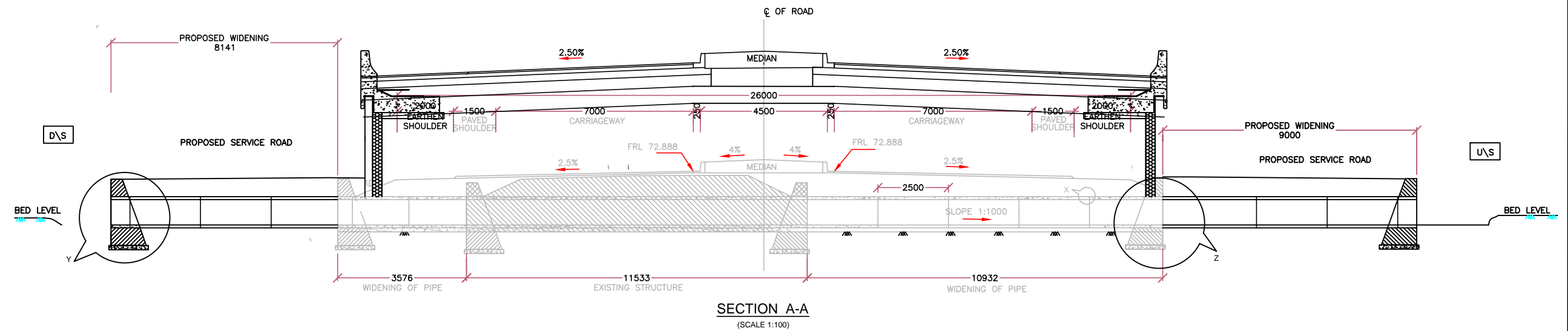
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :--- M30  
GRADE OF CONCRETE FOR PCC WORKS :--- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- GRADE OF REINFORCEMENT STEEL IS HYSD BARS CONFORMING TO IS 1786 WITH Fe 415
- NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION AND LAPPING IS STAGGERED LAP LENGTH = 72 X DIA. OF THE BAR FOR MAIN & 30 TIMES DIA OF BAR FOR DISTRIBUTION BARS (BAR MARKED 10 11 12)

#### REFERENCE DRAWINGS:-

- 206/S-U/STR/RETAINING WALL/01
- 206/S-U/STR/MISC/APPROACH SLAB AND BRACKET
- 206/S-U/STR/PARAPET WALL/E-01
- 206/S-U/STR/MISC/CURTAIN WALL
- 206/S-U/STR/BOX CUL/G-01 (SHEET 1 OF 2)
- 206/S-U/STR/BOX CUL/G-01 (SHEET 2 OF 2)
- 206/S-U/STR/BOX CUL/E-01
- 206/S-U/STR/BOX CUL/133-1 ((SHEET 1 OF 2)


<p>CLIENT:</p>  <p>NATIONAL HIGHWAY AUTHORITY OF INDIA G-5 &amp; G-6 DWARAKA NEW DELHI</p>	<p>CONCESSIONARE:</p> <p><b>SU Toll Road Private Ltd.</b> 3rd Floor, Reliance Energy Centre, Santa Cruz(East) Mumbai-400 055 Ph : 022-3009 6999, Facsimile : 022-30094111</p> <p>INDEPENDANT CONSULTANT:</p> <p><b>Technital S.P.A - Quest Engineers</b> PLOT NO. 8, MSK GARDEN, OOTRIKADU, ATTUR BYPASS ROAD, SEELANAICKENPATTY, SALEM- 636 201, TAMILNADU Ph : 0427-2466631</p>	<p>EPC CONTRACTOR:</p> <p><b>Utility Energytech And Engineers Private Limited</b> 3rd Floor, Reliance Energy Centre, Santa Cruz(East) Mumbai-400 055 Ph : 022-3009 6999, Facsimile : 022-30096999</p> <p>ENGINEERING DESIGN CONSULTANT:-</p> <p><b>NEEL CONSTRUCTION LINKS PVT. LTD.</b> A - 402, RAIL VIHAR, SECTOR - 15B, GURGAON- 122001 Ph : 0124-2225564, Fax: 0124-4032075 EMAIL : design@neel.co.in</p>	<p>CONSTRUCTION CONTRACTOR:</p>  <p><b>Oriental Structural Engineers Private Limited</b> 21, Commercial Complex, Malcha Marg, Diplomatic Enclave, New Delhi- 110 021 Ph : 011-51680224, Fax : 011-51680211</p>	<p>PROJECT:</p> <p><b>4/6 LANING OF SALEM - ULUNDURPET SECTION FROM KM 0+313 TO KM 136+670.516 OF NH-68 (SECTION II -FROM KM-62+000 TO KM 136+670.516)</b></p> <p>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 :1:50 0 2 4 6 8 10 12 14 16 18 20 :1:25</p>	<p>AS BUILT DRAWING</p> <p>TITLE:- <b>REINFORCEMENT DETAILS OF BOX CULVERT AND RETURN WALL LOCATION :132+508.639</b></p>	<p>PREPARED &amp; SUBMITTED BY :</p> <p>CHECKED BY : IC</p> <p>APPROVED BY : IC (TEAM LEADER)</p>	<p>DRAWING NUMBER</p> <p><b>206/S-U/STR/BOX CUL/133-1 ( SHEET 2 OF 2 )</b></p> <p>DATE :- MAY 2012</p>
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NET CUSSION AT END OF UNPAVED SHOULDER	
LEFT SIDE (MM)	RIGHT SIDE (MM)
544	469

- NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS.
  2. ALL PIPES FOR WIDENING ARE NP4 CLASS.
  3. THE LONGITUDINAL SLOPE OF PIPE ARE MATCH WITH THE EXISTING PIPE.
  4. ALL LOOSE MATERIAL BELOW PCC BEDDING REMOVED AND REPLACED WITH COMPACTED GRANULAR MATERIAL.
  5. FOR PIPE SPECIFICATION REFER IS 458 : 2003 (TABLE-6).

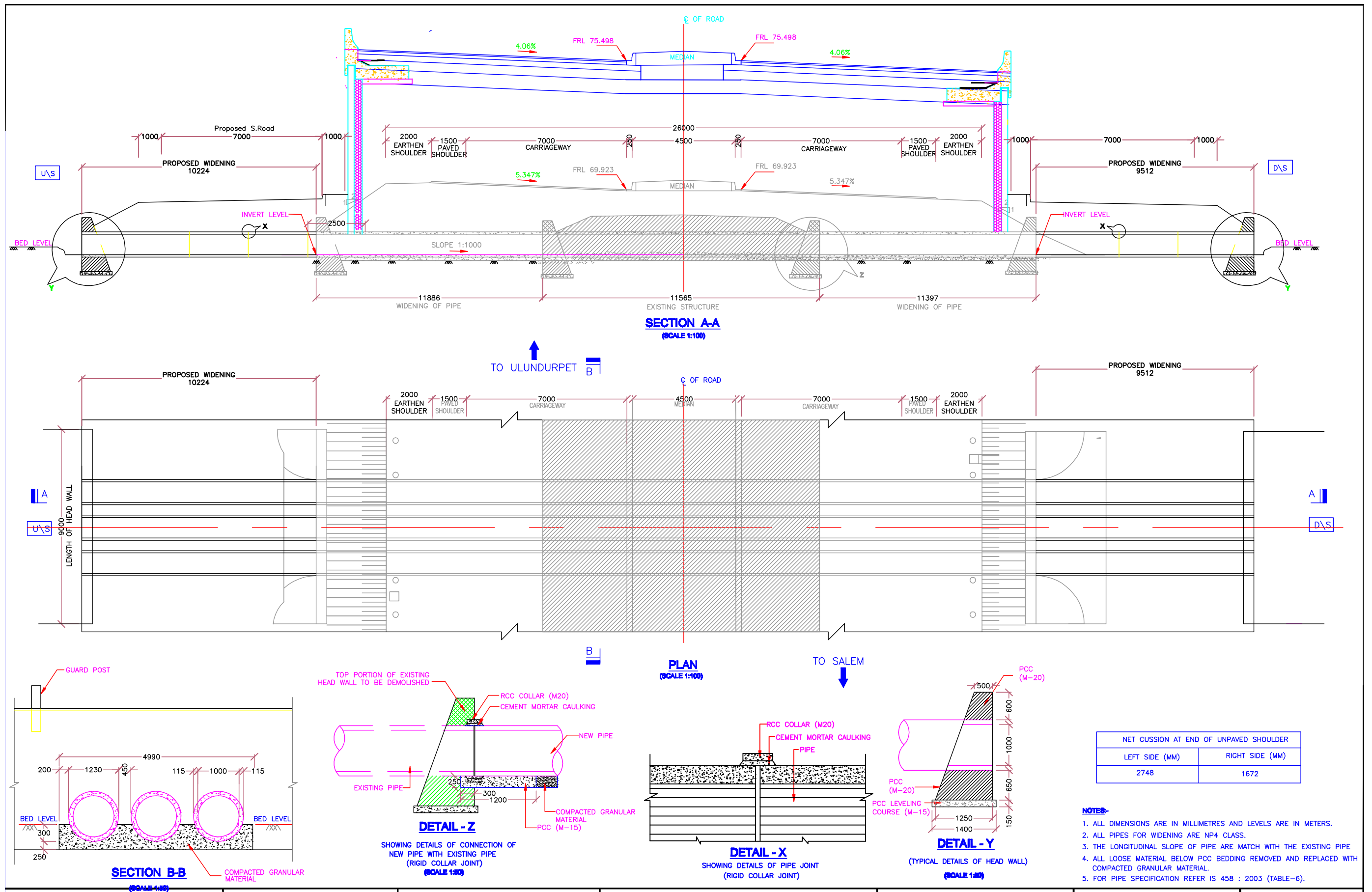
<p>CLIENT:</p>  <p><b>NATIONAL HIGHWAY AUTHORITY OF INDIA</b></p> <p>(Ministry of Road Transport &amp; Highways) Government of India.</p>	<p>INDEPENDANT ENGINEER:</p> <p><b>SA INFRASTRUCTURE CONSULTANTS PVT LTD</b> IN JOINT VENTURE WITH <b>QUEST ENGINEERS &amp; CONSULTANTS PVT LTD.</b></p> <p>1101B: 11Floor, Tower A-II, Ansal Corporate Park, Plot No:7A/1, Sector-142, Noida - 201 301, India</p>	<p>BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100 0 2 4 6 8 10 12 14 16 18 20 -1:50</p>	<p>PIPE CULVERT DRAWING With Service Road on Both side</p> <p>TITLE:- PIPE Culvert Widening at Km131+342</p>	<p>PROJECT:</p> <p><b>Permanent Rectification By constructing a Light Vehicular Underpass (LVUP) (12m x 4.5m) at Km 131+580 (Velayur) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode</b></p>
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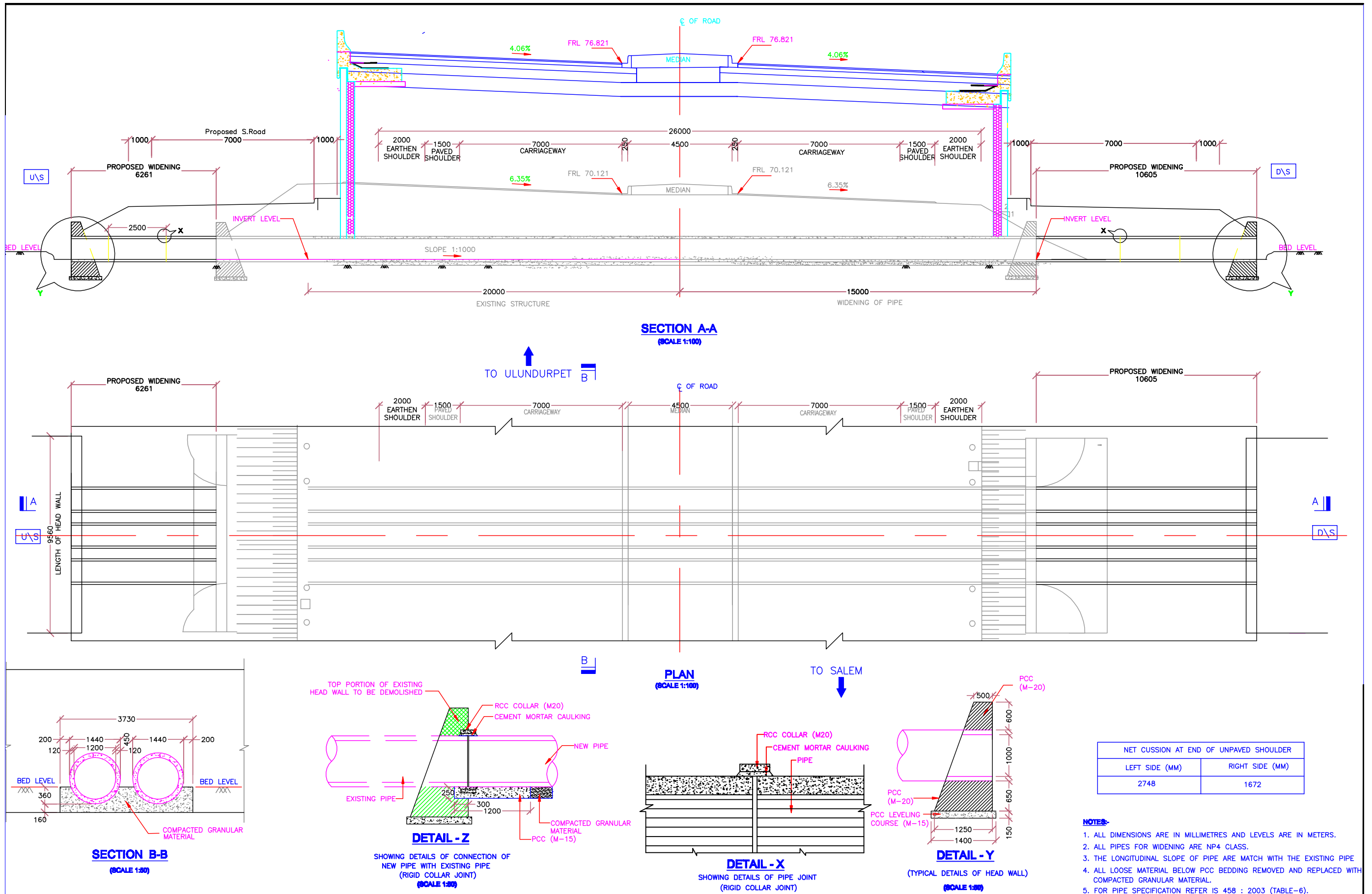


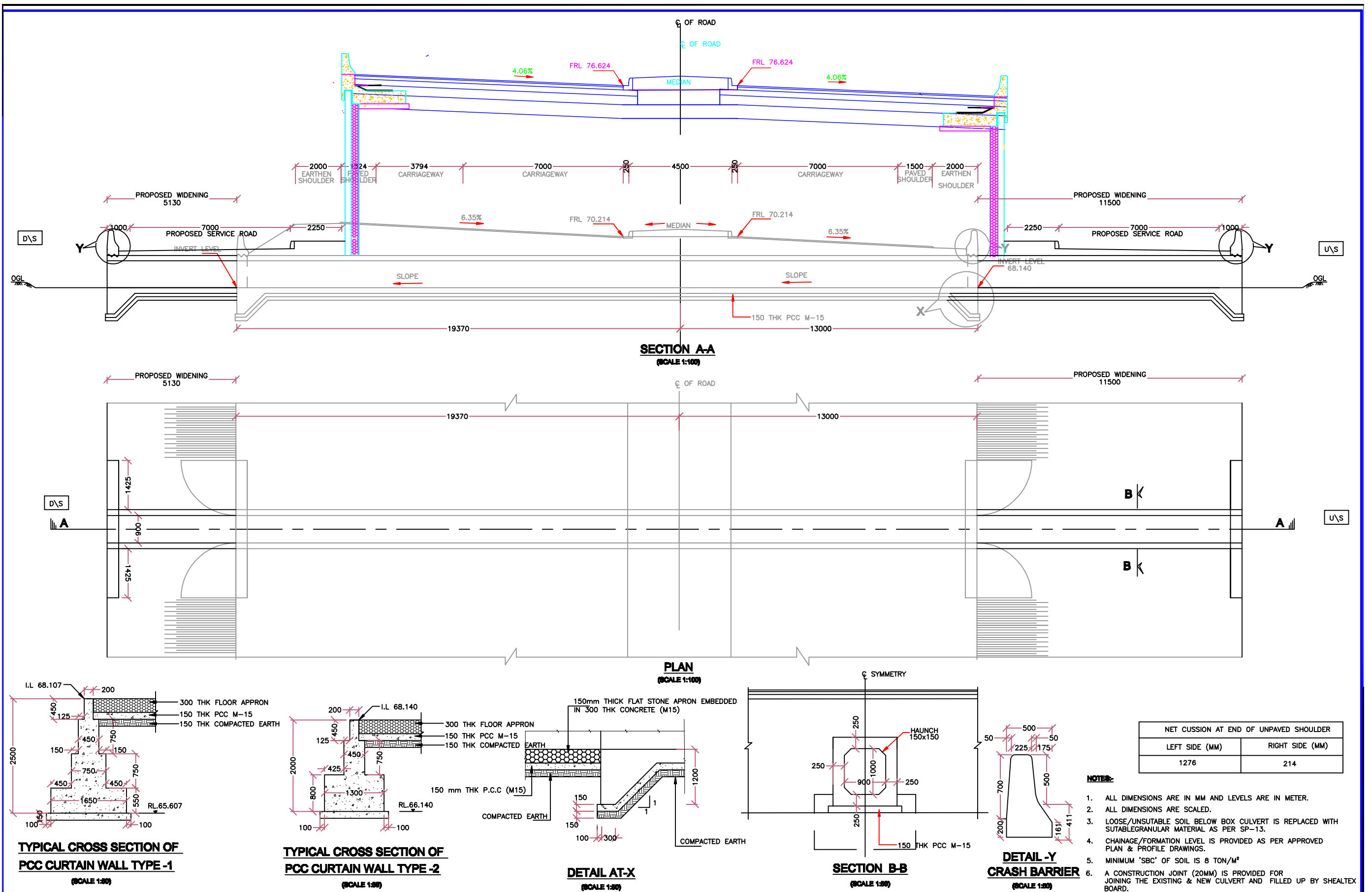
# **DRAWINGS**

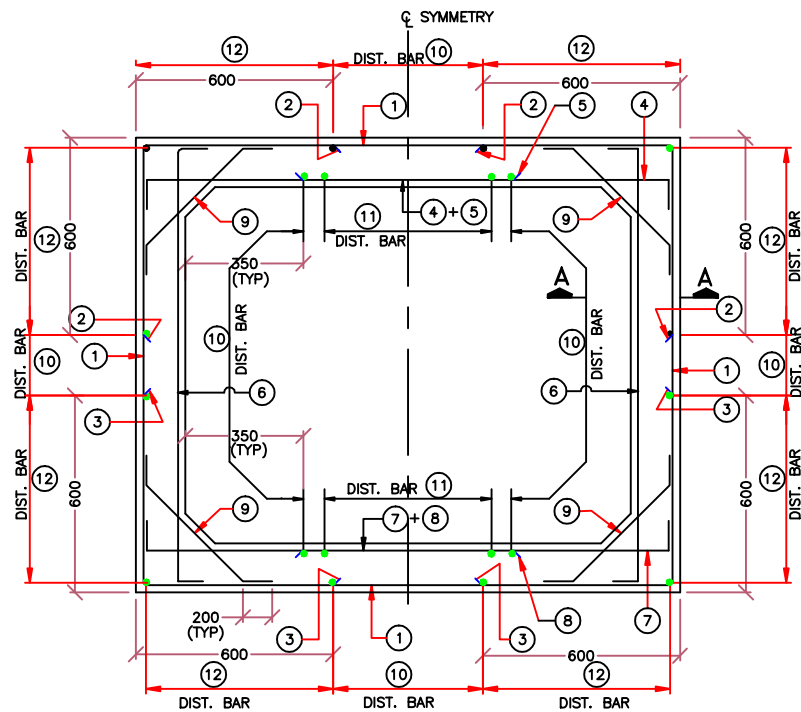
## **Salem to Ulunderpet Section of NH-79**

5. Ulundurpet Bypass@ Km 134+307

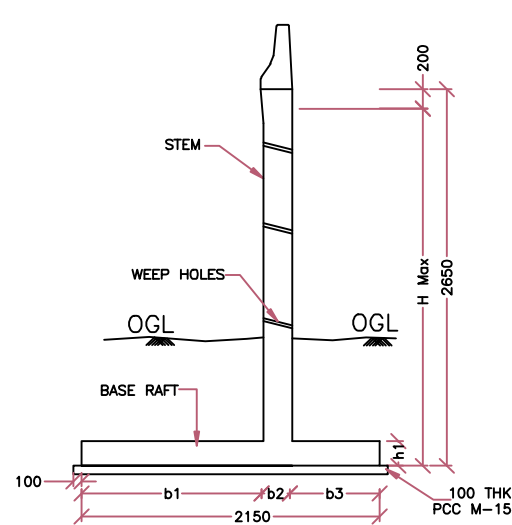




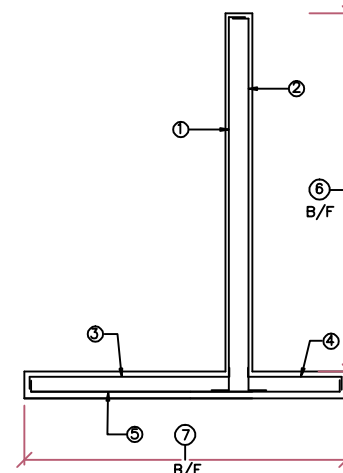




**REINFORCEMENT DETAILS**  
(SCALE 1:20)



**CROSS SECTION**  
(SCALE 1:20)



**REINFORCEMENT DETAILS**  
**CATEGORY- B**  
(SCALE 1:20)

**DIMENSIONAL DETAILS**

Category	H max	W	b1	b2	b1	b2	b3
Category-B	2800	2150	300	0	1100	450	600

**REINFORCEMENT DETAILS**

Bar No.	①	②	③	④	⑤	⑥	⑦
Bar Shape							
Category-B	10 @ 100/c	8 @ 120/c	8 @ 80/c	8 @ 120/c	8 @ 100/c	8 @ 120/c	8 @ 120/c

**NOTES FOR RETAINING WALL:-**

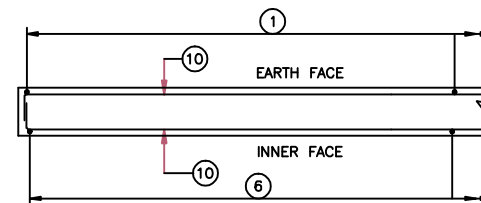
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :-- M30  
GRADE OF CONCRETE FOR PCC WORKS :-- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- LAPPING IS STAGGERED AND NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION. MINIMUM LAP LENGTH IS 30 TIMES DIA OF BAR FOR BAR MARK 9 & 10 AND 72 TIMES DIA OF BAR FOR OTHER BARS.
- WEEP HOLES ARE PROVIDED STARTING 150MM ABOVE GROUND LEVEL, AND SPACED 1000MM C/C ON STAGGERED DIRECTION. SLOPE OF 1:20 IS PROVIDED TOWARDS THE DRAINING FACE.
- 600MM THICK FILTER MEDIA IS PROVIDED BEHIND RETAINING WALL UP TO TOP OF EMBANKMENT.

**REINFORCEMENT DETAILS:-**

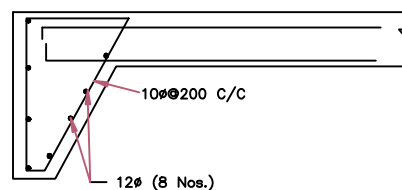
BAR MKD.	BAR DIA.	SPACING	SHAPE
1	12	200 C/C	
2	12	200 C/C	
3	12	200 C/C	
4	12	200 C/C	
5	10	200 C/C	
6	12	200 C/C	
7	12	200 C/C	
8	10	200 C/C	
9	10	200 C/C	
10	10	300 C/C	
11	10	200 C/C	
12	10	200 C/C	

**NOTES FOR BOX:-**

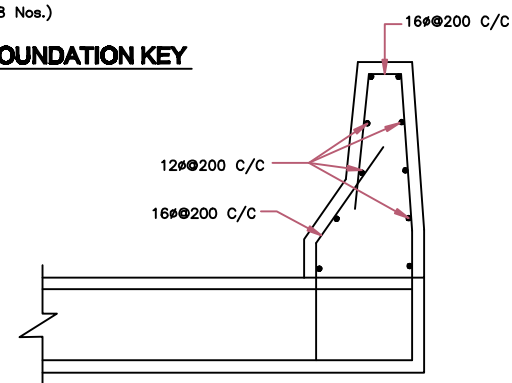
- ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER.
- GRADE OF CONCRETE FOR RCC WORKS :-- M30  
GRADE OF CONCRETE FOR PCC WORKS :-- M15
- CLEAR COVER TO REINFORCEMENT  
IN BASE RAFT = 75MM  
ALL OTHER COMPONENTS = 40MM
- GRADE OF REINFORCEMENT STEEL IS HYSD BARS CONFORMING TO IS 1786 WITH Fe 415
- NOT MORE THAN 50% OF BAR IS LAPPED AT A SECTION AND LAPPING IS STAGGERED LAP LENGTH = 72 X DIA. OF THE BAR FOR MAIN & 30 TIMES DIA OF BAR FOR DISTRIBUTION BARS (BAR MARKED ⑩, ⑪, ⑫)



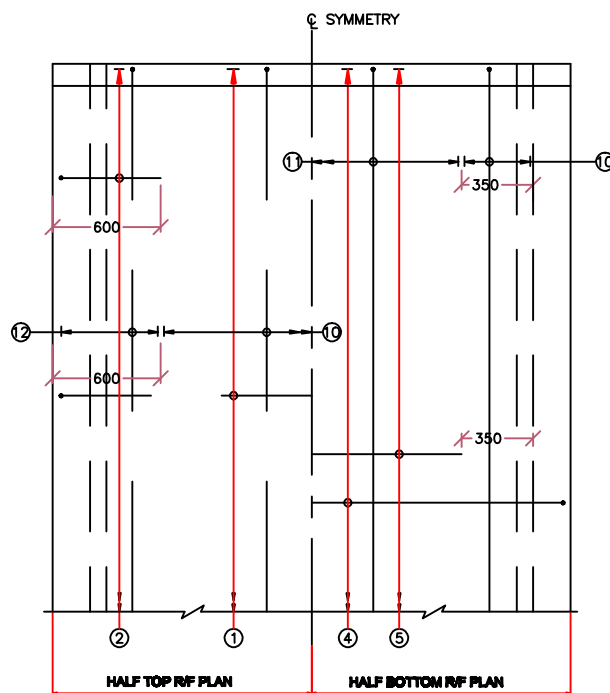
**SECTION A-A**



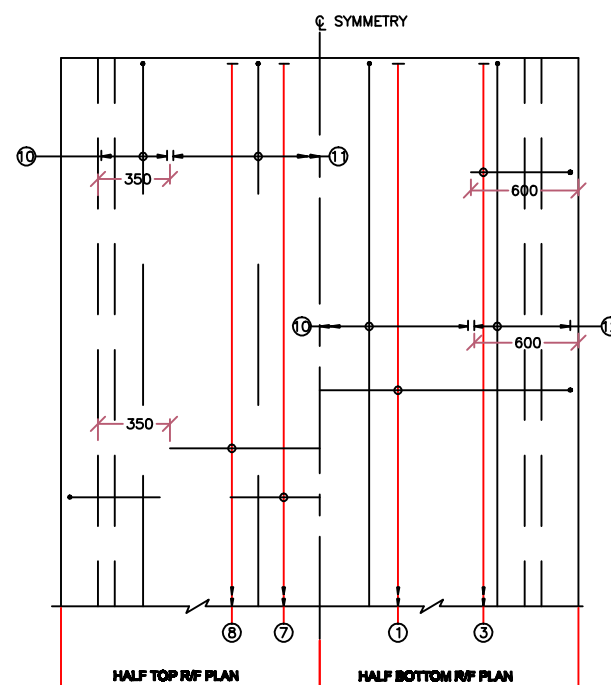
**DETAIL OF FOUNDATION KEY**



**DETAIL OF CRASH BARRIER**



**TOP SLAB R/F PLAN**  
(SCALE 1:20)



**BOTTOM SLAB R/F PLAN**  
(SCALE 1:20)

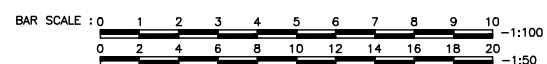
CLIENT:



**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

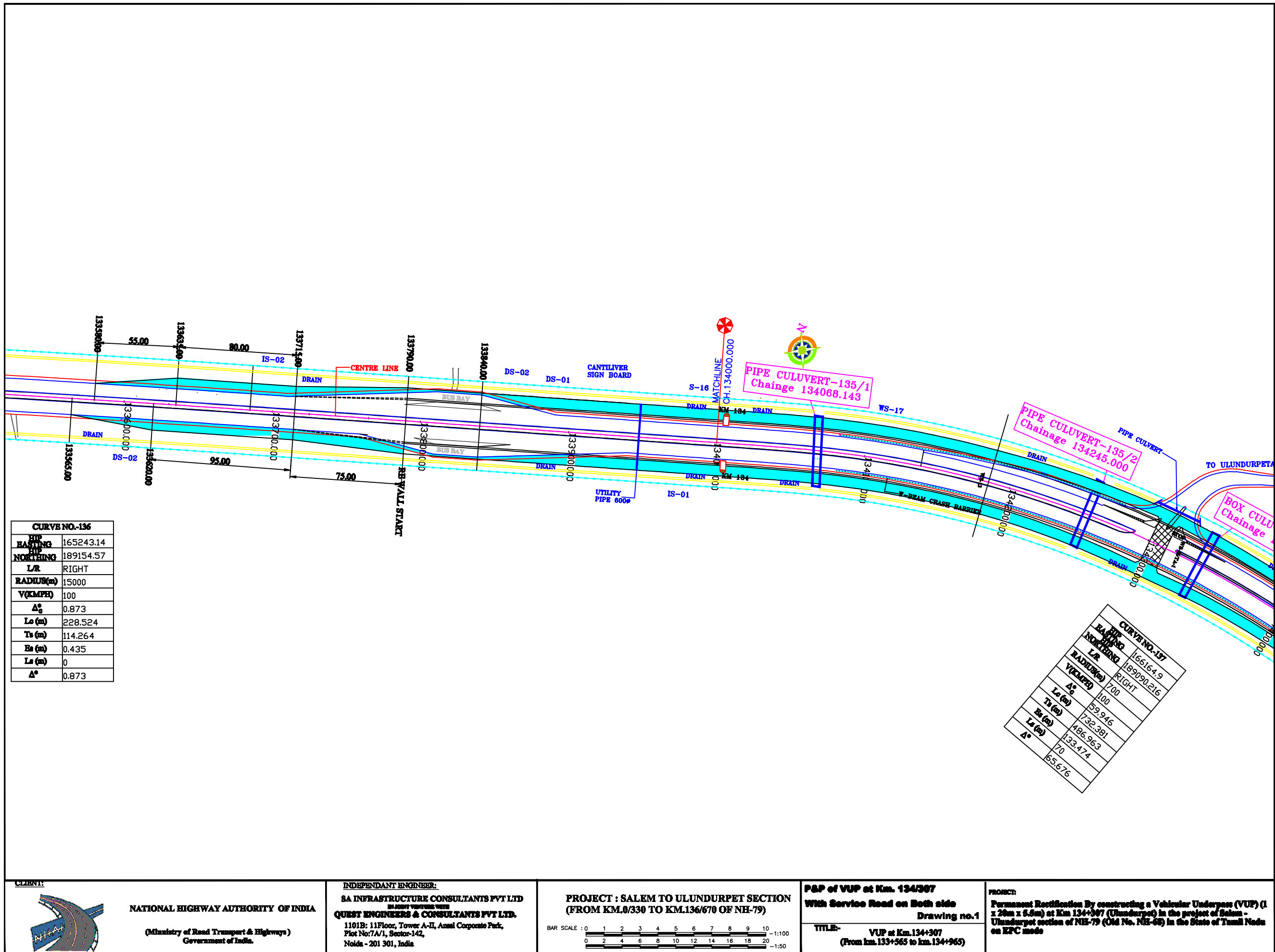


**BOX CULVERT RFT DRAWING.**  
**Km.134+334**

**TITLE:-**  
**RFT Details Box Culvert at Km.134+334**

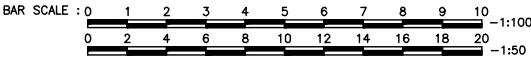
PROJECT:

**Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet Junction) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**





CURVE NO-137	
TYPE	RIGHT
BASTING	1166164.9
STARTING	189090.216
L/R	700
RADIUS (m)	100
Δ°	59.946
Lc (m)	732.381
Ts (m)	486.963
Es (m)	133.474
La (m)	70
Δ°	65.676



**P&P of VUP at Km. 134/307**  
**With Service Road on Both side**  
**Drawing no.2**  
**TITLE:-**  
**VUP at Km.134+307**  
**(From km.133+565 to km.134+965)**

**PROJECT:**  
**Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**

**CLIENT:**

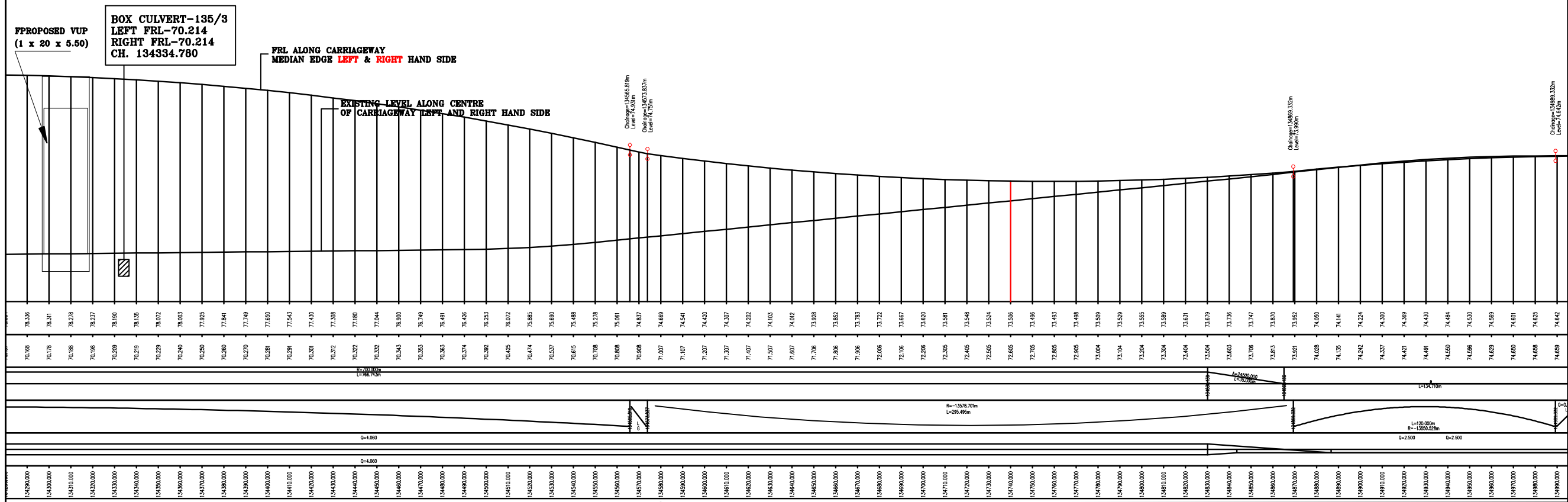
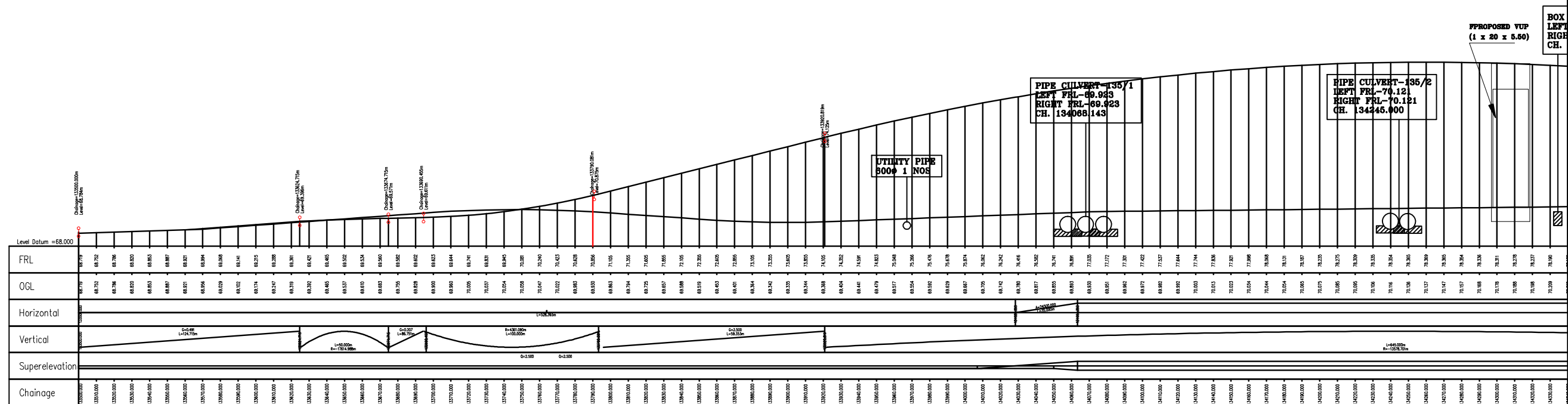


**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
**(Ministry of Road Transport & Highways)**  
**Government of India.**

**INDEPENDANT ENGINEER:**

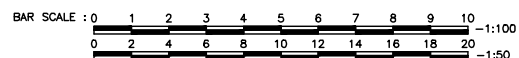
**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
**IN JOINT VENTURE WITH**  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India





**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

**INDEPENDANT ENGINEER:**  
**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
AN ISO 9001 CERTIFIED FIRM  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
 1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
 Plot No:7A/1, Sector-142,  
 Noida - 201 301, India

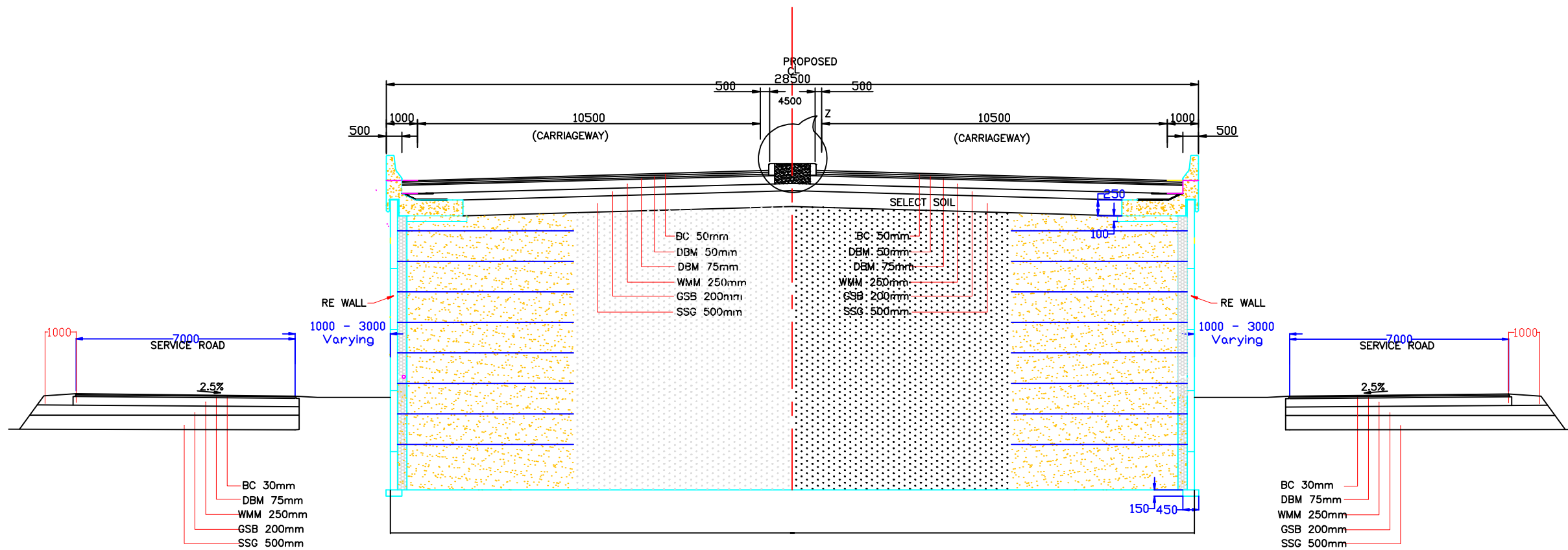


**P&P of VUP at Km. 134/307**  
**With Service Road on Both side**  
**Drawing no-3**

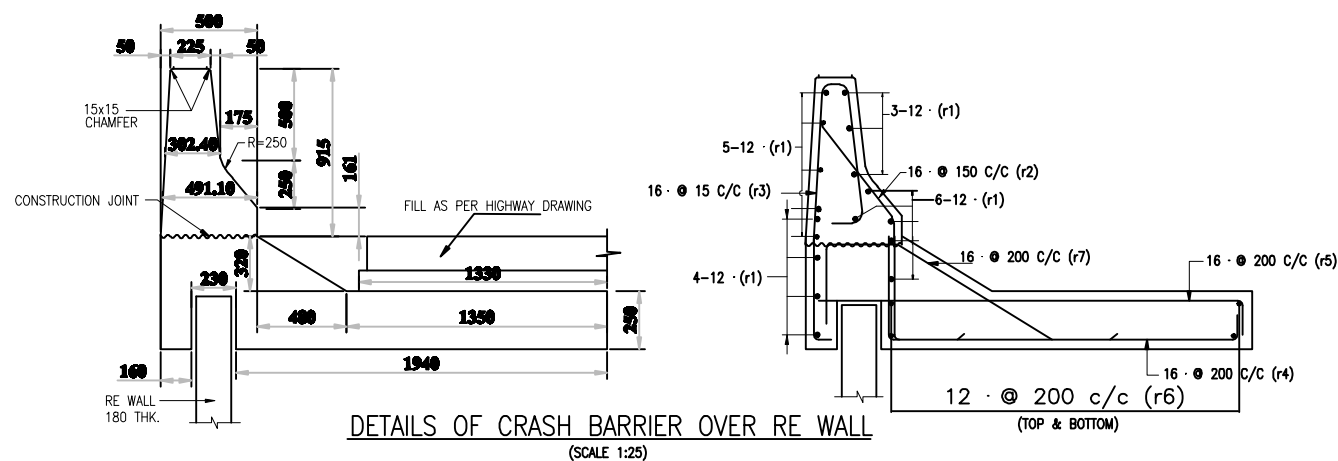
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**TITLE:-** VUP at Km.134/307  
 (From km.133+565 to km.134+965)

**PROJECT:**  
**Permanent Rectification By constructing a Vehicular Underpass (VUP) (12m x 5.5m) at Km 134+387 (Uthandurpet) in the project of Salem - Uthandurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**



**TYPICAL CROSS SECTION FOR SIX LANE APPROACHES AT VEHICULAR UNDERPASS**



**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR LOCATION OF THE UNDERPASS REFER HIGHWAY DRAWING.
4. THE PROPOSED ADDITIONAL 4-LANE BRIDGE TO BE DESIGNED FOR ONE LANE OF IRC 70R LOADING. OR 2-LANE OF IRC CLASS A.
5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
  - BOX STRUCTURE.....M30
  - CRASH BARRIER.....M40
  - APPROACH SLAB.....M30
6. GRADE OF UNTENSIONED STEEL SHALL BE S-415 CONFORMING TO IS:1786.
7. 62 THICK WEARING COURSE MASTIC ASPHALT.
8. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15 t/m<sup>2</sup>.

CLIENT:

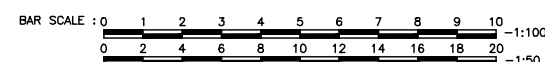


**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
IN JOINT VENTURE WITH  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11 Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**PROJECT : SALEM TO ULUNDURPET SECTION  
(FROM KM.0/330 TO KM.136/670 OF NH-79)**



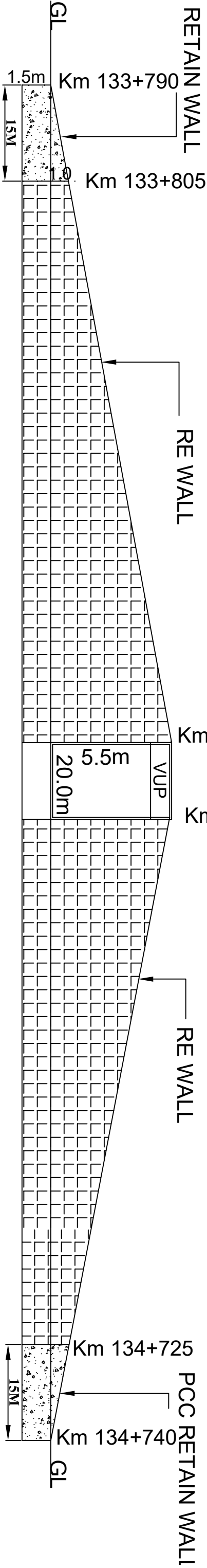
**Typ. C-Section of RE wall Brg.  
VUP at Km.134/307**


**TITLE:-**  
VUP at Km.134/307  
(From km.133+565 to km.134+965)

PROJECT:

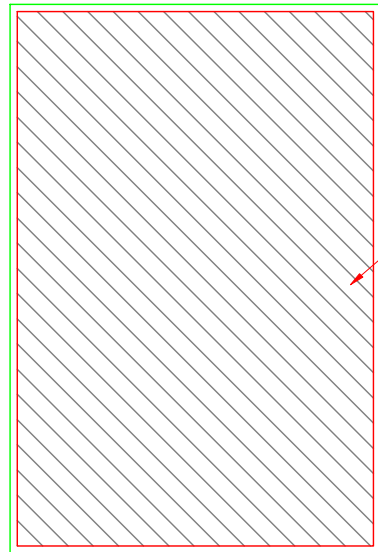
Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet Junction) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode

DRAWING SHOWING SIDE ELEVATION OF VUP RE WALL APPROACHES



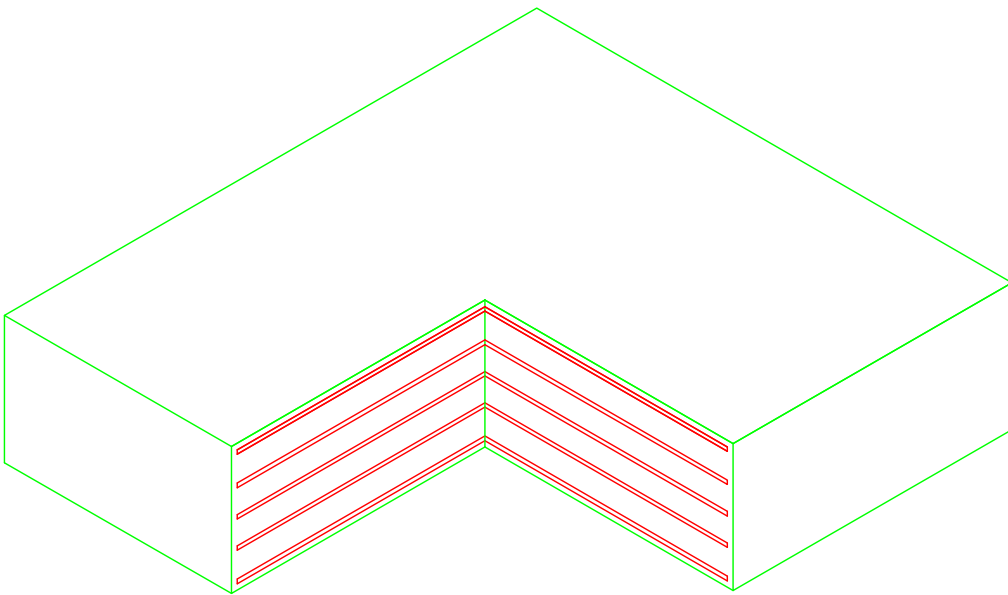
CLIENT:		
	NATIONAL HIGHWAY AUTHORITY OF INDIA (Ministry of Road Transport & Highways) Government of India.	
INDEPENDANT ENGINEER:		
SA INFRASTRUCTURE CONSULTANTS PVT LTD IN JOINT VENTURE WITH QUEST ENGINEERS & CONSULTANTS PVT LTD. 1101B: 11Floor, Tower A-II, Amsal Corporate Park, Plot No:7/A/1, Sector-142, Noida - 201 301, India		
PROJECT : SALEM TO ULUNDURPET SECTION (FROM KM.0/330 TO KM.136/670 OF NH-79)		
BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 0 2 4 6 8 10 12 14 16 18 20 -1:100 -1:50		
RE WALL ELEVATION DRAWING. VUP at Km.134/307		PROJECT: Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet Junction) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode
TITLE:- VUP at Km.134+307 (From km.133+565 to km.134+965)		

TRAFFIC DIRECTION →



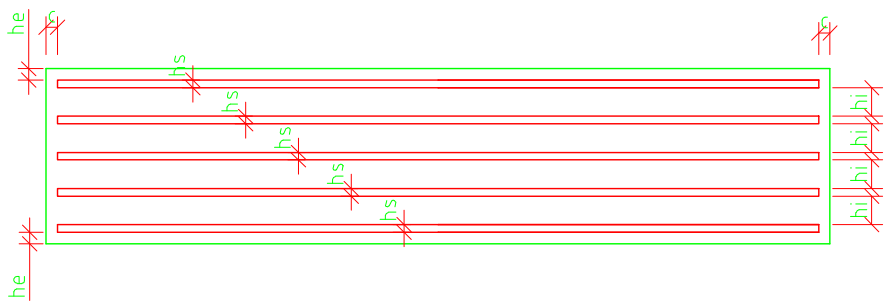
**PLAN FOR BEARING**

(SCALE 1:75)



**ISOMETRIC VIEW OF ELASTOMERIC BEARING**

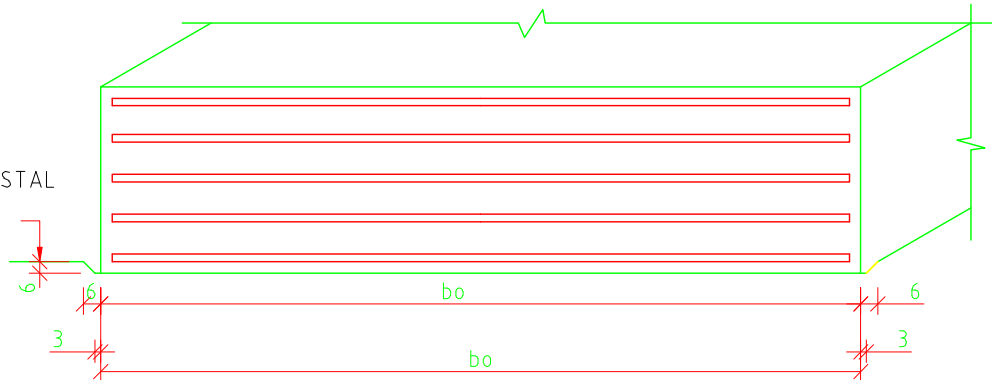
(SCALE 1:75)



**TYPICAL SECTION OF ELASTOMERIC BEARING**

(SCALE 1:75)

TOP OF PEDESTAL



**DETAIL OF RECESS/GROOVE**

(SCALE 1:75)

### INSTALLATION INSTRUCTIONS

#### (ELASTOMERIC BEARING)

- CARE SHALL BE TAKEN IN PACKING, TRANSPORTATION, STORAGE AND HANDLING TO AVOID ANY MECHANICAL DAMAGE, CONTAMINATION WITH OIL, GREASE AND DIRT, UNDE EXPOSURE TO SUNLIGHT AND WEATHER.
- THE BEARINGS SHALL BE PLACED IN A RECESS AS SHOWN IN THE DRAWING.
- THE POSITION OF THE BEARINGS SHALL BE ACCURATELY MARKED ON PIER/ ABUTMENT CAP AND THE AREA WHERE THE BEARINGS WILL BE SEATED ACCURATELY LEVELLED.
- THE CONCRETE SURFACE SHALL BE FREE FROM ANY LOOSE MATERIAL AND CLEANED OF ANY GREASE, OIL, PAINT ETC., AND IT SHALL BE DRY AT THE TIME OF FIXING OF BEARING. THE SURFACE SHALL BE SAND BLASTED, CLEAN OF ALL LAITANCE AND LEVELLED TRUE.
- BEARINGS MUST BE PLACED BETWEEN TRUE HORIZONTAL SURFACE (MAXIMUM TOLERANCE 0.2 PER CENT PERPENDICULAR TO LOAD) AND AT TRUE PLAN POSITION OF THEIR CONTROL LINES MARKED ON RECEIVING SURFACES (MAXIMUM TOLERANCE  $\pm 3$ MM). CONCRETE SURFACES SHALL BE FREE FROM LOCAL IRREGULARITIES (MAXIMUM TOLERANCE  $\pm 14$ MM IN HEIGHT).
- WHERE BEARINGS ARE INSTALLED PRIOR TO ITS CONCRETING, THE FORMS AROUND THE SHALL BE SOFT ENOUGH FOR EASY REMOVAL. FORM SHALL ALSO FIT THE BEARINGS SNUGLY AND PREVENT ANY LEAKAGE OF MORTAR ANY MORTAR CONTAMINATING THE BEARINGS DURING CONCRETING SHALL BE COMPLETELY REMOVED BEFORE SETTING.
- THE TEMPORARY FORMS SHALL BE REMOVED AFTER THE SUPERSTRUCTURE CONCRETE HAS SET. THE SIDES OF THE BEARINGS SHALL BE CLEANED OF ANY DEPOSIT OF CEMENT SLURRY/CONCRETE.

### MAINTANENCE:

- THE BEARINGS SHALL BE SUBJECTED TO PLANNED MAINTENANCE CARE.
- THE EXPOSED BEARING SURFACE SHALL BE MAINTAINED CLEAN AND FREE FROM CONTAMINATION WITH GREASE OR OIL, ETC.,
- ANNUAL ROUTINE MAINTENANCE INSPECTION OR SPECIAL MAINTENANCE INSPECTION OF ALL BEARINGS SHALL BE MADE TO CHECK FOR ANY SURFACE CRACKING OR SIGNS OF DAMAGE, DETERIORATION OR DISTRESS.
- DAMAGED BEARINGS SHALL BE REPLACED IMMEDIATELY. TO AVOID DIFFERENCES IN STIFFNESS, ALL ADJACENT BEARINGS ON THE SAME LINE OF SUPPORT SHALL ALSO BE REPLACED AND UNIFORM SEATING OF THE SUPERSTRUCTURE OVER ALL THE NEW BEARINGS SHALL BE ENSURED.
- PROCEDURE OF JACKING OF SUPERSTRUCTURE SHALL BE AS PER RELEVANT DRAWINGS.

### NOTES:

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN m, UNLESS OTHERWISE SPECIFIED.
- NO DIMENSIONS SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- SPECIFICATIONS INCLUDING PERMISSIBLE TOLERANCES FOR THE ELASTOMERIC BEARINGS SHALL BE IN ACCORDANCE WITH IRC:83 PART(III)-2018 FOR ROAD BRIDGES SECTION IX PART II ELASTOMERIC BEARINGS.
- RAW MATERIAL : CHLOROPRENE (CR) SHALL ONLY BE USED IN MANUFACTURE OF BEARINGS.
- GRADES OF RAW ELASTOMER OF PROVEN USE IN ELASTOMERIC BEARINGS, WITH LOW CRYSTALLIZATION RATES AND ADEQUATE SHELF LIFE (E.G.NEOPRENE WRT, BAYPRENE 110 OR EQUIVALENT) SHALL BE USED. NO RECLAIMED RUBBER OR VULCANIZED WASTES SHALL BE USED. THE RAW ELASTOMER CONTENT OF THE COMPOUND SHALL NOT BE LOWER THAN 60%. THE ASH CONTENT SHALL NOT EXCEED 5%. (AS PER TESTS CONDUCTED IN ACCORDANCE WITH ASTM D-297). EPDM AND OTHER SIMILAR CANDIDATE ELASTOMERS FOR BRIDGE BEARING USE SHALL NOT BE PERMITTED.
- FABRICATION, TESTING AND ACCEPTANCE OF BEARINGS SHALL BE IN ACCORDANCE WITH IRC:83 (PART III) 2018.
- ELASTOMERIC BEARINGS SHOULD NOT BE USED IN AREAS WHERE THE MINIMUM TEMPERATURE GOES BELOW (-) 10°C.
- BEARINGS SHALL BE HANDLED CAREFULLY THESE SHALL BE PROTECTED FROM BRIGHT SUN LIGHT AND EXTREME COLD. THESE SHALL BE STORED NEATLY UNDER COVER TILL INSTALLATION.
- BEARINGS SHALL BE PROCURED ONLY FROM PRE-QUALIFIED MANUFACTURES.
- THE LAMINATES AND LAYERS THUS SHOWN ARE ONLY SYMBOLIC REFER TABLE FOR DETAIL.
- SHEAR MODULUS OF ELASTOMER IS TAKEN AS 0.9MPa.

### TABLE FOR BEARING :

SPAN	BEARING WIDTH lo mm	BEARING LENGTH bo mm	BEARING THICKNESS ho mm	NO. OF INTERNAL LAYERS OF ELASTOMER ni	NO. OF STEEL LAMINATES ns	INTERNAL ELASTOMER THICKNESS hi mm	STEEL LAMINATES THICKNESS hs mm	EXTERNAL ELASTOMER THICKNESS he mm	SIDE COVER c mm	PEDESTAL CONCRETE GRADE	NO. OF BEARINGS
21.0 m (EFFECTIVE)	500	450	80	4	5	12	4	6	6	M40	2x(4+4)= 16 Nos

CIRBYA



NATIONAL HIGHWAY AUTHORITY OF INDIA

(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
AN ISO 9001:2015 CERTIFIED FIRM  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

PROJECT: FOUR LANE OF SALEM- ULUNDURPET SECTION (FROM KM 6330 TO KM 134/700F NH-79)

BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100  
0 2 4 6 8 10 12 14 16 18 20 -1:50

MISCELLANEOUS DETAILS  
FOR VEHICULAR UNDERPASS  
AT CH:134/307

TITLE: VUP at Km.134/307  
with S.Road B/Side (From km.133/615 to km.134/925)

PROJECT:

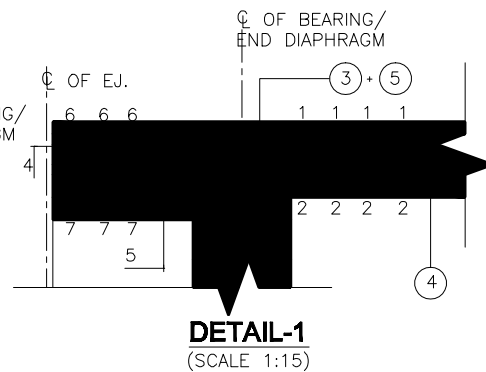
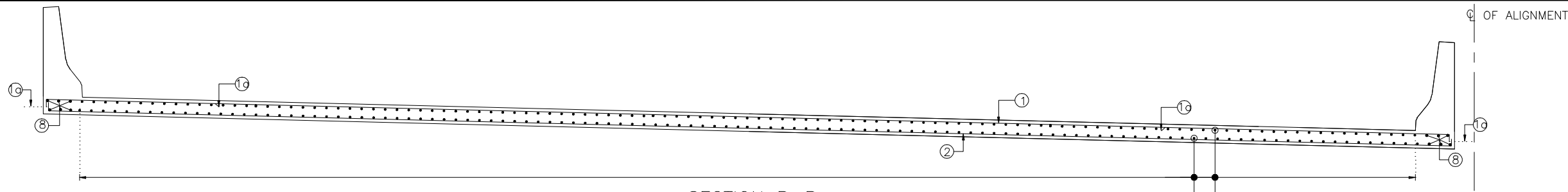
Permanent Rectification By constructing a Vehicular Underpass (VUP) (1x 20m x 5.5m) at Km 134+307 (Ulundurpet) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode





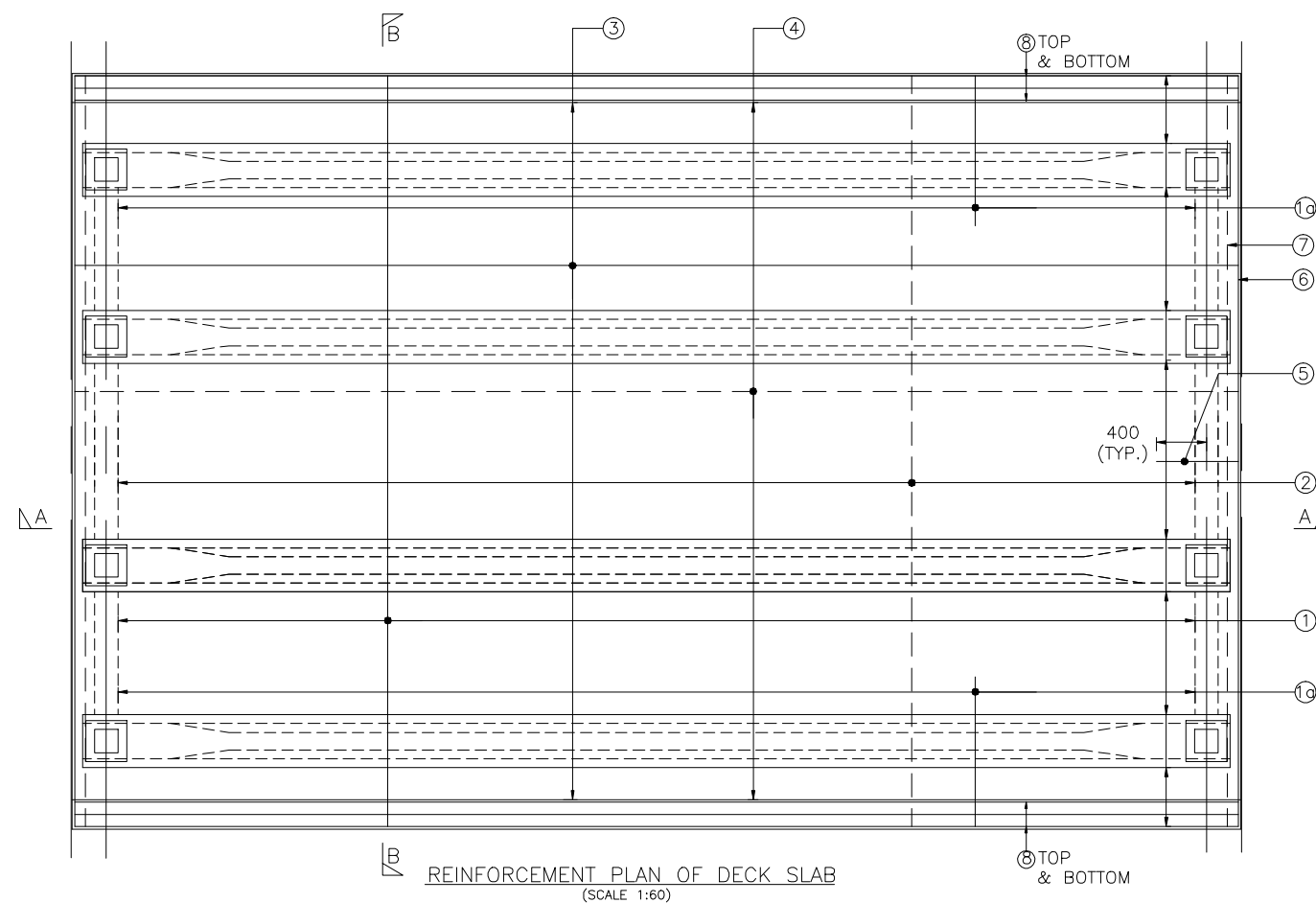






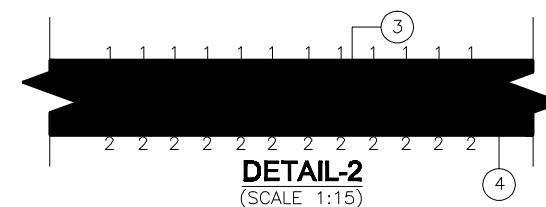
SCHEDULE OF REINFORCEMENT (FOR SLAB)

BAR MARK	DESCRIPTION	DIA OF BAR mm	SPACING IN mm/NO OF BARS	SHAPE OF BARS (NOT TO SCALE)
1	MAIN ROD FOR TOP	12	150	100 12420 100
1a	ADDITIONAL ROD AT TOP CANTILEVER	10	150	2310
2	MAIN ROD FOR BOTTOM	12	150	100 12420 100
3	DISTRIBUTION ROD FOR TOP	10	150	100 21880 100
4	DISTRIBUTION ROD FOR BOTTOM	10	150	100 21880 100
5	MAIN ROD FOR EJ EDGE	12	250	840 270 200
6	MAIN ROD AT SUPPORT	12	3x2Nos	12420
7	MAIN ROD AT SUPPORT	12	3x2Nos	12420
8	DISTRIBUTION ROD FOR CRASH BARRIER & RAILING	12	4x6Nos	21880



NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS. UNLESS OTHERWISE MENTIONED.
- DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSIONS ONLY.
- GRADE OF CONCRETE SHALL BE M35 FOR GIRDER,CROSS GIRDER AND M35 FOR DECK SLAB.
- GRADE OF STEEL SHALL BE Fe500. CONFIRMING TO IS:1786
- MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm FOR SUPERSTRUCTURE.
- DEVELOPMENT LENGTH SHALL BE 36 TIMES THE DIA OF BAR.
- LAP LENGTH OF THE STEEL SHALLBE PROVIDED AS BELOW  
LAP LENGTH =  $K \times 36 \times \text{BAR DIA}$   
 $K=1.4$  WHERE  $< 25\%$  BARS AT THE SECTION ARE LAPPED  $K=1.6$  WHERE BARS AT THE SECTION ARE LAPPED  $> 25\%$  BUT  $\leq 40\%$   
 $K=1.8$  WHERE BARS AT THE SECTION ARE LAPPED  $> 40\%$  BUT  $\leq 50\%$ .
- MAXIMUM OF 50% OF BARS CAN BE LAPPED AT A SECTION AND LAPS SHALL BE STAGGERED.



LEGEND:

- — — TOP REINFORCEMENT
- — — BOTTOM REINFORCEMENT

CLIENT:

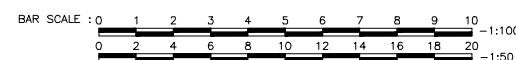


NATIONAL HIGHWAY AUTHORITY OF INDIA  
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Government of India.

INDEPENDANT ENGINEER:

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

PROJECT: FOUR LANE OF SALEM-ULUNDURPET SECTION  
(FROM KM 636 TO KM 136/700F NH-79)



MISCELLANEOUS DETAILS  
FOR VEHICULAR UNDERPASS  
AT CH:134/307

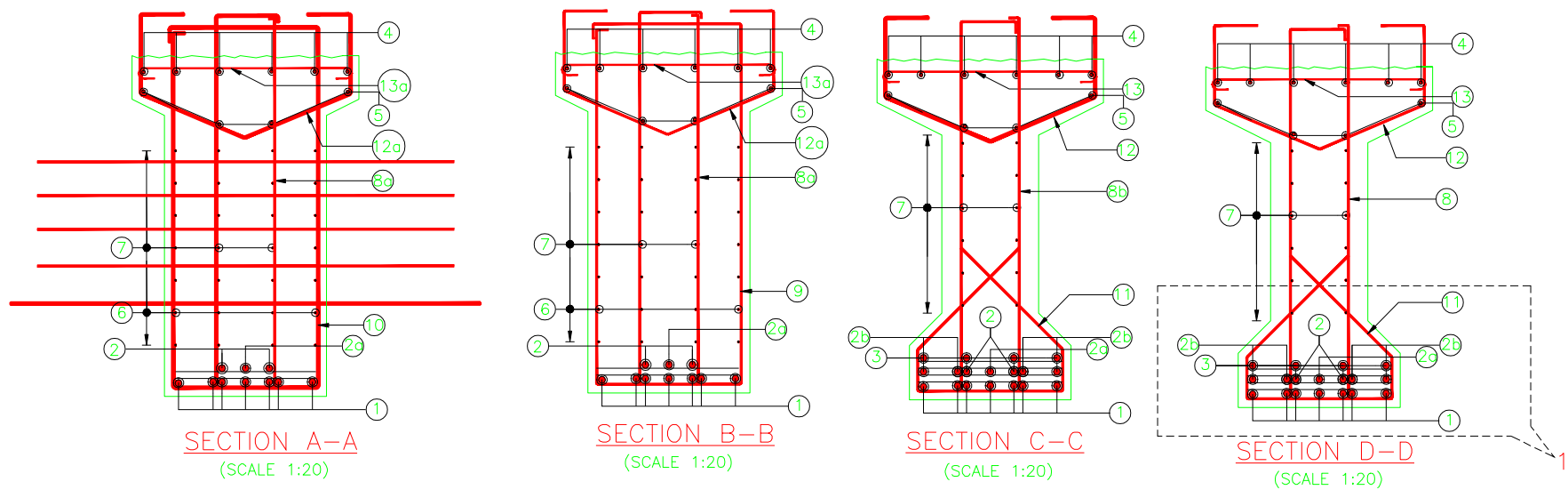
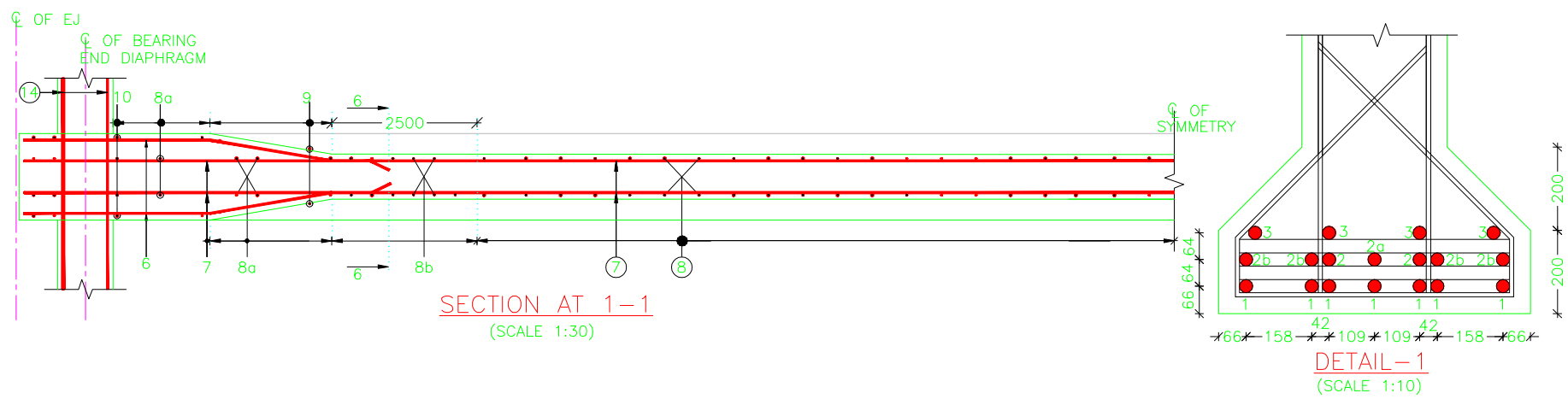
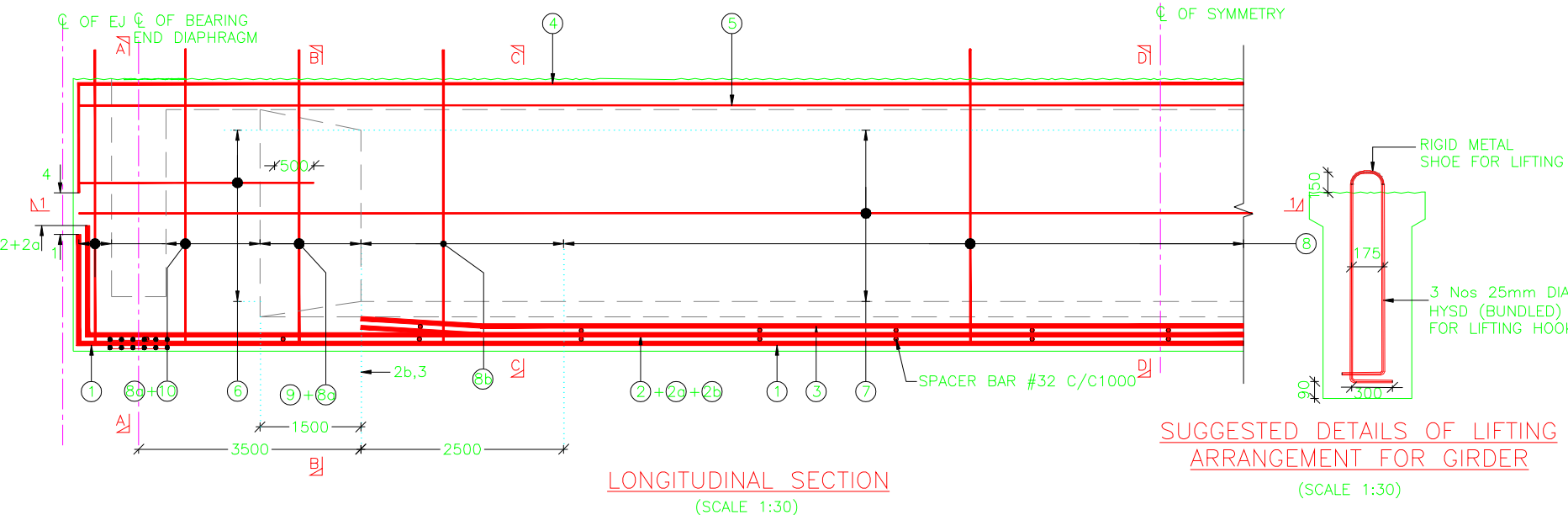
TITLE: VUP at Km.134/307  
with S.Road B/Side (From km.133/565 to km.134/965)

PROJECT:

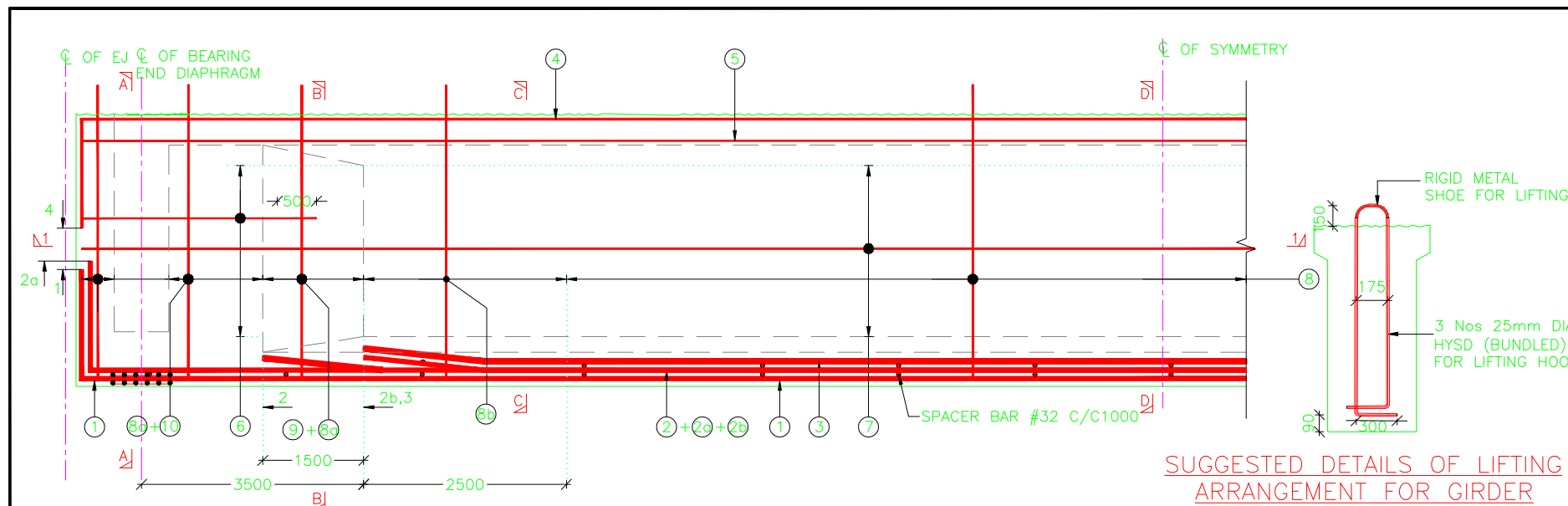
Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode

SCHEDULE OF REINFORCEMENT INNER GIRI  
(FOR ONE GIRD

BAR MARK	DESCRIPTION	DIA OF BAR "mm"	SPACING IN "mm"/ NO OF BARS	SHAPE OF BARS (NOT TO SCALE)
1	GIRDER BOTTOM LAYER-1	32	7 Nos	800 21620 800
2	GIRDER BOTTOM LAYER-2	32	2 Nos	800 21620 800
2a	GIRDER BOTTOM LAYER-2	32	1 Nos	800 21620 800
2b	GIRDER BOTTOM LAYER-2	32	4 Nos	14000
3	GIRDER BOTTOM LAYER-3	32	4 Nos	14000
4	GIRDER TOP	12	6 Nos	21620 500
5	HAUNCH DISTRIBUTION ROD	10	4 Nos	VARIES
6	SURFACE BAR	10	8X2 Nos	2270 VARIES 500
7	SURFACE BAR	10	8X2 Nos	21620
8	STIRRUPS	10	2LEGGED @ 175	270 1720
8a	STIRRUPS	10	2LEGGED @ 150	270 1720
8b	STIRRUPS	12	2LEGGED @ 150	270 1720
9	STIRRUPS	10	2LEGGED @ 150	Varies 1720
10	STIRRUPS	10	2LEGGED @ 150	670 1720
11	STIRRUPS	10	150/175	665 670
12	STIRRUPS	10	150/175	150 60
12a	STIRRUPS	10	150	150 60
13	LINKS	10	150/175	920
13a	LINKS	10	150	920
14	MESH	8	4 Nos FOR ONE GIRDER	

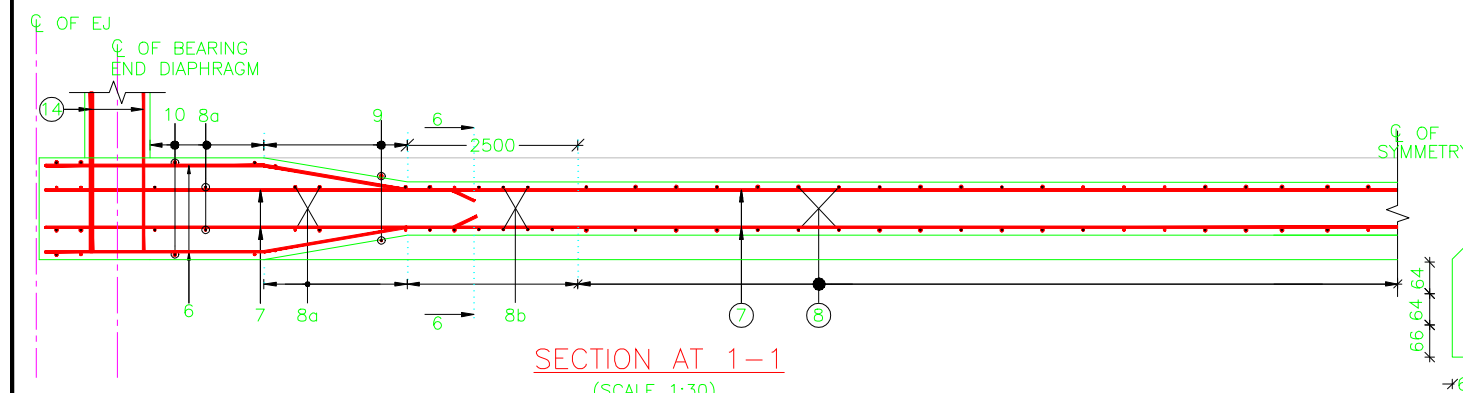


- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS. UNLESS OTHERWISE MENTIONED.
  - DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSIONS ONLY.
  - GRADE OF CONCRETE SHALL BE M35 FOR GIRDER,CROSS GIRDER AND M35 FOR DECK SLAB.
  - GRADE OF STEEL SHALL BE Fe500. CONFIRMING TO IS:1786
  - MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm FOR SUPERSTRUCTURE.
  - DEVELOPMENT LENGTH SHALL BE 36 TIMES THE DIA OF BAR.
  - LAP LENGTH OF THE STEEL SHALLBE PROVIDED AS BELOW  
LAP LENGTH = Kx42xBAR DIA  
K=1.4 WHERE < 25% BARS AT THE SECTION ARE LAPPED K=1.6 WHERE BARS AT THE SECTION ARE LAPPED > 25% BUT ≤ 40%  
K=1.8 WHERE BARS AT THE SECTION ARE LAPPED > 40% BUT ≤ 50%.
  - MAXIMUM OF 50% OF BARS CAN BE LAPPED AT A SECTION AND LAPS SHALL BE STAGGERED.

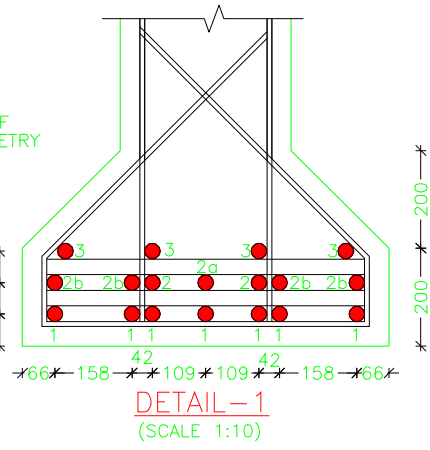


LONGITUDINAL SECTION  
(SCALE 1:30)

SUGGESTED DETAILS OF LIFTING  
ARRANGEMENT FOR GIRDER  
(SCALE 1:30)



SECTION AT 1-1  
(SCALE 1:30)

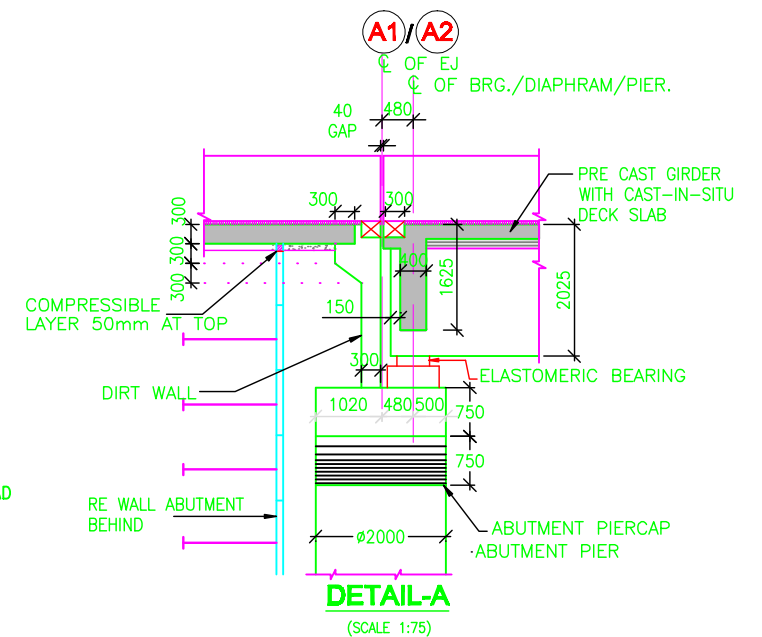
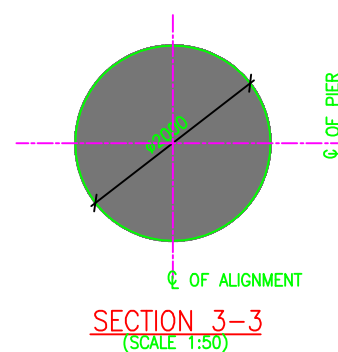
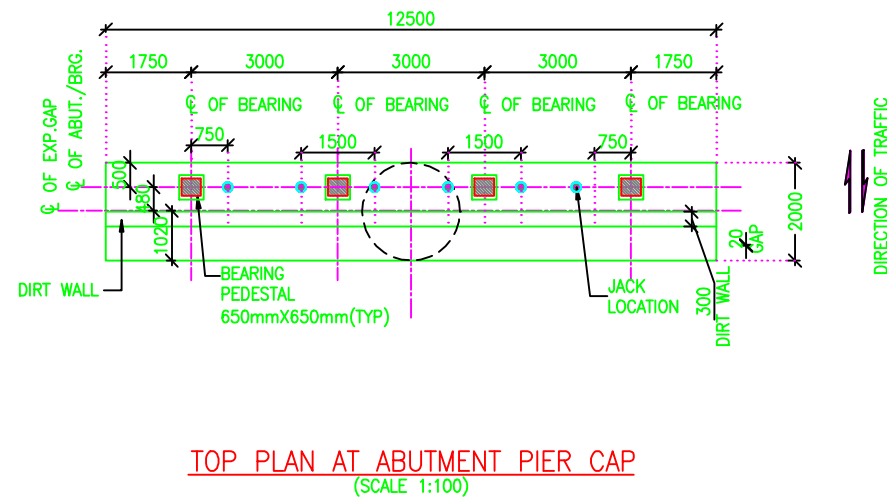
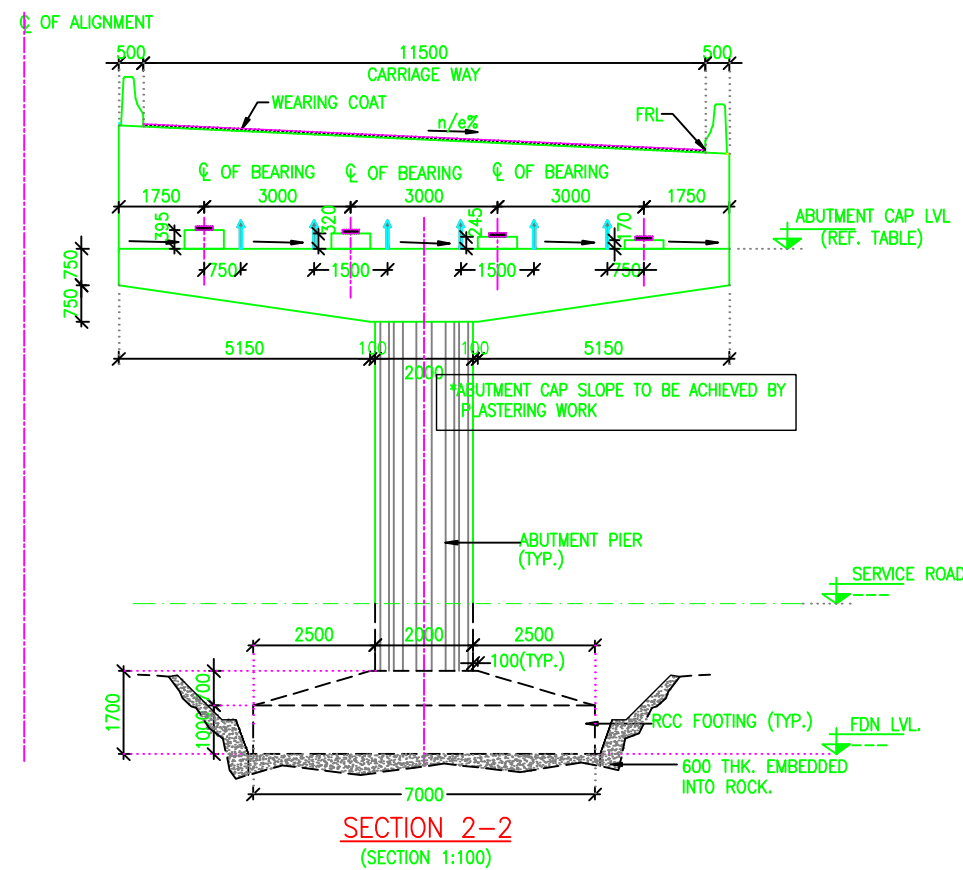
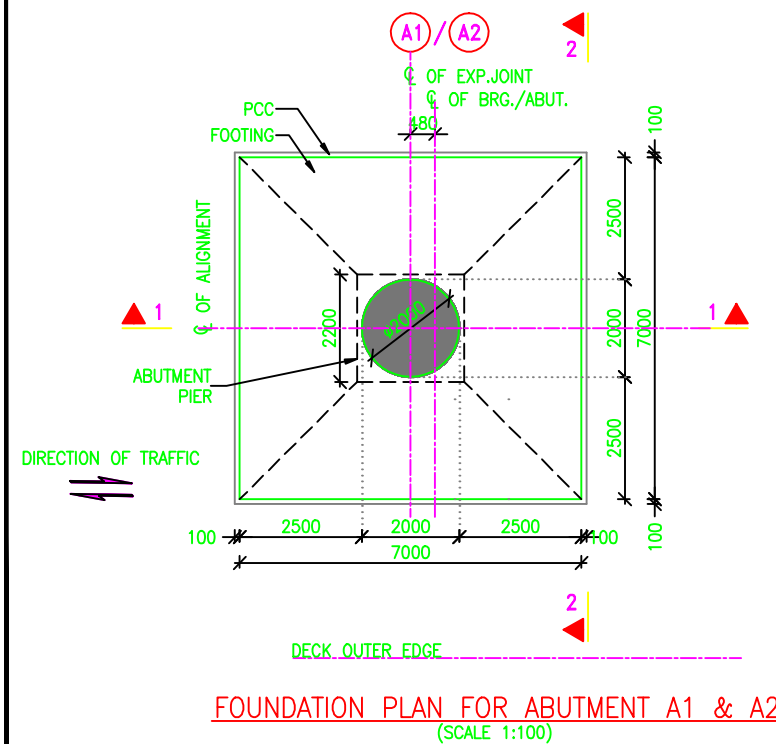
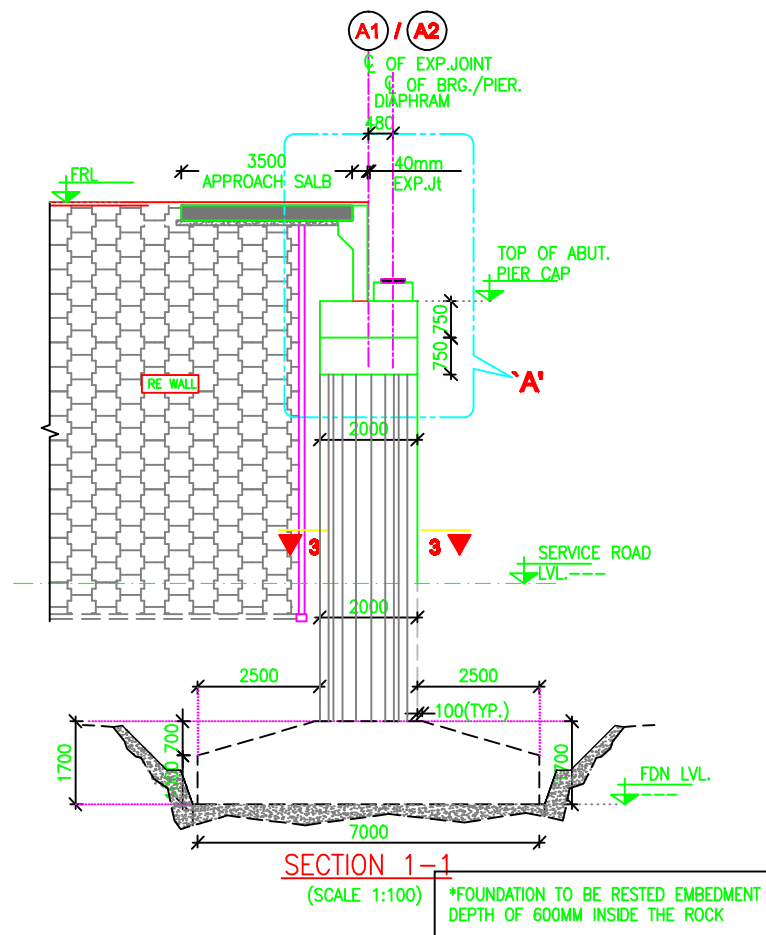


SCHEDULE OF REINFORCEMENT OUTER GIRDER  
(FOR ONE GIRDER)

BAR MARK	DESCRIPTION	DIA OF BAR mm	SPACING IN "mm"/ NO OF BARS	SHAPE OF BARS (NOT TO SCALE)
1	GIRDER BOTTOM LAYER-1	32	7 Nos	800 21620 1800
2	GIRDER BOTTOM LAYER-2	32	2 Nos	17000
2a	GIRDER BOTTOM LAYER-2	32	1 Nos	800 21620 1800
2b	GIRDER BOTTOM LAYER-2	32	4 Nos	14000
3	GIRDER BOTTOM LAYER-3	32	4 Nos	14000
4	GIRDER TOP	12	6 Nos	21620 500
5	HAUNCH DISTRIBUTION ROD	10	4 Nos	VARIES
6	SURFACE BAR	10	8X2 Nos	2270 VARIES 500
7	SURFACE BAR	10	8X2 Nos	21620
8	STIRRUPS	10	2LEGGED @ 175	270 1720
8a	STIRRUPS	10	2LEGGED @ 150	270 1720
8b	STIRRUPS	12	2LEGGED @ 150	270 1720
9	STIRRUPS	10	2LEGGED @ 150	Varies 1720
10	STIRRUPS	10	2LEGGED @ 150	670 1720
11	STIRRUPS	10	150/175	665 150 60
12	STIRRUPS	10	150/175	150 60
12a	STIRRUPS	10	150	150 60
13	LINKS	10	150/175	920
13a	LINKS	10	150	920
14	MESH	8	4 Nos FOR ONE GIRDER	

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS. UNLESS OTHERWISE MENTIONED.
- DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSIONS ONLY.
- GRADE OF CONCRETE SHALL BE M35 FOR GIRDER, CROSS GIRDER AND M35 FOR DECK SLAB.
- GRADE OF STEEL SHALL BE Fe500. CONFIRMING TO IS:1786
- MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm FOR SUPERSTRUCTURE.
- DEVELOPMENT LENGTH SHALL BE 36 TIMES THE DIA OF BAR.
- LAP LENGTH OF THE STEEL SHALL BE PROVIDED AS BELOW  
LAP LENGTH =  $K \times 42 \times \text{BAR DIA}$   
 $K=1.4$  WHERE  $< 25\%$  BARS AT THE SECTION ARE LAPPED  $K=1.6$  WHERE BARS AT THE SECTION ARE LAPPED  $> 25\%$  BUT  $\leq 40\%$   
 $K=1.8$  WHERE BARS AT THE SECTION ARE LAPPED  $> 40\%$  BUT  $\leq 50\%$ .
- MAXIMUM OF 50% OF BARS CAN BE LAPPED AT A SECTION AND LAPS SHALL BE STAGGERED.



#### LEGEND:

BRG.-BEARING  
●-JACK LOCATION IN PLAN  
●-JACK LOCATION IN ELEVATION  
FRL-FINISHED ROAD LEVEL  
CAP LVL-ABUTMENTCAP TOP LEVEL

#### NOTES:

- ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METERS. UNLESS OTHERWISE SPECIFIED.
- NO DIMENSIONS SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- TYPE OF BEARING : ELASTOMERIC.
- THE LOCATION OF JACKS FOR LIFTING OF SUPERSTRUCTURE TO REPLACE BEARING ETC. IS SHOWN ↑ THUS THIS SHALL BE DISTINCTLY ETCHED FOR EASY IDENTIFICATION ON THE END CROSS GIRDERS AND PIER/ABUTMENT CAPS.
- GRADE OF CONCRETE SHALL BE
 

(a) RCC ABUTMENT PIER & PIER CAP	- M35
(b) RCC BEARING PEDESTAL	- M40
(A) FOUNDATION	- M35
(c) PCC LEVELING COURSE	- M15
(d) RCC CRASH BARRIER	- M40
- THE REINFORCEMENT SHALL BE HYSD BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS:1786.
- STRIP SEAL TYPE EXPANSION JOINTS SHALL BE PROVIDED IN TERMS OF MODIFIED INTERIM SPECIFICATION FOR EXPANSION JOINTS ISSUED VIDE "MORTH" CIRCULAR No.RW/NH-34059/1/96-S&R DATED 30.11.2000 & 25.1.2001.
- SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL CONSIDERED AS 65.20T/M<sup>2</sup> AS PER GEOTECH REPORT. SEISMIC ZONE = II AS PER IS: 1893 - 2002.
- TYPE OF LIVE LOAD CONSIDERED (UPTO 3 LANE OF CLASS - A) (OR) (ONE LANE OF 70R) (OR)(ONE 70R + ONE LANE OF CLASS -A)
- RECESS FOR BEARING AND EXPANSION JOINT SHALL BE LEFT AS PER MANUFACTURER'S SPECIFICATION.
- CLEAR COVER TO OUTERMOST STEEL SHALL BE 40mm FOR SUBSTRUCTURE & 75mm FOR FOUNDATION
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
- EXCEPT THE PORTION UNDER BEARINGS, THE TOP SURFACE OF CAPS SHOULD HAVE SLOPE IN ORDER TO ALLOW DRAINAGE OF WATER.

CIRBY

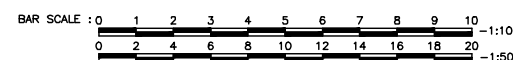


**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
(Ministry of Road Transport & Highways)  
Government of India.

**INDEPENDANT ENGINEER:**

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
AL JAWHRI ENGINEERING WORKS  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**PROJECT: FOUR LANE OF SALEM-ULANDURPET SECTION (FROM KM 134 TO KM 136) OF NH-79**

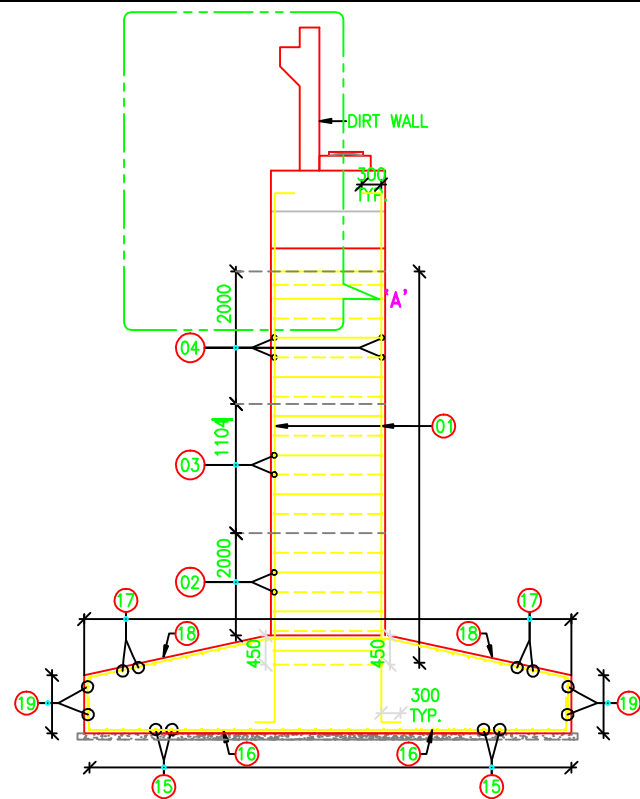


**MISCELLANEOUS DETAILS FOR VEHICULAR UNDERPASS AT CH:134/387**

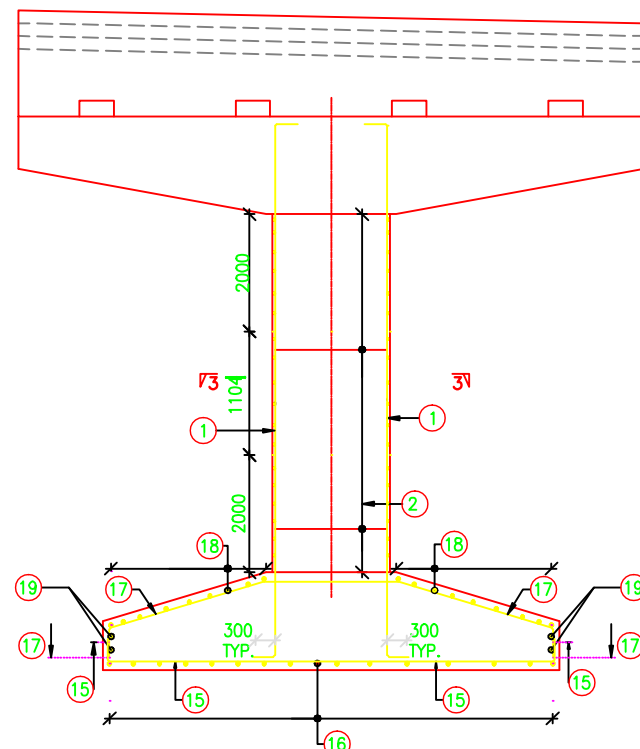
**TITLE: VUP at Km.134/307**  
with S.Road B/Side (From km.133/565 to km.134/965)

**PROJECT:**

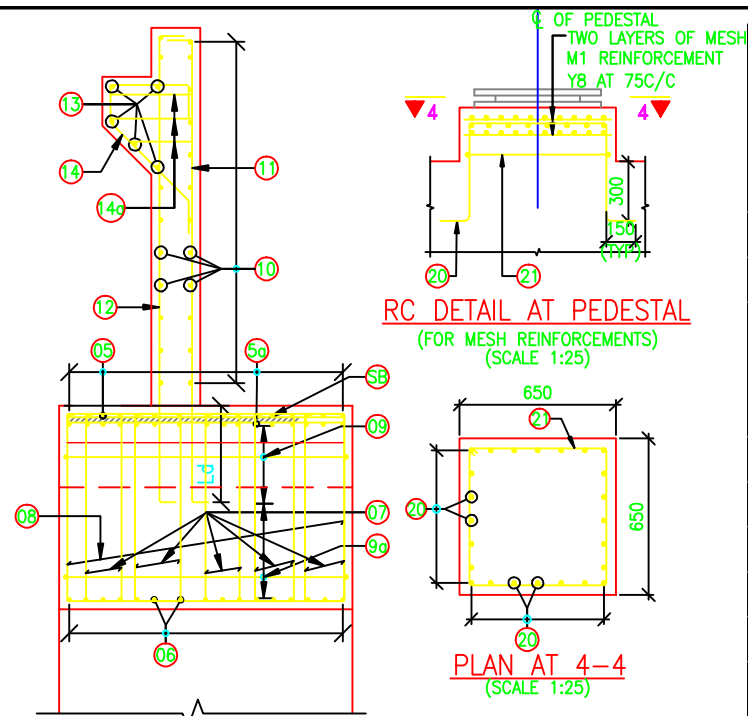
Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+387 (Ulandurpet) in the project of Salem - Ulandurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



SECTION 1-1  
(SCALE 1:75)



SECTION 2-2  
(SCALE 1:75)  
(BAR MARK NO.04 NOT SHOWN FOR CLARITY)



DETAIL-A  
(SCALE 1:30)

### SCHEDULE OF REINFORCEMENT

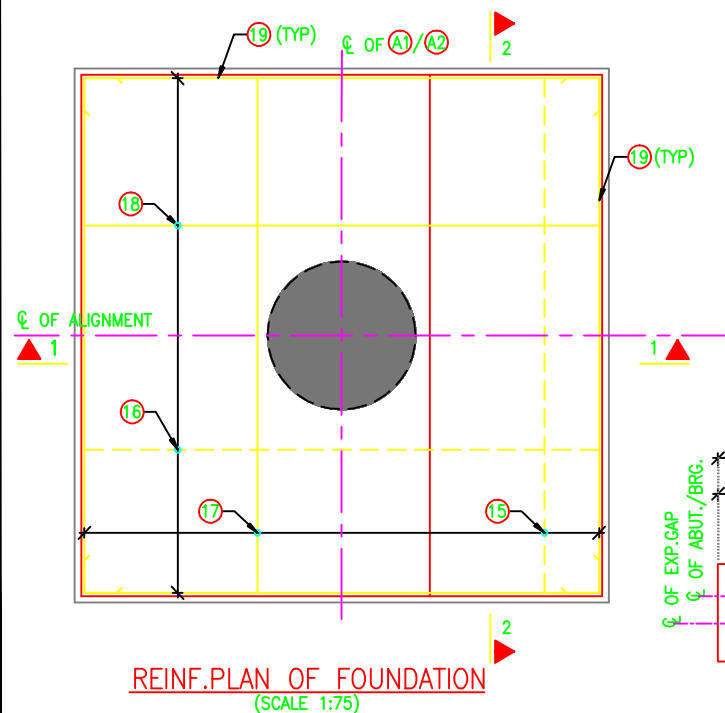
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING IN mm /NOS
<b>PIER REINFORCEMENT</b>			
01	300	VARIES	25
02	VARIES	12	100
03	VARIES	12	125
04	VARIES	12	100
<b>PIER CAP REINFORCEMENT</b>			
05	500 12420 1500	32	18Nos-LAYER-1
06	500 12420 1500	25	18Nos-LAYER-2
07	500 5167 2194 280 1920	25	18Nos.
08	VARIES	10L-12	120
09	14420	16	200
09	VARIES	16	200
<b>DIRT WALL REINFORCEMENT</b>			
10	150 12420 150	10	200
11	150 150	12	200
12	150 150	12	200
13	12420	12	5Nos.
14	200 200	12	200
14a		2L-10	400
<b>FOOTING REINFORCEMENT</b>			
15	600 6850 600	25	125
16	600 6850 600	25	125
17	500 VARIES 600	20	125
18	500 VARIES 600	20	125
19	500 6850 500	16	2Nos EACH FACE
<b>PEDESTAL REINFORCEMENT</b>			
20	VARIES	12	150
21	600	10	150

### LEGEND

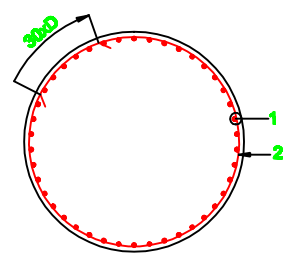
- DENOTES BOTTOM BAR / OUTER FACE
- DENOTES TOP BAR/EARTH FACE

### NOTES:

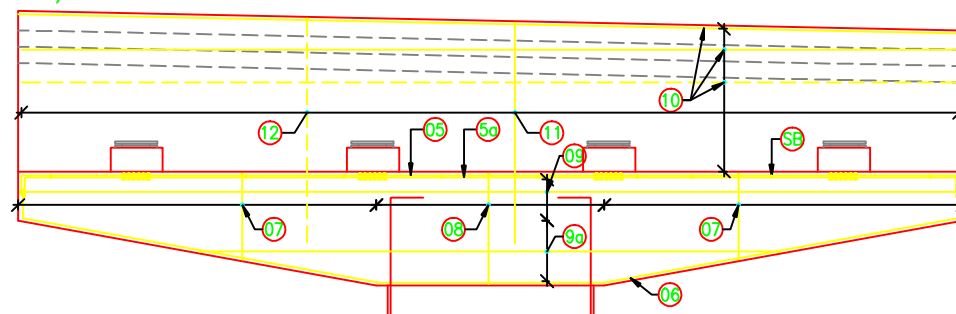
- ALL DIMENSIONS ARE IN MILLIMETER.
- FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE THE DRAWING.
- GRADE OF CONCRETE SHALL BE AS FOLLOWS:-  
SUB STRUCTURE - M35  
FOUNDATION - M35  
LEVELLING COURSE - M15
- GRADE OF STEEL SHALL BE Fe 500 CONFIRMING TO IS:1786
- NOT MORE THAN 50% OF THE BARS BE LAPPED AT ONE SECTION
- LAP LENGTH SHALL BE 51 TIMES DIA OF THE BAR AND SHALL BE STAGGERED.
- CLEAR COVER SHALL BE :-  
FOUNDATION - 75 mm  
WALL - 40 mm
- DEVELOPMENT LENGTH OF BAR SHALL BE 36 TIMES DIA. OF BAR UNLESS SHOWN OTHERWISE.



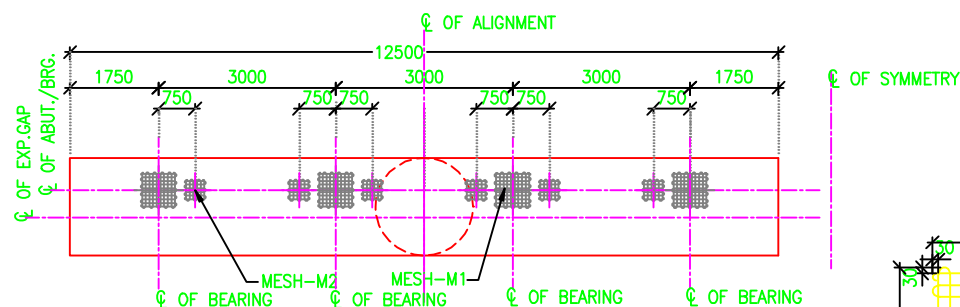
REINF.PLAN OF FOUNDATION  
(SCALE 1:75)



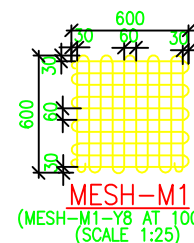
SECTION 3-3  
(SCALE 1:30)



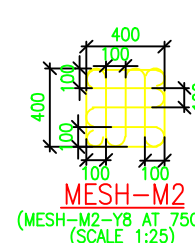
REINFORCEMENT DETAILS OF ABUTMENT CAP & DIRT WALL  
(SCALE 1:75)



MESH DETAILS OF ABUTMENT CAP  
(SHOWING MESH REINFORCEMENT AT PEDESTAL AND JACK POSITION)  
(SCALE 1:100)



MESH-M1  
(MESH-M1-Y8 AT 100C/C)  
(SCALE 1:25)



MESH-M2  
(MESH-M2-Y8 AT 75C/C)  
(SCALE 1:25)

CLIENT

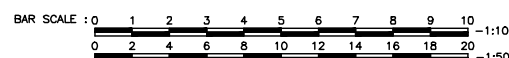


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INDEPENDANT ENGINEER

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
ALABET VEDHANA WERE  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

PROJECT: FOUR LANE OF SALEM-ULANDURPET SECTION (FROM KM 134 TO KM 136) OF NH-79



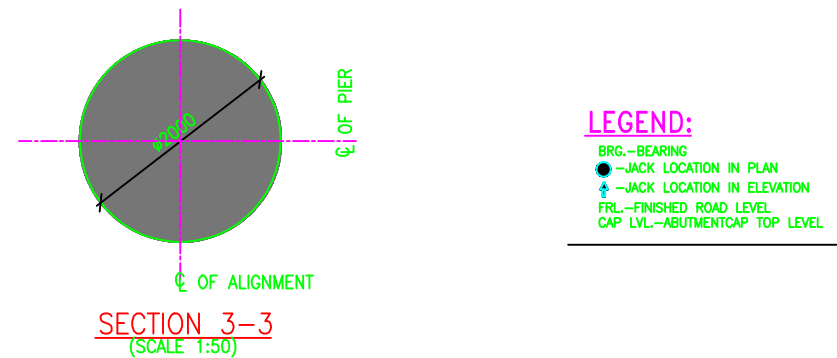
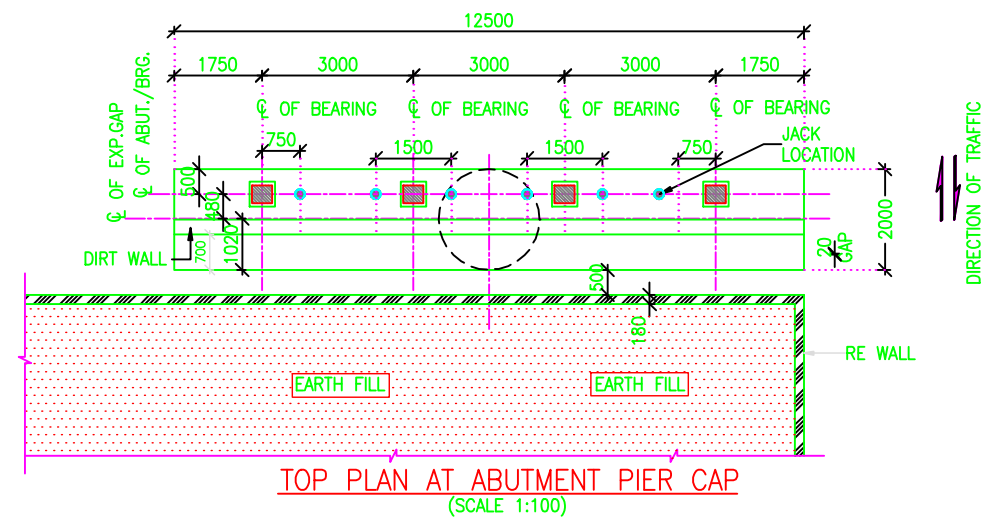
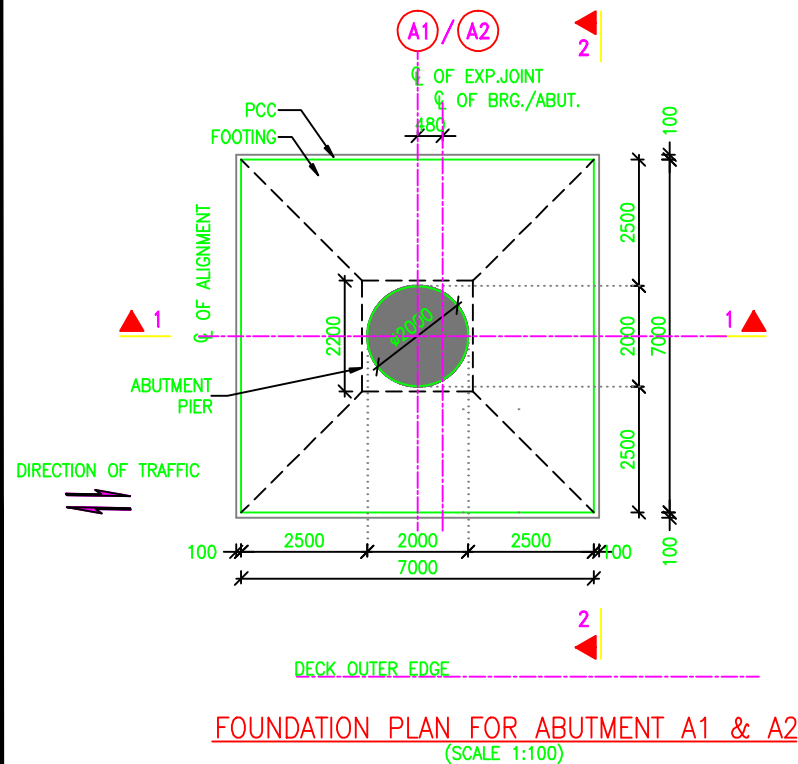
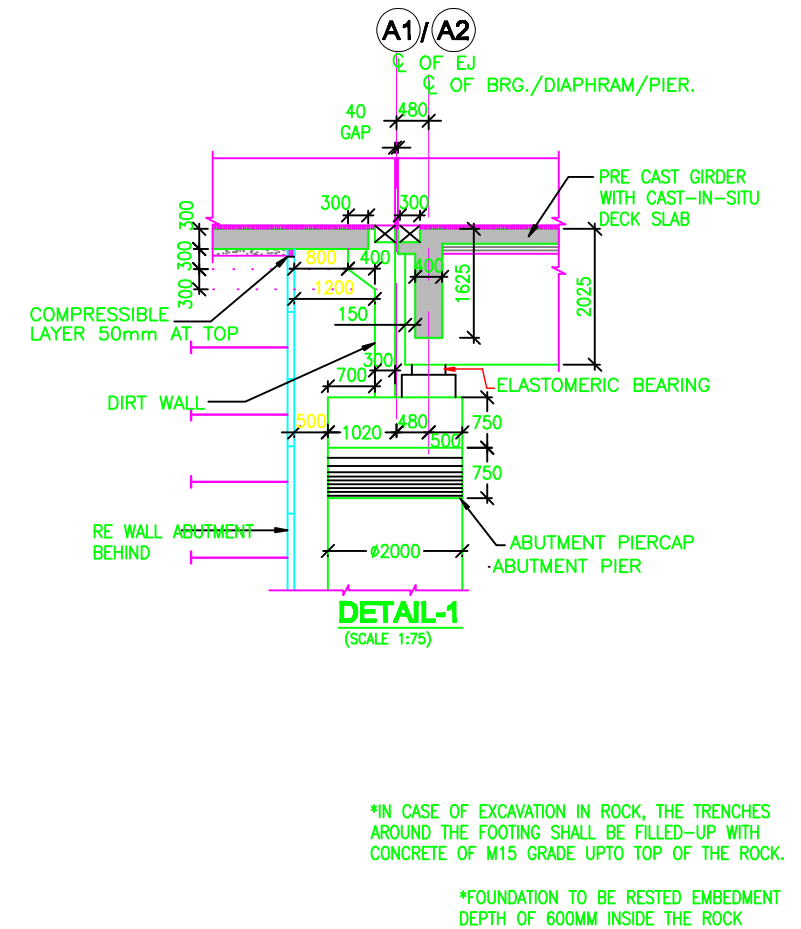
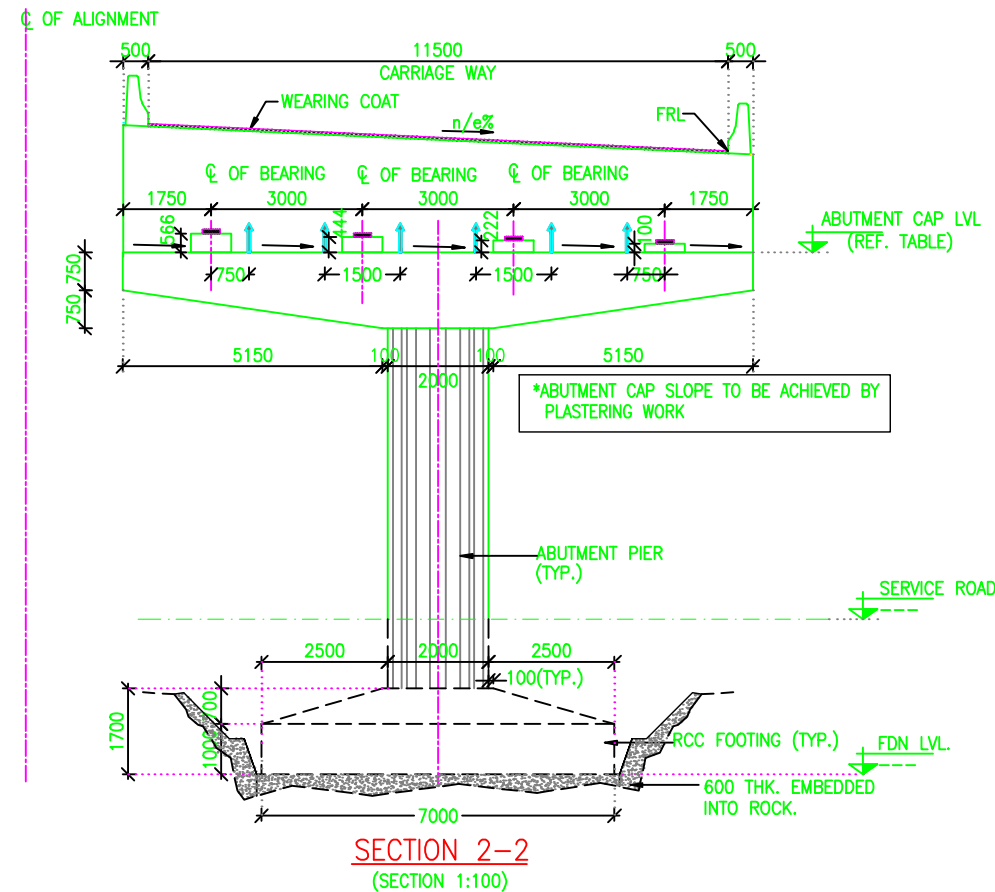
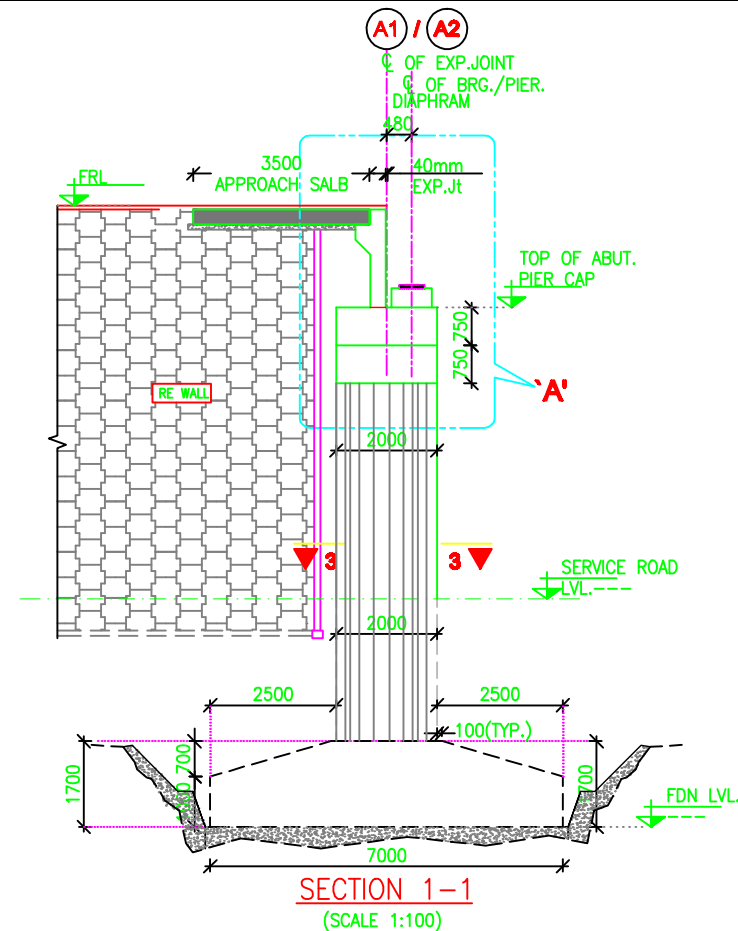
MISCELLANEOUS DETAILS  
FOR VEHICULAR UNDERPASS  
AT CH:134/387

TITLE: VUP at Km.134/387  
with S.Road B/Side (From km.133/565 to km.134/965)

PROJECT

Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+387 (Ulandurpet) in the project of Salem - Ulandurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



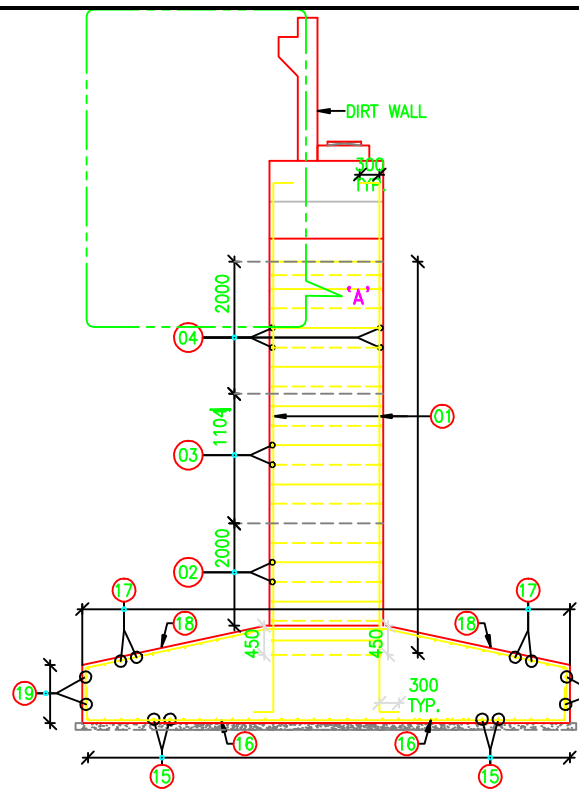


#### NOTES:

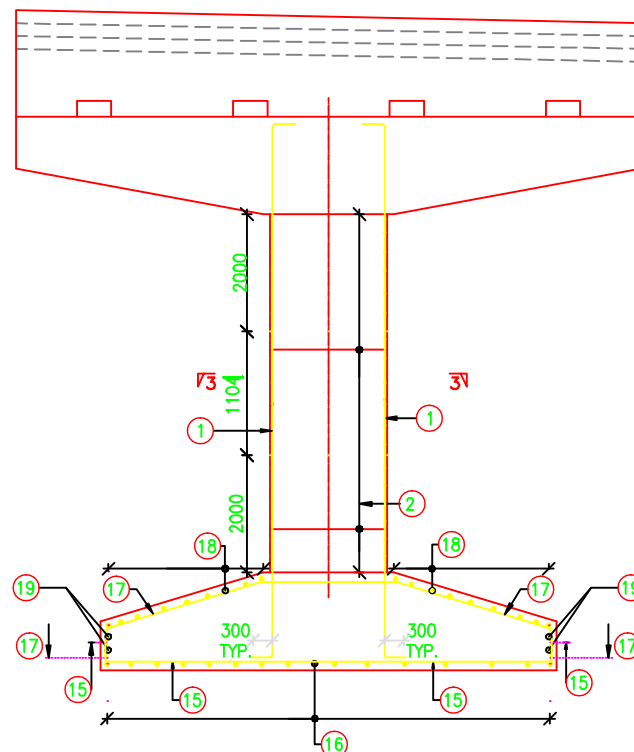
- ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METERS. UNLESS OTHERWISE SPECIFIED.
- NO DIMENSIONS SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- TYPE OF BEARING : ELASTOMERIC.
- THE LOCATION OF JACKS FOR LIFTING OF SUPERSTRUCTURE TO REPLACE BEARING ETC. IS SHOWN  $\blacktriangle$  THUS THIS SHALL BE DISTINCTLY ETCHED FOR EASY IDENTIFICATION ON THE END CROSS GIRDERS AND PIER/ABUTMENT CAPS.
- GRADE OF CONCRETE SHALL BE
 

(a) RCC ABUTMENT PIER & PIER CAP	- M35
(b) RCC BEARING PEDESTAL	- M40
(A) FOUNDATION	- M35
(c) PCC LEVELING COURSE	- M15
(d) RCC CRASH BARRIER	- M40
- THE REINFORCEMENT SHALL BE HYSD BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS:1786.
- STRIP SEAL TYPE EXPANSION JOINTS SHALL BE PROVIDED IN TERMS OF MODIFIED INTERIM SPECIFICATION FOR EXPANSION JOINTS ISSUED VIDE "MORTH" CIRCULAR No.RW/NH-34059/1/96-S&R DATED 30.11.2000 & 25.1.2001.
- SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL CONSIDERED AS 65.20T/M<sup>2</sup> AS PER GEOTECH REPORT. SEISMIC ZONE = II AS PER IS: 1893 - 2002.
- TYPE OF LIVE LOAD CONSIDERED (UPTO 3 LANE OF CLASS - A) (OR) (ONE LANE OF 70R) (OR) (ONE 70R + ONE LANE OF CLASS - A)
- RECESS FOR BEARING AND EXPANSION JOINT SHALL BE LEFT AS PER MANUFACTURER'S SPECIFICATION.
- CLEAR COVER TO OUTERMOST STEEL SHALL BE 40mm FOR SUBSTRUCTURE & 75mm FOR FOUNDATION
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
- EXCEPT THE PORTION UNDER BEARINGS, THE TOP SURFACE OF CAPS SHOULD HAVE SLOPE IN ORDER TO ALLOW DRAINAGE OF WATER.

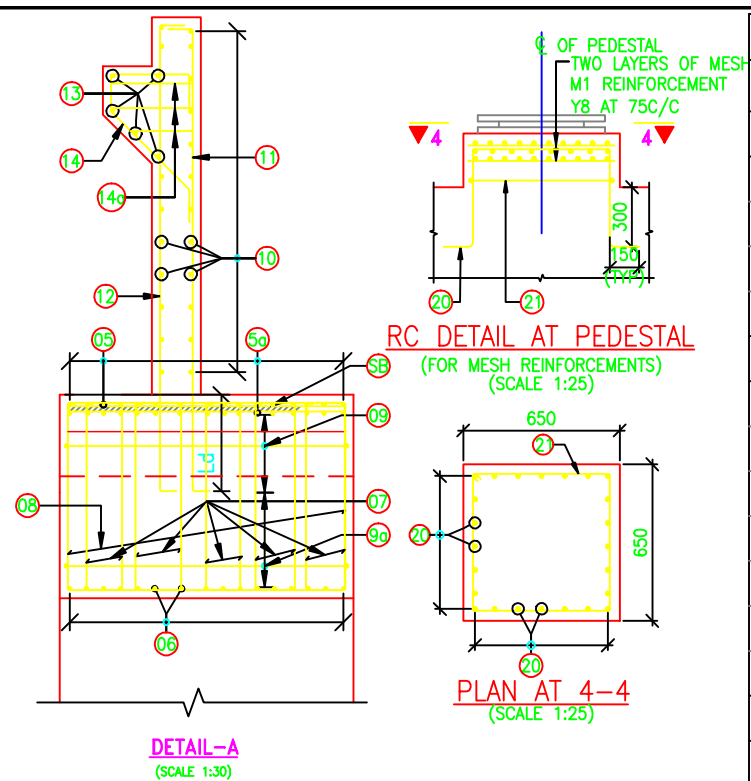




SECTION 1-1  
(SCALE 1:75)



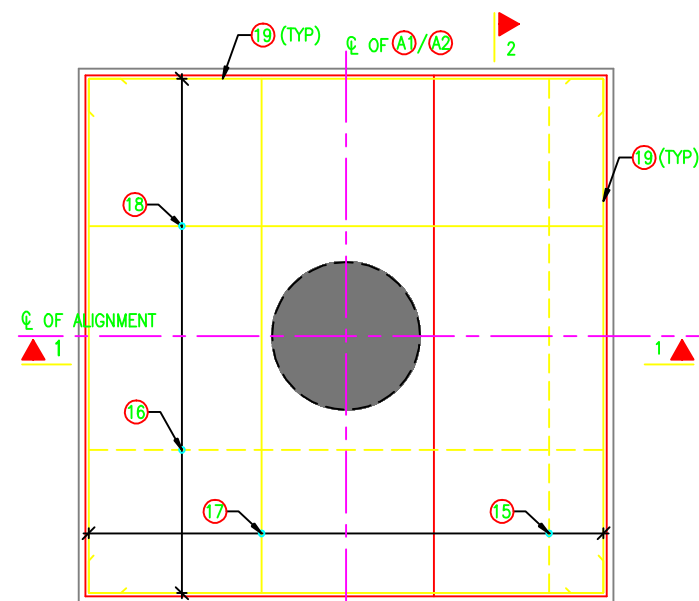
SECTION 2-2  
(SCALE 1:75)  
(BAR MARK NO.04 NOT SHOWN FOR CLARITY)



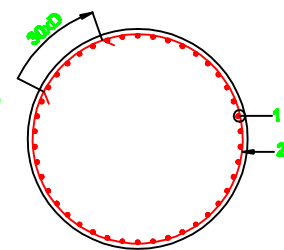
DETAIL-A  
(SCALE 1:30)

RC DETAIL AT PEDESTAL  
(FOR MESH REINFORCEMENTS)  
(SCALE 1:25)

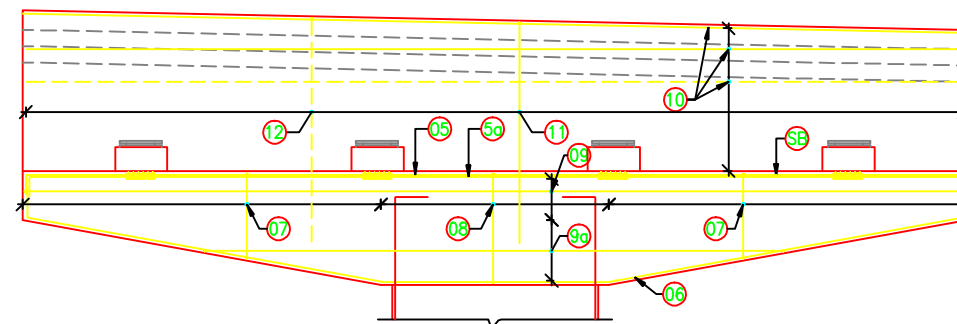
PLAN AT 4-4  
(SCALE 1:25)



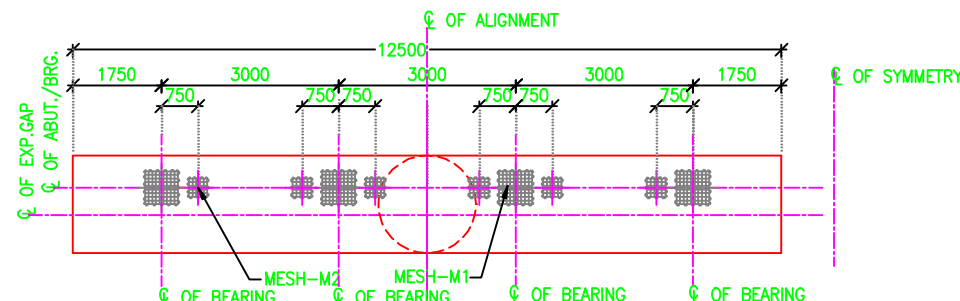
REINF. PLAN OF FOUNDATION  
(SCALE 1:75)



SECTION 3-3  
SCALE 1:50



REINFORCEMENT DETAILS OF ABUTMENT CAP & DIRT WALL  
(SCALE 1:75)



MESH DETAILS OF ABUTMENT CAP  
(SHOWING MESH REINFORCEMENT AT PEDESTAL AND JACK POSITION)  
(SCALE 1:100)

## SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING IN mm / NOS
PIER REINFORCEMENT			
01	300 VARIES	25	42Nos.
02	VARIES	12	100
03	VARIES	12	125
04	VARIES	12	100
PIER CAP REINFORCEMENT			
05	500 12420 500	32	18Nos-LAYER-1
06	500 12420 500	25	18Nos-LAYER-2
07	500 5167 500	25	18Nos.
08	VARIES	10L-12	120
09	VARIES	2L-12	120
10	14420	16	200
11	VARIES	16	200
DIRT WALL REINFORCEMENT			
12	150 12420 150	10	200
13	150 150	12	200
14	150 150	12	200
15	12420	12	5Nos.
16	200 200	12	200
17	VARIES	2L-10	400
FOOTING REINFORCEMENT			
18	600 6850 600	25	125
19	600 6850 600	25	125
20	500 VARIES 600	20	125
21	500 VARIES 600	20	125
22	500 6850 500	16	2Nos EACH FACE
PEDESTAL REINFORCEMENT			
23	VARIES	12	150
24	600	10	150

## LEGEND

- DENOTES BOTTOM BAR / OUTER FACE
- DENOTES TOP BAR/EARTH FACE

## NOTES:

- ALL DIMENSIONS ARE IN MILLIMETER.
- FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE THE DRAWING.
- GRADE OF CONCRETE SHALL BE AS FOLLOWS:-  
SUB STRUCTURE - M35  
FOUNDATION - M35  
LEVELLING COURSE - M15
- GRADE OF STEEL SHALL BE Fe 500 CONFIRMING TO IS:1786
- NOT MORE THAN 50% OF THE BARS BE LAPPED AT ONE SECTION
- LAP LENGTH SHALL BE 51 TIMES DIA OF THE BAR AND SHALL BE STAGGERED.
- CLEAR COVER SHALL BE :-  
FOUNDATION - 75 mm  
WALL - 40 mm
- DEVELOPMENT LENGTH OF BAR SHALL BE 36 TIMES DIA. OF BAR UNLESS SHOWN OTHERWISE.

CLIENT



NATIONAL HIGHWAY AUTHORITY OF INDIA  
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Government of India.

INDEPENDANT ENGINEER

SA INFRASTRUCTURE CONSULTANTS PVT LTD  
AT JALPAIGURI  
QUEST ENGINEERS & CONSULTANTS PVT LTD.  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

PROJECT: FOUR LANE OF SALEM-ULANDURPET SECTION (FROM KM 134 TO KM 134+307) OF NH-79

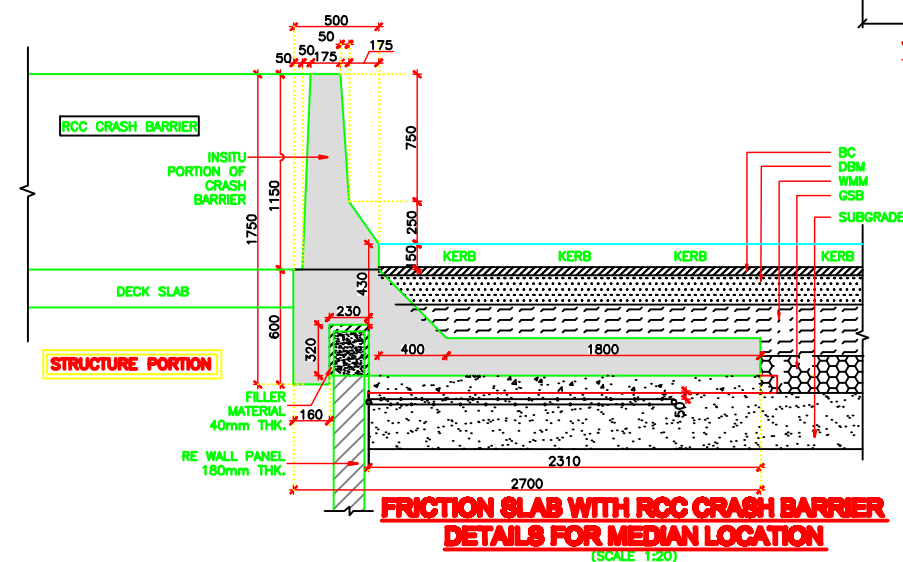
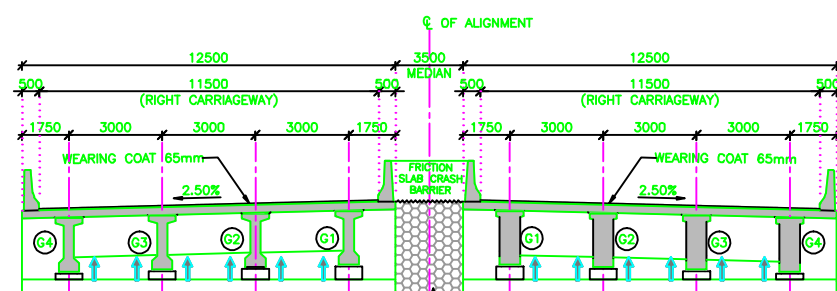
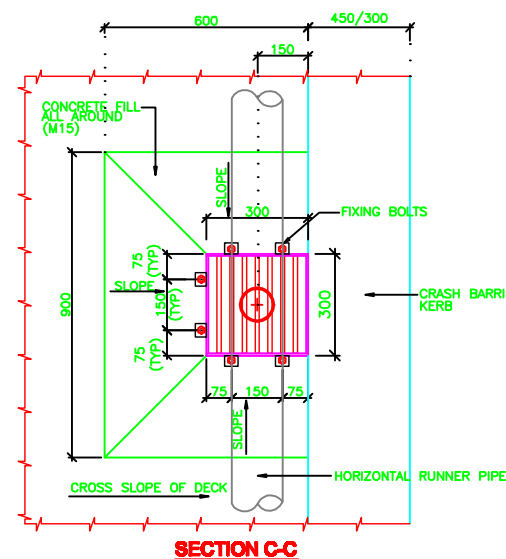
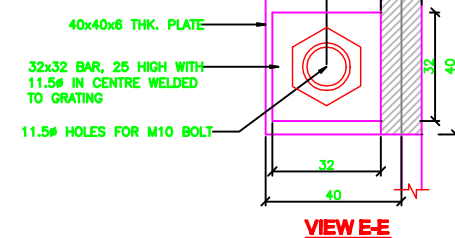
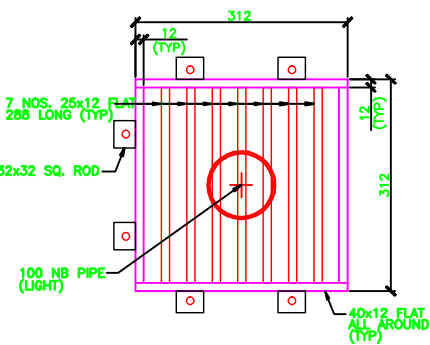
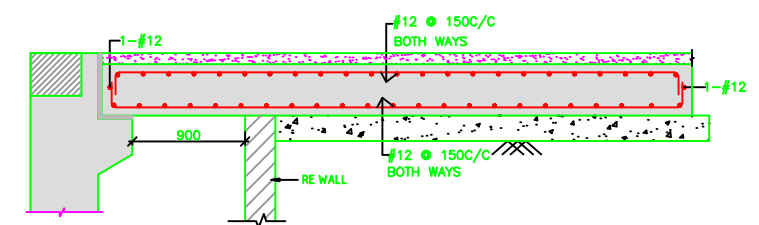
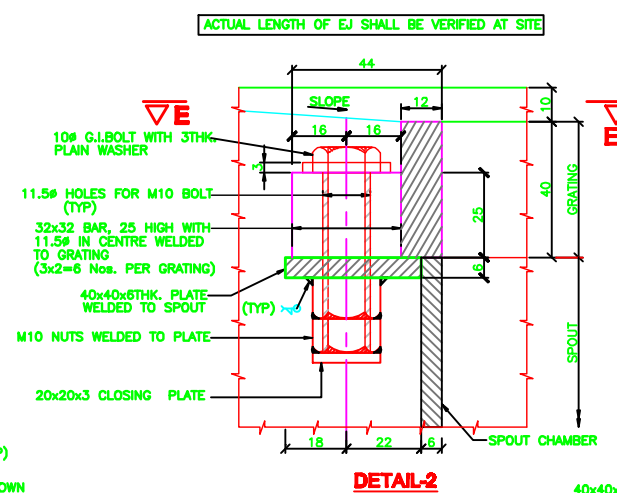
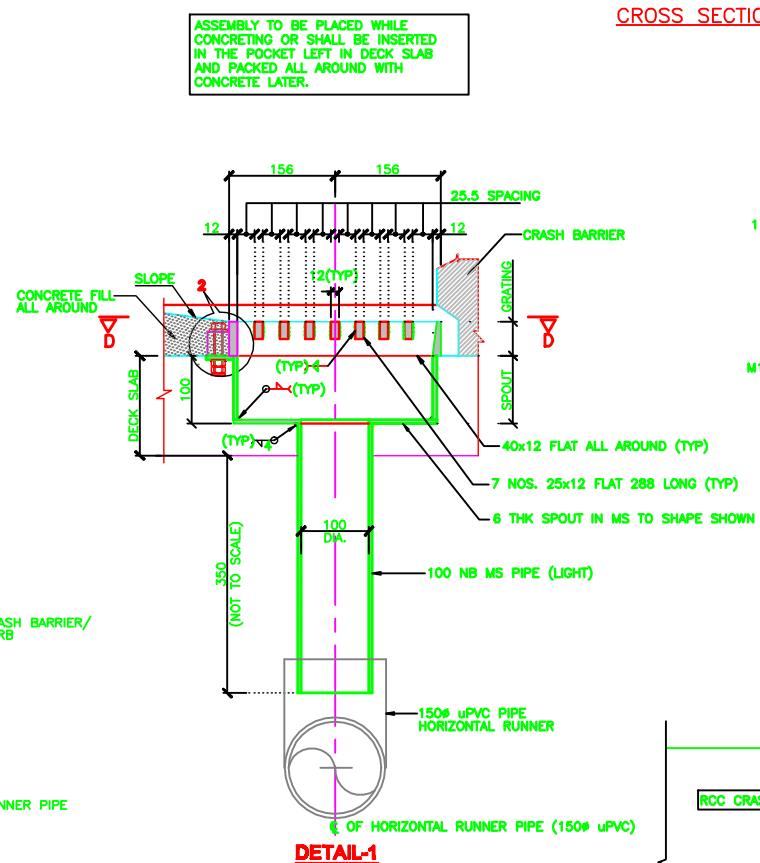
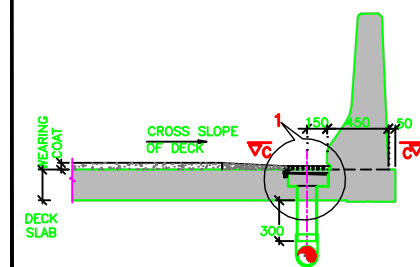
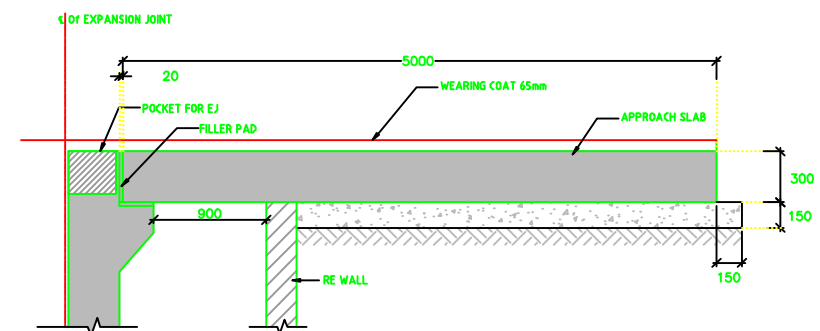
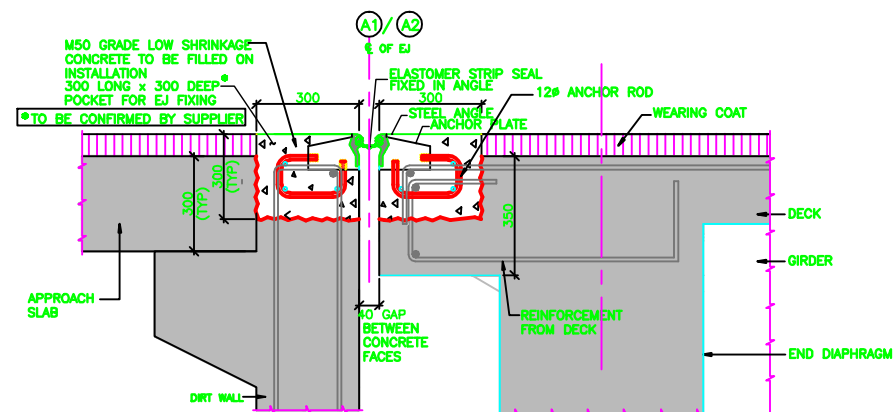
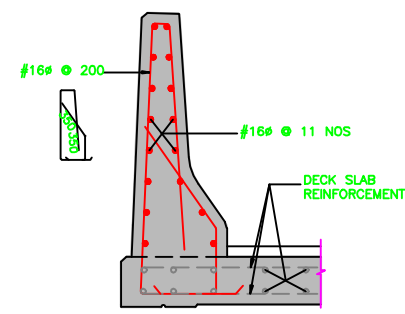
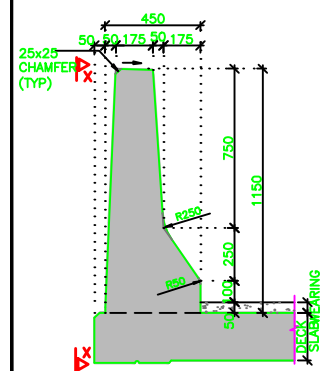
BAR SCALE : 0 1 2 3 4 5 6 7 8 9 10 -1:100  
0 2 4 6 8 10 12 14 16 18 20 -1:50

MISCELLANEOUS DETAILS  
FOR VEHICULAR UNDERPASS  
AT CH:134/307

TITLE: VUP at Km.134/307  
with S.Road B/Side (From km.133/565 to km.134/965)

PROJECT

Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulandurpet) in the project of Salem - Ulandurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



- NOTES FOR EJ:**

1. EXPANSION JOINTS SHALL CONFORM TO LATEST "MORTH" SPECIFICATIONS IN RESPECT OF MATERIALS, INSTALLING PROCEDURES ETC.
2. EXPANSION JOINTS SHALL BE PROCURED FROM THE MANUFACTURER APPROVED BY MORTH.
3. ALL JOINTS SHALL BE OF STRIP SEAL TYPE. (SINGLE UNIT)
4. SUPPLIER TO GIVE WORKING DRAWINGS AND GET IT APPROVED BEFORE FABRICATION.
5. PROFILE OF JOINTS SHALL FOLLOW THE DECK INCLUDING CROSS SLOPE AT EVERY LOCATION.
6. EXPANSION JOINTS SHALL BE INSTALLED AFTER LAYING OF WEARING COAT ONLY.
7. TEMPERATURE FOR SITE (DESIGN VALUES)
  - Max. TEMPERATURE - 40°C
  - Min. TEMPERATURE - 12°C
8. DETAILS SHOWN ARE INDICATIVE. ACTUAL DETAILS SHALL BE AS PER MANUFACTURER
9. DESIGN MOVEMENT (MAX) :

MOVEMENT	SINGLE UN
Max	mm
OPENING	40
CLOSING	20

10. GAP HAS BEEN FIXED FOR A SETTING TEMPERATURE OF 28°C



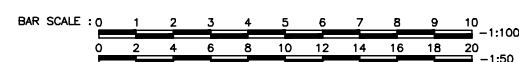
**NATIONAL HIGHWAY AUTHORITY OF INDIA**

(Ministry of Road Transport & Highways)  
Government of India.

**INDEPENDANT ENGINEER:**

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
IN JOINT VENTURE WITH  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**PROJECT: FOUR LANING OF SALEM-ULUNDURPET SECTION  
(FROM KM 0/330 TO KM 136/670 OF NH-79)**

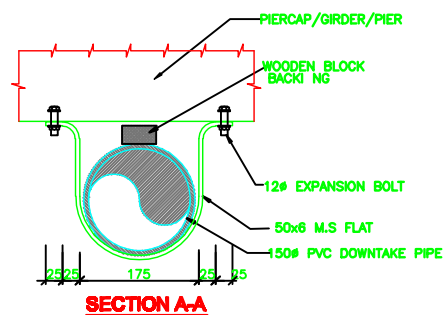
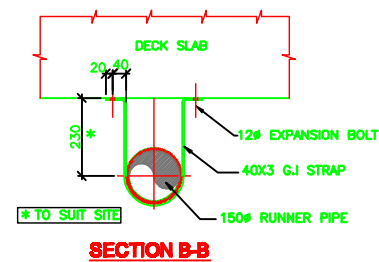
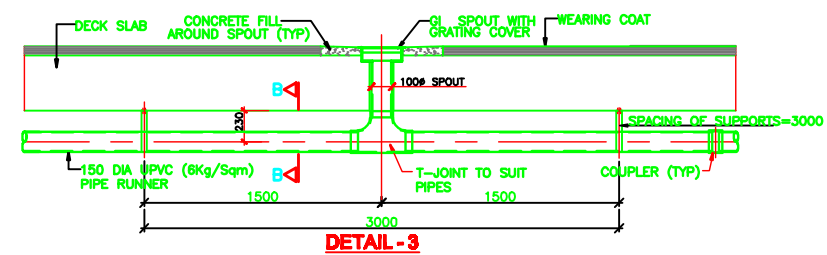
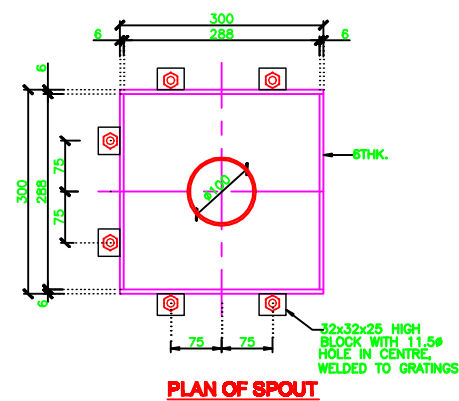
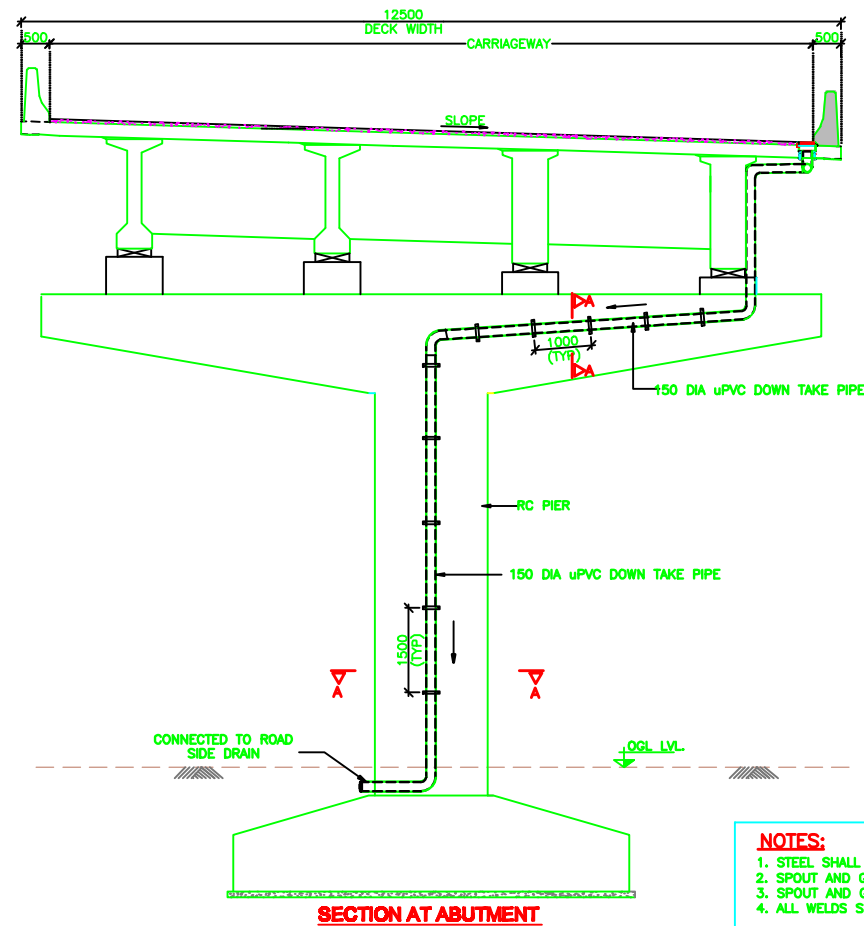
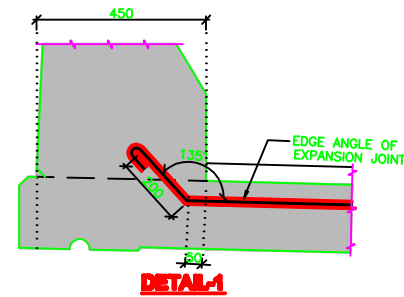
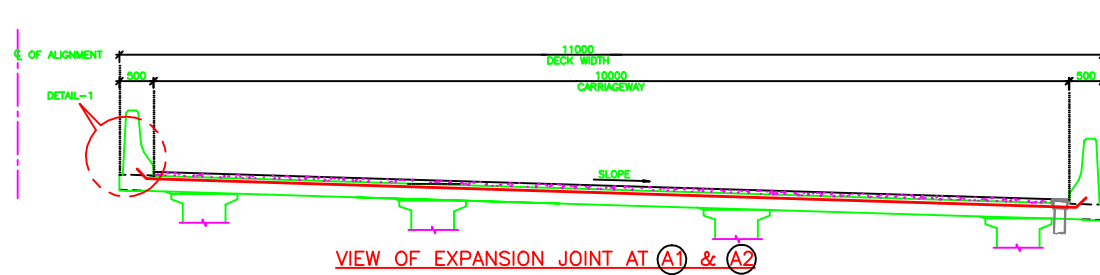


**MISCELLANEOUS DETAILS  
FOR VEHICULAR UNDERPASS  
AT CH:134/307**

**TITLE:-**  
**VUP at Km.134/307**  
**with S.Road B/Side (From km.133/565 to km.134/965)**

PROJECT:

**Permanent Rectification** By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode



- NOTES:**
1. STEEL SHALL CONFORM TO IS:2062, Fe 250 GRADE.
  2. SPOUT AND GRATINGS COVER SHALL BE FABRICATED AS PER IS:800.
  3. SPOUT AND GRATINGS SHALL BE GALVANISED.
  4. ALL WELDS SHALL BE 4mm. UNLESS NOTED OTHERWISE.

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRE.
  2. GRADE OF CONCRETE IN CRASH BARRIER SHALL BE OF GRADE M40
  3. CLEAR COVER TO REINFORCEMENT SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
  4. GRADE OF STEEL SHALL BE Fe500.
  5. CRASH BARRIER PROFILE IS AS PER FIG.2 OF IRC:5-2015.

CLIENT:

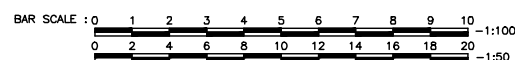


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(Ministry of Road Transport & Highways)  
Government of India.

INDEPENDANT ENGINEER:

**SA INFRASTRUCTURE CONSULTANTS PVT LTD**  
AN ISO 9001 CERTIFIED FIRM  
**QUEST ENGINEERS & CONSULTANTS PVT LTD.**  
1101B: 11Floor, Tower A-II, Ansal Corporate Park,  
Plot No:7A/1, Sector-142,  
Noida - 201 301, India

**PROJECT: FOUR LANE OF SALEM- ULUNDURPET SECTION**  
(FROM KM 6336 TO KM 1366700F NH-79)



**MISCELLANEOUS DETAILS**  
**FOR VEHICULAR UNDERPASS**  
**AT CH:134/307**

**TITLE:-**  
**VUP at Km.134/307**  
**with S.Road B/Side (From km.133/565 to km.134/965)**

PROJECT:

**Permanent Rectification By constructing a Vehicular Underpass (VUP) (1 x 20m x 5.5m) at Km 134+307 (Ulundurpet) in the project of Salem - Ulundurpet section of NH-79 (Old No. NH-68) in the State of Tamil Nadu on EPC mode**

# **DRAWINGS**

## **Tindivanam to Ulunderpet Section of NH-32,132,38**

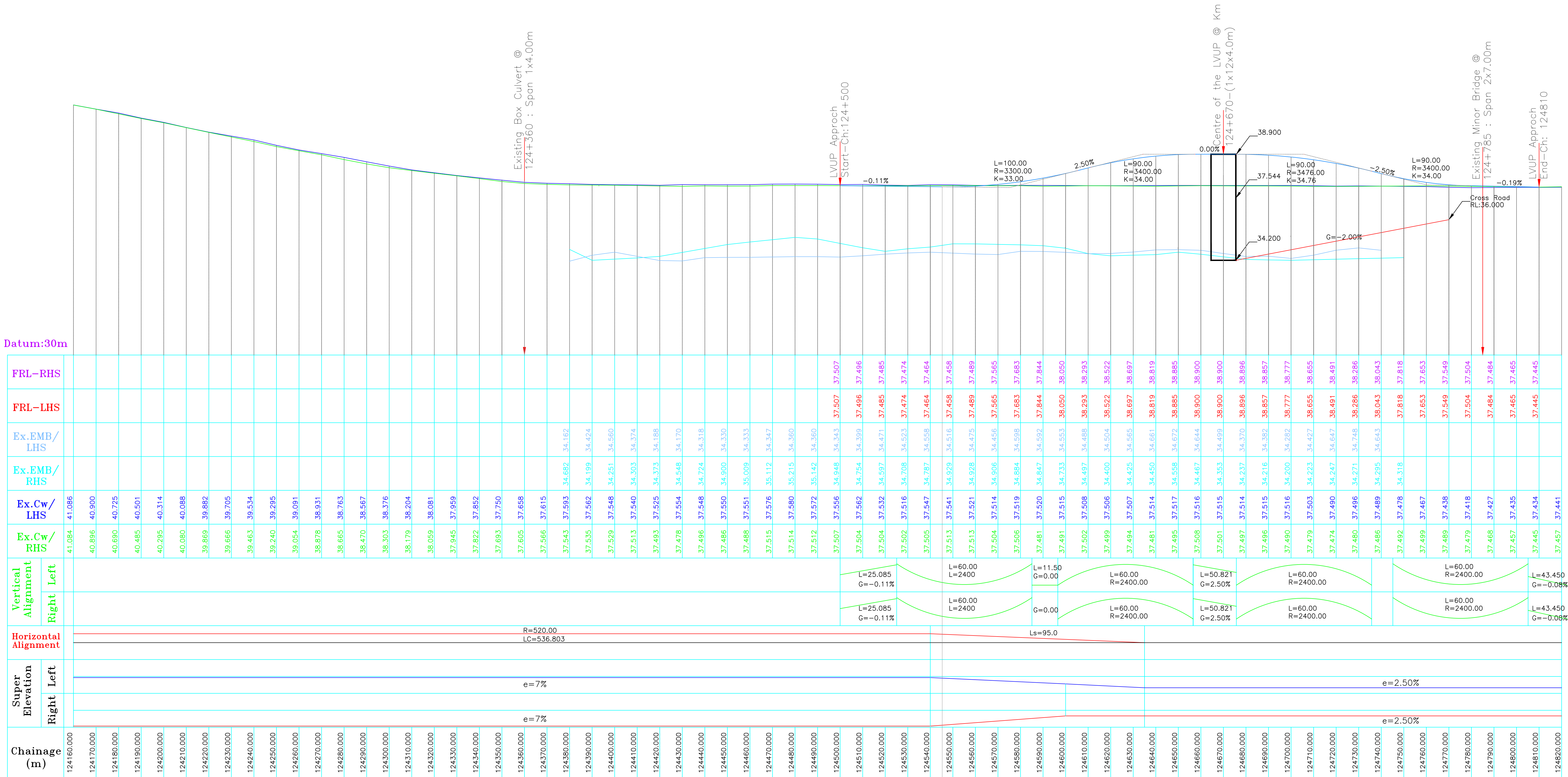
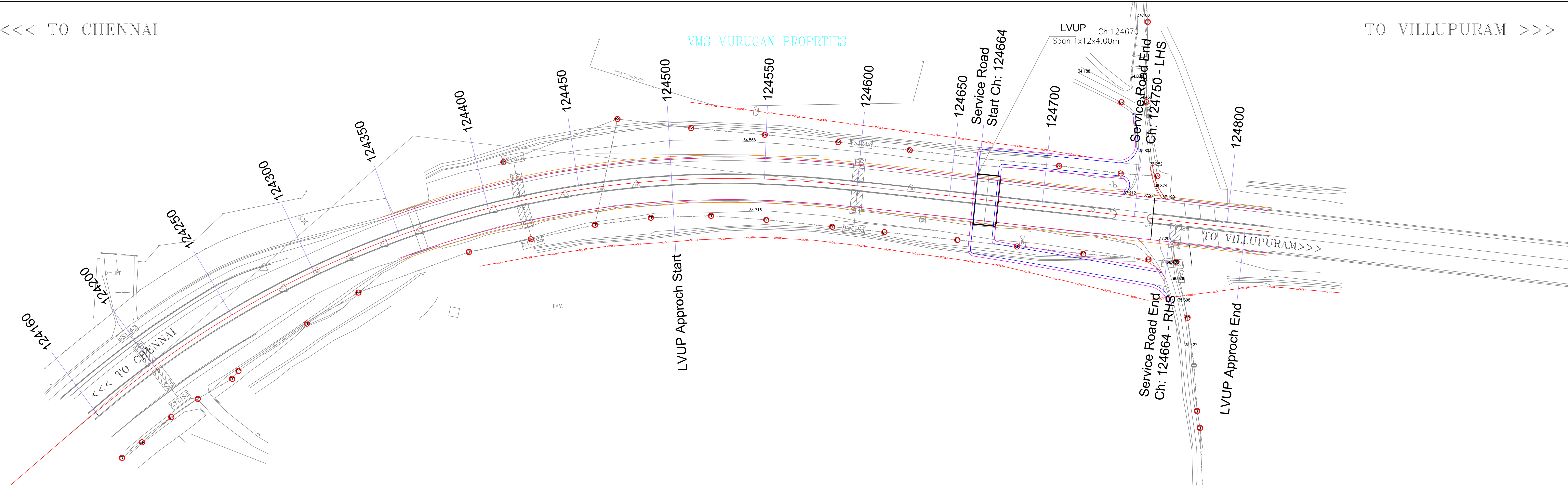
1. Karnavur @ Km 124+670



Proposed Light Vehicular Underpass Alignment @ Km 124+670

<<< TO CHENNAI

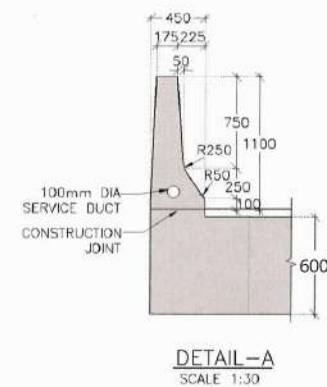
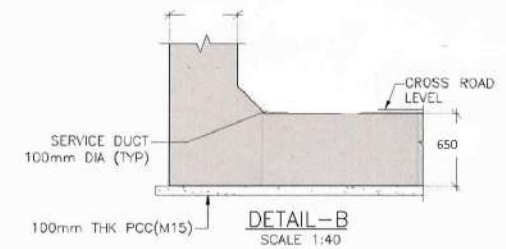
TO VILLUPURAM >>>



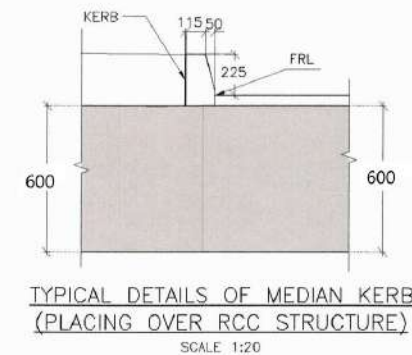
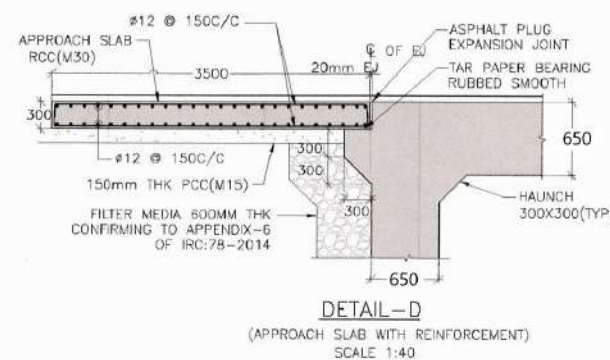
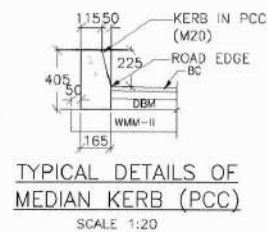
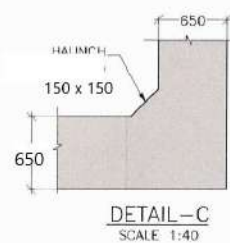
Datum:30m

Chainage (m)	Super Elevation		Horizontal Alignment	Vertical Alignment		Ex.Cw/ RHS	Ex.EMB/ RHS	Ex.EMB/ LHS	FRL-LHS	FRL-RHS
	Right	Left		Right	Left					
124160.000						41.084				
124170.000						40.896				
124180.000						40.890				
124190.000						40.725				
124200.000						40.465				
124210.000						40.295				
124220.000						40.080				
124230.000						39.869				
124240.000						39.666				
124250.000						39.463				
124260.000						39.240				
124270.000						39.054				
124280.000						38.878				
124290.000						38.695				
124300.000						38.470				
124310.000						38.303				
124320.000						38.179				
124330.000						38.059				
124340.000						37.945				
124350.000						37.822				
124360.000						37.693				
124370.000						37.605				
124380.000						37.566				
124390.000						37.543				
124400.000						37.535				
124410.000						37.529				
124420.000						37.513				
124430.000						37.493				
124440.000						37.478				
124450.000						37.468				
124460.000						37.466				
124470.000						37.468				
124480.000						37.515				
124490.000						37.514				
124500.000						37.512				
124510.000						37.507				
124520.000						37.504				
124530.000						37.504				
124540.000						37.502				
124550.000						37.505				
124560.000						37.513				
124570.000						37.521				
124580.000						37.514				
124590.000						37.506				
124600.000						37.481				
124610.000						37.491				
124620.000						37.502				
124630.000						37.499				
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124650.000						37.481				
124660.000						37.495				
124670.000						37.508				
124680.000						37.501				
124690.000						37.497				
124700.000						37.498				
124710.000						37.479				
124720.000						37.474				
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124780.000						37.479				
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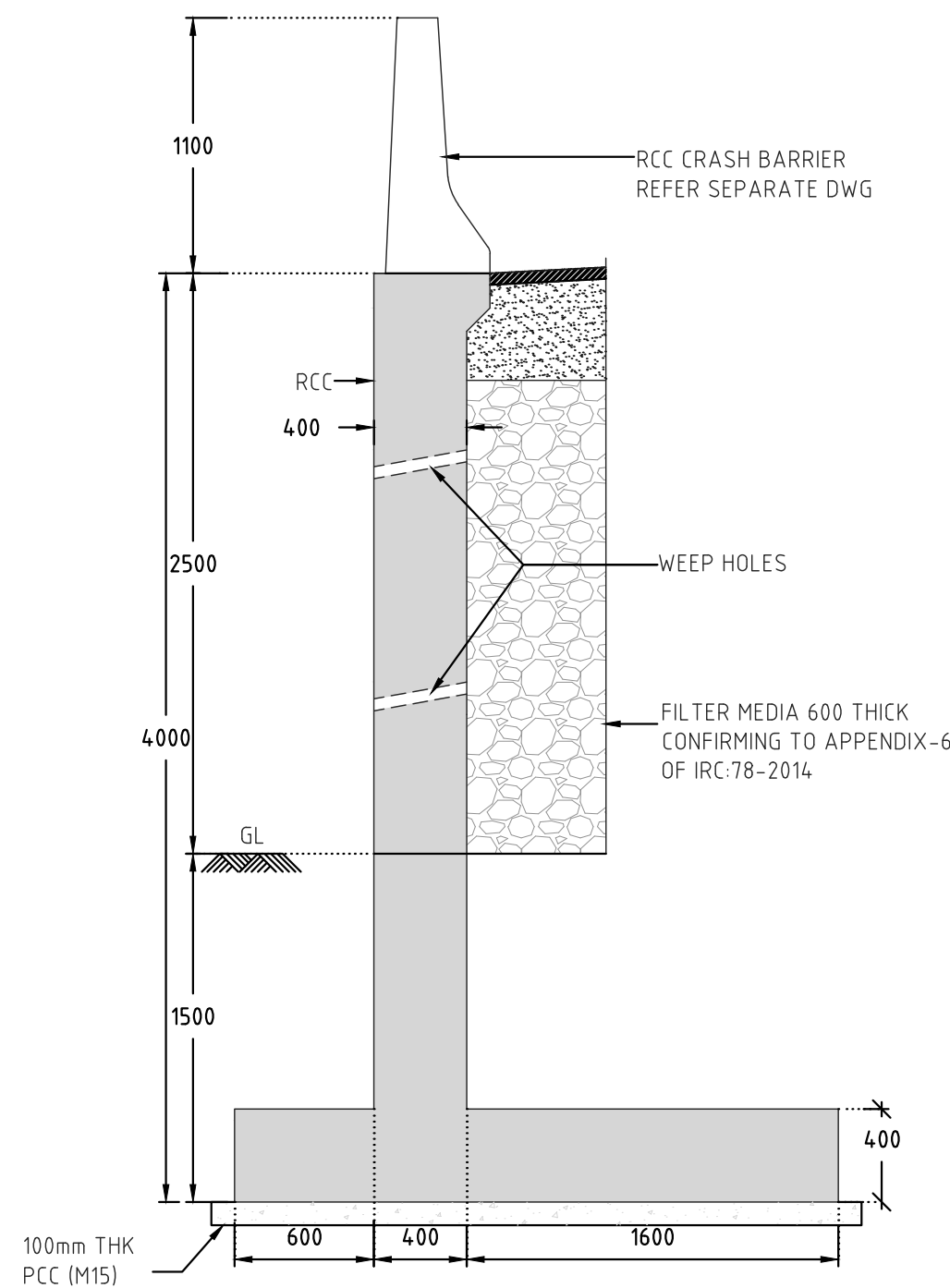


Q	CENTER LINE
FRL	FINISHED ROAD LEVEL
FCRL	FINISHED CROSS ROAD LEVEL
EJ	EXPANSION JOINT
NGL	NATURAL GROUND LEVEL
TYP.	TYPICAL
LHS	LEFT SIDE
RHS	RIGHT SIDE

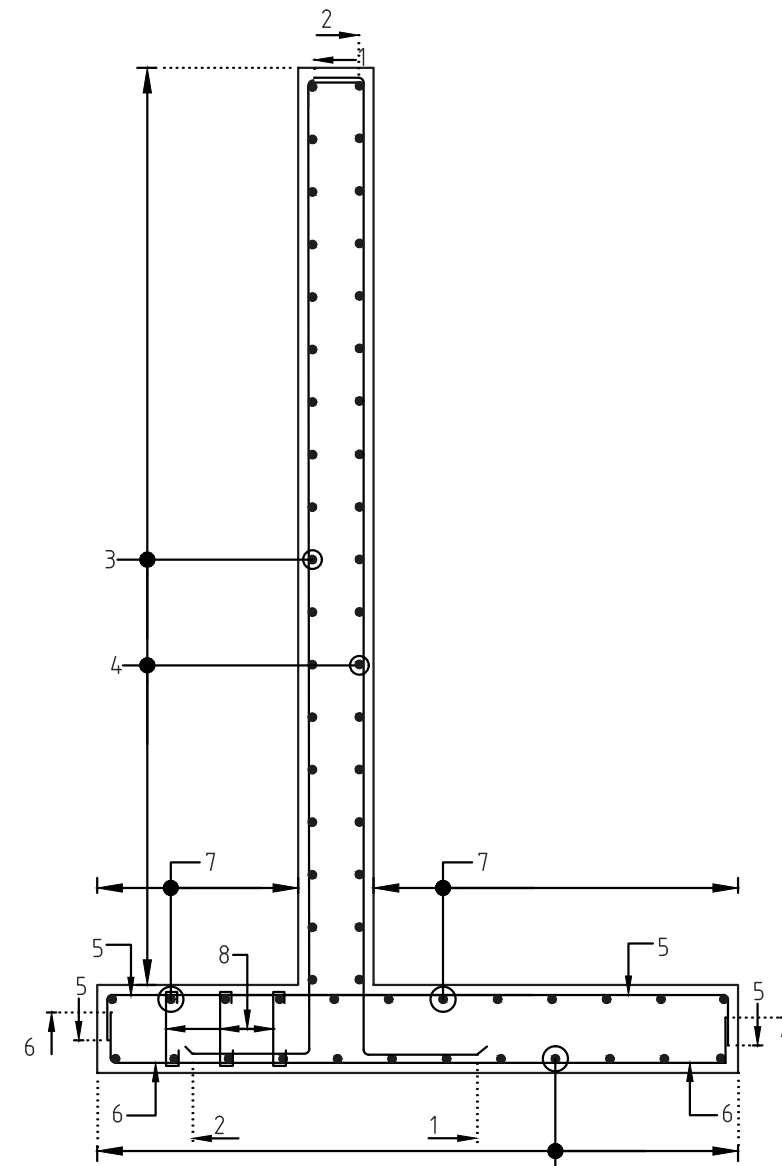


DWG. NO:





**DIMENSION DETAILS OF RETAINING WALL  
FOR 4.0m HEIGHT**  
SCALE 1:30



**REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 4.0m HEIGHT**  
SCALE 1:30

**SCHEDULE OF REINFORCEMENT:**

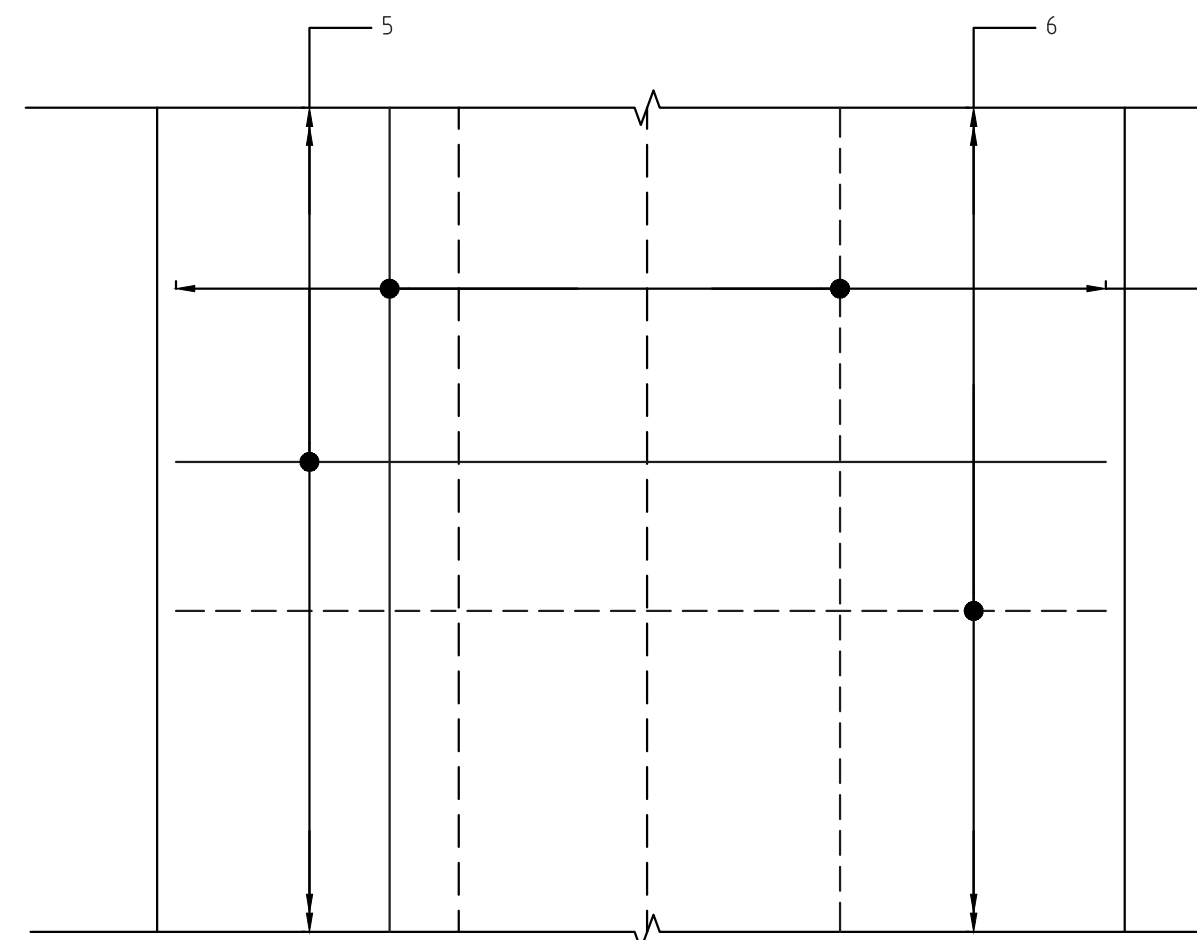
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	285 3885 650	16	150
2	3885 285 300	12	150
3	150 VARIES 150	10	200
4	150 VARIES 150	10	200
5	250 2450 250	12	150
6	250 2450 250	12	150
7	150 VARIES 150	10	200
8		8	200X300

**NOTES:-**

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

**NOTES:-**

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE  
A) RCC RETURN WALL - M30  
B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-  
EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.50T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 14T/Sq.m

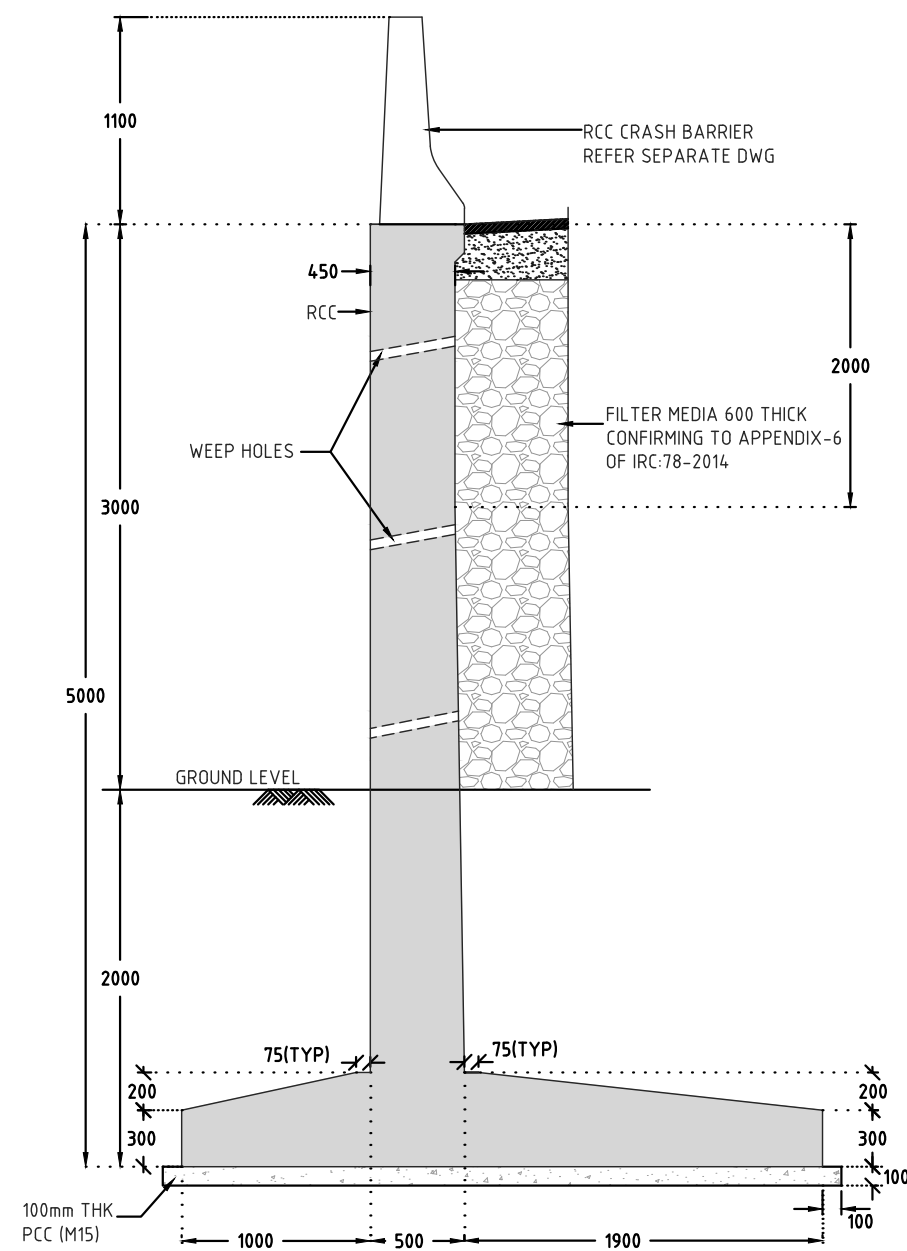


**REINFORCEMENT PLAN AT BOTTOM**  
SCALE 1:30

**DRAWING TITLE:**

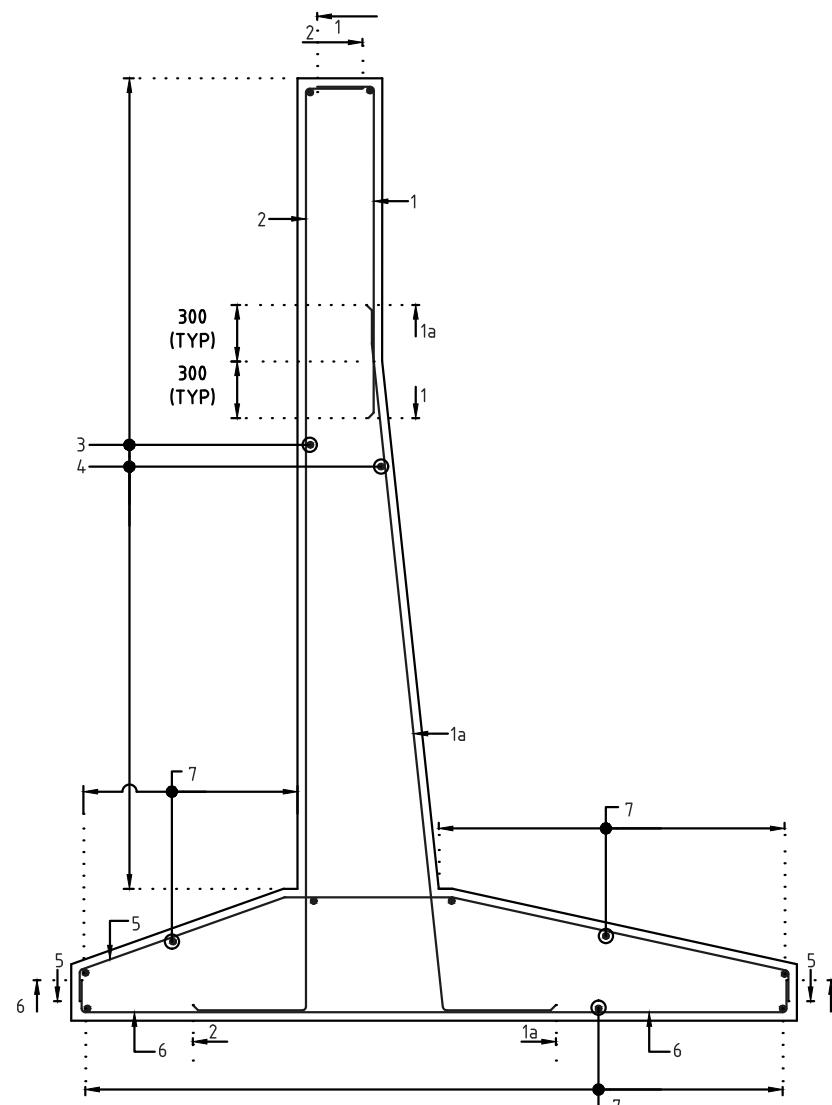
DETAIL DRAWING FOR 4.0m  
RCC RETAINING WALL

DWG. NO. - 120-NH45-RW-003



DIMENSION DETAILS OF RETAINING WALL  
FOR 5.0m HEIGHT

SCALE 1:30



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 5.0m HEIGHT

SCALE 1:30

SCHEDULE OF REINFORCEMENT:

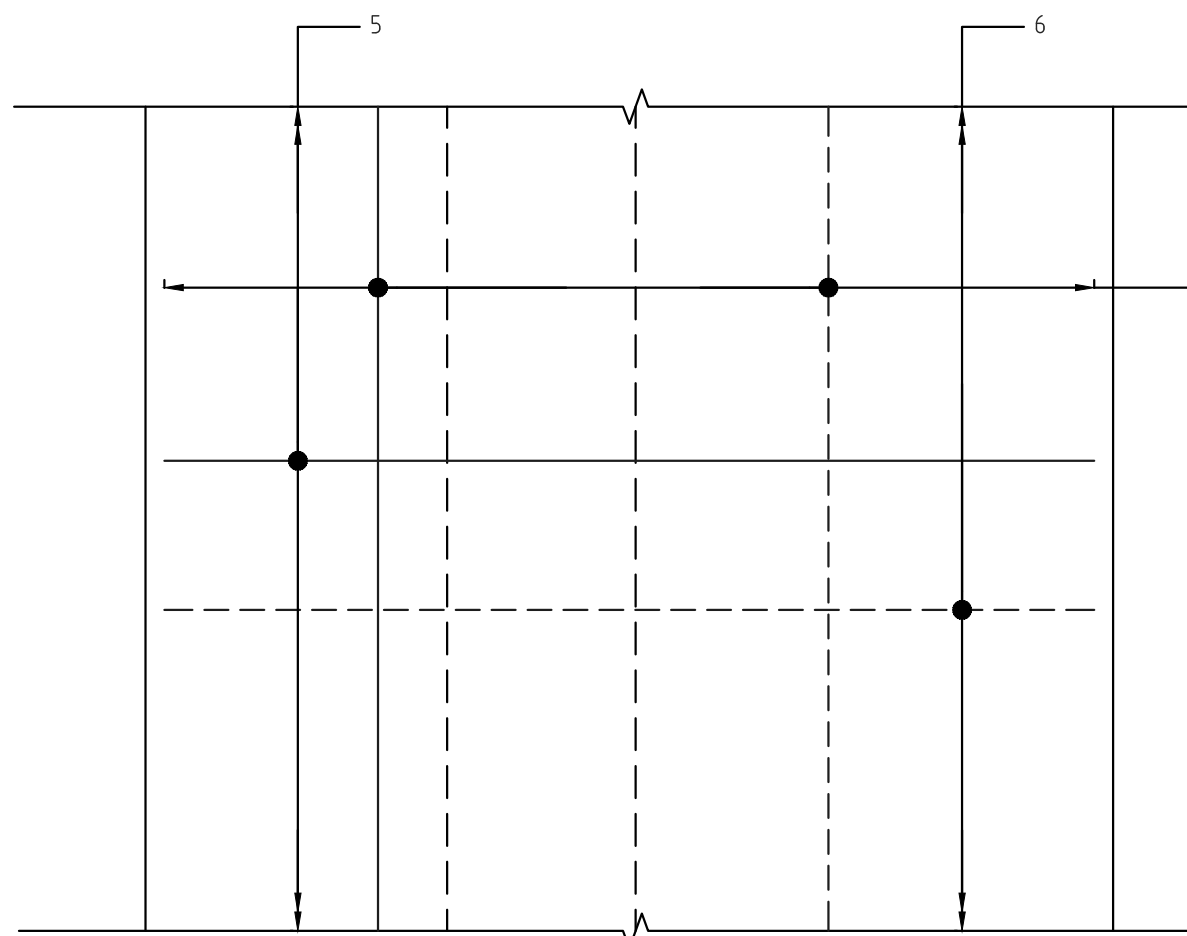
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	120
1a	3301 662	16	120
2	4885 335 480	12	120
3	150 VARIES 1150	10	200
4	150 VARIES 1150	10	200
5	886 615 1780 1150	12	120
6	150 3250 1150	12	120
7	150 VARIES 1150	10	200

NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - A) EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mm/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 14.5T/Sq.m



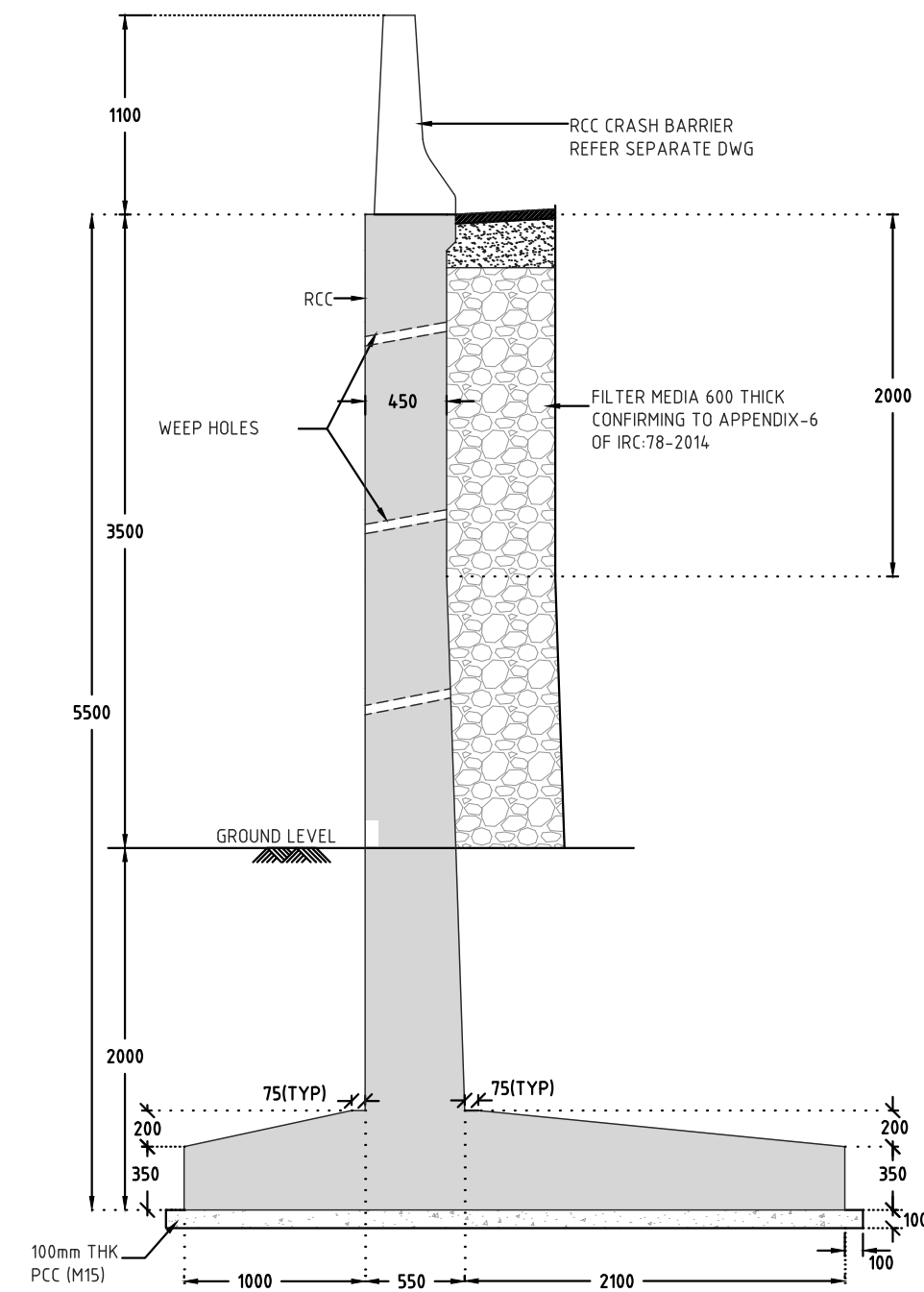
REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

DRAWING TITLE:

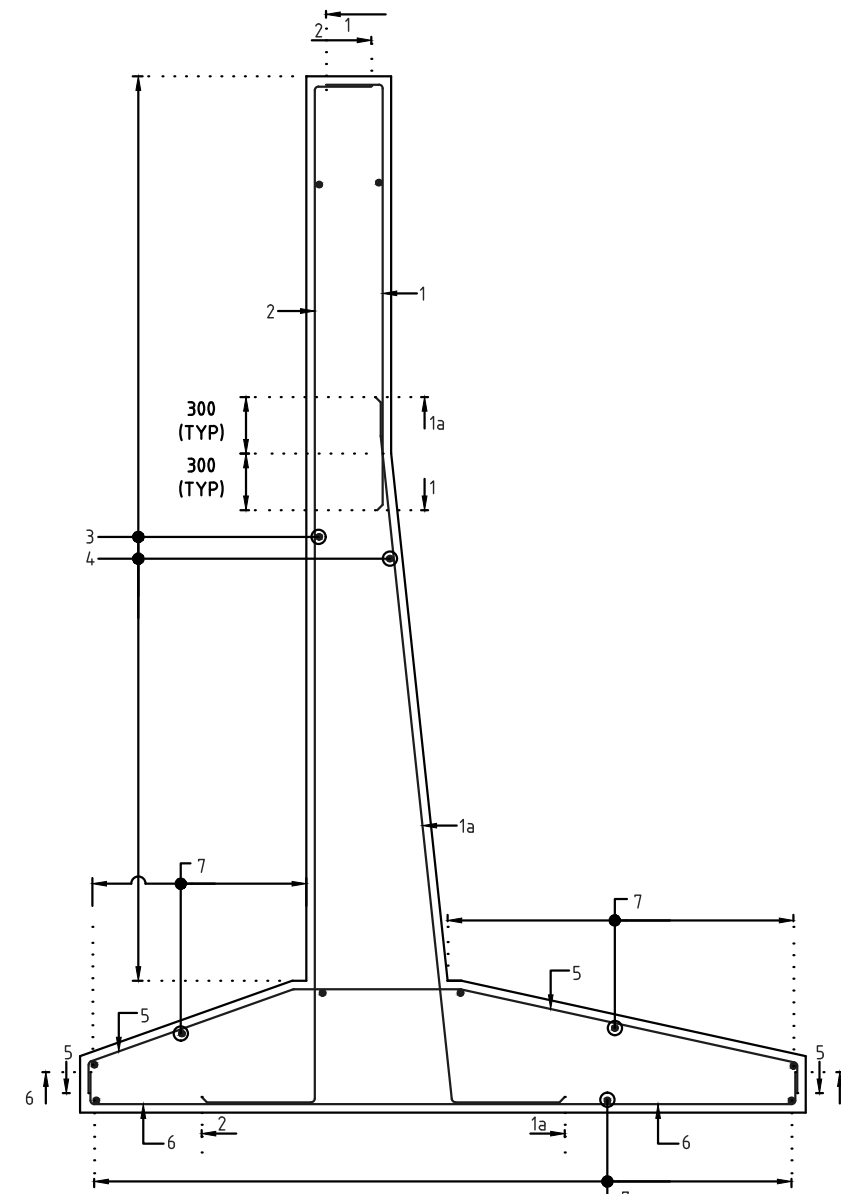
DETAIL DRAWING FOR 5.0m  
RCC RETAINING WALL

DWG. NO. P-120-NH45-RW-004



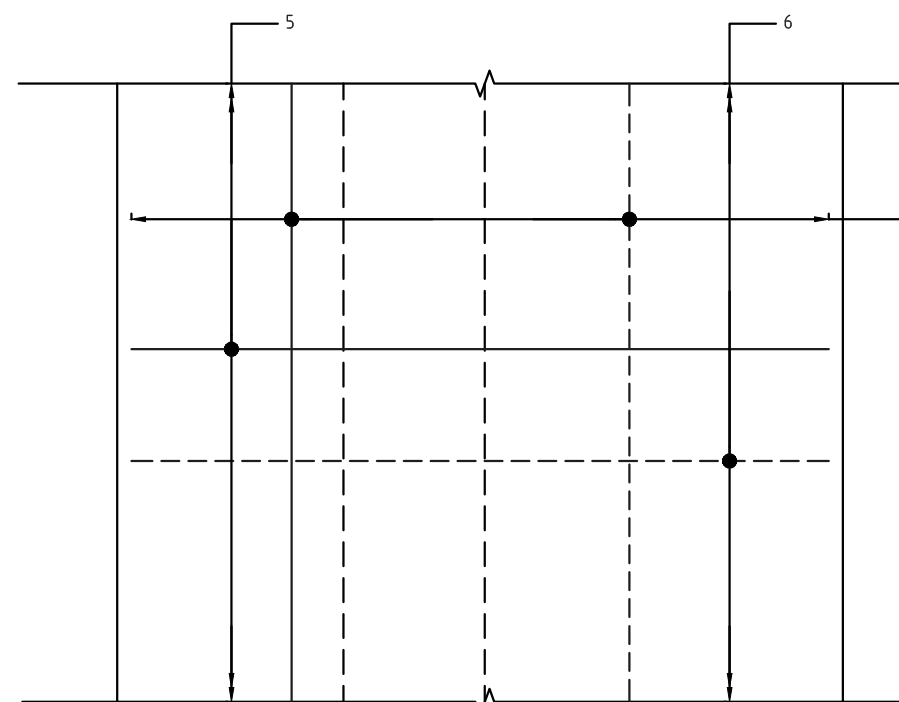
DIMENSION DETAILS OF RETAINING WALL  
FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

### SCHEDULE OF REINFORCEMENT:

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	100
1a	3801 662	16	100
2	5385 335 480	12	100
3	150 VARIES 1150	10	200
4	150 VARIES 1150	10	200
5	886 663 1980 200 1200	12	100
6	200 3500 200	12	100
7	150 VARIES 150	10	200

### NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

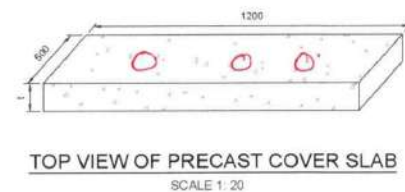
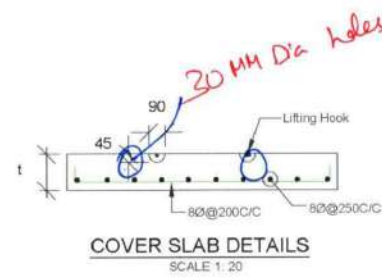
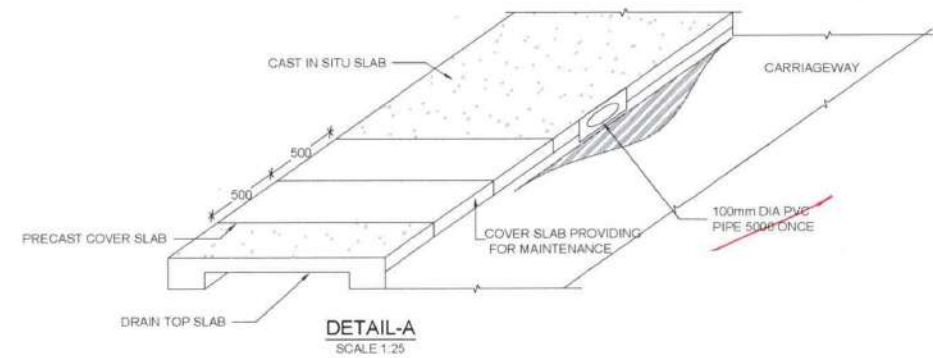
### NOTES:-

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - A) EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO  $30^\circ$
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-14.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 16.5T/Sq.m

DRAWING TITLE:

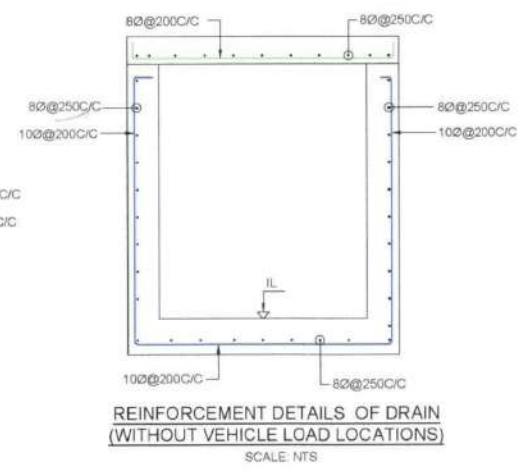
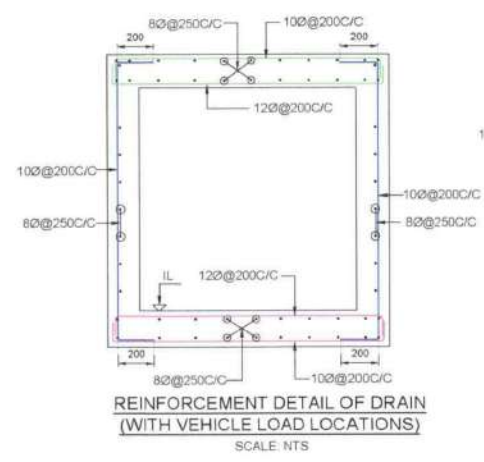
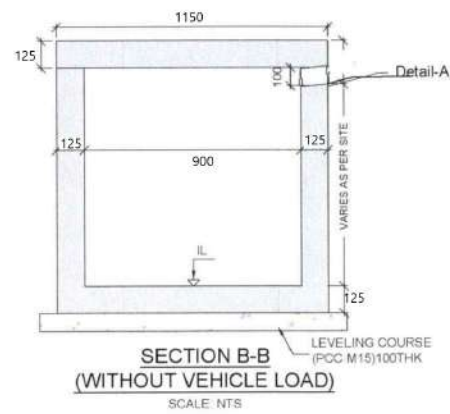
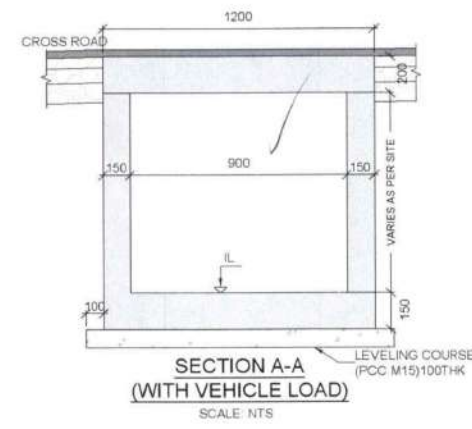
DETAIL DRAWING FOR 5.5m  
RCC RETAINING WALL

W.G. NOP-120-NH45-RW-005



- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED
  2. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe500 CONFORMING TO IS 1786-1985
  3. GRADE OF CONCRETE:  
DRAIN (RCC) - M25  
LEVELING COARSE (PCC) - M15
  4. LAPS NOT SHOWN ON THE DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION
  5. WHERE MORE THAN 50% OF BARS ARE TO BE LAPPED IN ANY ONE CROSS SECTION
  6. MINIMUM CONCRETE COVER TO REINFORCEMENT NEAREST TO THE EARTH SURFACE SHALL BE 40mm IN BASE SLAB AND OUTER FACE OF WALLS AND 40mm IN TOP SLAB AND INNER FACE OF WALLS
  7. BAR BENDING SHALL CONFORM TO IS 2502
  8. REINFORCEMENT DETAILING HAS BEEN DONE AS PER IRC 112: 2020
  9. DESIGN CRITERIA:  
11. i. IRC: 5-2015 ii. IRC: 6-2017 iii. IRC: 112-2020 iv. IRC: 78-2014
  10. PRECAST COVER SLAB AT EVERY 15M INTERVALS 2 NOS.
  11. ALL OTHER LOCATION DRAIN COVER SLAB WILL BE CAST IN SITU
  12. 1M PRECAST COVER SLAB IS USED FOR MAINTENANCE PURPOSE ON EVERY 15M ONCE

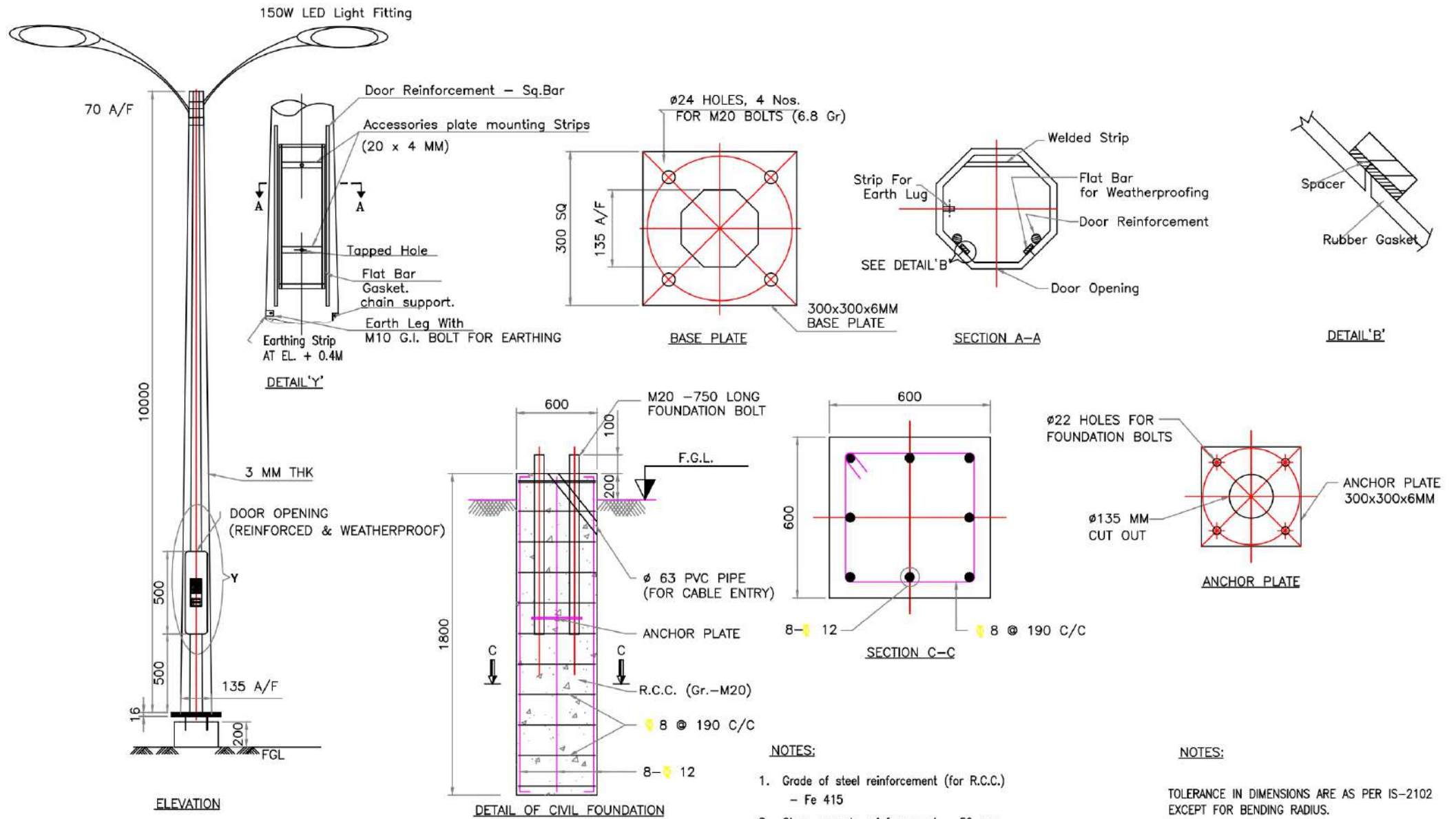
SCALE 1:40





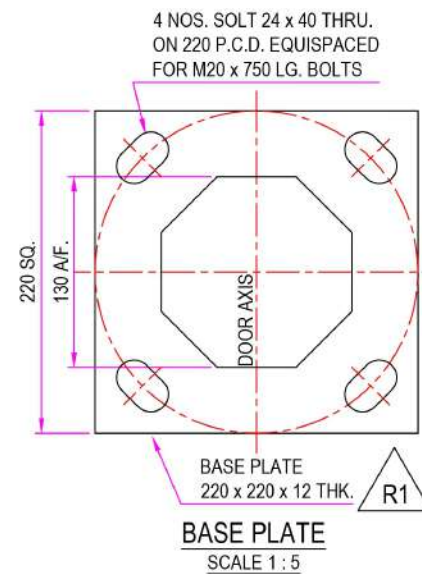
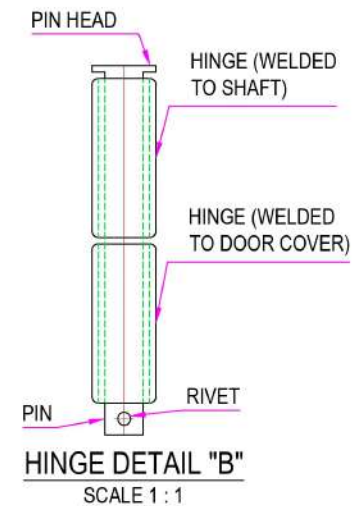
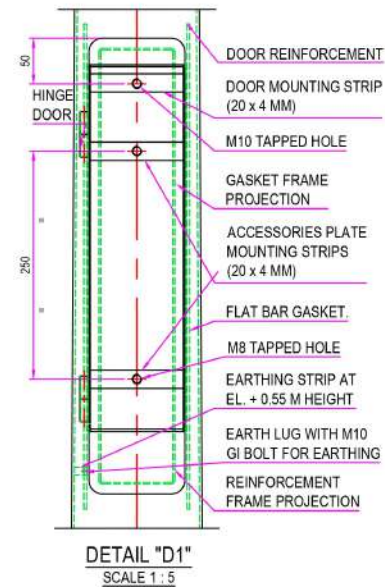
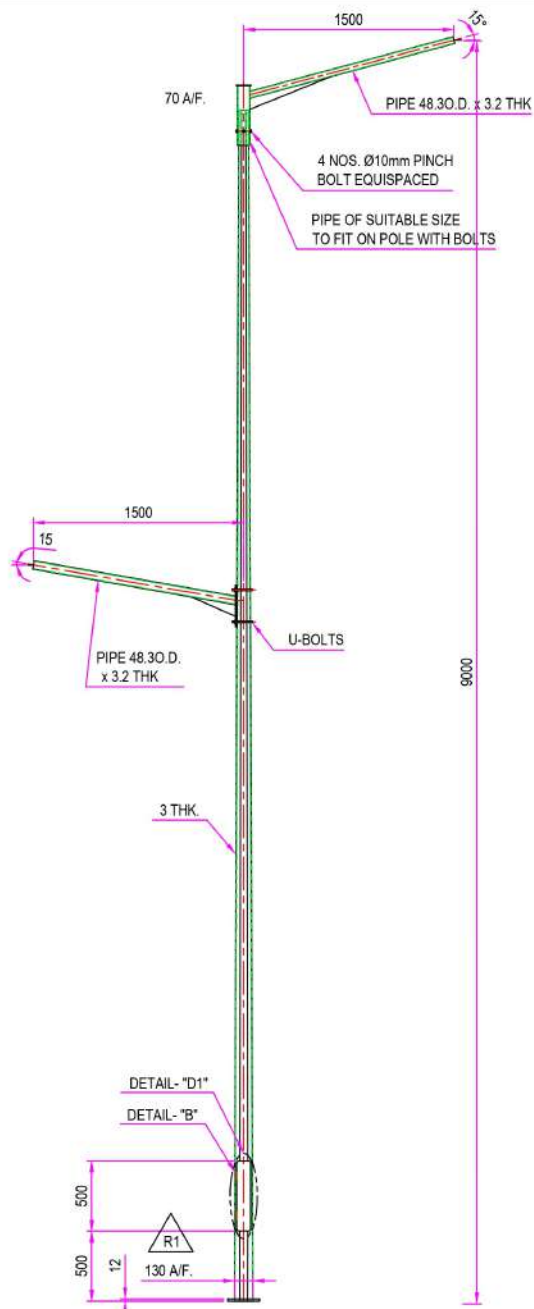


# **Tindivanam - Ulundurpet Section of NH-45 - Double Arm Lighting for Black Spot Locations**









#### GENERAL NOTES :-

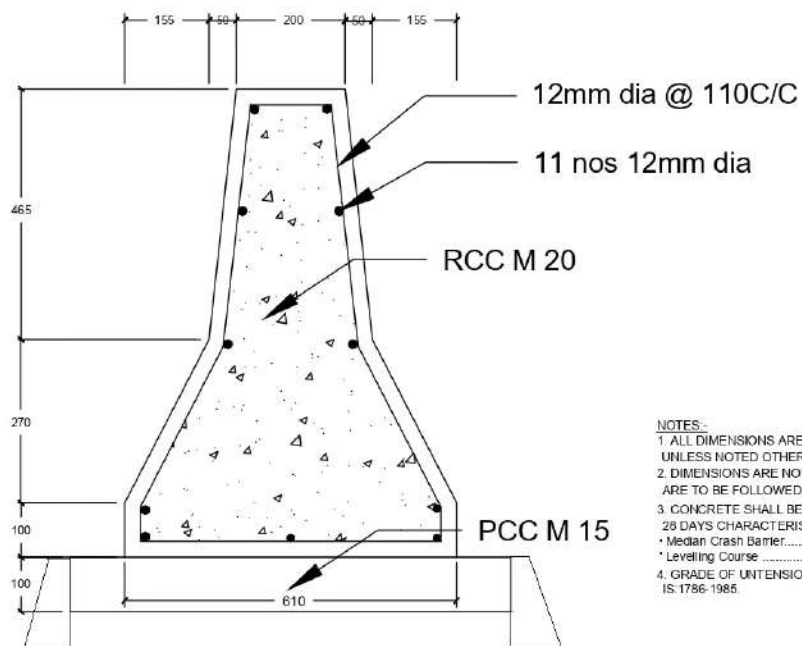
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL OF POLE - S355 J0/JR CONFORMING TO BSEN 10025.
3. MATERIAL OF BASE PLATE - E250 CONFORMING TO IS 2062.
4. GALVANIZATION - BS EN ISO 1461 OR EQUI.
5. POLE SHALL BE HOT DIP GALVANIZED.
6. FOUNDATION BOLTS SHALL BE OF TS-600 GRADE.
7. IN CASE OF NON AVAILABILITY OF MATERIALS OF DESIRED SIZE / THICKNESS, MATERIAL OF HIGHER SIZE/THICKNESS MAY BE USED
8. CROSS SECTION OF POLE : OCTAGONAL

#### TOLERANCES:-

CIRCUMFERENCE -  $\pm 1\%$   
 POLE TOTAL LENGTH -  $\pm 25\text{MM}$   
 POLE STRAIGHTNESS -  $0.1\%$

TITLE
9M MOUNTING HEIGHT OCTAGONAL POLE GA DRG
DRAWING No:- NHAI/UEPL/VUP/ POLE GA/04
DATE: OCTOBER 2020

### Median RCC Crash Barrier - Cross Section



#### NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:  
 \* Median Crash Barrier.....M20 RCC  
 \* Levelling Course .....M15 PCC
4. GRADE OF UNTENSIONED STEEL SHALL BE HYSD CONFORMING TO IS. 1786-1985.

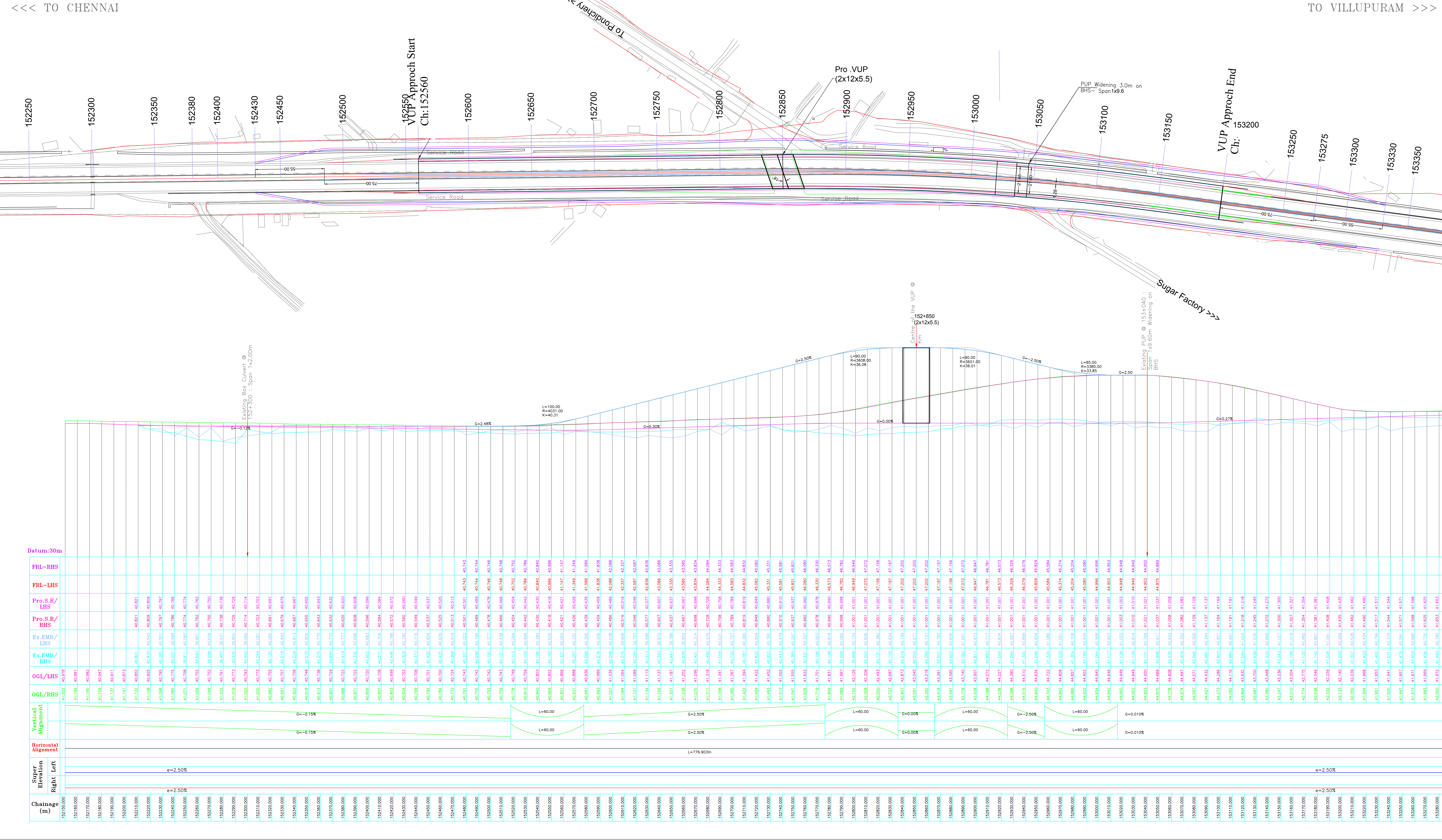
# **DRAWINGS**

## **Tindivanam to Ulunderpet Section of NH-32,132,38**

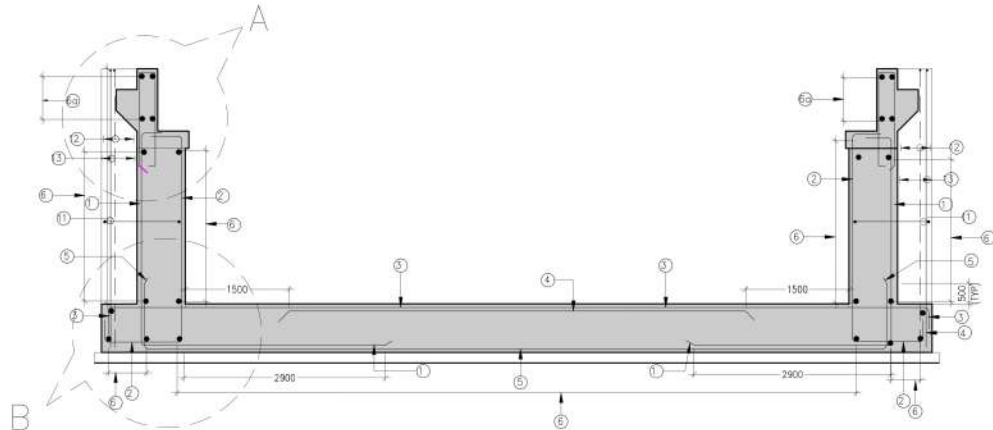
2. Mundiyanbakkam Sugar Factory @  
Km 152+850



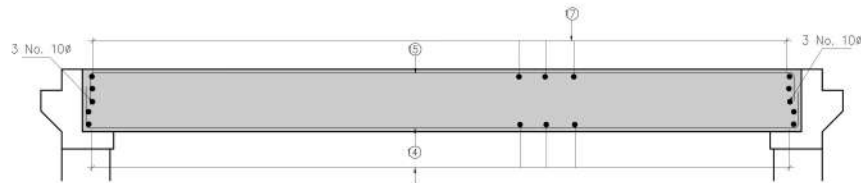
Proposed Vehicular Underpass Alignment @ Km 152+850



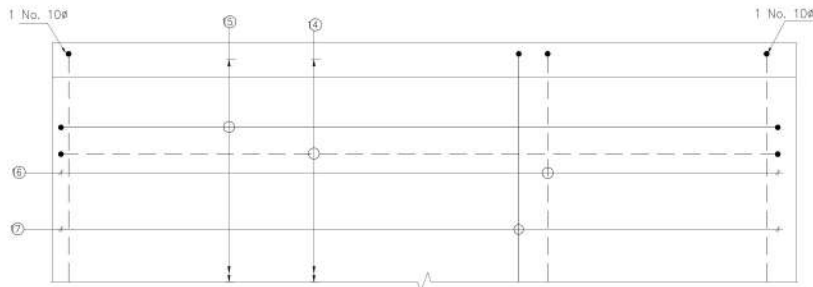




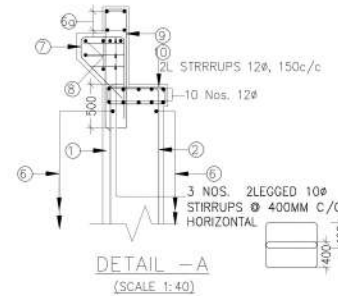
REINFORCEMENT DETAILS OF ABUTMENT & RAFT  
(SCALE 1:50)



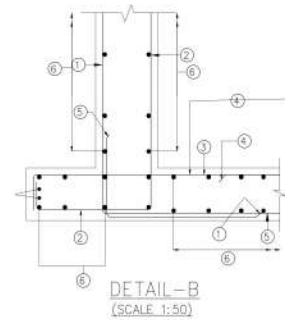
REINFORCEMENT DETAILS OF TOP SLAB  
(SCALE 1:50)



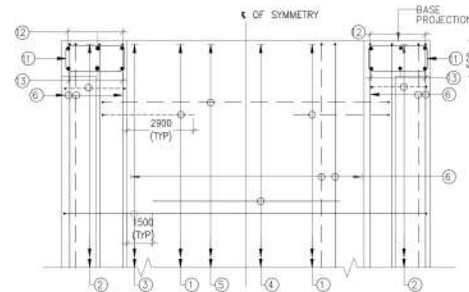
TOP SLAB R/F PLAN  
(SCALE 1:50)



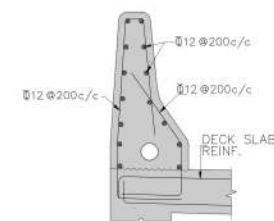
DETAIL - A  
(SCALE 1:40)



DETAIL - B  
(SCALE 1:50)



BOTTOM RAFT R/F PLAN  
(SCALE 1:50)



REINFORCEMENT  
DETAILS OF CRASH  
BARRIER

SCHEDULE OF REINFORCEMENT			
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DA	SPACING IN MM
1		25	175
2		12	175
3		25	180
4		25	180
5		16	175
6		16	200
7		12	200
8		10	150
9		12	150
10		12	150
11		12	150
12		12	150
13		12	150
14		12	150
15		12	150
16		12	150
17		12	150
18		12	150
19		12	150
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25		12	150
26		12	150

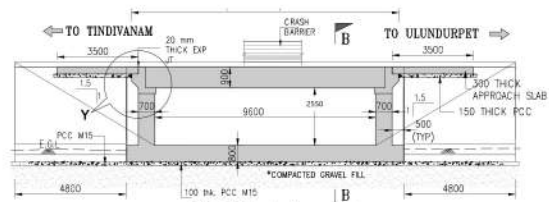
#### NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED.
- CLEAR COVER TO ALL REINFORCEMENT IS 75mm.
- ALL REINFORCEMENT STEEL HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS 1786 GRADE DESIGNATION S-415.
- LAPS ARE STAGGERED AND NOT MORE THAN 50% BARS ARE SPICED AT ANY SECTION IN WHICH CASE THE MINIMUM LAP LENGTH IS 72 TIMES DIAMETER OF BAR.
- MINIMUM BOND LENGTH FOR REINFORCEMENT IS 56 TIMES DIAMETER OF THE BAR.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.

#### LEGEND:

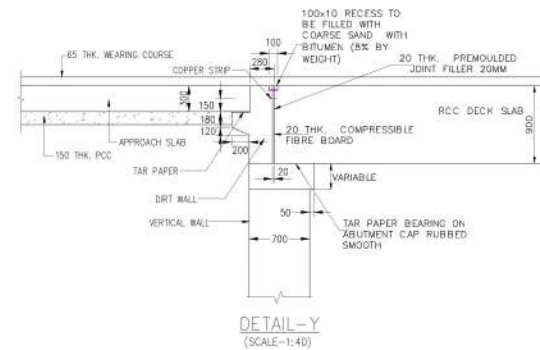
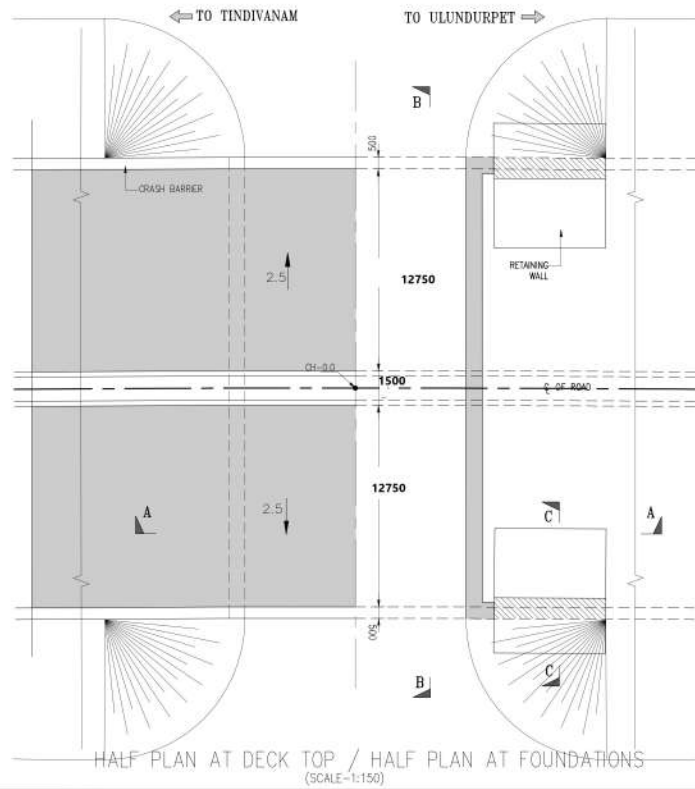
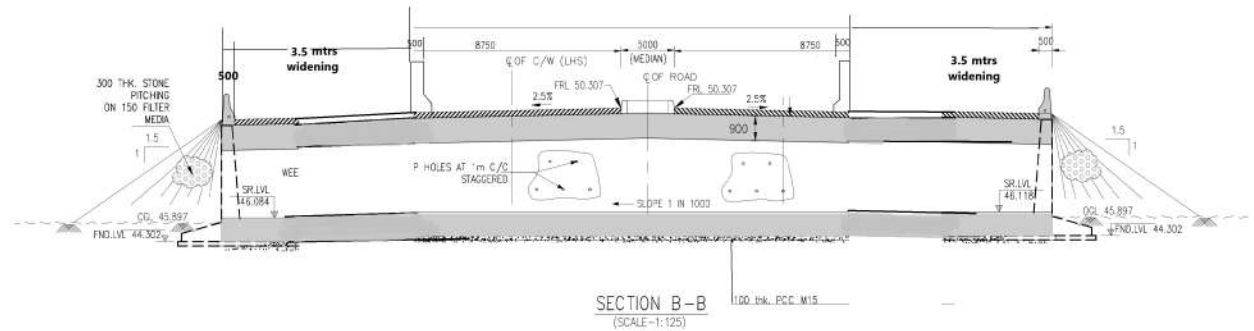
TOP BAR —————  
BOTTOM BAR - - - - -





SECTION A-A  
(SCALE-1:150)

DISTANCE	-5.50	0.00	5.50
F.R.L.	41.332	41.332	41.332
EX.G.L.	37.269		37.316
FND. LVL.	36.837	36.837	36.837

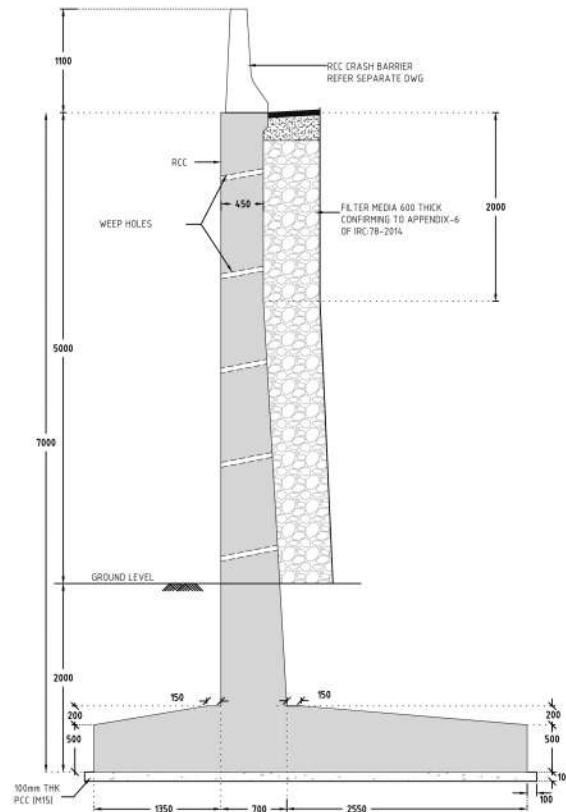


#### NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED.
- GRADE OF CONCRETE FOR ALL RCC WORK IS M30 AND PCC WORK IS M15.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
- THE LOCATION OF LIGHTING POSTS AS PER THE HIGHWAY LIGHTING DRAWINGS.
- THE SUPERSTRUCTURE RESTS ON TAR PAPER BEARINGS.
- THE FOUNDATIONS HAVE BEEN DESIGNED RESTING ON SOIL STRATA WITH AN SBC OF 15 T/M<sup>2</sup>.
- THE SPECIFICATION CONFORMS TO MOST SPECIFICATION FOR ROAD AND BRIDGES.
- JOINT BETWEEN THE RETURN WALLS AND RETAINING WALLS IS BITUMINOUS JOINT FILLER OF SUITABLE THICKNESS (TYPICAL SHAUTEX JOINT FILLER)

#### REF:-

1. GMR/PT/108/10/PUP/64.842/10-02

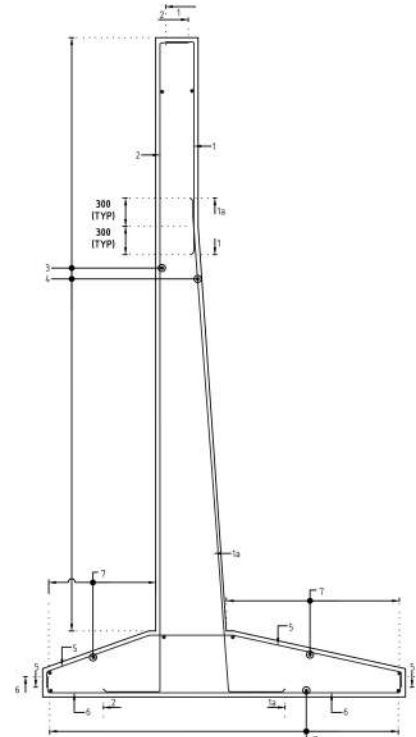


DIMENSION DETAILS OF RETAINING WALL  
FOR 7.0m HEIGHT

SCALE 1:30

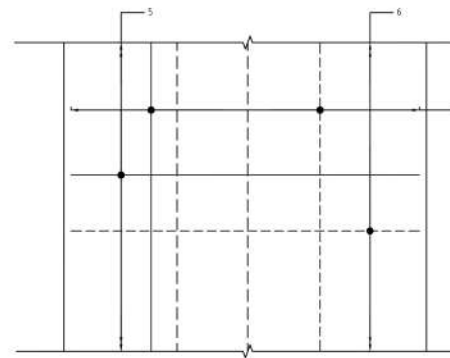
#### NOTES:-

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
- THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
- GRADE OF CONCRETE SHALL BE
  - RCC RETURN WALL - M30
  - LEVELING COURSE CONCRETE - M15
- CLEAR COVER -
  - EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
- GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS, CONFIRMING TO IS 1786 - 2000.
- LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
- LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
- DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
- FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
- COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
- FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO  $30^\circ$ .
- WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mm/C/HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
- MAXIMUM PRESSURE ON SOIL IS -17.427/Sq.m
- SAFE BEARING CAPACITY OF SOIL TO BE- 19.57/Sq.m



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 7.0m HEIGHT

SCALE 1:30



REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

#### SCHEDULE OF REINFORCEMENT:

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	130
1a	5306 662	20	130
2	6885 335 640	16	130
3	1501 VARIES 1150	10	150
4	1501 VARIES 1150	10	150
5	1153 922 2348 3501 1350	16	130
6	3501 4450 1350	16	130
7	1501 VARIES 1150	10	150

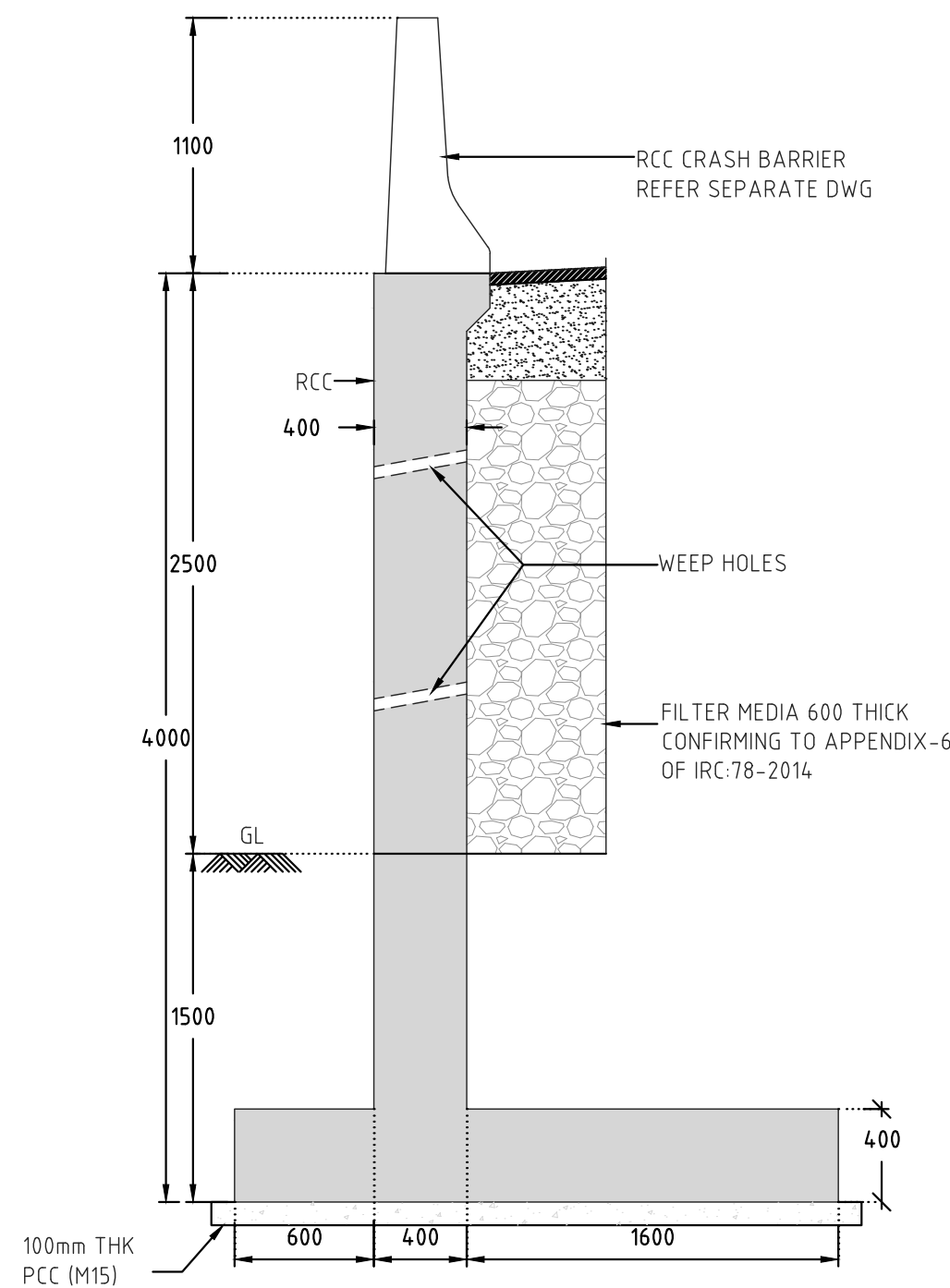
#### NOTES:-

- ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

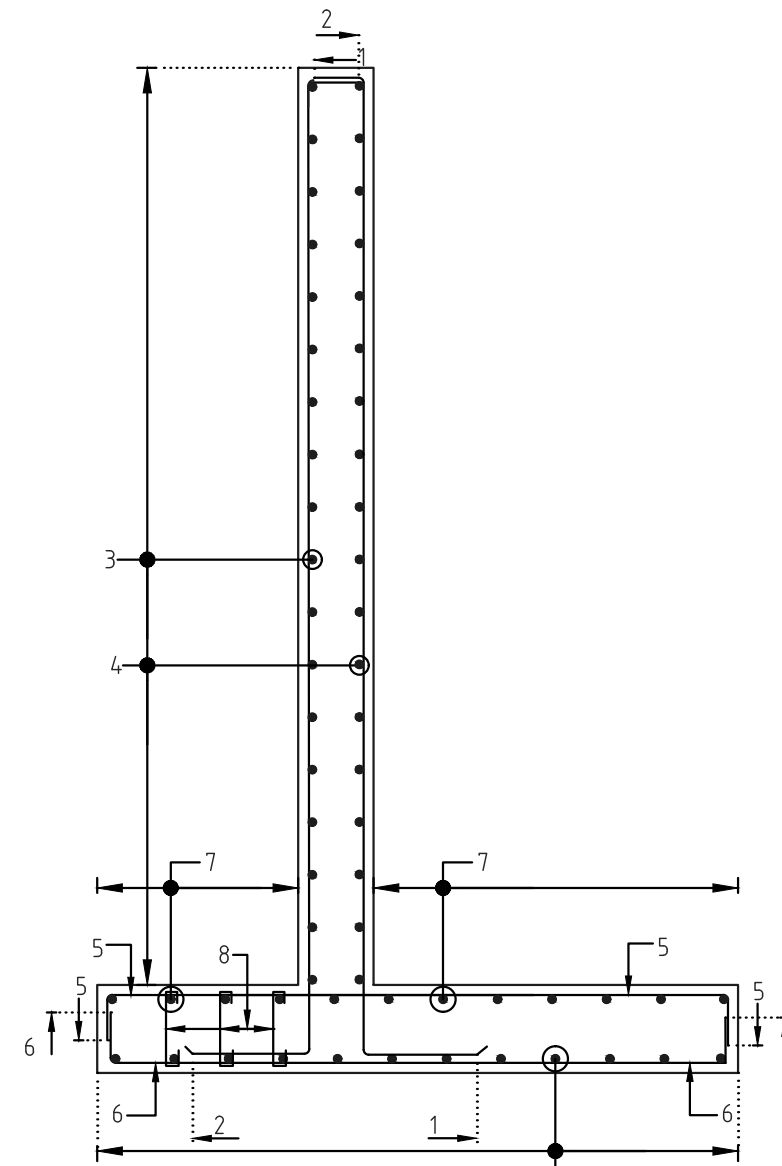
DRAWING TITLE:

DETAIL DRAWING FOR 7.0m  
RCC RETAINING WALL

DWG. NO: P-120-NH45-RW-008



**DIMENSION DETAILS OF RETAINING WALL  
FOR 4.0m HEIGHT**  
SCALE 1:30



**REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 4.0m HEIGHT**  
SCALE 1:30

**SCHEDULE OF REINFORCEMENT:**

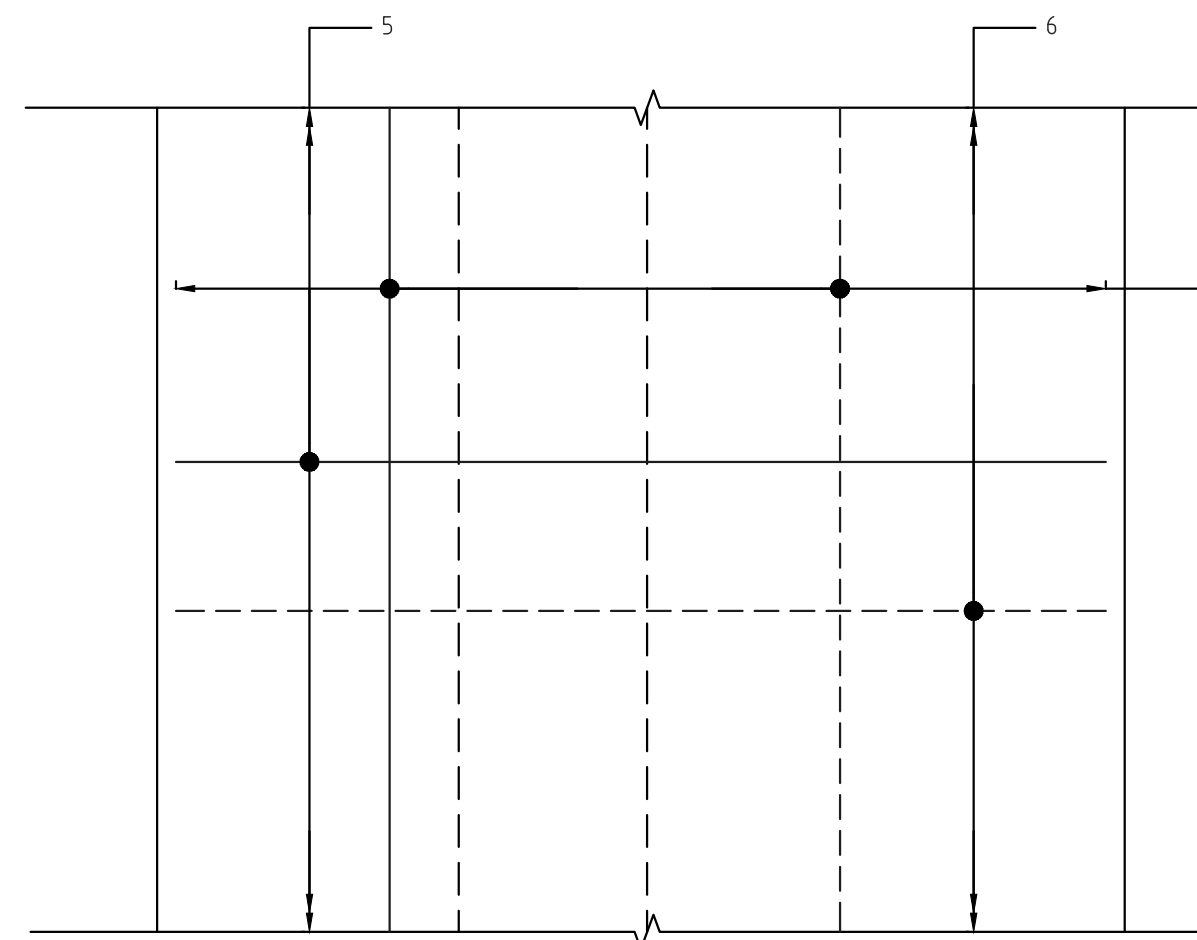
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	285 3885 650	16	150
2	3885 285 300	12	150
3	150 VARIES 150	10	200
4	150 VARIES 150	10	200
5	250 2450 250	12	150
6	250 2450 250	12	150
7	150 VARIES 150	10	200
8		8	200X300

**NOTES:-**

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

**NOTES:-**

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE  
A) RCC RETURN WALL - M30  
B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-  
EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.50T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 14T/Sq.m

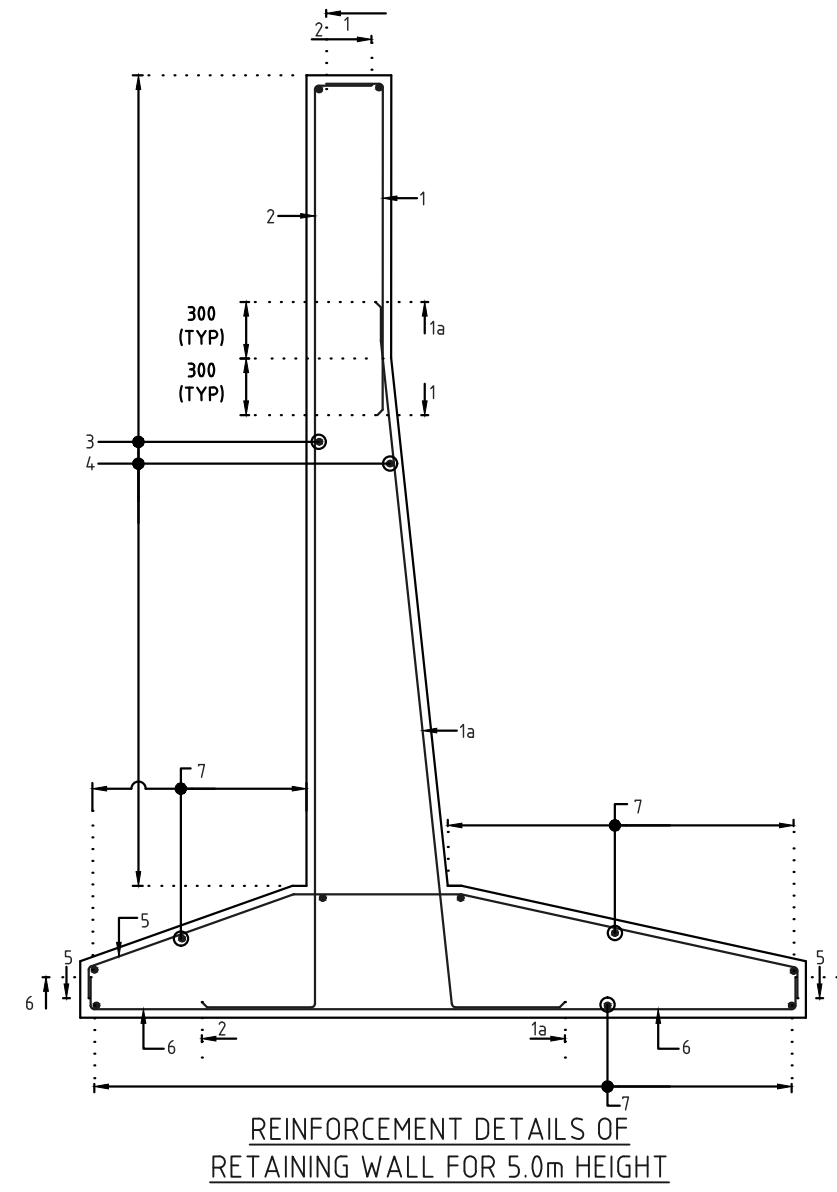
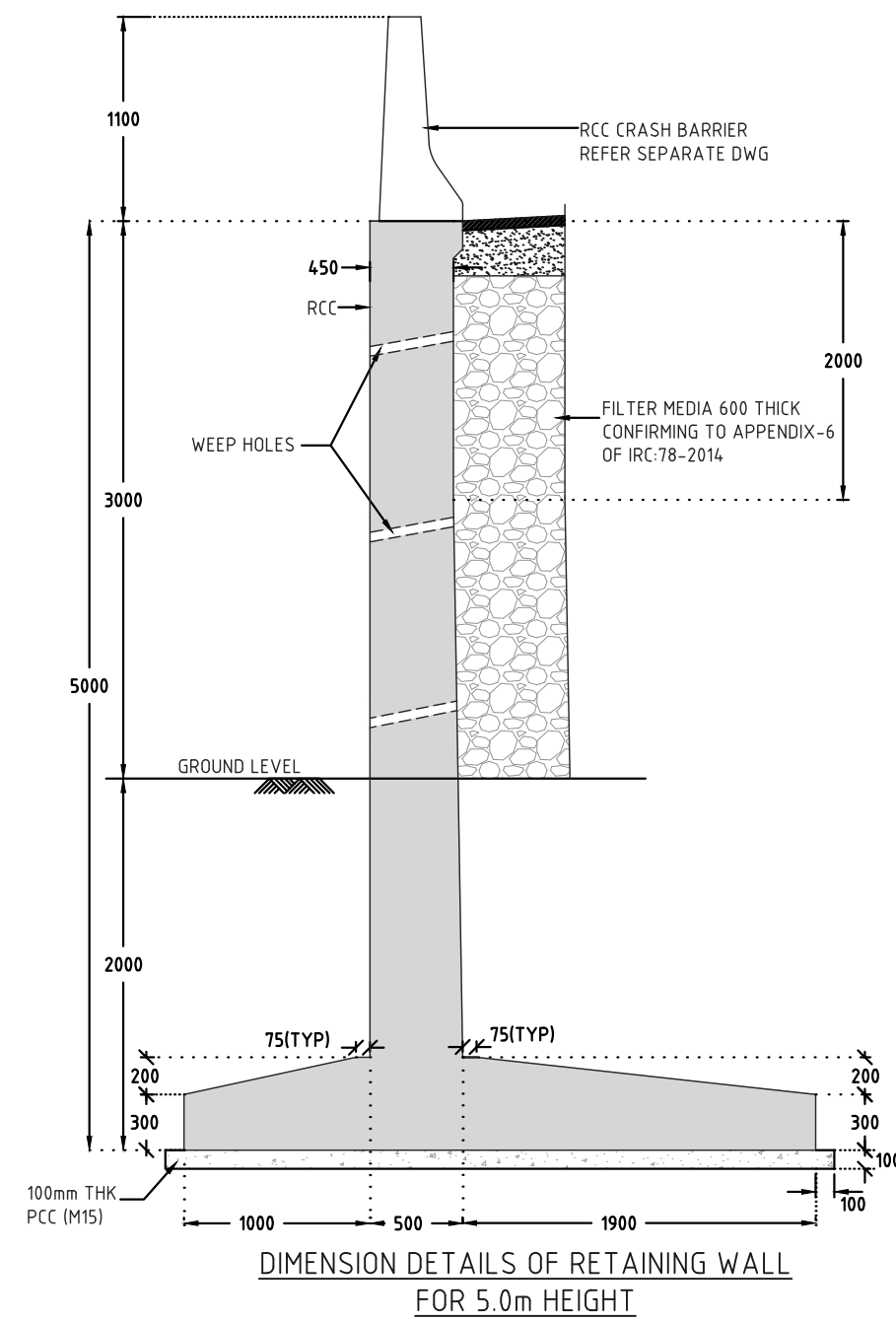


**REINFORCEMENT PLAN AT BOTTOM**  
SCALE 1:30

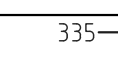

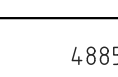
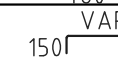
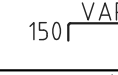
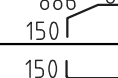
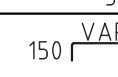

**DRAWING TITLE:**

DETAIL DRAWING FOR 4.0m  
RCC RETAINING WALL

**DWG. NO:- 120-NH45-RW-003**



SCHEDULE OF REINFORCEMENT:

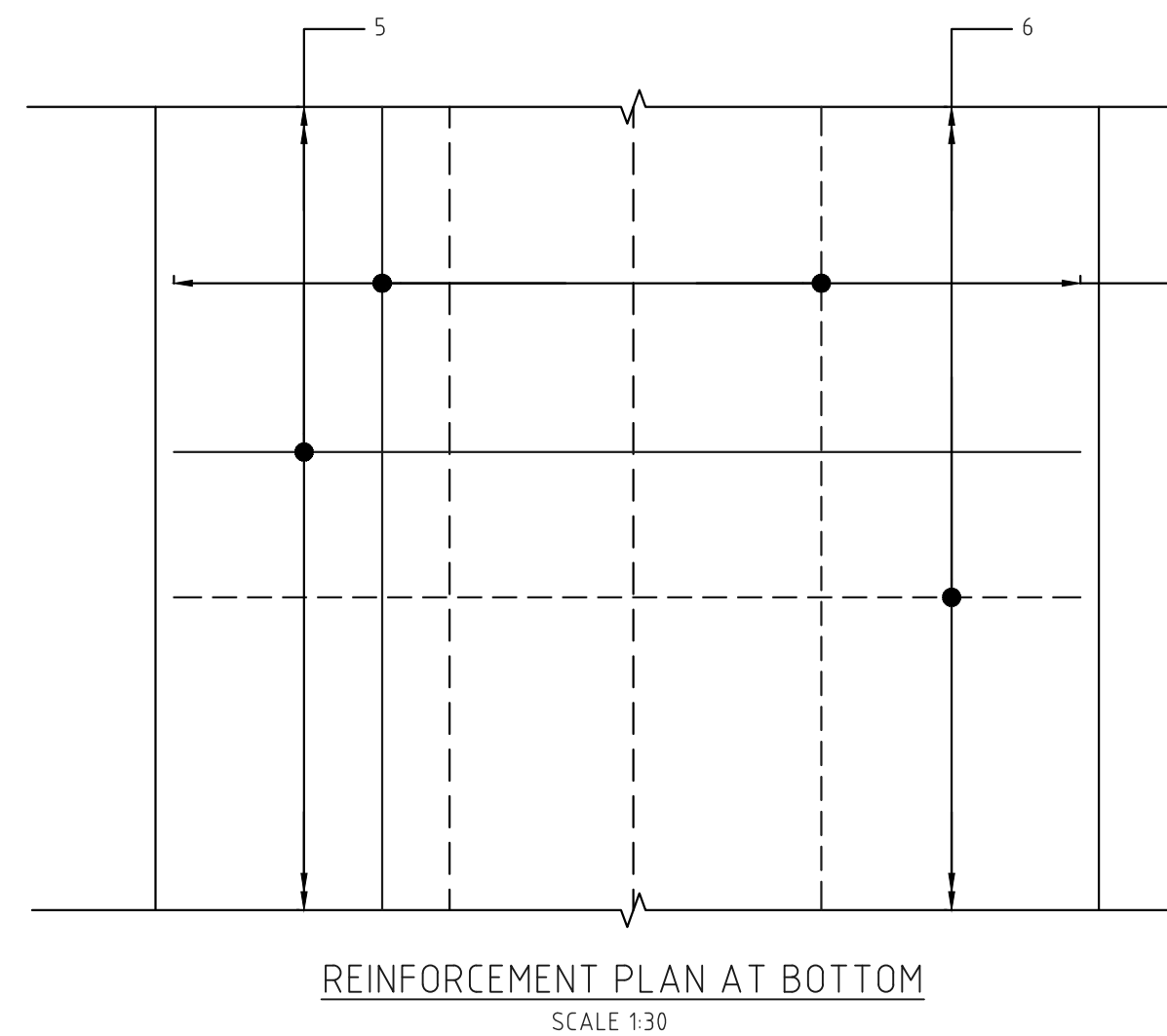
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1		12	120
1a		16	120
2		12	120
3		10	200
4		10	200
5		12	120
6		12	120
7		10	200

NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

- NOTES:-

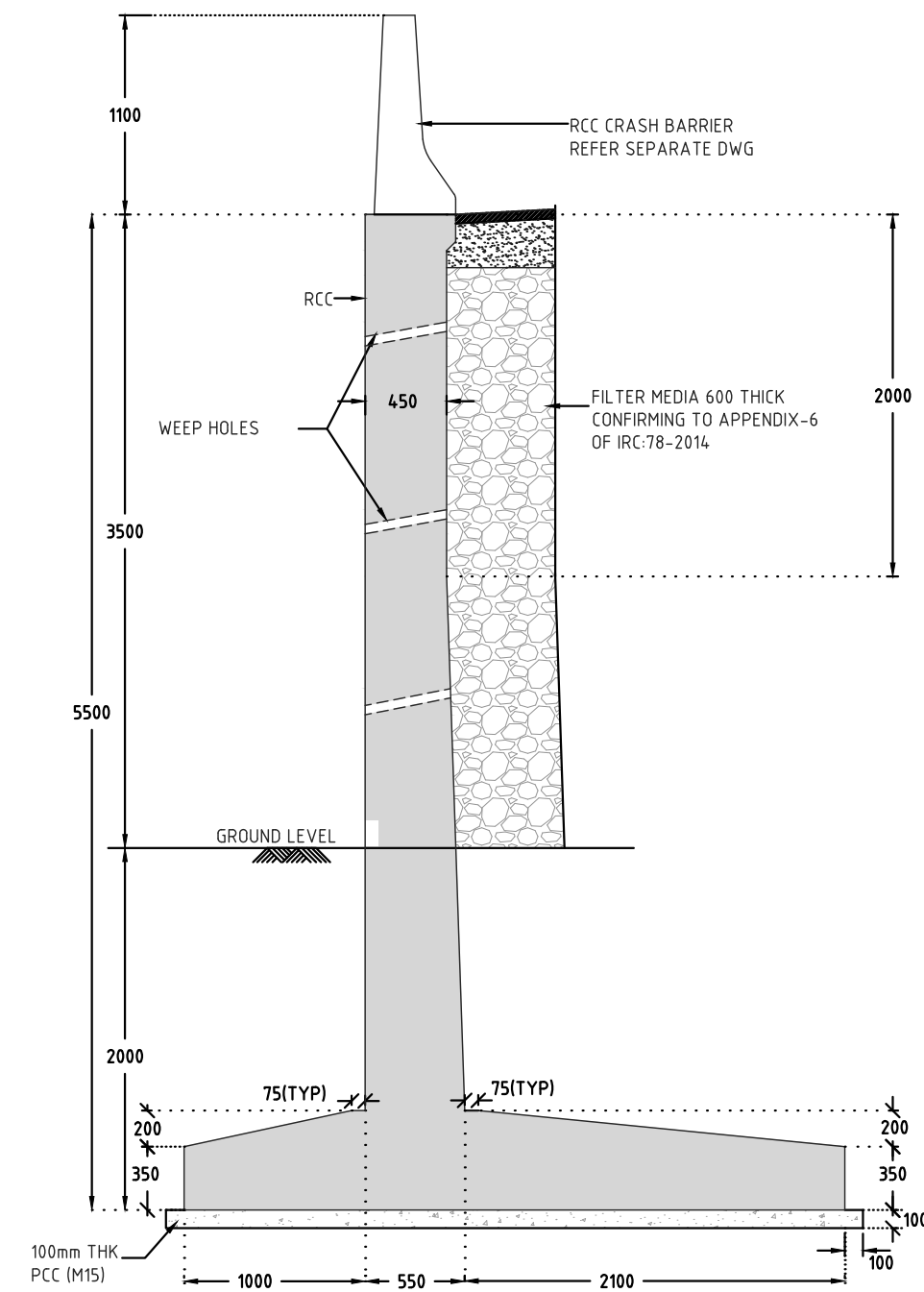
1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE - 14.5T/Sq.m



**DRAWING TITLE:**

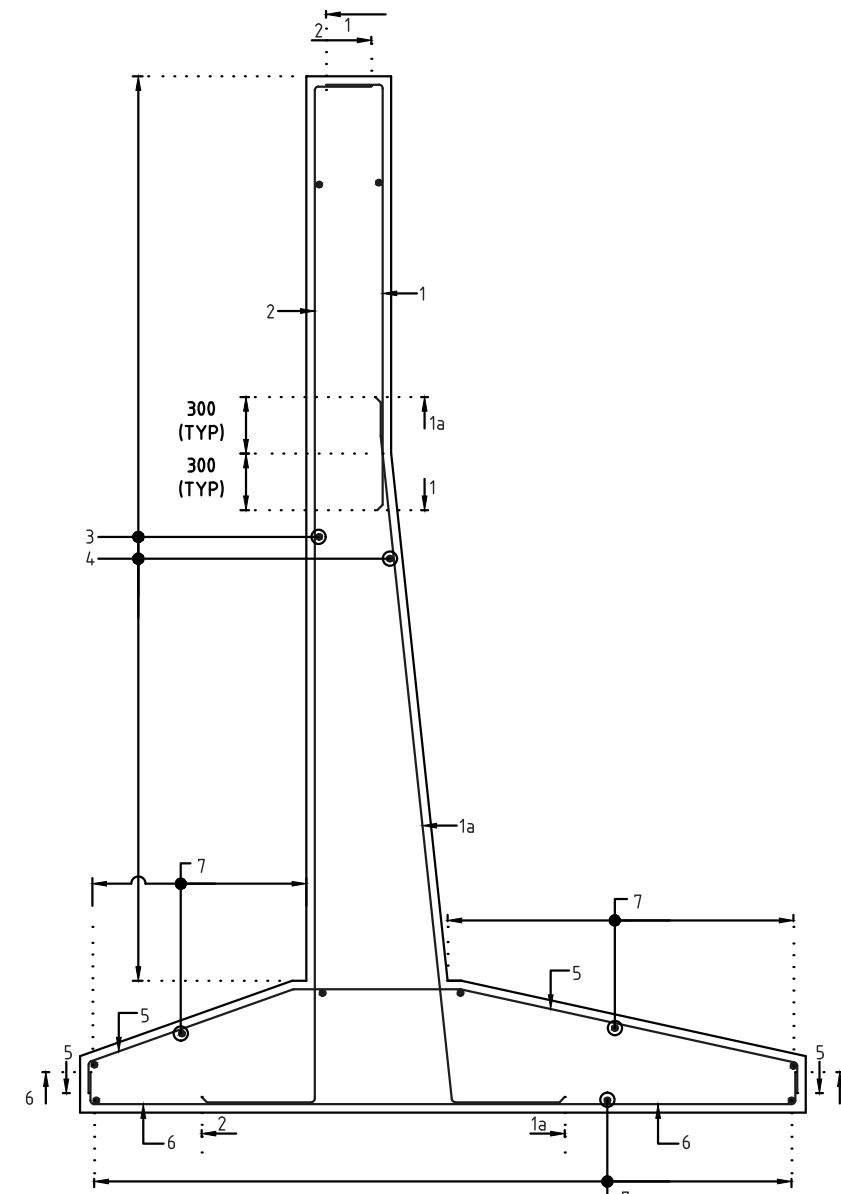
DETAIL DRAWING FOR 5.0m  
RCC RETAINING WALL

DWG. NO P-120-NH45-RW-004



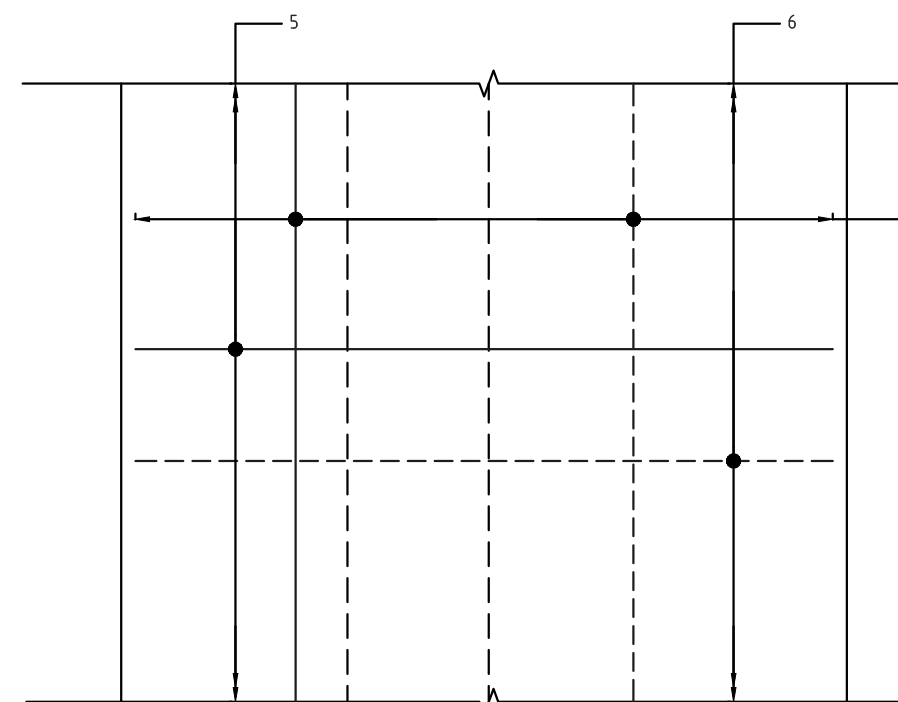
DIMENSION DETAILS OF RETAINING WALL  
FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

# SCHEDULE OF REINFORCEMENT:

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	100
1a	3801 662	16	100
2	5385 335 480	12	100
3	VARIES 150 1150	10	200
4	VARIES 150 1150	10	200
5	886 663 1980 200 1200	12	100
6	200 3500 200	12	100
7	VARIES 150 150	10	200

## NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

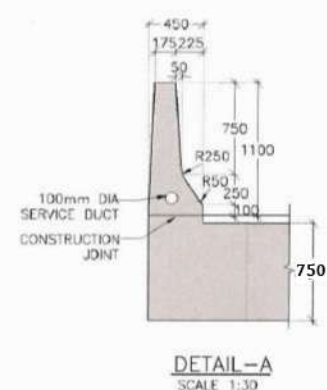
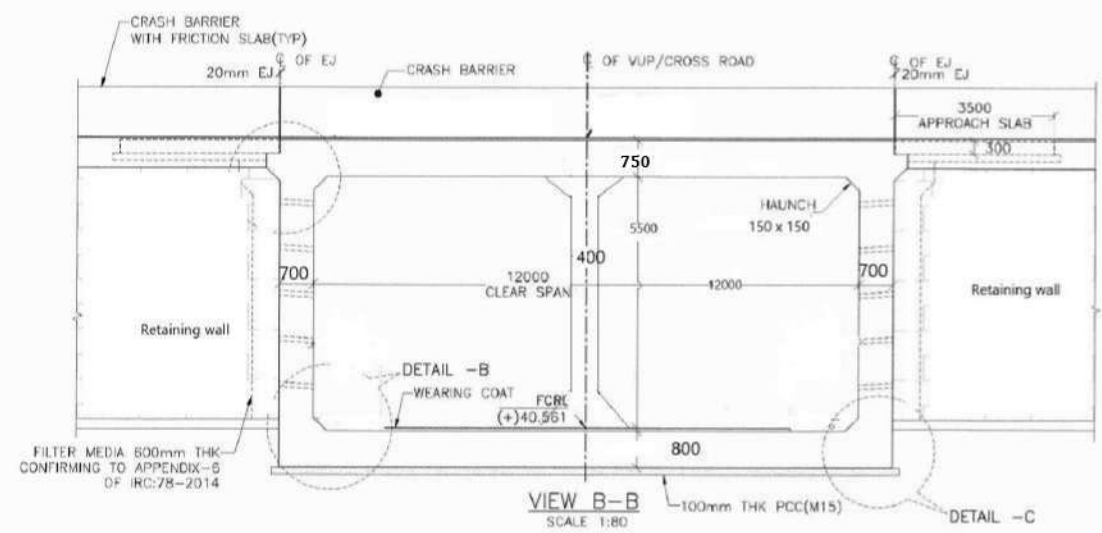
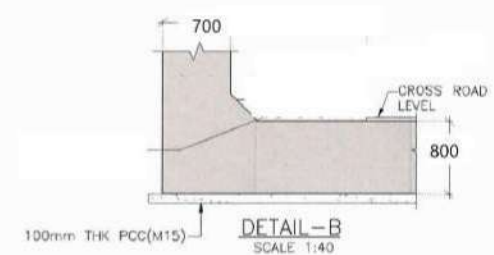
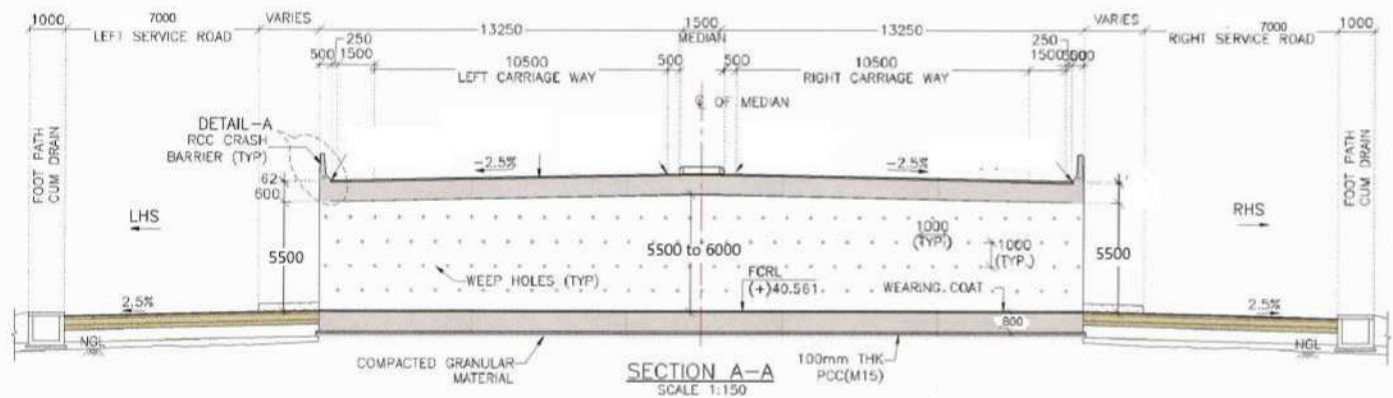
## NOTES:-

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - A) EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-14.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 16.5T/Sq.m

DRAWING TITLE:

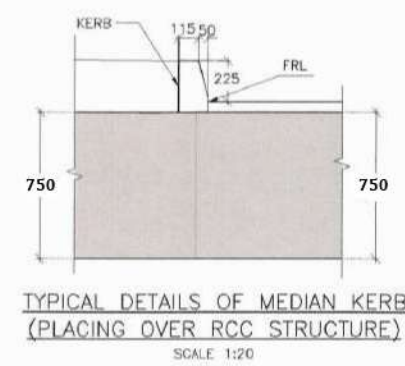
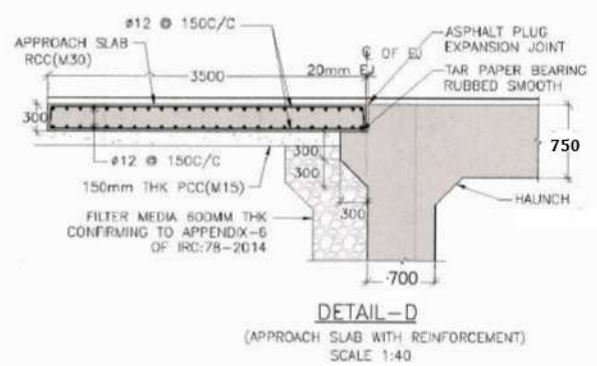
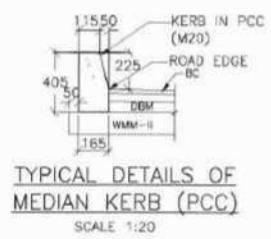
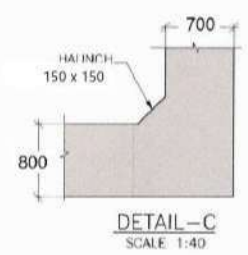
DETAIL DRAWING FOR 5.5m  
RCC RETAINING WALL

W.G. NO P-120-NH45-RW-005



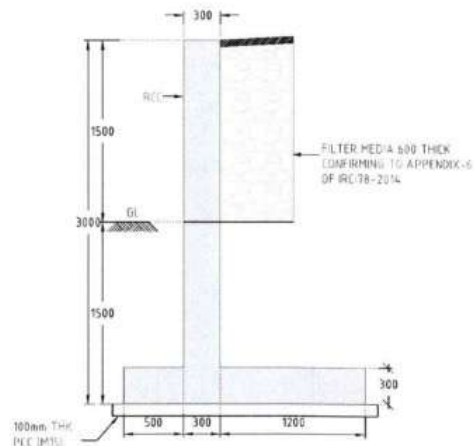
**LEGEND:-**

C	CENTER LINE
FRL	FINISHED ROAD LEVEL
FCRL	FINISHED CROSS ROAD LEVEL
EJ	EXPANSION JOINT
NGL	NATURAL GROUND LEVEL
TYP.	TYPICAL
LHS	LEFT SIDE
RHS	RIGHT SIDE



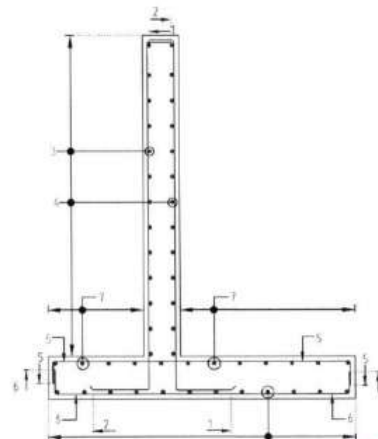
DRAWING TITLE:  
 GENERAL ARRANGEMENT DRAWING  
 FOR VEHICULAR UNDERPASS.  
 km - 152+850  
 DWG. NO:



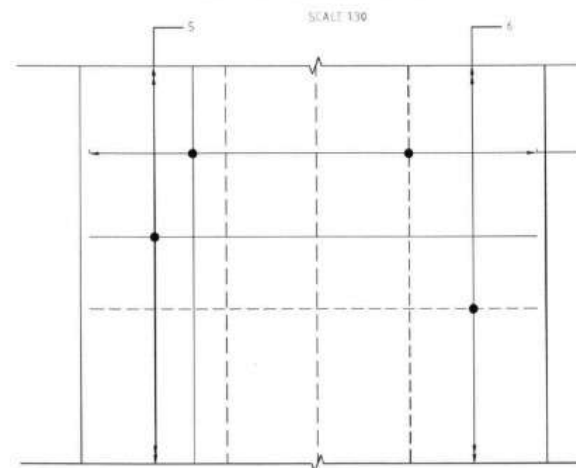


**DIMENSION DETAILS OF RETAINING WALL  
FOR 3.0m HEIGHT**

SCALE 1:30



**REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 3.0m HEIGHT**



**REINFORCEMENT PLAN AT BOTTOM**

SCALE 1:30

**SCHEDULE OF REINFORCEMENT**

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	185 2885 500	12	150
2	2885 185 100	12	150
3	VARIES 150	12	200
4	VARIES 150	12	200
5	185 185 150	12	150
6	150 185 150	12	150
7	VARIES 150	12	200

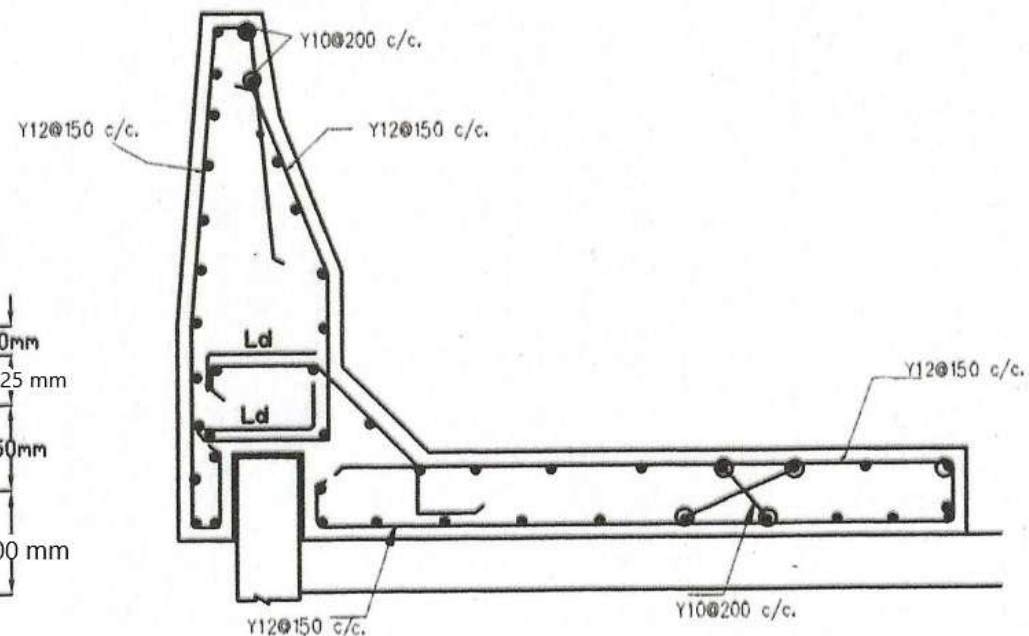
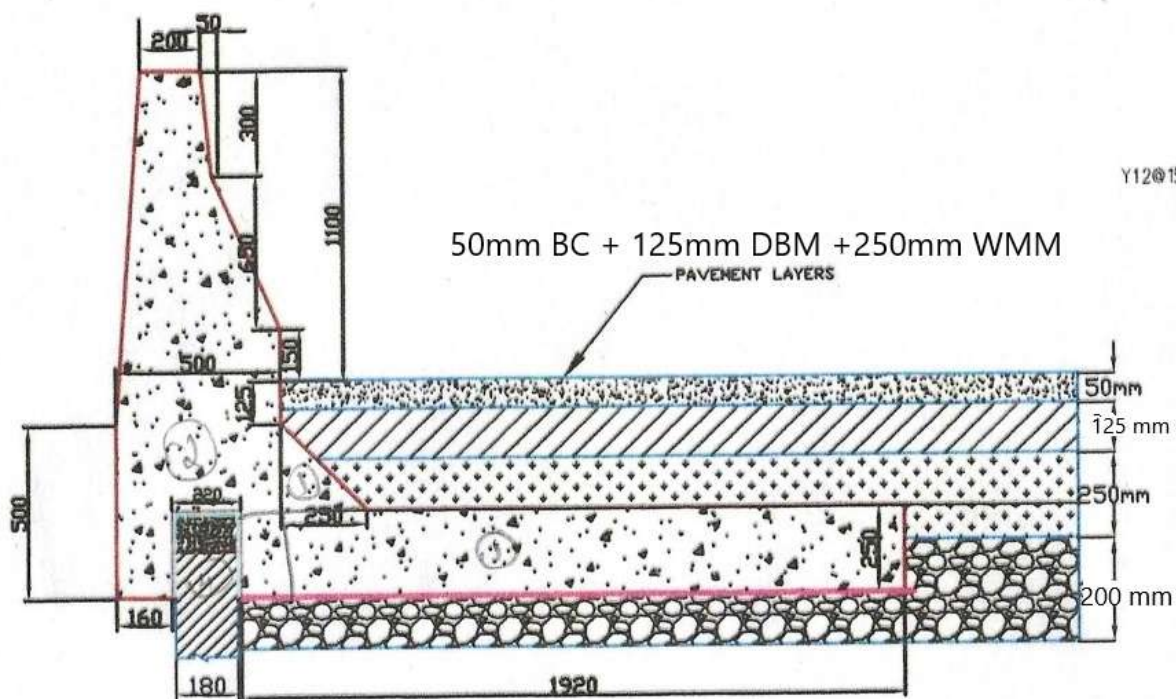
**NOTES:-**

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
- THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
- GRADE OF CONCRETE SHALL BE - M30
- GRADE OF STEEL BE 18-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS - 1786 - 2000.
- LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
- LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR.
- DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR.
- FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
- COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
- FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\theta$  MORE THAN OR EQUAL TO  $30^\circ$ .
- WEED PROLES TO BE PROVIDED 100mm WITH 1000mm C/J HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
- MAXIMUM PRESSURE ON SOIL IS 8-90T/5cm.
- SAFE BEARING CAPACITY OF SOIL TO BE 127/5sqm.

DRAWING TITLE:

DETAIL DRAWING FOR 3.0m  
RCC RETAINING WALL

DWG. NO: P-124-NH 45-RW-01

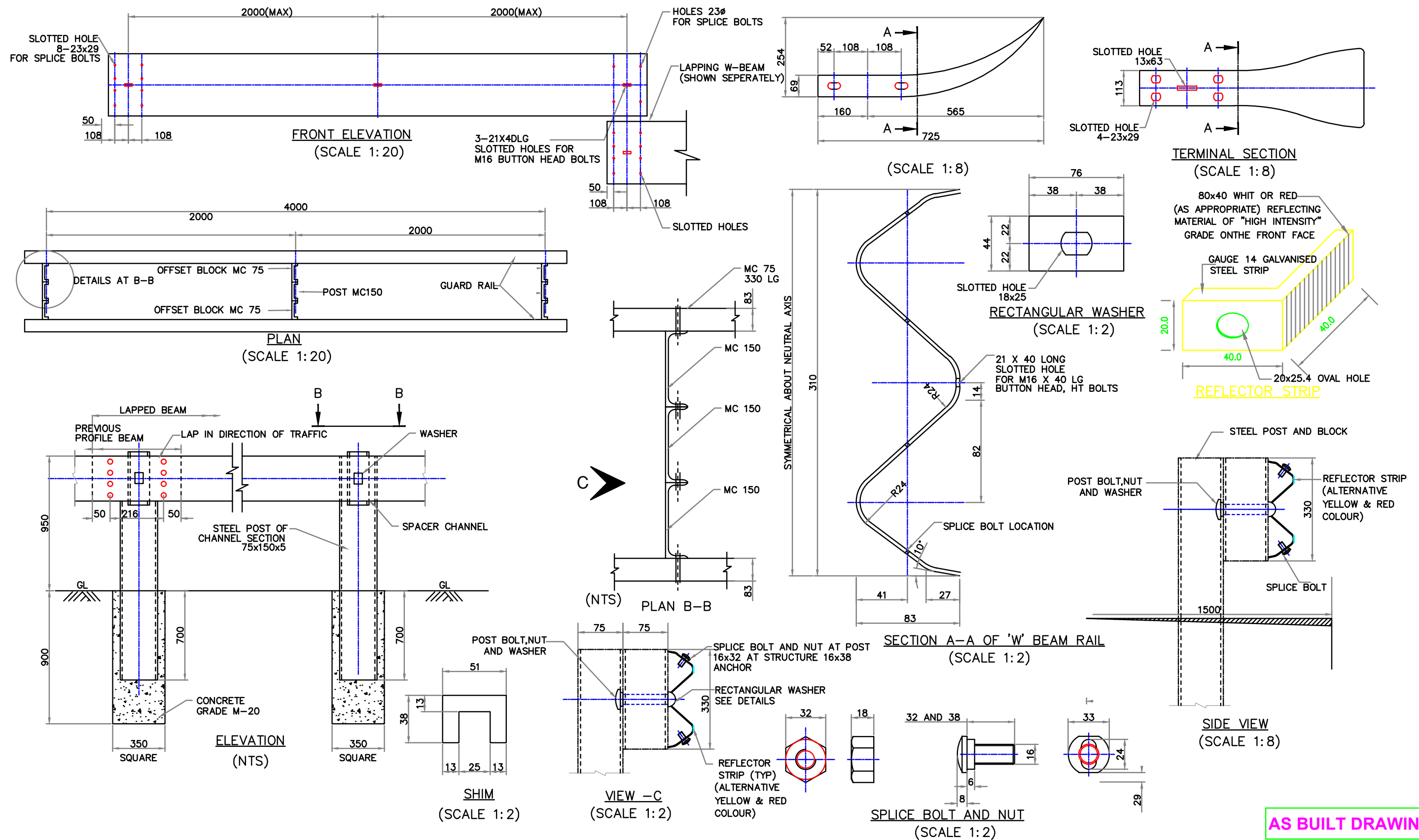


DIMENSIONAL DETAILS OF FRICTION SLAB & CRASH BARRIER

REINFORCEMENT DETAILS OF FRICTION SLAB & CRASH BARRIER

NOTES

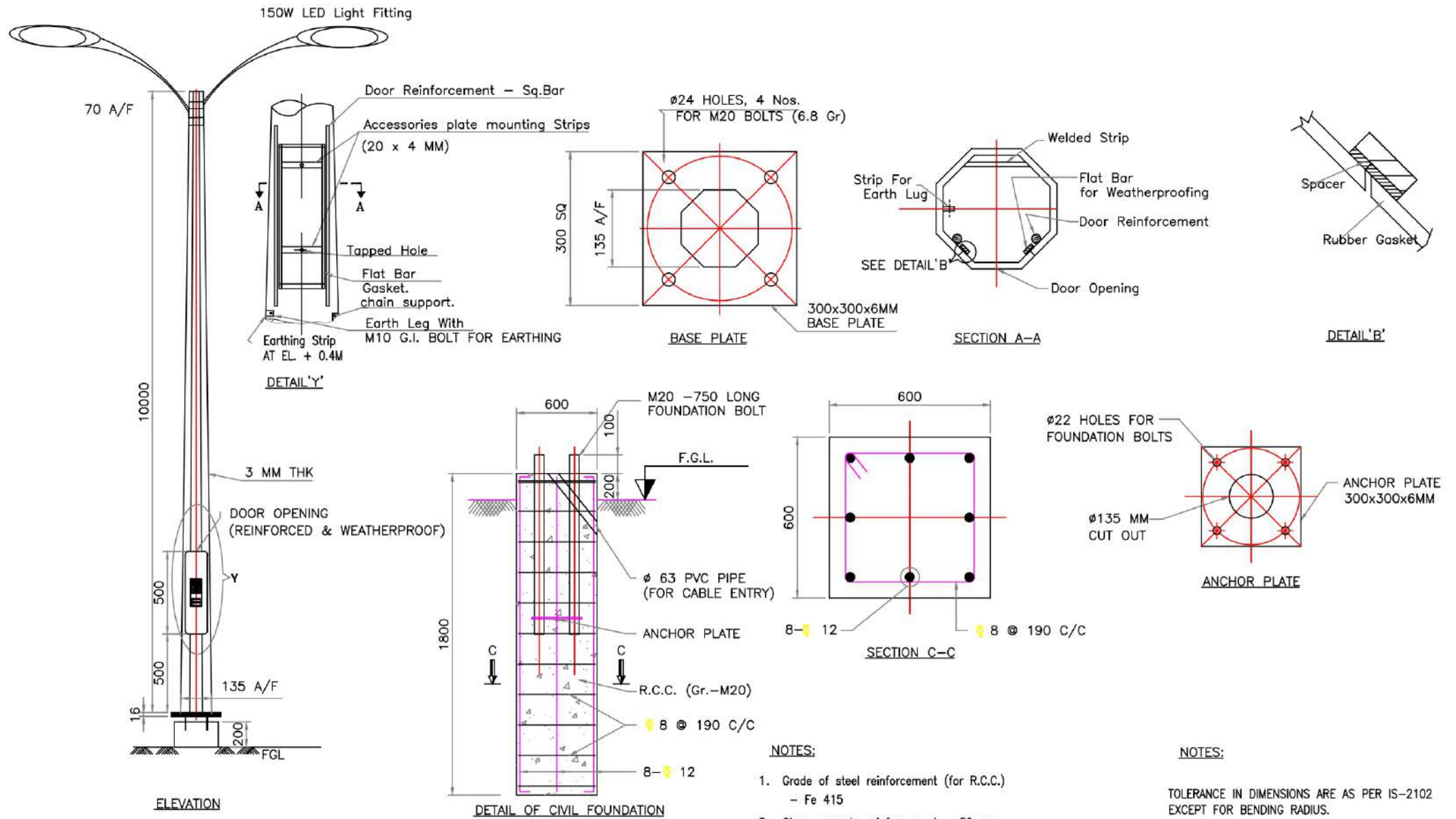
1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED
2. GRADE OF CONCRETE IN CRASH BARRIER SHALL BE GRADE M 40 AND M 30 FOR FRICTION SLAB
3. ALL REINFORCEMENT BARS SHALL BE HIGH STRENGTH DEFORMED BARS OF GRADE Fe 500 CONFORMING TO IS 1786 1985
4. CLEAR COVER TO THE REINFORCEMENT SHALL BE 40MM UNLESS OTHERWISE SPECIFIED
5. ENSURE THE GSB OF 150 MM IS LAID UNDERNEATH THE FRICTION SLAB TO HAVE CONTINUITY OF SUB SURFACE DRAINAGE
6. HOPE SHEET 250MICRON THICKNESS BE LAID OVER THE GSB BEFORE THE FRICTION SLAB IS CAST IN SITU
7. DEVELOPMENT LENGTH  $L_d = 36 \times \text{DIA OF BAR}$



AS BUILT DRAWING

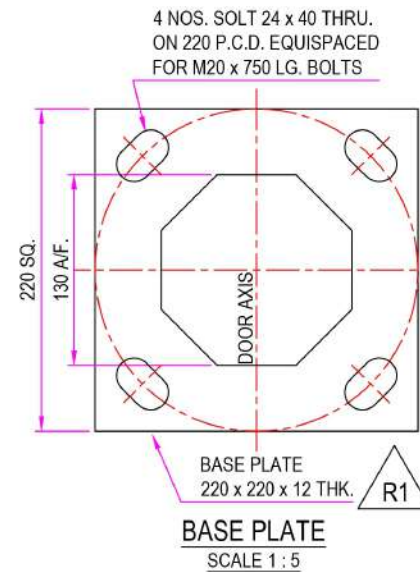
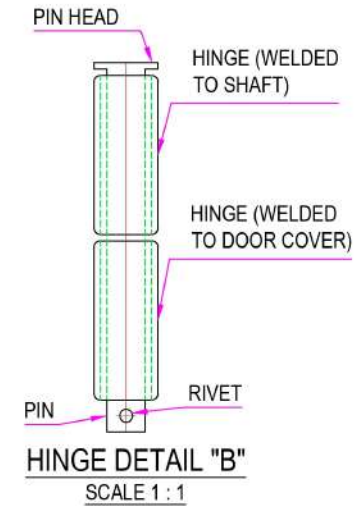
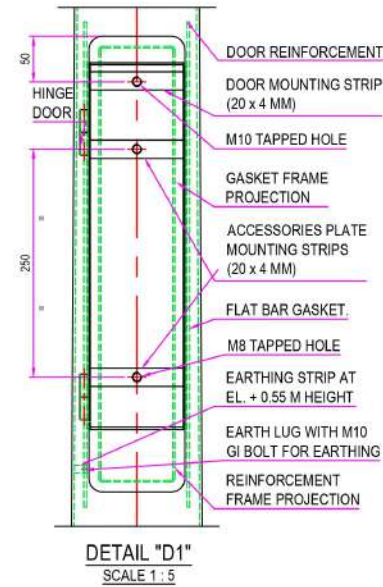
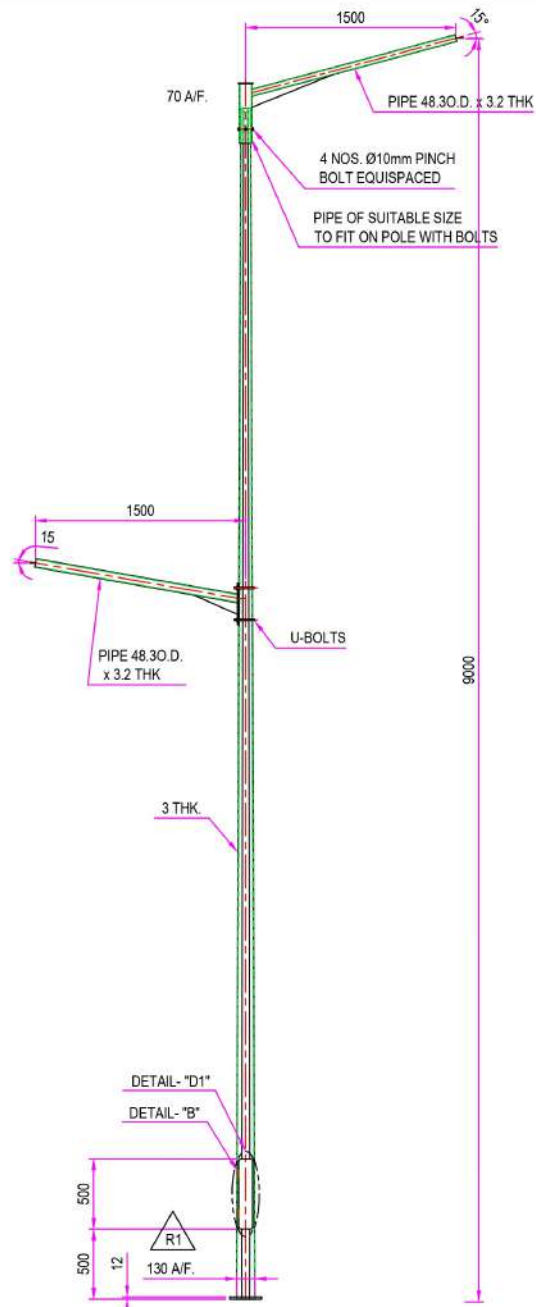
DETAILS OF W-BEAM / METALLIC CRASH BARRIER BETWEEN MCW & SR

# **Tindivanam - Ulundurpet Section of NH-45 - Double Arm Lighting for Black Spot Locations**









#### GENERAL NOTES :-

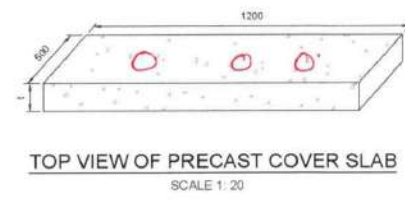
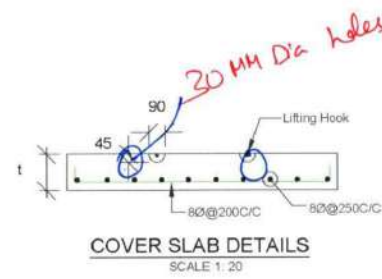
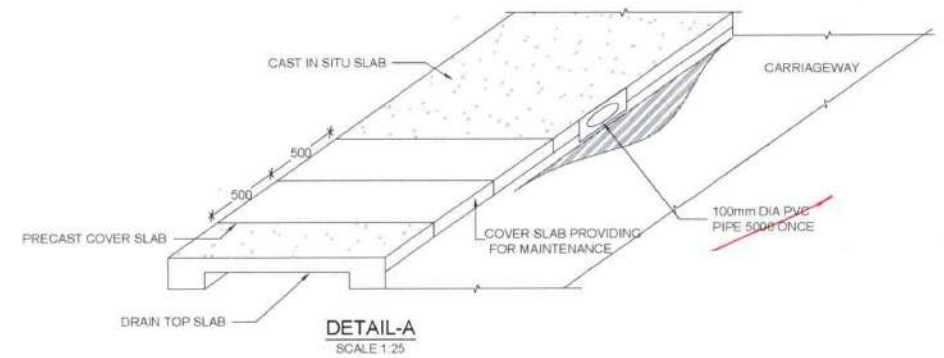
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL OF POLE - S355 J0/JR CONFORMING TO BSEN 10025.
3. MATERIAL OF BASE PLATE - E250 CONFORMING TO IS 2062.
4. GALVANIZATION - BS EN ISO 1461 OR EQUI.
5. POLE SHALL BE HOT DIP GALVANIZED.
6. FOUNDATION BOLTS SHALL BE OF TS-600 GRADE.
7. IN CASE OF NON AVAILABILITY OF MATERIALS OF DESIRED SIZE / THICKNESS, MATERIAL OF HIGHER SIZE/THICKNESS MAY BE USED
8. CROSS SECTION OF POLE : OCTAGONAL

#### TOLERANCES:-

CIRCUMFERENCE -  $\pm 1\%$   
 POLE TOTAL LENGTH -  $\pm 25\text{MM}$   
 POLE STRAIGHTNESS -  $0.1\%$

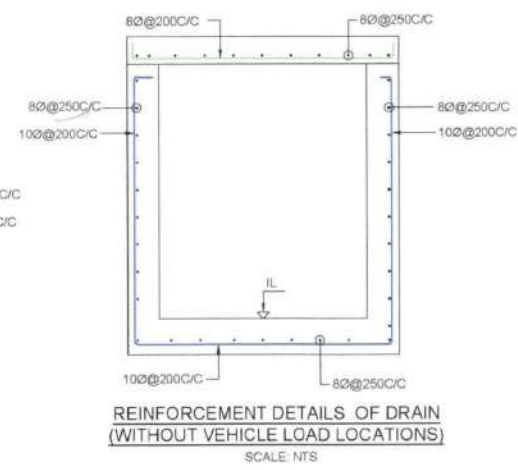
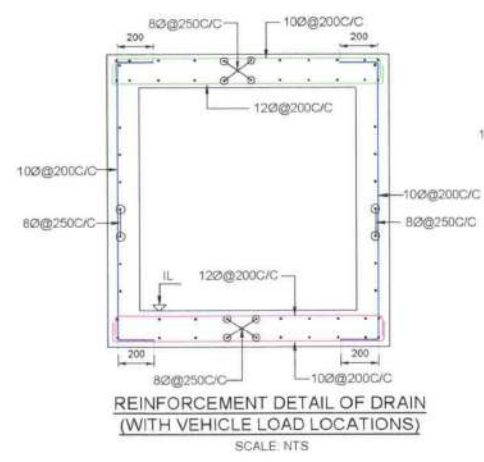
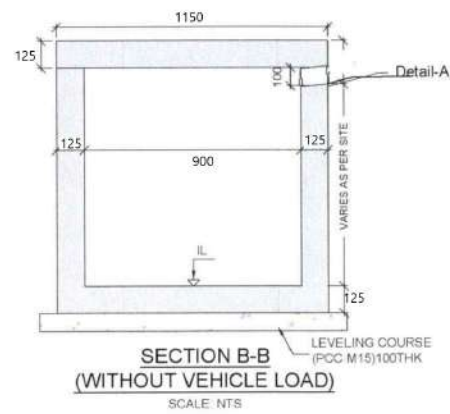
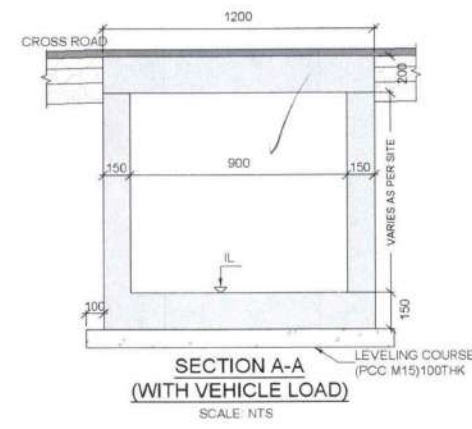
TITLE	
9M MOUNTING HEIGHT OCTAGONAL POLE GA DRG	
DRAWING No:-	NHAI/UEPL/VUP/ POLE GA/04
DATE:	OCTOBER 2020



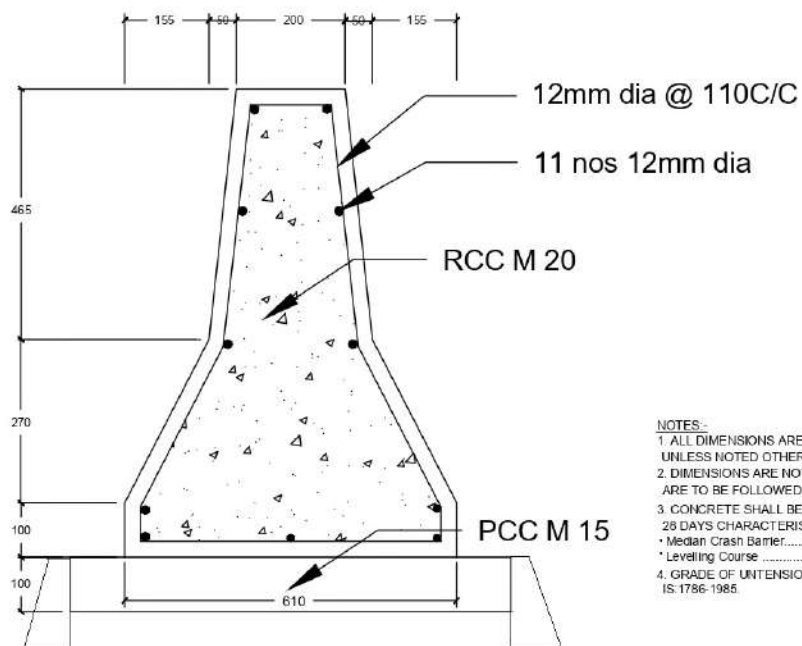


- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED
  2. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe500 CONFORMING TO IS 1786-1985.
  3. GRADE OF CONCRETE:  
DRAIN (RCC) - M25  
LEVELING COARSE (PCC) - M15
  4. LAPS NOT SHOWN ON THE DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.
  5. WHERE MORE THAN 50% OF BARS ARE TO BE LAPPED IN ANY ONE CROSS SECTION
  6. MINIMUM CONCRETE COVER TO REINFORCEMENT NEAREST TO THE EARTH SURFACE SHALL BE 40mm IN BASE SLAB AND OUTER FACE OF WALLS AND 40mm IN TOP SLAB AND INNER FACE OF WALLS.
  7. BAR BENDING SHALL CONFORM TO IS 2502.
  8. REINFORCEMENT DETAILING HAS BEEN DONE AS PER IRC 112: 2020
  9. DESIGN CRITERIA:
  10. i. IRC: 5-2015 ii. IRC: 6-2017 iii. IRC: 112-2020 iv. IRC: 78-2014
  11. PRECAST COVER SLAB AT EVERY 15M INTERVALS 2 NOS.
  12. ALL OTHER LOCATION DRAIN COVER SLAB WILL BE CAST IN SITU.
  13. 1M PRECAST COVER SLAB IS USED FOR MAINTENANCE PURPOSE ON EVERY 15M ONCE.

SCALE 1:40



### Median RCC Crash Barrier - Cross Section



#### NOTES:-

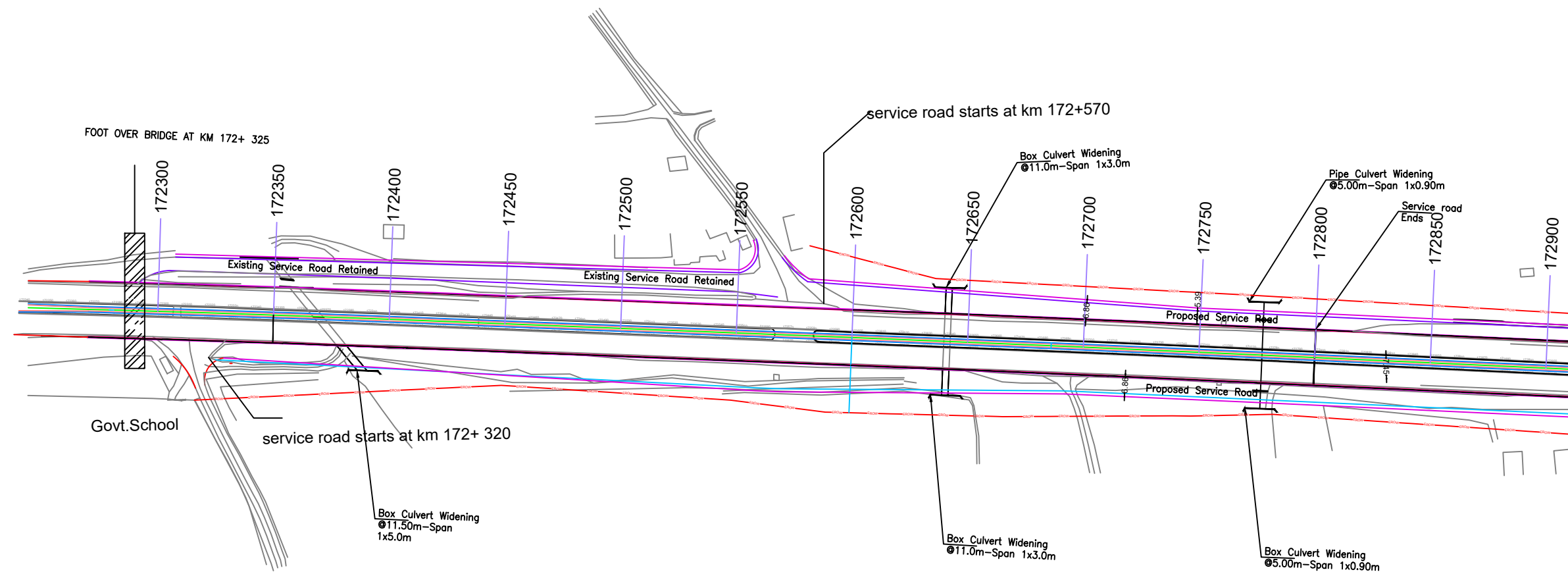
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:  
 \* Median Crash Barrier.....M20 RCC  
 \* Levelling Course .....M15 PCC
4. GRADE OF UNTENSIONED STEEL SHALL BE HYSD CONFORMING TO IS. 1786-1985.

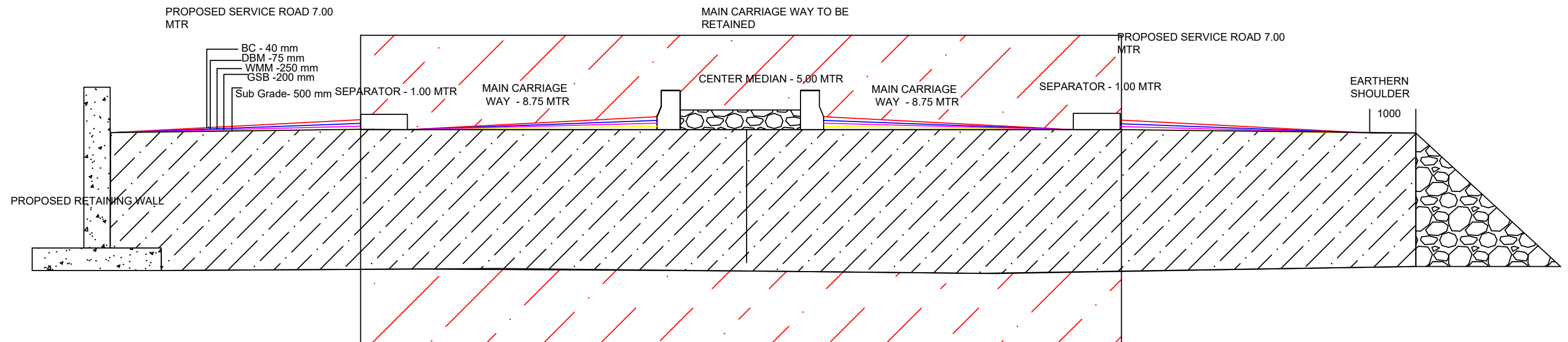
# DRAWINGS

## Tindivanam to Ulunderpet Section of NH-32,132,38

3.Karumboor@ Km 172+330

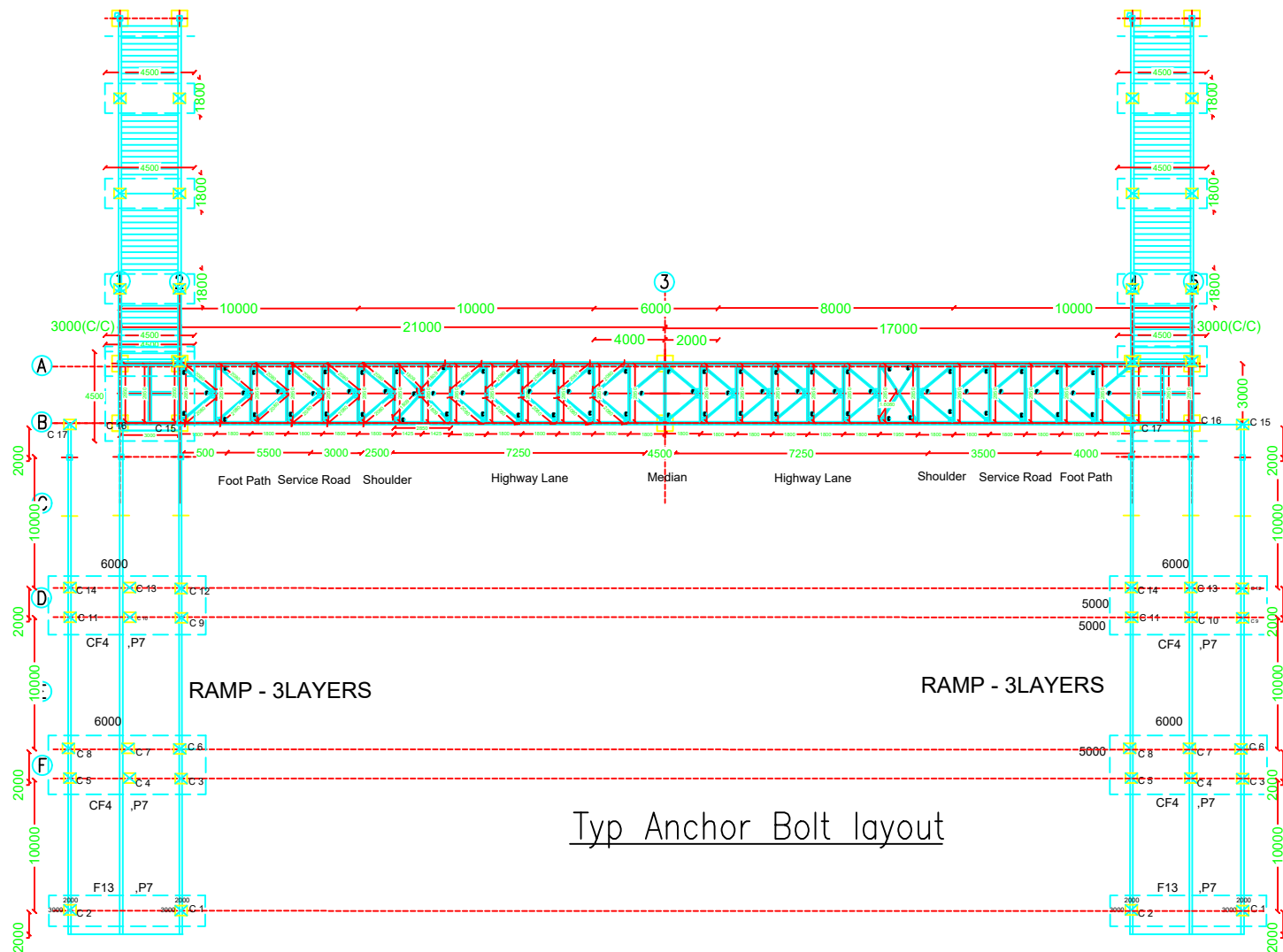
## construction of Service road at km - 172 + 325 to 172 + 800



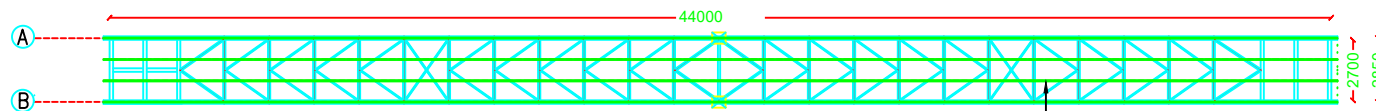


TYPICAL CROSS SECTION AT KM 172 + 320 TO 172 + 800 BHS TYPE-IV

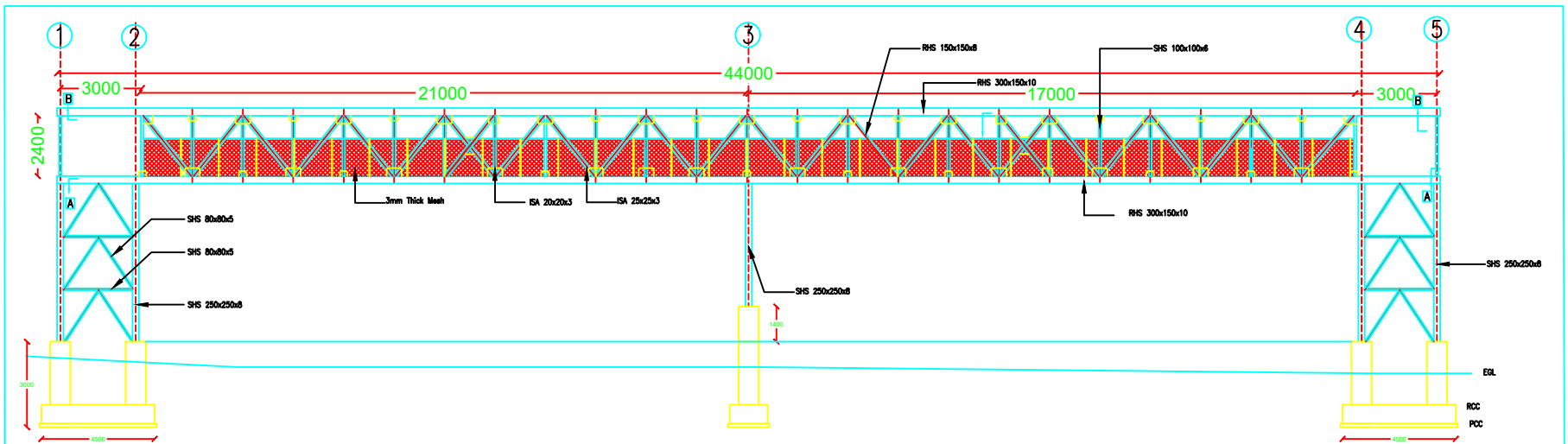




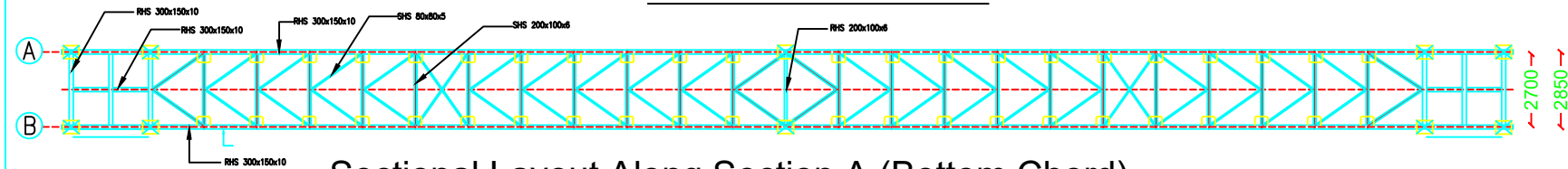
Typ Anchor Bolt layout



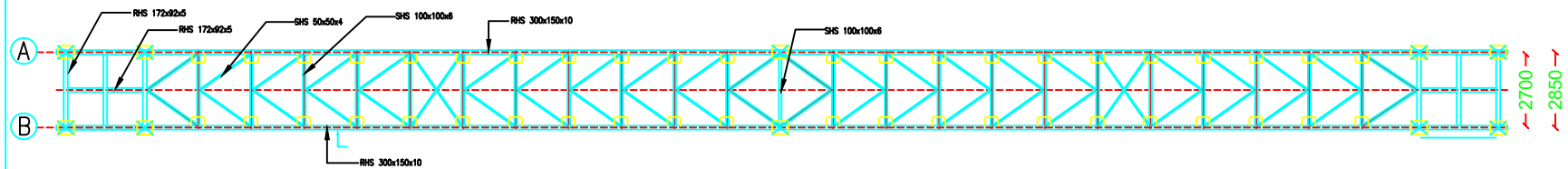
Secondary Member Layout



FRONT ELEVATION

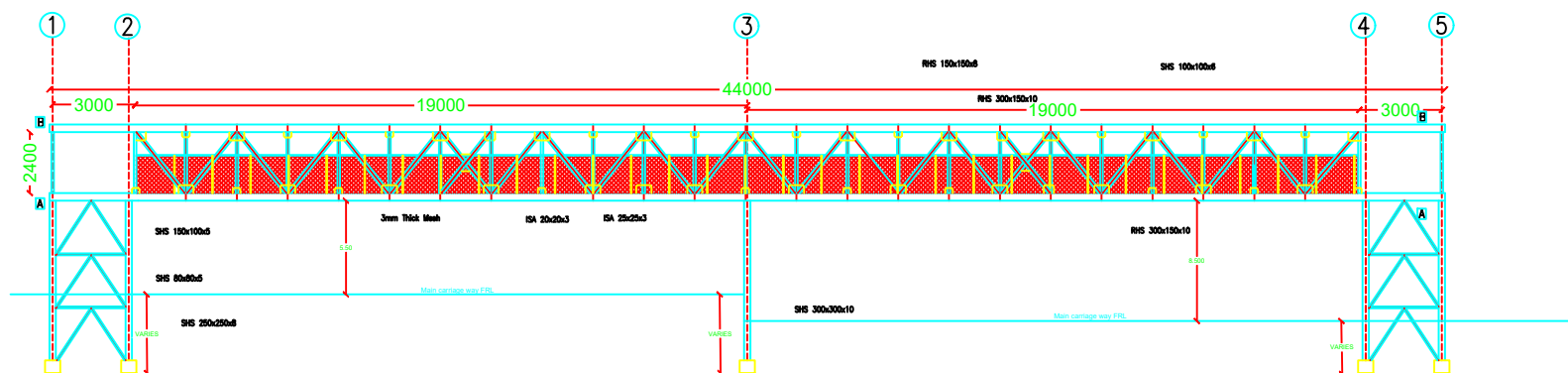


Sectional Layout Along Section A (Bottom Chord)

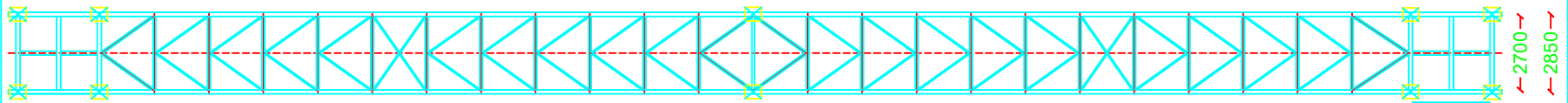


Sectional Layout Along Section B (Top Chord)

NOTES:  
1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.  
2. ALL AREAS TO BE CHECKED AT WORK SITE BY CIVIL CONTRACTOR.



## Sectional Layout Along Section A (Bottom Chord)



### Section Details

Bottom Main Chord-RHS 300x150x10

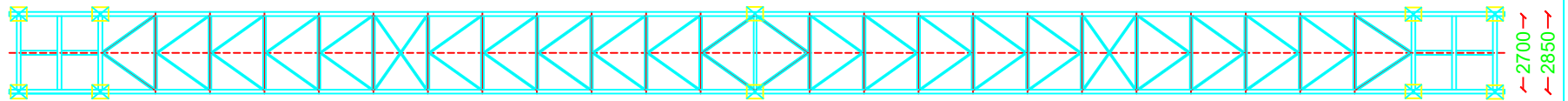
Bottom Chord Tie Beam-RHS 200x100x6.3

Bottom Chord Bracing-RHS 80x80x5

#### NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
2. ALL AXES TO BE CHECKED AT WORK SITE BY CIVIL CONTRACTOR.

### Sectional Layout Along Section B(Top Chord)



## Section Details

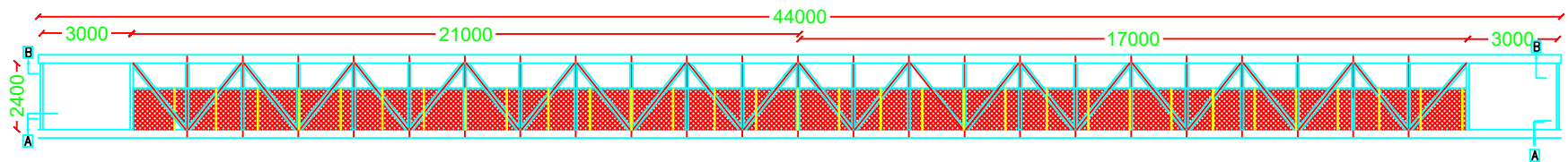
Top Main Chord-RHS 300x150x10

Top Chord Tie Beam-RHS 100x100x6

Top Chord Bracing-RHS 50x50x4



## FRONT ELEVATION



## Section Details

Top Main Chord-RHS 300x150x10

Bottom Main Chord-RHS 300x150x10

Inclined Member(Intermediate)-SHS 150x150x8

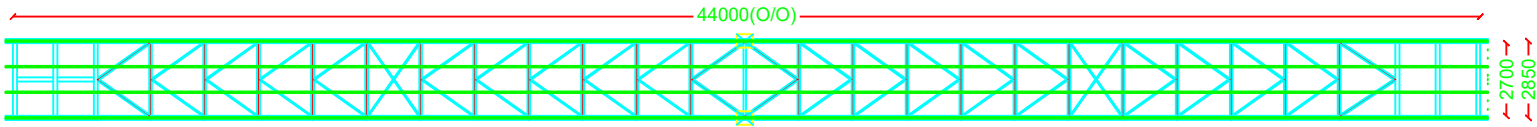
Inclined Member(Ends)-SHS 150x150x8

Vertical Member-SHS 100x100x6

### NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE  
2. ALL AXES TO BE CHECKED AT WORK SITE BY CIVIL CONTRACTOR

Secondary Member Layout

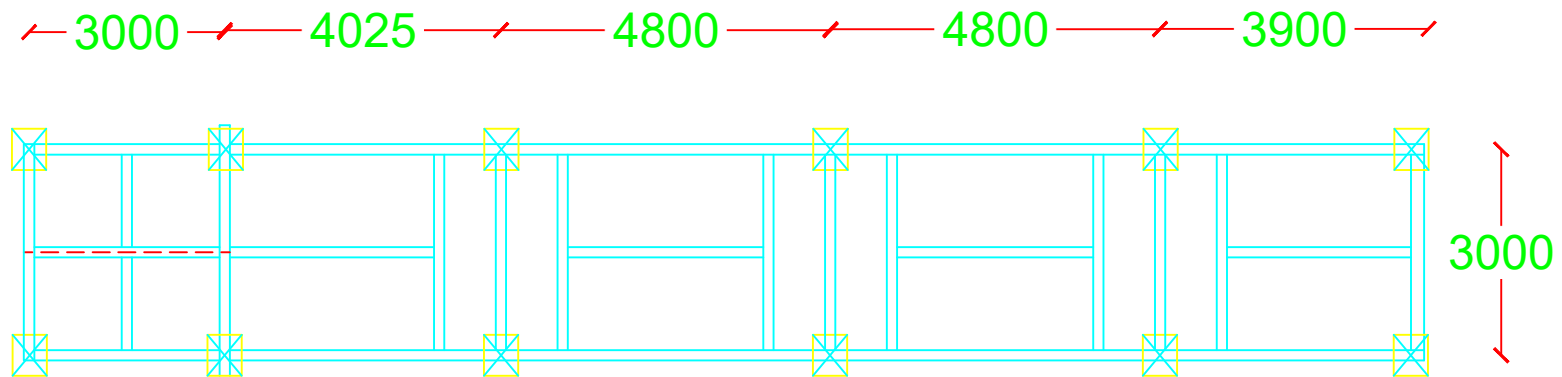


Section Details

Purlin Section-SHS50x50x5

NOTES:  
1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.  
2. ALL AXES TO BE CHECKED AT WORK SITE BY CIVIL CONTRACTOR.

# Stair Case Layout

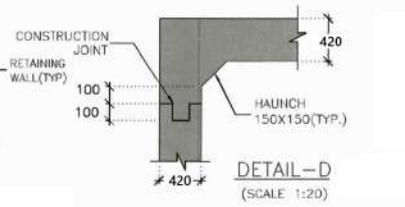
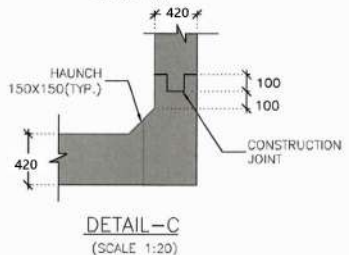
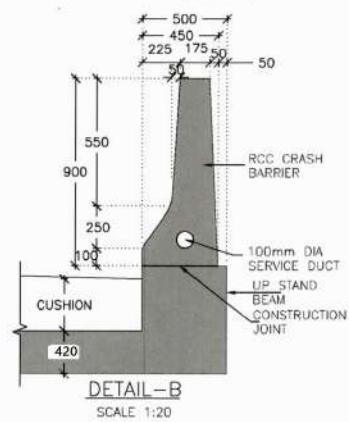
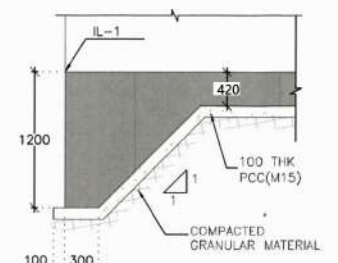
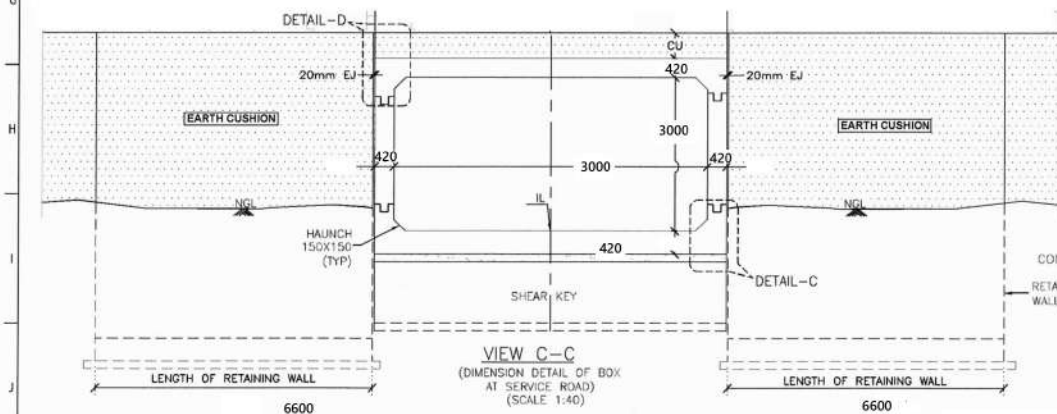
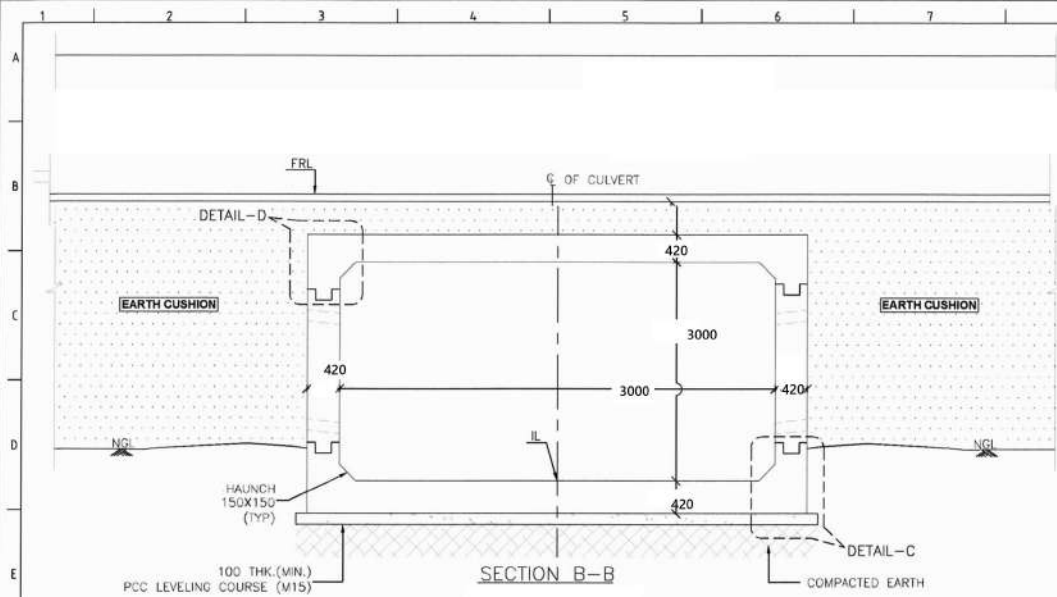


## Section Details

Stringer Beam-RHS 300x150x8  
Landing Beam-RHS 300x150x8

NOTES:  
1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.  
2. ALL AXES TO BE CHECKED AT WORK SITE BY CIVIL CONTRACTOR.





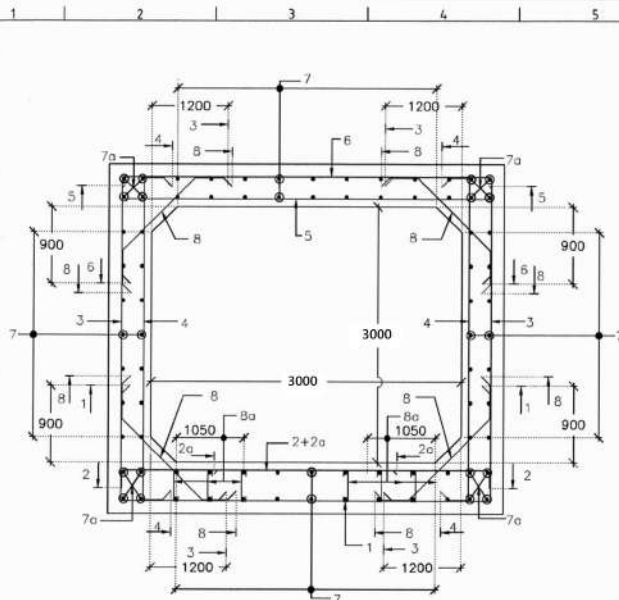
**NOTES:-**

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN m. DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSION ONLY.
- GRADE OF CONCRETE FOR VARIOUS COMPONENTS SHALL BE AS FOLLOWS:
  - BOX STRUCTURE (RCC) - M30 GRADE
  - RETAINING WALL (RCC) - M30 GRADE
  - CRASH BARRIER (RCC) - M40 GRADE
  - DRAIN (RCC) - M20 GRADE
- DESIGN SPECIFICATIONS:
  - IRC : 5-2015
  - IRC : 6-2017
  - IRC : 112-2020
  - IRC : 78-2014
  - IS:1893-1984
- DESIGN LIVELOAD SHALL BE,
  - ONE LANE OF IRC 70R TRACKED/WHEELED
  - ONE /TWO/THREE LANES OF IRC CLASS A
  - ONE LANE OF IRC 70R TRACKED/WHEELED + ONE LANE OF IRC CLASS A
- SAFE BEARING CAPACITY AT FOUNDING LEVEL IS 15 t/m<sup>2</sup>.
- THE ROAD TOP LEVELS, CROSS SLOPES AND GEOMETRY SHALL BE AS PER THE FINAL APPROVED HIGHWAY PLAN & PROFILE DRAWINGS.
- BACK FILLING SHALL BE DONE SIMULTANEOUSLY ON EITHER SIDE ONLY AFTER TOP SLAB CAST.
- WEEP HOLES SHALL BE 100mm DIA AC PIPES STAGGERED AT 1000mm C/C HORIZONTALLY AND VERTICALLY WITH SLOPE OF 1 IN 20.
- FILTER MEDIA OF 600mm MINIMUM THK SHALL BE PROVIDED OVER THE ENTIRE SURFACE BEHIND RETAINING WALLS TO THE FULL HEIGHT AS PER IRC 78-2014.
- BED SLOPE AND BED LEVEL SHALL MATCH WITH EXISTING SITE CONDITIONS. VARIATION IN SITE DATA, IF ANY, SHALL BE REPORTED BACK TO THE DESIGNERS.
- SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
- ANY LOOSE POCKETS/VOIDS AT FOUNDING LEVEL WITH GRANULAR MATERIAL/ PCC M15 AS DECIDED BY ENGINEER IN CHARGE.
- CLEAR COVER:
  - EARTH FACE = 75mm
  - OTHER FACE COMPONENTS OF STRUCTURE = 40mm
- LOCATION OF STRUCTURE, CAMBER, GRADIENT, FRL, WIDTH OF STRUCTURE, BED LEVELS, INVERT LEVELS, FOUNDING LEVELS, SKEW IF ANY, FLOW DIRECTION, SBC UNDER FOUNDATION ETC. SHOULD BE VERIFIED JOINTLY WITH THE REPRESENTATIVE OF AUTHORITY ENGINEER AT SITE, PRIOR TO EXECUTION OF WORK.
- LONGITUDINAL SLOPE OF CULVERT SHOULD BE MINIMUM 1 IN 1000
- CLEAR OPENING SIZE AND EARTH CUSHION MENTIONED SHALL BE VERIFIED WITH APPROVED PLAN AND PROFILE DRAWINGS AND INCASE OF ANY DISCREPANCY IT SHOULD BE IMMEDIATELY REPORTED FOR SUITABLE ACTION PRIOR TO COMMENCEMENT OF THE WORK.
- SOFT AND LOOSE PATCHES IN THE BEARING AREA TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH SANDY MOORUM AND WITH LAYERS NOT EXCEEDING 300mm.
- SUITABLE TEMPORARY DIVERSION SHALL BE PROVIDED AS PER THE SITE REQUIREMENT FOR RECONSTRUCTION OF CULVERTS.

FOR RETAINING WALL DIMENSION AND REINFORCEMENT DETAILS REFER DRAWING : P-124-NH45-RW-03

**DRAWING TITLE:**  
 GENERAL ARRANGEMENT DRAWING  
 FOR SINGLE CELL (1x3x3) BOX  
 CULVERT  
 WIDENING AT KM 172+641  
 DWG. NO: P-124-NH 45-BC-002  
 12 13





SECTION 1-1  
(SCALE 1:20)

#### GENERAL NOTES

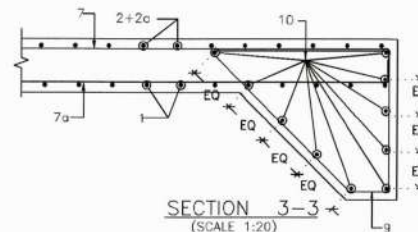
1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe500 CONFORMING TO IS : 1786-1985.
3. MINIMUM CONCRETE COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 75mm IN BASE SLAB AND OUTER FACE OF WALLS AND 40mm IN TOP SLAB AND INNER FACE OF WALLS.
4. LAPS NOT SHOWN ON THE DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THEN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.
5. UNLESS OTHERWISE SPECIFIED THE MINIMUM DEVELOPMENT LENGTHS AND LENGTHS OF LAPS SHALL BE AS SHOWN IN TABLE 1.
6. BAR BENDING SHALL CONFORM TO IS 2502.
7. REINFORCEMENT DETAILING HAS BEEN DONE AS PER IRC 112 : 2020.
8. DESIGN CRITERIA:  
I. IRC : 5-2015 II. IRC : 6-2017 III. IRC : 112-2020  
iv. IRC : 78-2014

TABLE - 1  
LAP DETAILS FOR 50% LAPPING

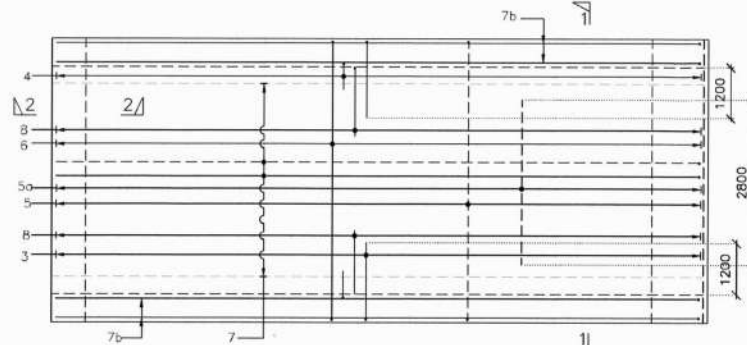
GRADE OF CONCRETE	M30	LEGEND:
DEVELOPMENT LENGTH (LD)	40d	— TOP FACE BARS
LAP LENGTH FOR 50% LAPPING	56d	--- BOTTOM FACE BARS
		EQ.—EQUALLY DISTRIBUTED

NOTES:  
THE NO. OF RODS SHALL NOT BE COUNTED FROM THE DRAWING.

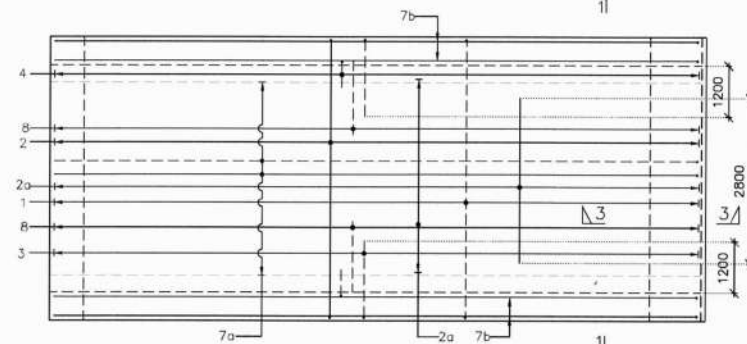
SECTION 3-3  
(SCALE 1:20)



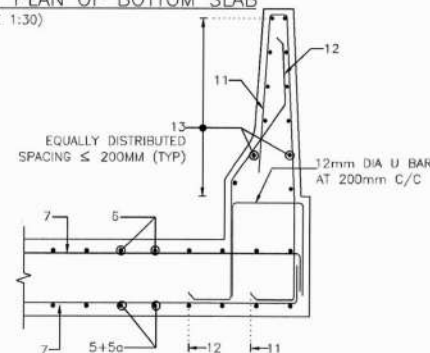
REINFORCEMENT PLAN OF TOP SLAB  
(SCALE 1:30)



REINFORCEMENT PLAN OF BOTTOM SLAB  
(SCALE 1:30)



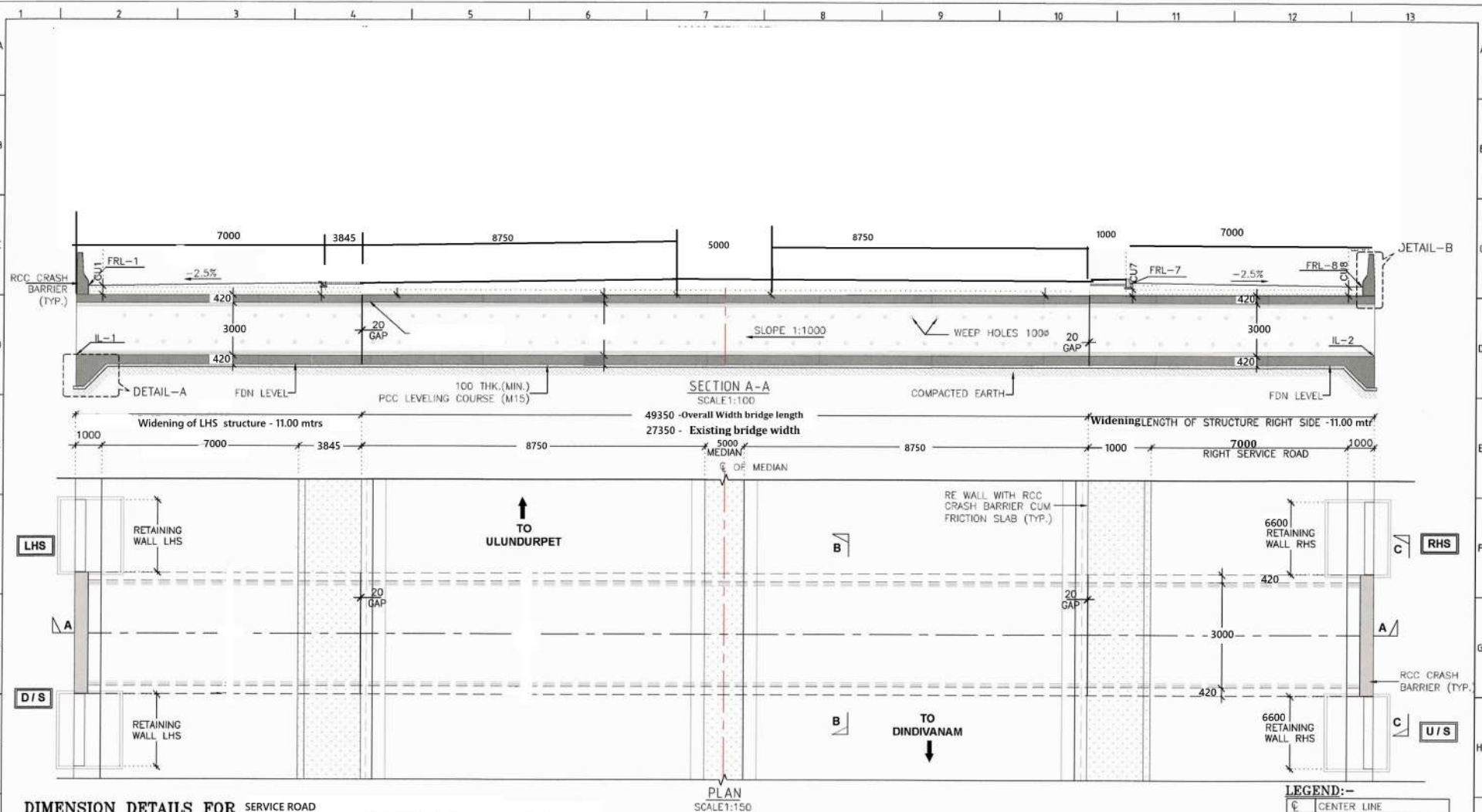
SECTION 2-2  
(WITH UPSTAND BEAM)  
SCALE 1:30



#### SCHEDULE OF REINFORCEMENT (SERVICE ROAD) :-

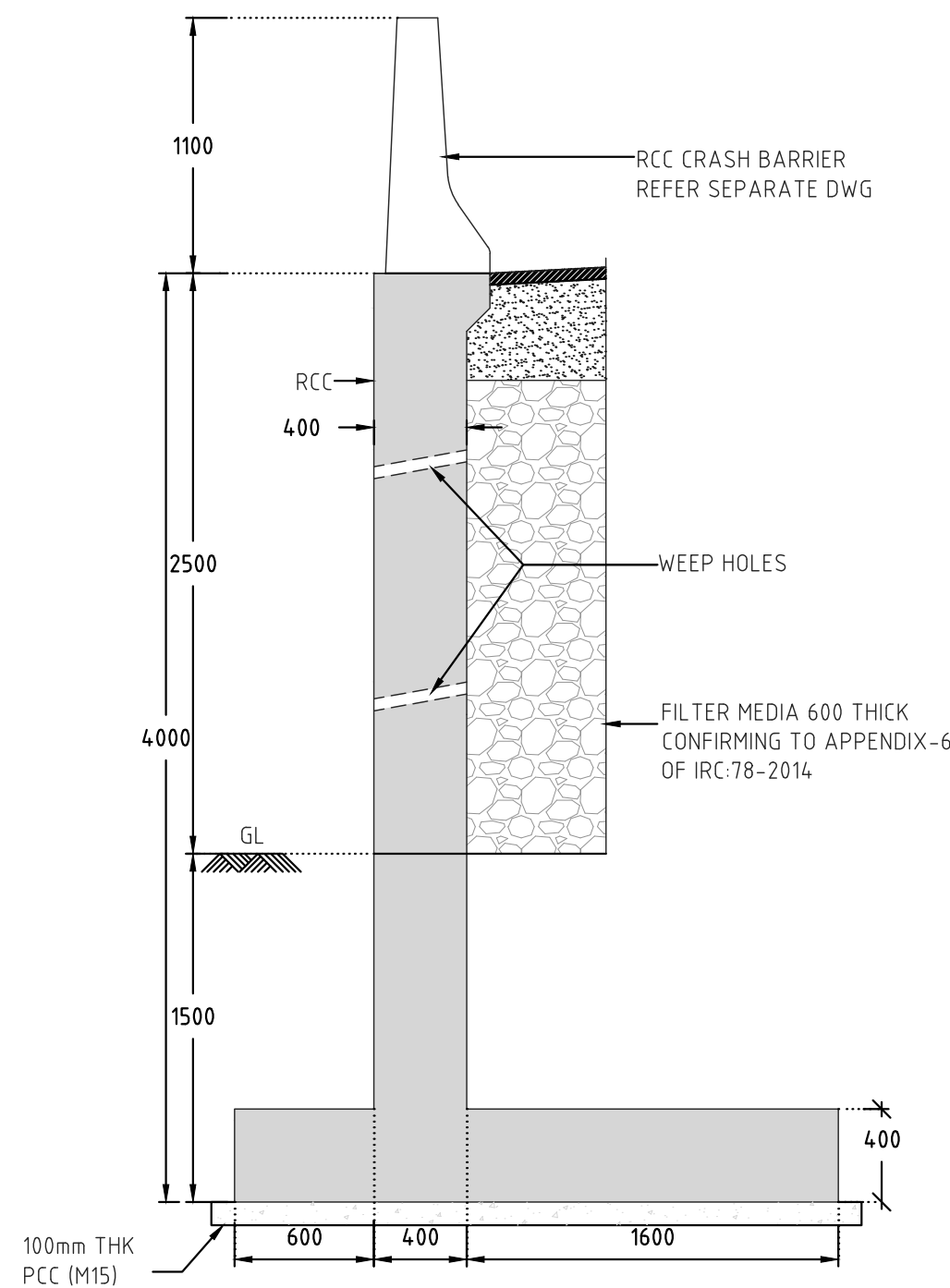
BAR MARK	DESCRIPTION	Dia of BAR mm	Spacing in mm	SHAPE OF BARS (not to scale)
BASE SLAB				
1	MAIN ROD AT BOTTOM	12	200	1305 [4810] 1305
2	MAIN ROD AT TOP	12	200	365 [4810] 365
2a	ADDITIONAL ROD AT TOP	12	200	2800
SIDE WALL				
3	MAIN BAR AT OUTER FACE	12	200	3780 [1605] 3780
3a	MAIN BAR AT INNER FACE	12	200	3780 [1605] 365
4	MAIN BAR AT INNER FACE	12	200	365 [3780] 365
TOP SLAB				
5	MAIN ROD AT BOTTOM	12	200	370 [4810] 370
5a	ADDITIONAL ROD AT BOTTOM	10	200	2800
6	MAIN ROD AT TOP	12	200	1310 [4810] 1310
7	DISTRIBUTION ROD TOP & SIDE WALL	10	250	8920
7a	DISTRIBUTION ROD AT BOTTOM SLAB	10	250	8920
7b	CORNER BARS	10	4x4 = 16 Nos	8920
8	LAUNCH ROD	10	200	VARIES 200
8a	SHEAR LINK	8	200 C/C IN LONGITUDINAL & 400 C/C IN TRANSVERSE DIRECTION	VARIES 18x20 18x20
BASE SLAB KEY PORTION				
9	KEY ROD	10	200	1100 [1300] 1500
10	DISTRIBUTION ROD	10	—	—
CRASH BARRIER				
11	MAIN ROD	16	200	VARIES 300
12	MAIN ROD	16	200	400 [490] VARIES 300
13	DISTRIBUTION ROD	12	11 nos.	—

DRAWING TITLE:  
REINFORCEMENT DRAWING FOR  
SERVICE ROAD SINGLE CELL  
BOX CULVERT  
KM -172+641 (1X3X3) WIDENING  
DWG. NO: P-124-NH 45-BC-004

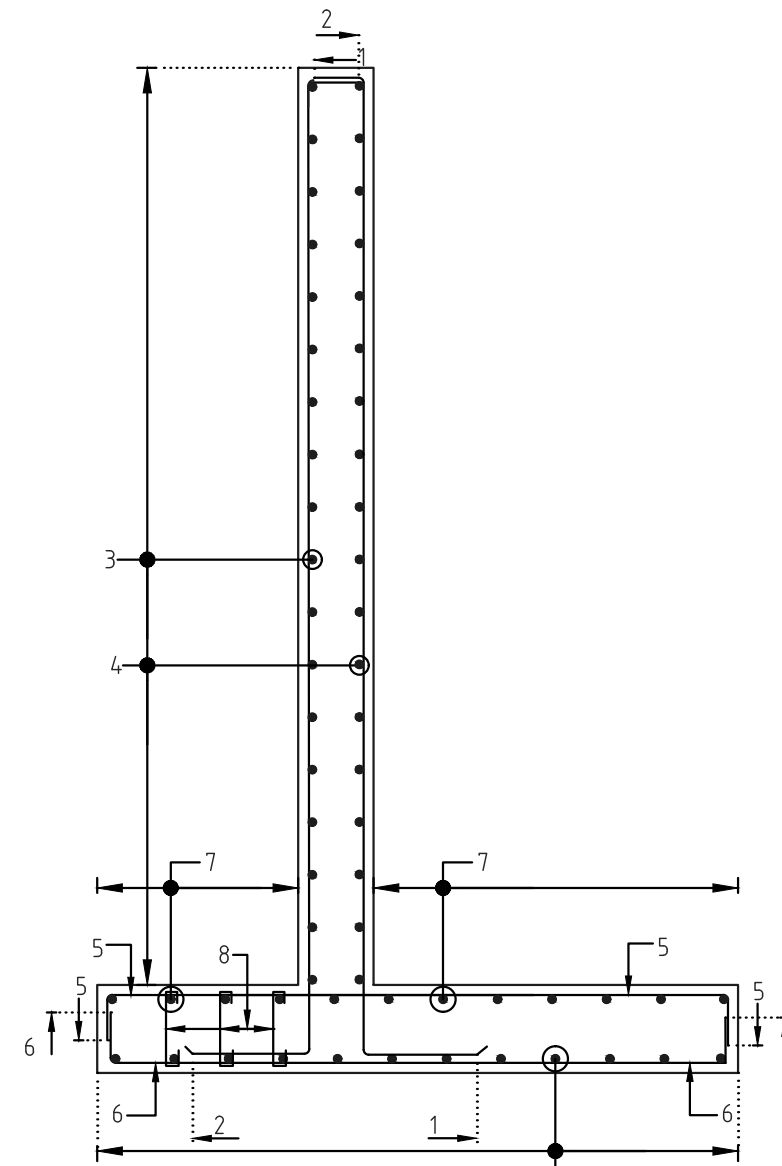


# **DIMENSION DETAILS FOR SERVICE ROAD**

SI NO.	As per CA Chainage	As per P&P Design Chainage	SPAN (mm)	BOX DIMENSIONS (mm)			FLOW DIRECTION	PROPOSAL
				TOP SLAB	OUTER WALL	BOTTOM SLAB		
1	172+641	172+641	(1x3000x3000)	420	420	420	R-L	Widening



**DIMENSION DETAILS OF RETAINING WALL  
FOR 4.0m HEIGHT**  
SCALE 1:30



**REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 4.0m HEIGHT**  
SCALE 1:30

**SCHEDULE OF REINFORCEMENT:**

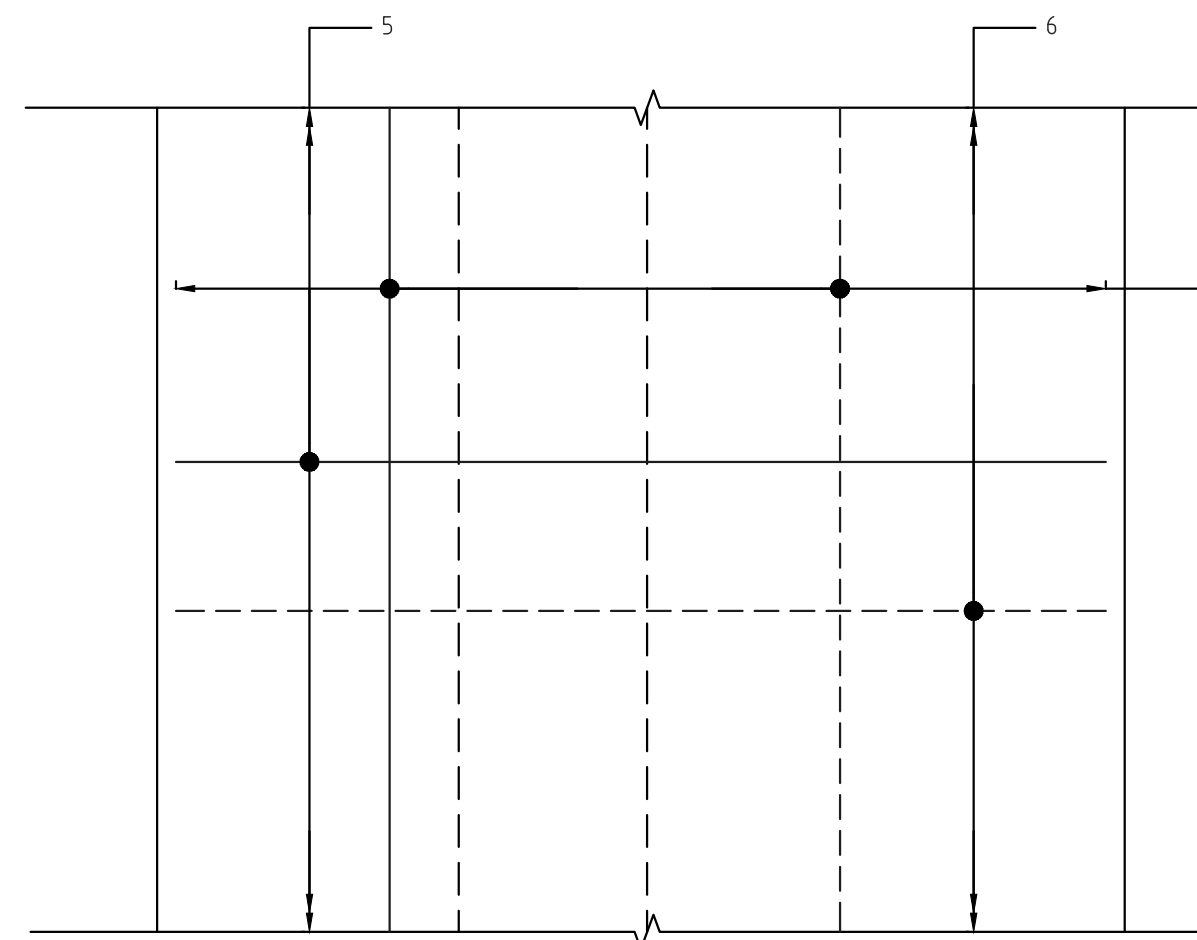
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	285 3885 650	16	150
2	3885 285 300	12	150
3	150 VARIES 150	10	200
4	150 VARIES 150	10	200
5	250 2450 250	12	150
6	250 2450 250	12	150
7	150 VARIES 150	10	200
8		8	200X300

**NOTES:-**

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

**NOTES:-**

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE  
A) RCC RETURN WALL - M30  
B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-  
EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.50T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 14T/Sq.m

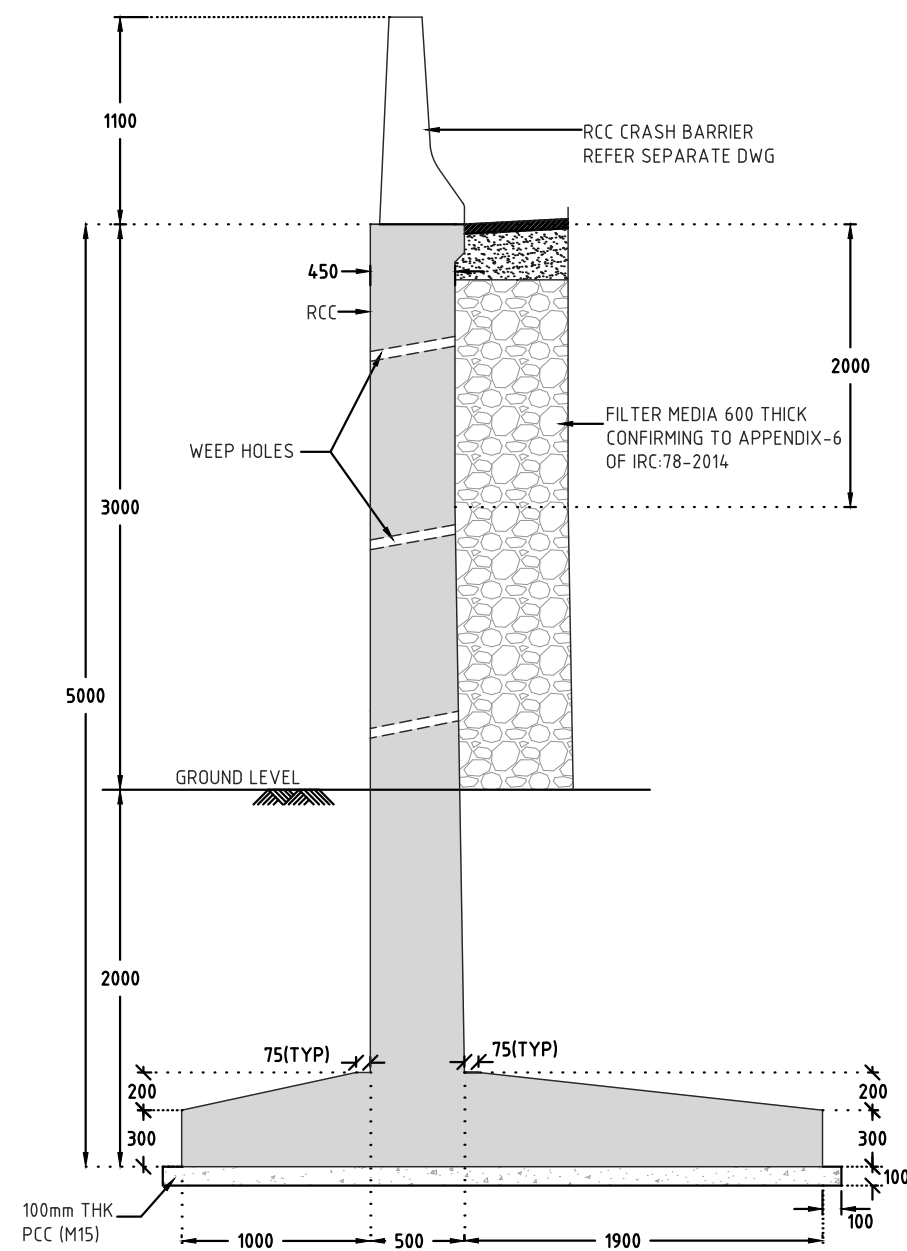


**REINFORCEMENT PLAN AT BOTTOM**  
SCALE 1:30

**DRAWING TITLE:**

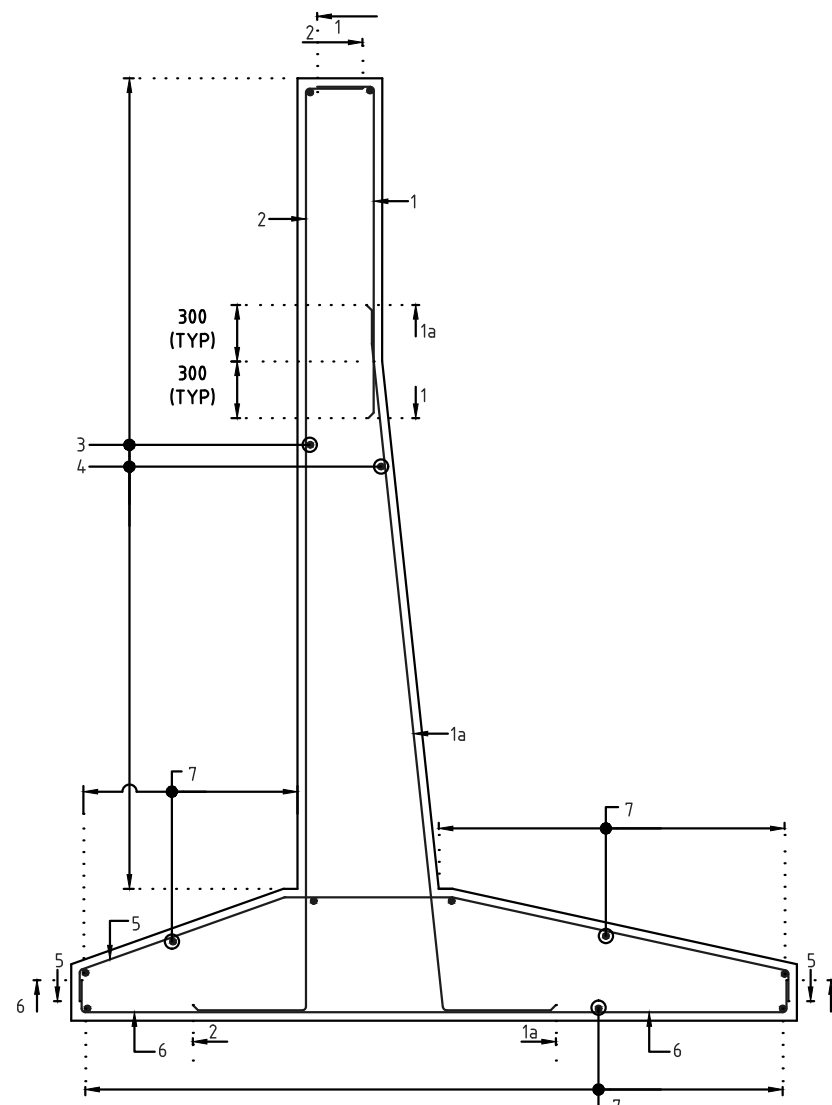
DETAIL DRAWING FOR 4.0m  
RCC RETAINING WALL

DWG. NO. - 120-NH45-RW-003



DIMENSION DETAILS OF RETAINING WALL  
FOR 5.0m HEIGHT

SCALE 1:30



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 5.0m HEIGHT

SCALE 1:30

SCHEDULE OF REINFORCEMENT:

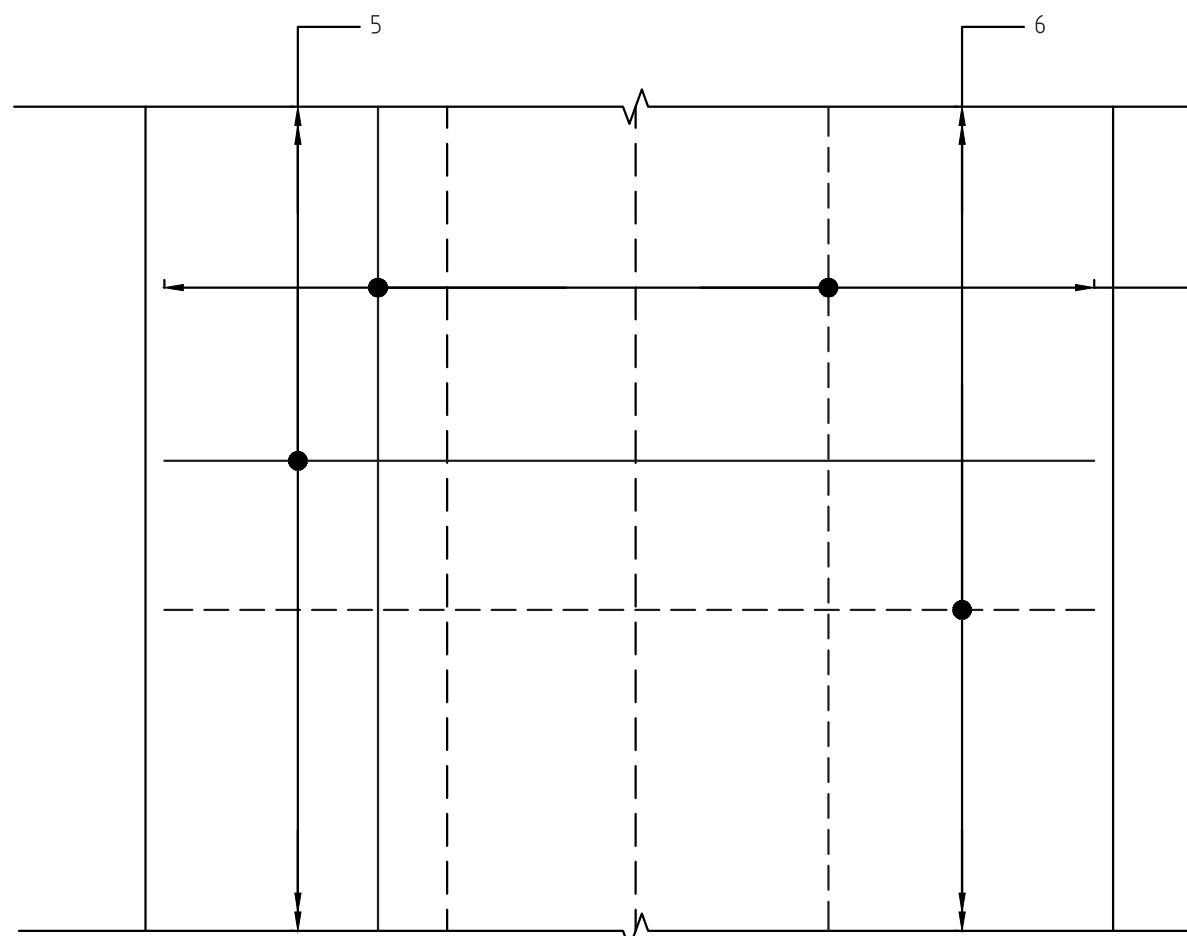
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	120
1a	3301 662	16	120
2	4885 335 480	12	120
3	150 VARIES 1150	10	200
4	150 VARIES 1150	10	200
5	886 615 1780 1150	12	120
6	150 3250 1150	12	120
7	150 VARIES 1150	10	200

NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - A) EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO 30°
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-12.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 14.5T/Sq.m



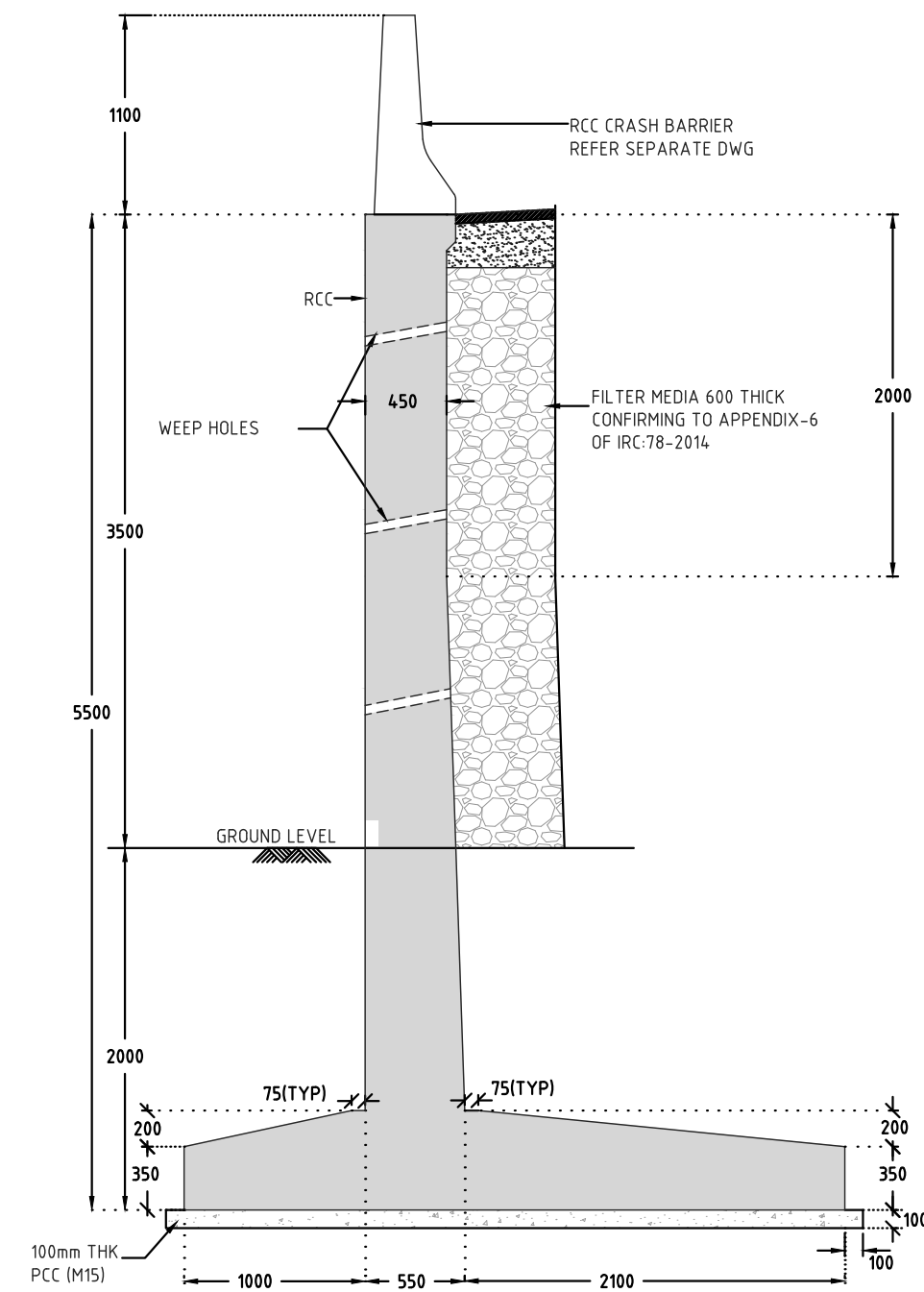
REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

DRAWING TITLE:

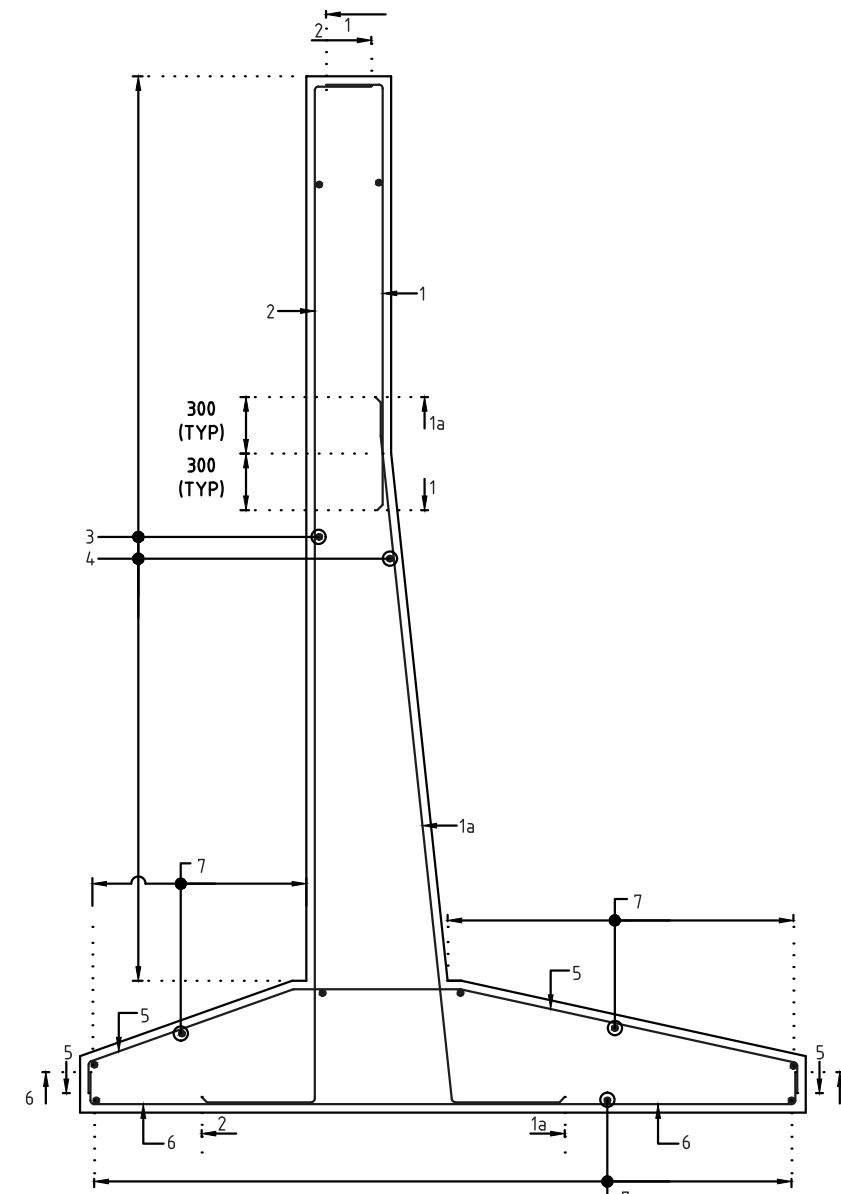
DETAIL DRAWING FOR 5.0m  
RCC RETAINING WALL

DWG. NO-120-NH45-RW-004



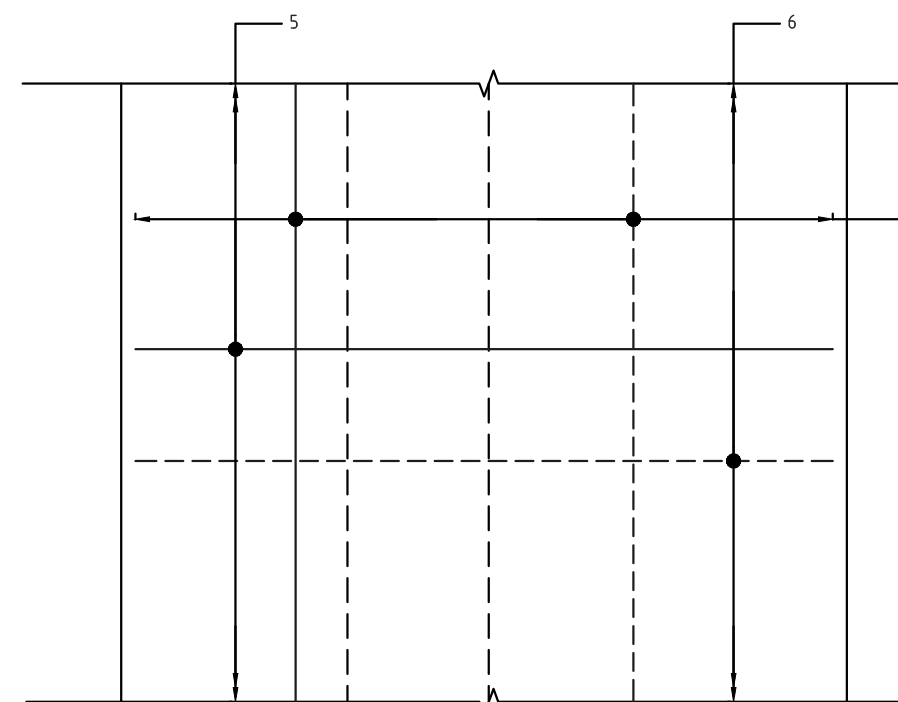
DIMENSION DETAILS OF RETAINING WALL  
FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 5.5m HEIGHT

SCALE 1:30



REINFORCEMENT PLAN AT BOTTOM

SCALE 1:30

### SCHEDULE OF REINFORCEMENT:

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	335 2260	12	100
1a	3801 662	16	100
2	5385 335 480	12	100
3	150 VARIES 1150	10	200
4	150 VARIES 1150	10	200
5	886 663 1980 200 1200	12	100
6	200 3500 200	12	100
7	150 VARIES 150	10	200

### NOTES:-

1. ABOVE RETAINING WALL RCC CRASH BARRIER SHOULD BE PROVIDED FOR SAFETY OF ROAD USER WHEREVER NECESSARY.

### NOTES:-

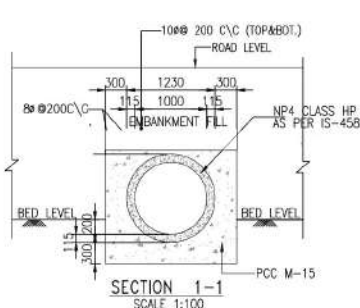
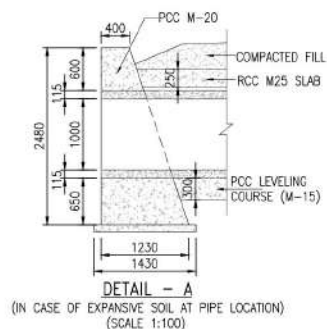
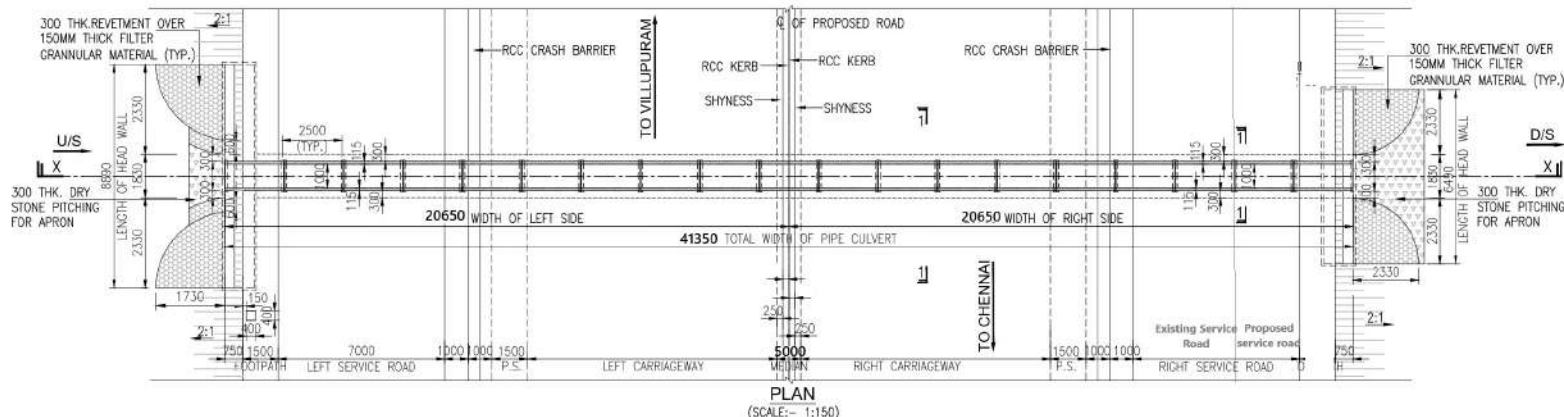
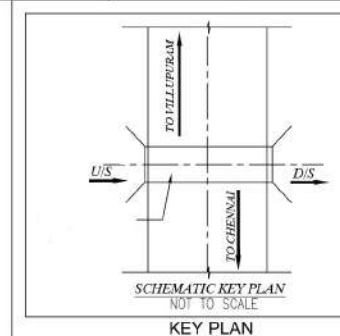
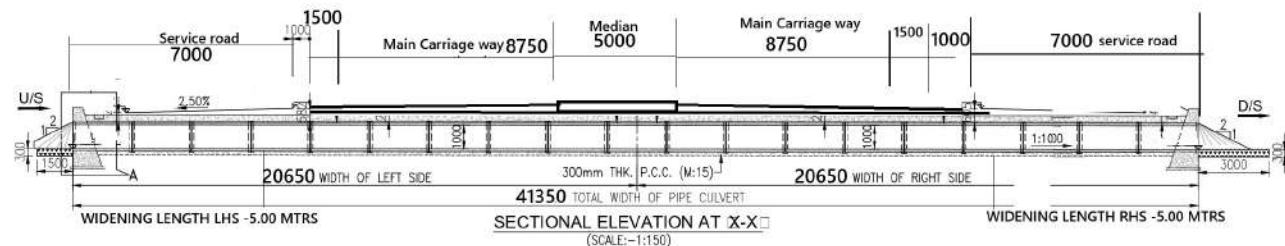
1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE
  - A) RCC RETURN WALL - M30
  - B) LEVELING COURSE CONCRETE - M15
4. CLEAR COVER :-
  - A) EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
5. GRADE OF STEEL BE FE-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS : 1786 - 2000.
6. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
7. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR
8. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR
9. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
10. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
11. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\phi$  MORE THAN OR EQUAL TO  $30^\circ$
12. WEEP HOLES TO BE PROVIDED 100mm $\phi$  WITH 1000mmC/C HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
13. MAXIMUM PRESSURE ON SOIL IS-14.30T/Sq.m
14. SAFE BEARING CAPACITY OF SOIL TO BE- 16.5T/Sq.m

DRAWING TITLE:

DETAIL DRAWING FOR 5.5m  
RCC RETAINING WALL

W.G. NOP-120-NH45-RW-005





**LEGENDS:**

C - CENTER LINE  
 RCC - REINFORCED CEMENT CONCRETE  
 TYP - TYPICAL ARRANGEMENT  
 FRL - FINISH ROAD LEVEL  
 RL - ROAD EDGE LEVEL  
 PCC - PLAIN CEMENT CONCRETE  
 EQ - EQUAL DISTANCE  
 GL - GROUND LEVEL  
 CH - CHAINAGE  
 U/S - UP STREAM (IF APPLICABLE)  
 D/S - DOWN STREAM (IF APPLICABLE)  
 INV - INVERT LEVEL  
 LHS - LEFT HAND SIDE  
 RHS - RIGHT HAND SIDE  
 EX - EXISTING STRUCTURE (IF APPLICABLE)

#### REFERENCE DRAWINGS

1. MISCELLANEOUS DETAILS - TN02-521/STR/MSC

#### IMP NOTES:

1. ENSURE INVERT LEVEL, LOCATION AND FLOW DIRECTION ON SITE BEFORE EXECUTION. IF ANY DISCREPANCY FOUND, IMMEDIATELY BROUGHT INTO THE NOTICE OF DESIGN ENGINEER FOR NECESSARY MODIFICATION IN THE DRAWING.

#### NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
- ALL PIPES FOR NEW CONSTRUCTION SHALL BE OF NP4 CLASS TYPE CONFORMING TO IS : 458.
- PIPES SHALL BE JOINTED BY INTERNAL FLUSH JOINT AS PER IS 458 & AS PER THE DETAILS GIVEN IN SECTION 2906 OF MORTH SPECIFICATIONS OF ROAD AND BRIDGE WORKS. JOINTING SPACE SHALL BE FILLED WITH CEMENT MORTAR OF PROPORTION 1:2 OF CEMENT & SAND.
- LENGTH OF EACH PIPE HAS BEEN CONSIDERED AS 2.5M.
- PCC SHALL BE 300MM THK & WEARING COAT SHALL BE 53MM THK.
- FRL, CAMBER/SUPERELEVATION & WIDTH OF THE MEDIAN AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY PLAN, PROFILE AND CROSS SECTION DRAWINGS. DISCREPANCY, IF ANY FOUND, IS TO BE BROUGHT TO THE NOTICE OF DESIGN CONSULTANT FOR NECESSARY MODIFICATION IN THE DRAWING.
- FOR PIPE BEDDING PCC M15 HAS BEEN PROVIDED AS PER THE SPECIFICATION OF RCSP:13-2004.
- ANY LOOSE/UNSATURABLE SOIL FOUND BELOW THE HEAD WALL, THE SAME SHALL BE REPLACED WITH BOULDERS AND STONE METAL AS DIRECTED BY ENGINEER-IN-CHARGE.
- BACK FILLING UP TO 300mm ABOVE THE TOP OF PIPE SHALL BE CAREFULLY DONE IN LAYERS NOT EXCEEDING 150MM.
- SPIGOT TYPE PIPE JOINTING IS NOT SHOWN TO AVOID TO DRAWING CLUTTER AND IMPROVE VISIBILITY OF CRADLE DETAILS.

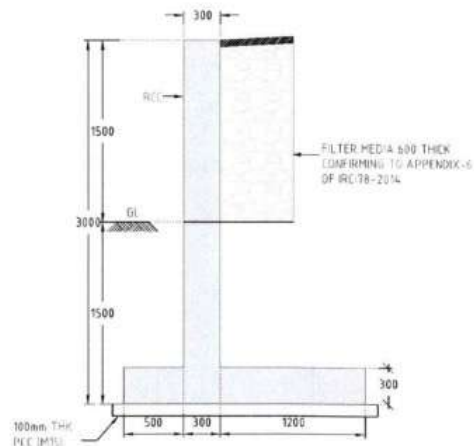
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00	24.09.23	INITIAL SUBMISSION				
1						
2						
3						
4						
5						
6						
7						
8						

CLIENT:  
  
 NATIONAL HIGHWAY  
 AUTHORITY OF INDIA  
 VILLUPURAM

**AUTHORITY ENGINEER :**  
 Corporate Office India: 1100, 8th C/W, 1st Floor, Tech Park, Sector 10, Gurgaon, Haryana-122001  
 Regional Office: 17A/20, Laxmi Nagar, Anand Nagar, Gurgaon, Haryana-122001  
 Phone: 012-26110000  
 E-Mail: [info@nhai.org](mailto:info@nhai.org)

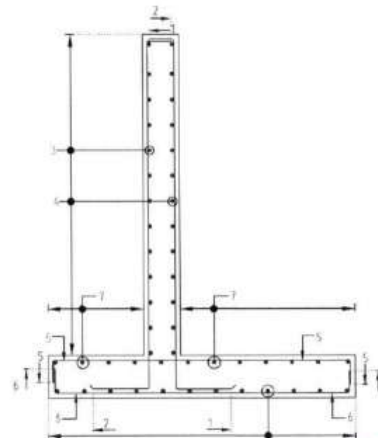
DESIGNED	DATE
DRAWN	SUP
CHECKED	DATE
APPROVED	DATE
DATE	SCALE
28.09.2023	AS SHOWN

TITLE:	WIDENING OF PIPE CULVERT AT CH:	REV: R0
	DRAWING OF SIZE 1x1.000	SIZE: A2
	KM - 172+788 - PIPE CULVERT , 5.00 WIDENING BHS	
		SHEET 01 OF 01

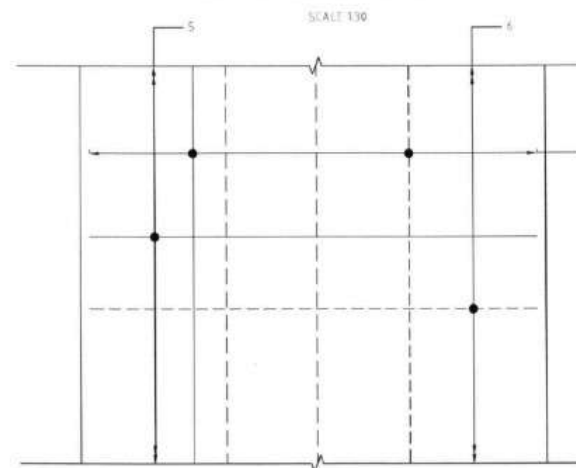


**DIMENSION DETAILS OF RETAINING WALL  
FOR 3.0m HEIGHT**

SCALE 1:30



**REINFORCEMENT DETAILS OF  
RETAINING WALL FOR 3.0m HEIGHT**



**REINFORCEMENT PLAN AT BOTTOM**

SCALE 1:30

**SCHEDULE OF REINFORCEMENT**

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	DIA OF BAR	SPACING
1	185 2885 500	12	150
2	2885 185 100	12	150
3	VARIES 150	12	200
4	VARIES 150	12	200
5	185 185 150	12	150
6	150 185 150	12	150
7	VARIES 150	12	200

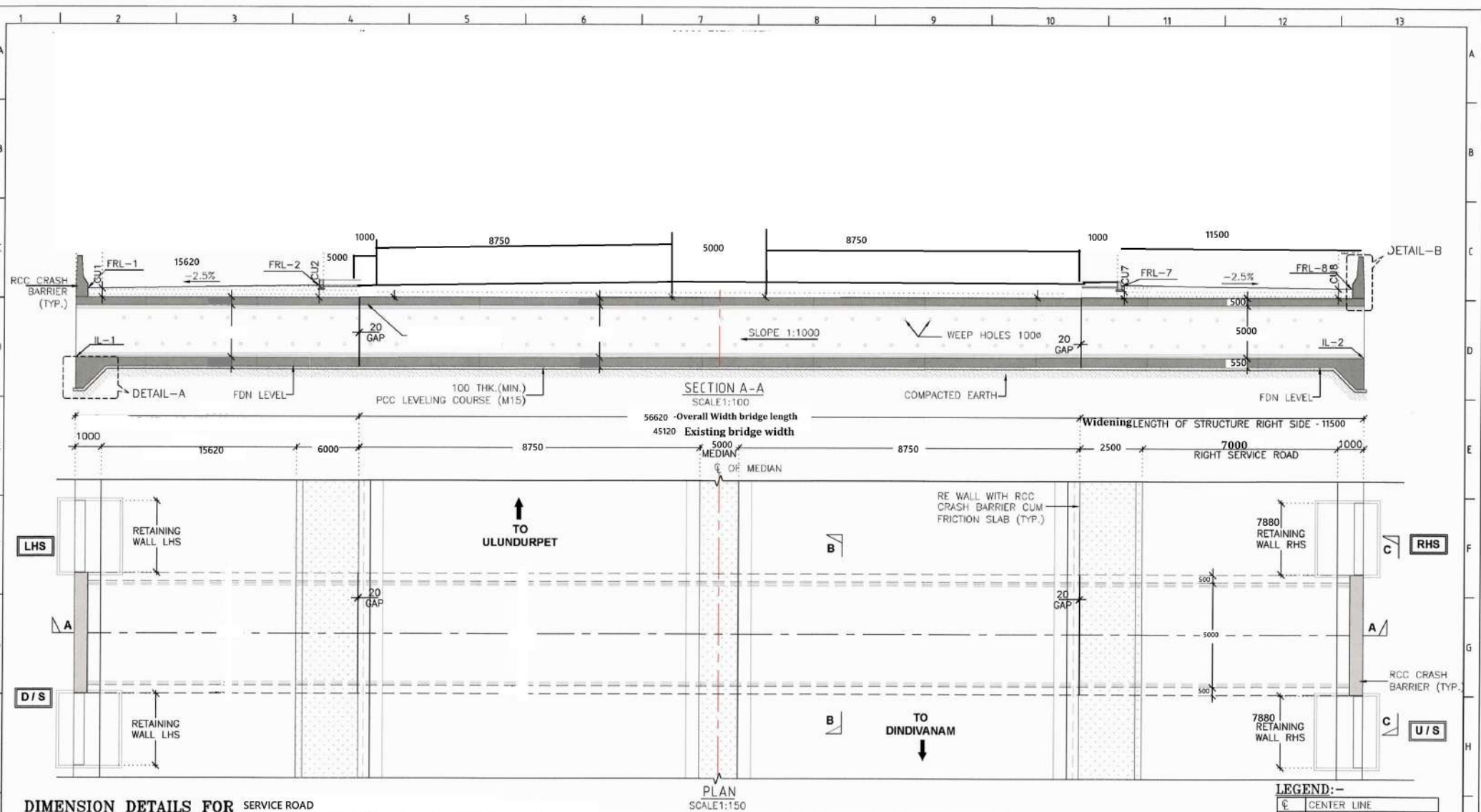
**NOTES:-**

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING SHALL NOT BE SCALED OFF ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE - M30
4. CLEAR COVER -  
a) RCC RETURN WALL - M30  
b) LEVELING COURSE CONCRETE - M15
5. EARTH FACE - 75mm, OTHER THAN EARTH FACE - 40mm
6. GRADE OF STEEL BE 16-500 HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING TO IS - 1786 - 2000.
7. LAP JOINTS SHALL BE PROVIDED IN STAGGERED MANNER AND NOT MORE THAN 50% OF REINFORCEMENT BARS SHALL BE LAPPED AT ANY LOCATION.
8. LAP LENGTH OF BAR SHALL BE 56 X DIA OF BAR.
9. DEVELOPMENT LENGTH OF BAR SHALL BE 40 X DIA OF BAR.
10. FILTER MEDIA OF 600mm THICK BEHIND THE RETURN WALL ON THE EARTH RETURN FACE SHALL BE AS PER IRC-78-2014.
11. COMPACTION OF EARTH FILL BEHIND THE RETURN WALL SHALL BE DONE IN ACCORDANCE WITH SECTION 305.4.4 OF SPECIFICATION FOR ROADS & BRIDGES.
12. FOR FILLING BEHIND RETURN WALL SOIL/GRAVEL USED SHOULD HAVE THE ANGLE OF FRICTION  $\theta$  MORE THAN OR EQUAL TO  $30^\circ$ .
13. WECP-HOLES TO BE PROVIDED 100mm WITH 1000mm  $\phi$  HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER WITH SLOPE OF 1 IN 20.
14. MAXIMUM PRESSURE ON SOIL IS 8-9 KGT/5cm.
15. SAFE BEARING CAPACITY OF SOIL TO BE 127/5sqm.

DRAWING TITLE:

DETAIL DRAWING FOR 3.0m  
RCC RETAINING WALL

DWG. NO: P-124-NH 45-RW-01



**DIMENSION DETAILS FOR SERVICE ROAD**

SI NO.	As per CA Chainage	As per P&P Design Chainage	SPAN (mm)	BOX DIMENSIONS (mm)			FLOW DIRECTION	PROPOSAL
				TOP SLAB	OUTER WALL	BOTTOM SLAB		
1	172+370	172+370	(1 X 5000 X 5000)	500	500	550	R-L	Widening (RHS)

**LEGEND:-**

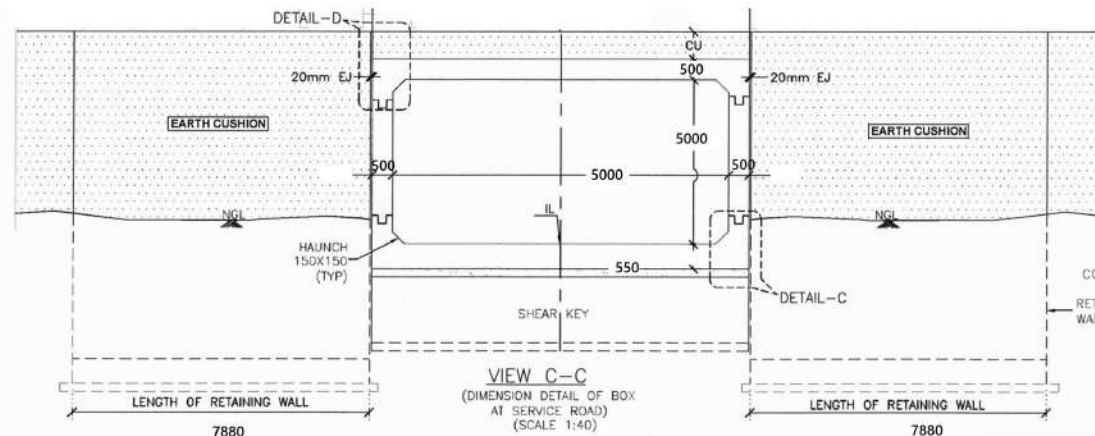
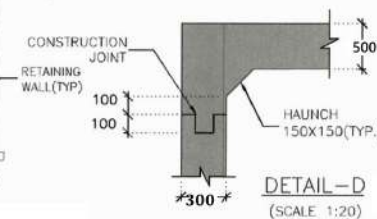
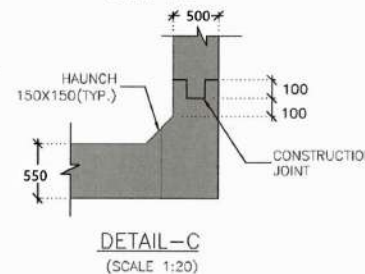
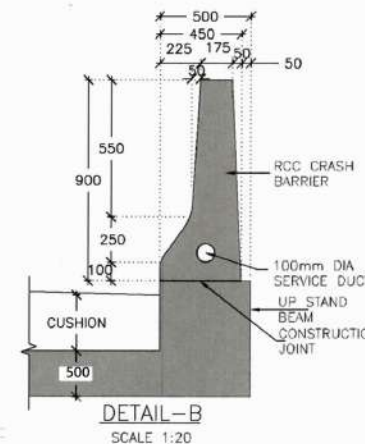
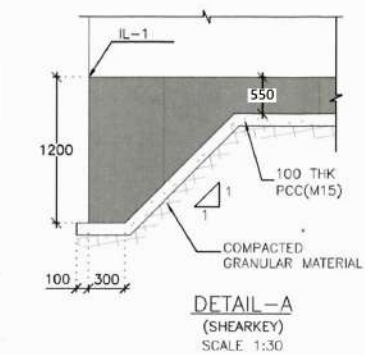
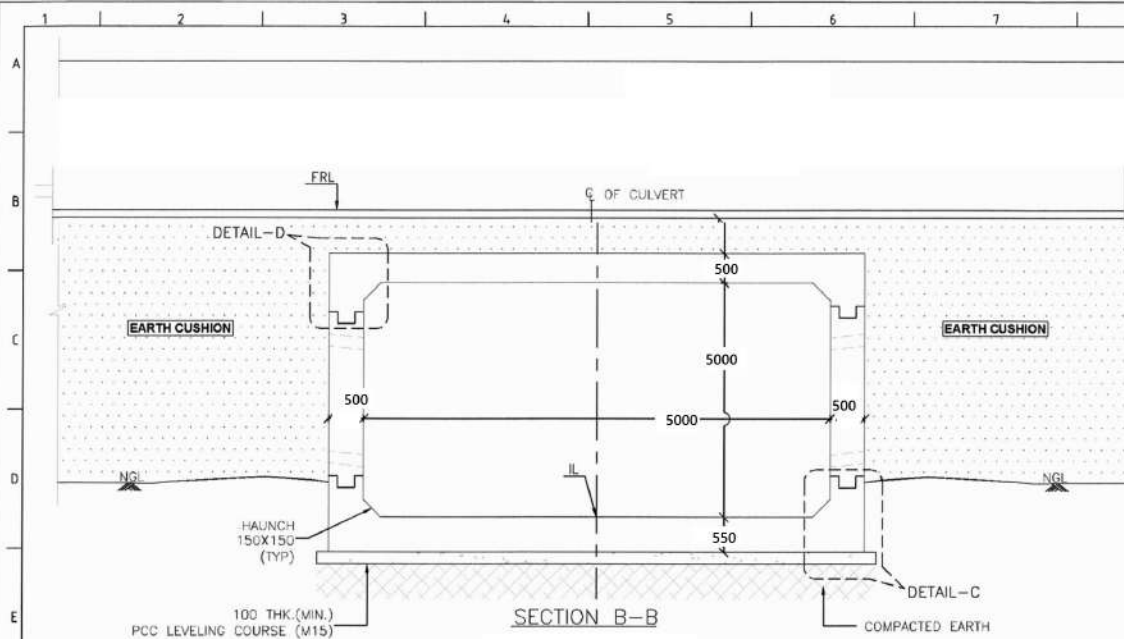
CL	CENTER LINE
IL	INVERT LEVEL
FRL	FINISHED ROAD LEVEL
NGL	NATURAL GROUND LEVEL
TYP.	TYPICAL
U/S	UP STREAM
D/S	DOWN STREAM
MIN.	MINIMUM
CU	CUSHION
LHS	LEFT SIDE
RHS	RIGHT SIDE

FOR RETAINING WALL DIMENSION AND REINFORCEMENT DETAILS REFER DRAWING : P-124-NH45-RW-D3

**DRAWING TITLE:**  
GENERAL ARRANGEMENT DRAWING FOR SINGLE CELL (1X5X5) BOX CULVERT @ (Widening)

**DWG. NO:** P-124-NH 45-BC-001





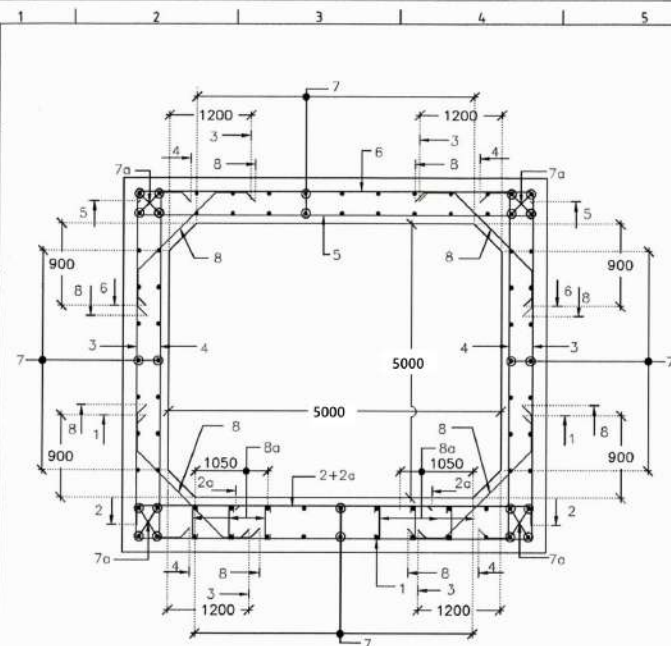
# **NOTES:-**

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN m.
- DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSION ONLY.
- GRADE OF CONCRETE FOR VARIOUS COMPONENTS SHALL BE AS FOLLOWS:
  - BOX STRUCTURE (RCC) - M30 GRADE
  - RETAINING WALL (RCC) - M30 GRADE
  - CRASH BARRIER (RCC) - M40 GRADE
  - DRAIN (RCC) - M20 GRADE
- DESIGN SPECIFICATIONS:
  - IRC : 5-2015 ii. IRC : 6-2017 iii. IRC : 112-2020
  - IRC : 78-2014
  - IS:1893-1984
- DESIGN LIVELOAD SHALL BE,
  - ONE LANE OF IRC 70R TRACKED/WHEELED
  - ONE /TWO/THREE LANES OF IRC CLASS A
  - ONE LANE OF IRC 70R TRACKED/WHEELED + ONE LANE OF IRC CLASS A
- SAFE BEARING CAPACITY AT FOUNDING LEVEL IS 15 t/m<sup>2</sup>.
- THE ROAD TOP LEVELS, CROSS SLOPES AND GEOMETRY SHALL BE AS PER THE FINAL APPROVED HIGHWAY PLAN & PROFILE DRAWINGS.
- BACK FILLING SHALL BE DONE SIMULTANEOUSLY ON EITHER SIDE ONLY AFTER TOP SLAB CAST.
- WEEP HOLES SHALL BE 100mm DIA AC PIPES STAGGERED AT 1000mm C/C HORIZONTALLY AND VERTICALLY WITH SLOPE OF 1 in 20.
- FILTER MEDIA OF 600mm MINIMUM THK SHALL BE PROVIDED OVER THE ENTIRE SURFACE BEHIND RETAINING WALLS TO THE FULL HEIGHT AS PER IRC 78-2014.
- BED SLOPE AND BED LEVEL SHALL MATCH WITH EXISTING SITE CONDITIONS. VARIATION IN SITE DATA, IF ANY, SHALL BE REPORTED BACK TO THE DESIGNERS.
- SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
- ANY LOOSE POCKETS/VOIDS AT FOUNDING LEVEL WITH GRANULAR MATERIAL/ PCC M15 AS DECIDED BY ENGINEER IN CHARGE.
- CLEAR COVER:
  - EARTH FACE = 75mm
  - OTHER FACE COMPONENTS OF STRUCTURE = 40mm
- LOCATION OF STRUCTURE, CAMBER, GRADIENT, FRL, WIDTH OF STRUCTURE, BED LEVELS, INVERT LEVELS, FOUNDING LEVELS, SKEW IF ANY, FLOW DIRECTION, SBC UNDER FOUNDATION ETC. SHOULD BE VERIFIED JOINTLY WITH THE REPRESENTATIVE OF AUTHORITY ENGINEER AT SITE, PRIOR TO EXECUTION OF WORK.
- LONGITUDINAL SLOPE OF CULVERT SHOULD BE MINIMUM 1 IN 1000
- CLEAR OPENING SIZE AND EARTH CUSHION MENTIONED SHALL BE VERIFIED WITH APPROVED PLAN AND PROFILE DRAWINGS AND IN CASE OF ANY DISCREPANCY IT SHOULD BE IMMEDIATELY REPORTED FOR SUITABLE ACTION PRIOR TO COMMENCEMENT OF THE WORK.
- SOFT AND LOOSE PATCHES IN THE BEARING AREA TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH SANDY MOORUM AND WITH LAYERS NOT EXCEEDING 300mm.
- SUITABLE TEMPORARY DIVERSION SHALL BE PROVIDED AS PER THE SITE REQUIREMENT FOR RECONSTRUCTION OF CULVERTS.

FOR RETAINING WALL DIMENSION AND REINFORCEMENT DETAILS REFER DRAWING : P-124-NH45-RW-03

**DRAWING TITLE:**  
GENERAL ARRANGEMENT DRAWING FOR SINGLE CELL (1X5X5) BOX CULVERT

**WIDENING AT KM 172+370**  
**DWG. NO: P-124-NH 45-BC-002**



SECTION 1-1  
(SCALE 1:20)

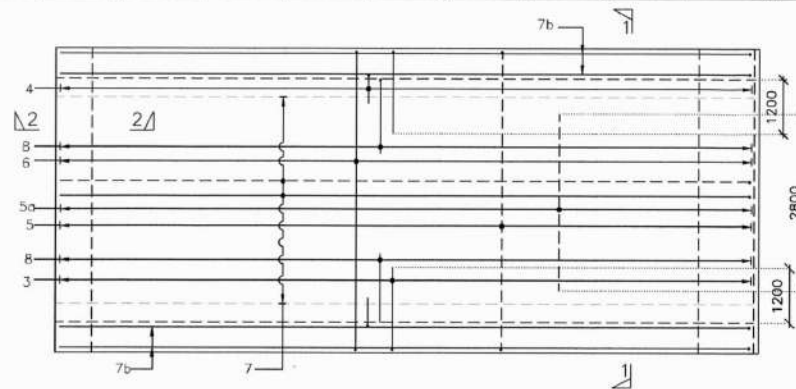
#### GENERAL NOTES

1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe500 CONFORMING TO IS : 1785-1985.
3. MINIMUM CONCRETE COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 75mm IN BASE SLAB AND OUTER FACE OF WALLS AND 40mm IN TOP SLAB, AND INNER FACE OF WALLS.
4. LAPS NOT SHOWN ON THE DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.
5. UNLESS OTHERWISE SPECIFIED THE MINIMUM DEVELOPMENT LENGTHS AND LENGTHS OF LAPS SHALL BE AS SHOWN IN TABLE 1.
6. BAR BENDING SHALL CONFIRM TO IS 2502.
7. REINFORCEMENT DETAILING HAS BEEN DONE AS PER IRC 112 : 2020.
8. DESIGN CRITERIA:  
i. IRC : 5-2015 ii. IRC : 6-2017 iii. IRC : 112-2020  
iv. IRC : 78-2014

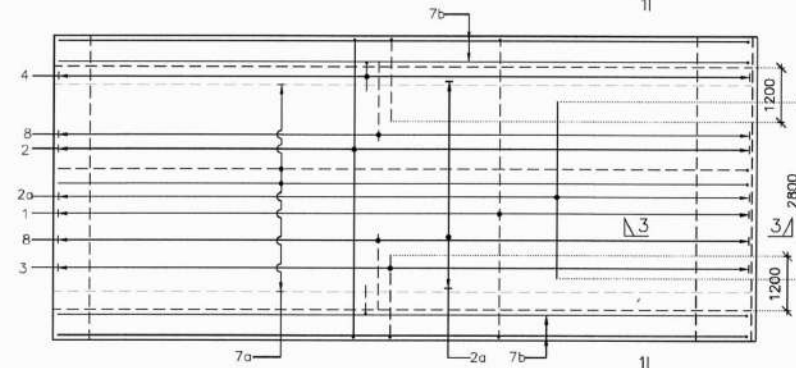
TABLE - 1  
LAP DETAILS FOR 50% LAPPING

GRADE OF CONCRETE	M30	LEGEND:
DEVELOPMENT LENGTH (LD) 40 $\phi$		— TOP FACE BARS - - - BOTTOM FACE BARS
LAP LENGTH FOR 50% LAPPING	56 $\phi$	EQ.-EQUALLY DISTRIBUTED

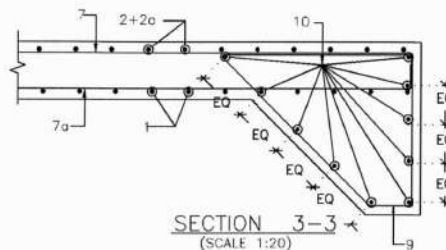
NOTES:  
THE NO. OF RODS SHALL NOT BE COUNTED FROM THE DRAWING.



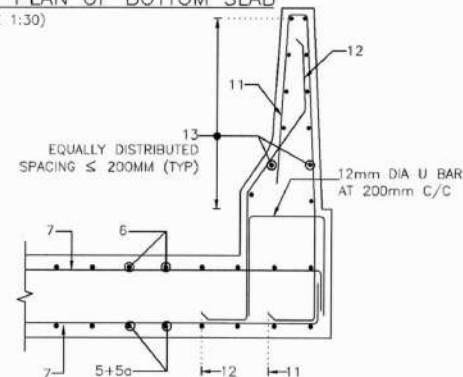
REINFORCEMENT PLAN OF TOP SLAB  
(SCALE 1:30)



REINFORCEMENT PLAN OF BOTTOM SLAB  
(SCALE 1:30)



SECTION 3-3  
(SCALE 1:20)



SECTION 2-2  
(WITH UPSTAND BEAM)  
SCALE 1:30

#### SCHEDULE OF REINFORCEMENT (SERVICE ROAD) :-

BAR MARK	DESCRIPTION	Dia of BAR mm	Spacing in mm	SHAPE OF BARS (not to scale)
<b>BASE SLAB</b>				
1	MAIN ROD AT BOTTOM	12	200	1305 (4810) 1305
2	MAIN ROD AT TOP	12	200	365 (4810) 365
2a	ADDITIONAL ROD AT TOP	12	200	2800
<b>SIDE WALL</b>				
3	MAIN BAR AT OUTER FACE	12	200	3780 (1605) 1605
3a	MAIN BAR AT INNER FACE	12	200	3780 (365) 365
4	MAIN BAR AT INNER FACE	12	200	365 (3780) 365
<b>TOP SLAB</b>				
5	MAIN ROD AT BOTTOM	12	200	370 (4810) 370
5a	ADDITIONAL ROD AT BOTTOM	10	200	2800
6	MAIN ROD AT TOP	12	200	1310 (4810) 1310
7	DISTRIBUTION ROD TOP & SIDE WALL	10	250	8920
7a	DISTRIBUTION ROD AT BOTTOM SLAB	10	250	8920
7b	CORNER BARS	10	4x4 = 16 Nos	8920
8	HAUNCH ROD	10	200	VARIES 200
8a	SHEAR LINK	B	200 C/C IN LONGITUDINAL & 400 C/C IN TRANSVERSE DIRECTION	18x $\phi$ 18x $\phi$
<b>BASE SLAB KEY PORTION</b>				
9	KEY ROD	10	200	1100 (1300) 1500
10	DISTRIBUTION ROD	10	—	—
<b>CRASH BARRIER</b>				
11	MAIN ROD	16	200	VARIES 95 300
12	MAIN ROD	16	200	400 (490) VARIES 300
13	DISTRIBUTION ROD	12	11 nos.	—

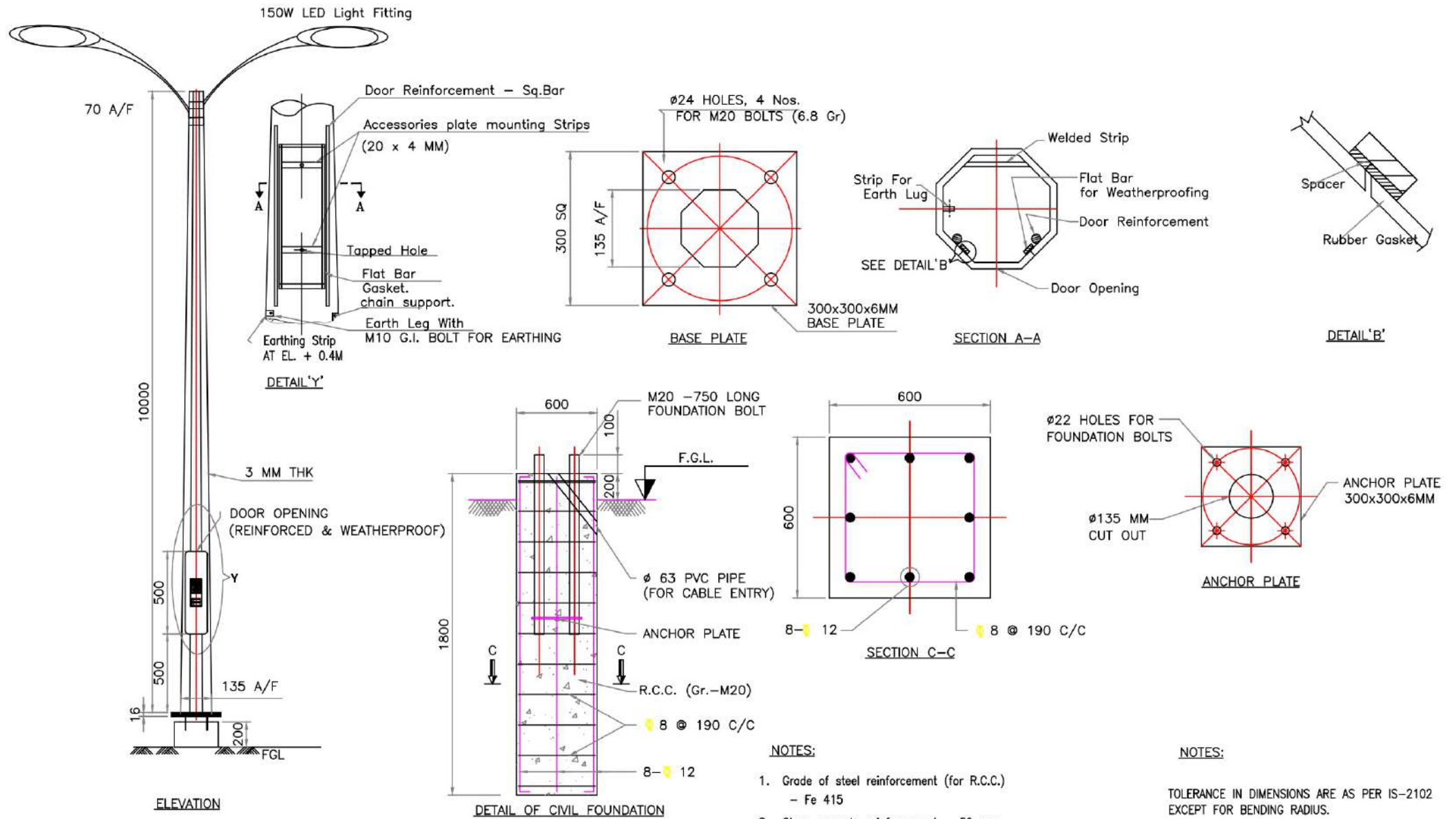
DRAWING TITLE:  
REINFORCEMENT DRAWING FOR  
SERVICE ROAD SINGLE CELL  
BOX CULVERT  
KM - 172+360 (1 X 5 X 5) WIDENING  
DWG. NO: P-124-NH 45-BC-004  
12 13



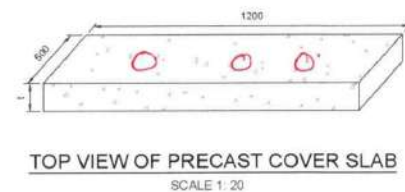
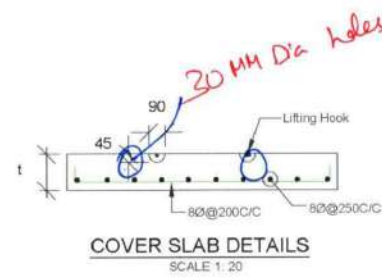
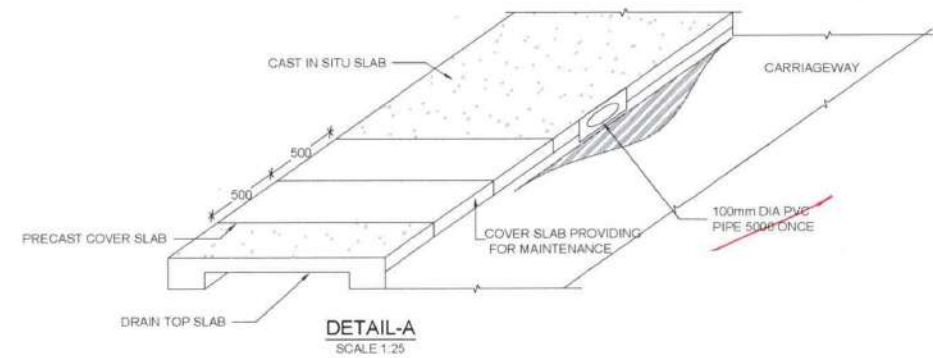


## DETAILS OF W-BEAM / METALLIC CRASH BARRIER BETWEEN MCW & SR

# **Tindivanam - Ulundurpet Section of NH-45 - Double Arm Lighting for Black Spot Locations**

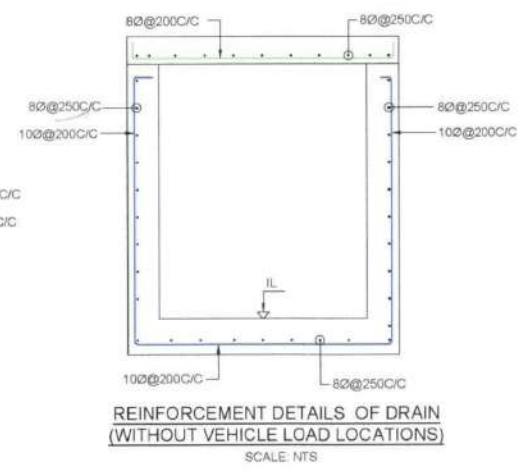
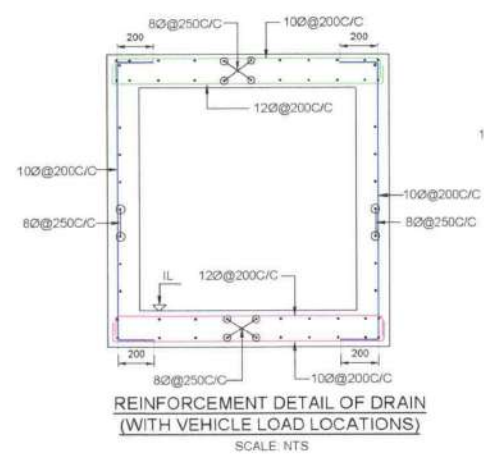
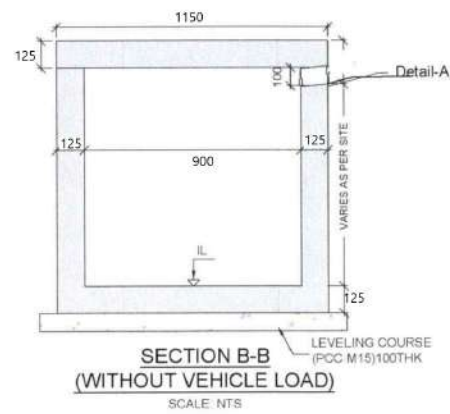
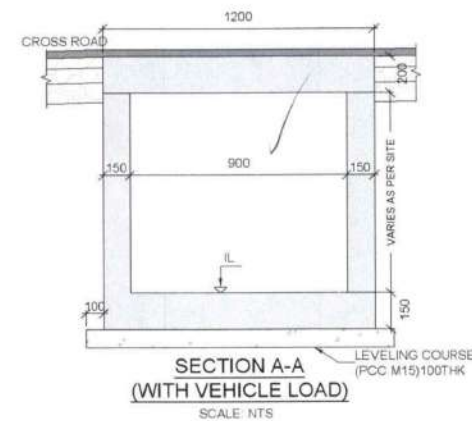






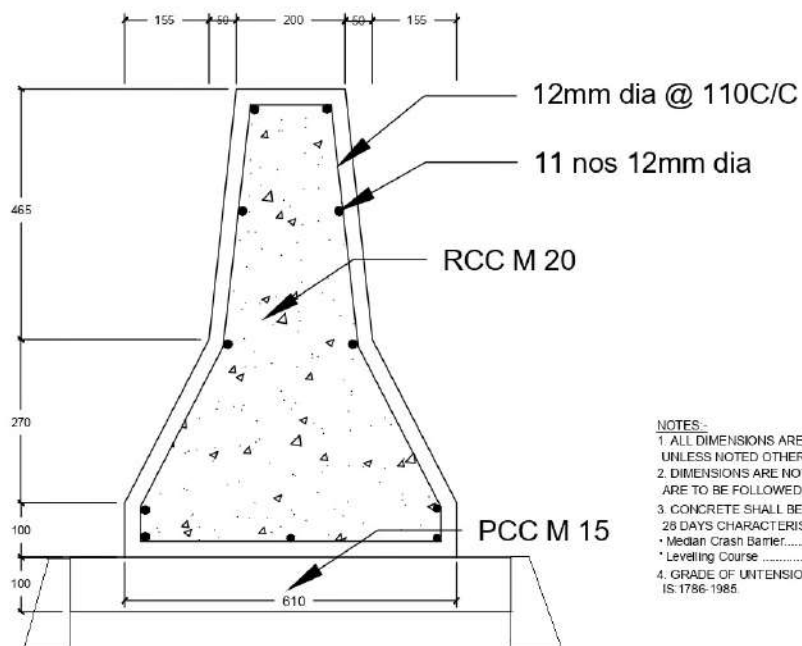
- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE UNLESS OTHERWISE SPECIFIED.
  2. ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe500 CONFORMING TO IS 1786-1985.
  3. GRADE OF CONCRETE:  
DRAIN (RCC) - M25  
LEVELING COARSE (PCC) - M15
  4. LAPS NOT SHOWN ON THE DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.
  5. WHERE MORE THAN 50% OF BARS ARE TO BE LAPPED IN ANY ONE CROSS SECTION.
  6. MINIMUM CONCRETE COVER TO REINFORCEMENT NEAREST TO THE EARTH SURFACE SHALL BE 40mm IN BASE SLAB AND OUTER FACE OF WALLS AND 40mm IN TOP SLAB AND INNER FACE OF WALLS.
  7. BAR BENDING SHALL CONFORM TO IS 2502.
  8. REINFORCEMENT DETAILING HAS BEEN DONE AS PER IRC 112: 2020.
  9. DESIGN CRITERIA:
  10. I. IRC: 5-2015 II. IRC: 6-2017 III. IRC: 112-2020 IV. IRC: 78-2014
  11. PRECAST COVER SLAB AT EVERY 15M INTERVALS 2 NOS.
  12. ALL OTHER LOCATION DRAIN COVER SLAB WILL BE CAST IN SITU.
  13. 1M PRECAST COVER SLAB IS USED FOR MAINTENANCE PURPOSE ON EVERY 15M ONCE.

SCALE 1:40





### Median RCC Crash Barrier - Cross Section



#### NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:  
 \* Median Crash Barrier.....M20 RCC  
 \* Levelling Course .....M15 PCC
4. GRADE OF UNTENSIONED STEEL SHALL BE CONFORMING TO IS. 1786-1985.



# **DRAWINGS**

## **Tindivanam to Ulunderpet Section of NH-32,132,38**

4. Other Miscellaneous works Recommended  
by Road Safety Consultant 12 Locations








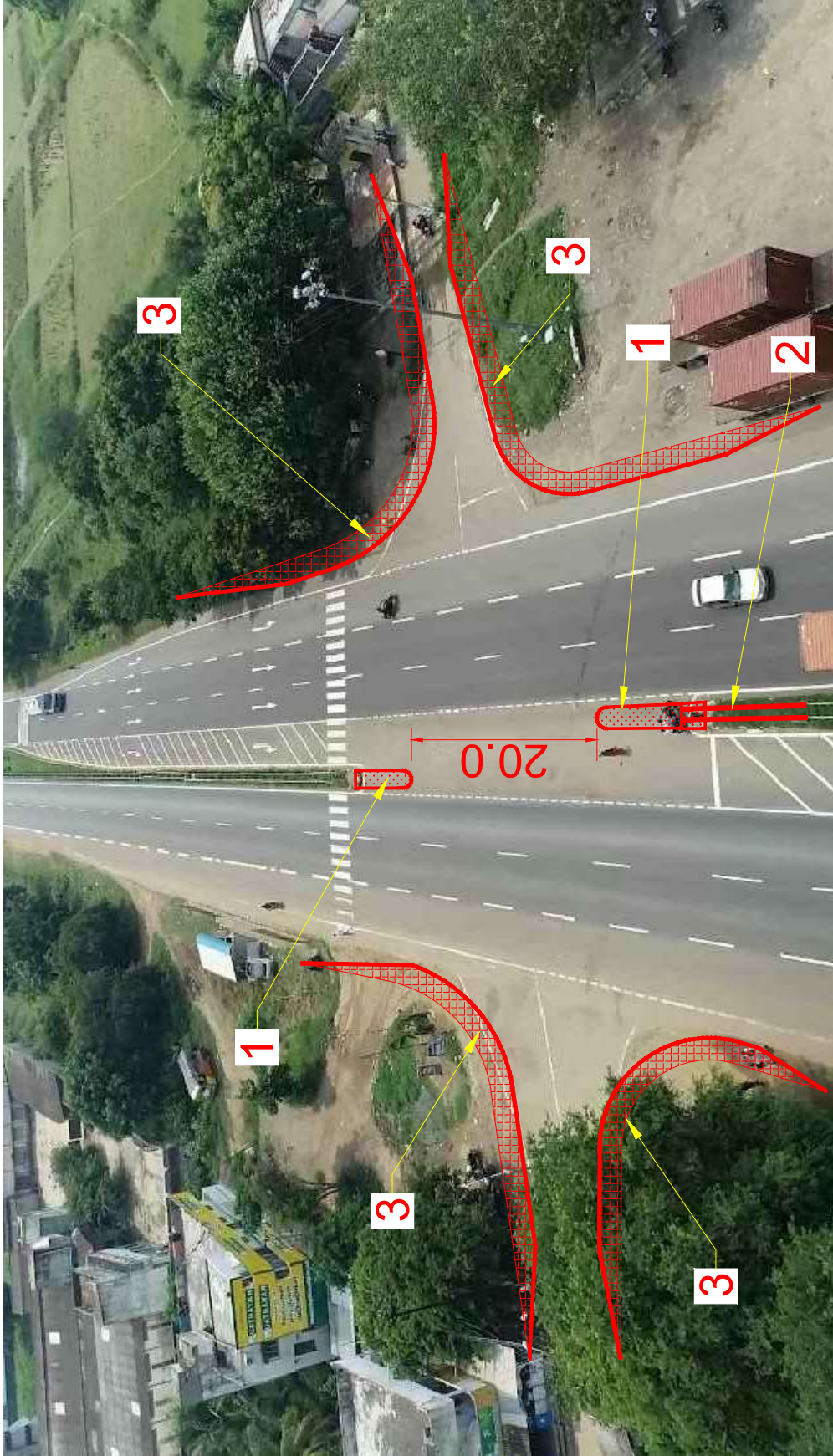


Recommended safety improvement :-

- 1. Provide separator with raised paved refuge area.
- 2. Provide hazard marker.
- 3. Redesign median opening.




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				<div>DRAWING - SAFETY AUDIT RECOMMENDATION @ CH. 140+900</div>			
				<div>Purpose of Issue :-</div> <div>SCHEMATIC DRAWINGS</div> <div>Date :-</div> <div>DECEMBER 2023</div> <div>Scale :-</div> <div>NTS</div>			
				<div>Rev.</div>	<div>Date</div>	<div>Description of Revisions</div>	
					<div>01</div>	<div>DEC. 2023</div>	<div>ISSUE FOR SCHEMATIC DRAWING</div>





**Recommended safety improvement :-**

1. Extend median.
2. Extend W Beam crash barrier.
3. Provide paver block as a walkway and kerb stone along hard shoulder edge.

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				<div><b>Purpose of Issue :-</b></div> <div>SCHEMATIC DRAWINGS</div>	<div><b>Date :-</b></div> <div>DECEMBER 2023</div>					
				<div><b>Scale :-</b></div> <div>NTS</div>						
				<div><b>Rev.</b></div> <div>80</div>	<div><b>Date</b></div> <div>DEC. 2023</div>	<div><b>Issue For</b></div> <div>ISSUE FOR SCHEMATIC DRAWING</div>				
						<div><b>Description of Revisions</b></div>				







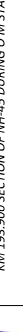




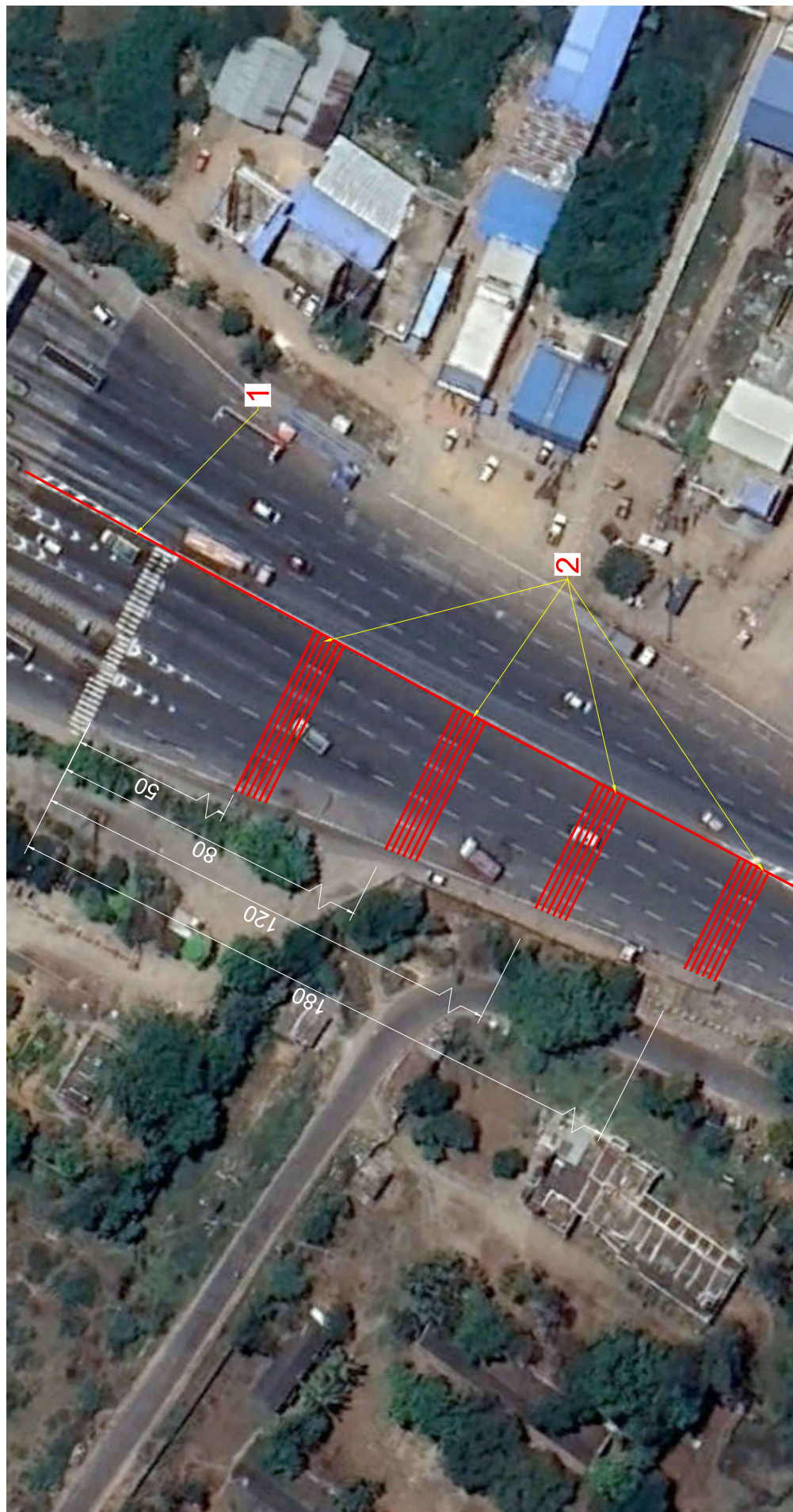
Recommended safety improvement :-

1. Provide temporary barricades.
2. Provide 4 set TBM.

CH. 150+300

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				<b>Scale :-</b> NTS	
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					ISSUE FOR SCHEMATIC DRAWING
					DESCRIPTION OF REVISIONS



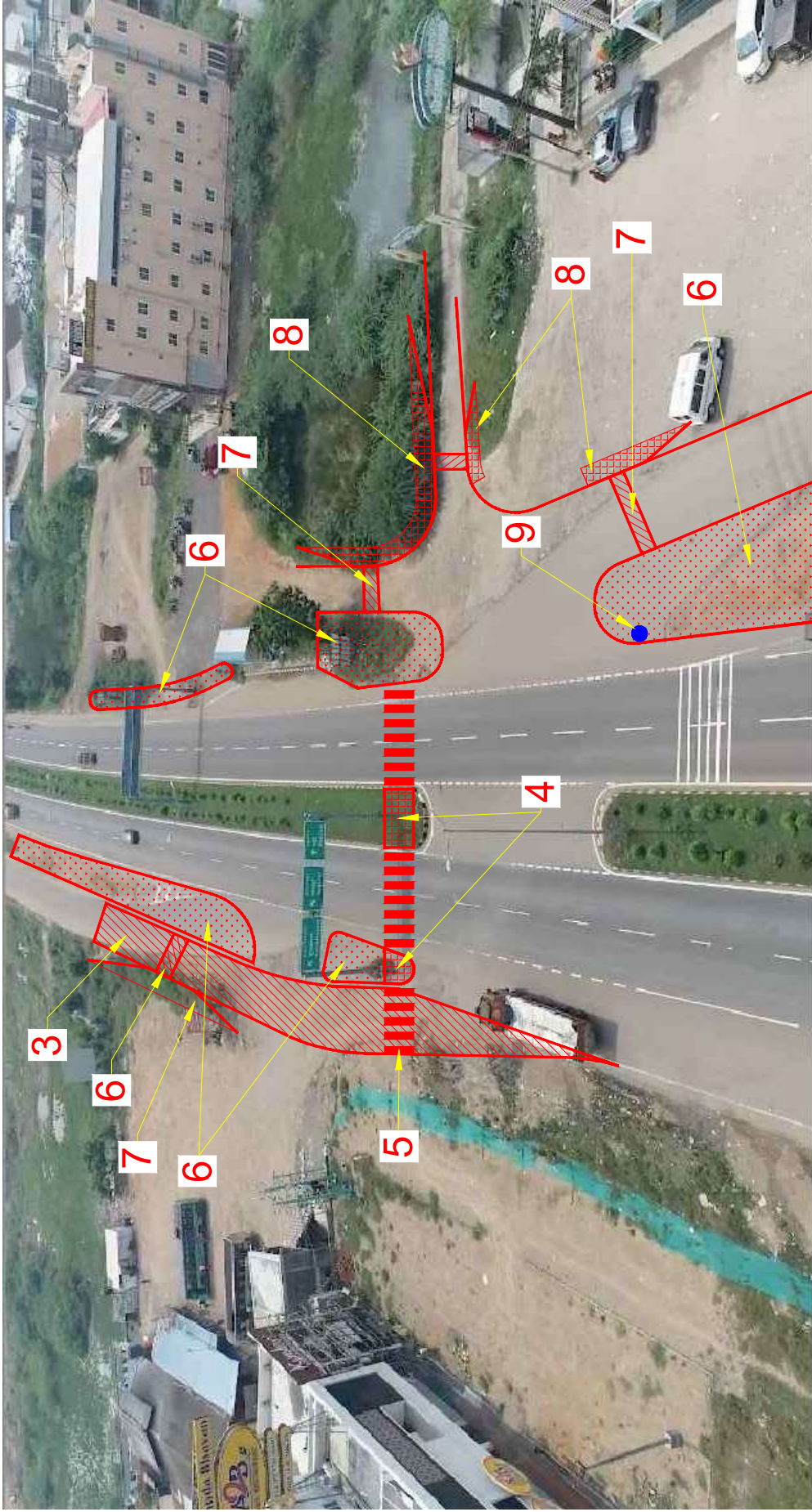


Recommended safety improvement :-

1. Provide temporary barricades.
2. Provide 4 set TBM.

CH. 150+300







**Recommended safety improvement :-**

3. Extend service road.
4. Provide raised paved refuge area in median and island.
5. Provide pedestrian crossing.
6. Provide separating island.
7. Provide speed hump / rumble strip upto kerb edge on either side with sign board.
8. Provide paver block as a walkway and kerb stone along hard shoulder edge.
9. Provide hazard marker.

CH. 150+600

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			<div>Description of Revisions</div> <div></div>	<div>Issue For Schematic Drawing</div> <div></div>							








Recommended safety improvement :-

1. Provide solar blinker.
2. Provide / Extend end to end pedestrian crossing with sign board.
3. Remove pedestrian path blocking w beam crash barrier.
4. Provide raised paved refuge area in median.
5. Provide speed hump / rumble strip upto kerb edge on either side with sign board.
6. Provide pedestrian guard railing (PGR).

7. Redesign island to exit traffic from petrol pump.
8. Provide hazard marker.
9. Provide stop line marking with sign board / road marking.
10. Provide paver block as a walkway and kerb stone along hard shoulder edge.
11. Provide chevron marking.

CH. 156+300

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Recommended safety improvement :-





1. Extend end to end pedestrian crossing with sign board.
2. Provide speed hump / rumble strip upto kerb edge on either side with sign board.
3. Provide raised paved refuge area in median and channelize island.
4. Redesign channelize island.
5. Provide hazard marker.
6. Provide chevron marking.
7. Provide paver block as a walkway and kerb stone along hard shoulder edge.
8. Provide W Beam crash barrier / Guard post.

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			<b>Scale :-</b>	NTS		
			<b>Rev</b>	<b>Date</b>	<b>Description of Revisions</b>	
			NO	DEC. 2023	ISSUE FOR SCHEMATIC DRAWINGS	



**Recommended safety improvement :-**

1. Provide W Beam crash barrier / Guard post.

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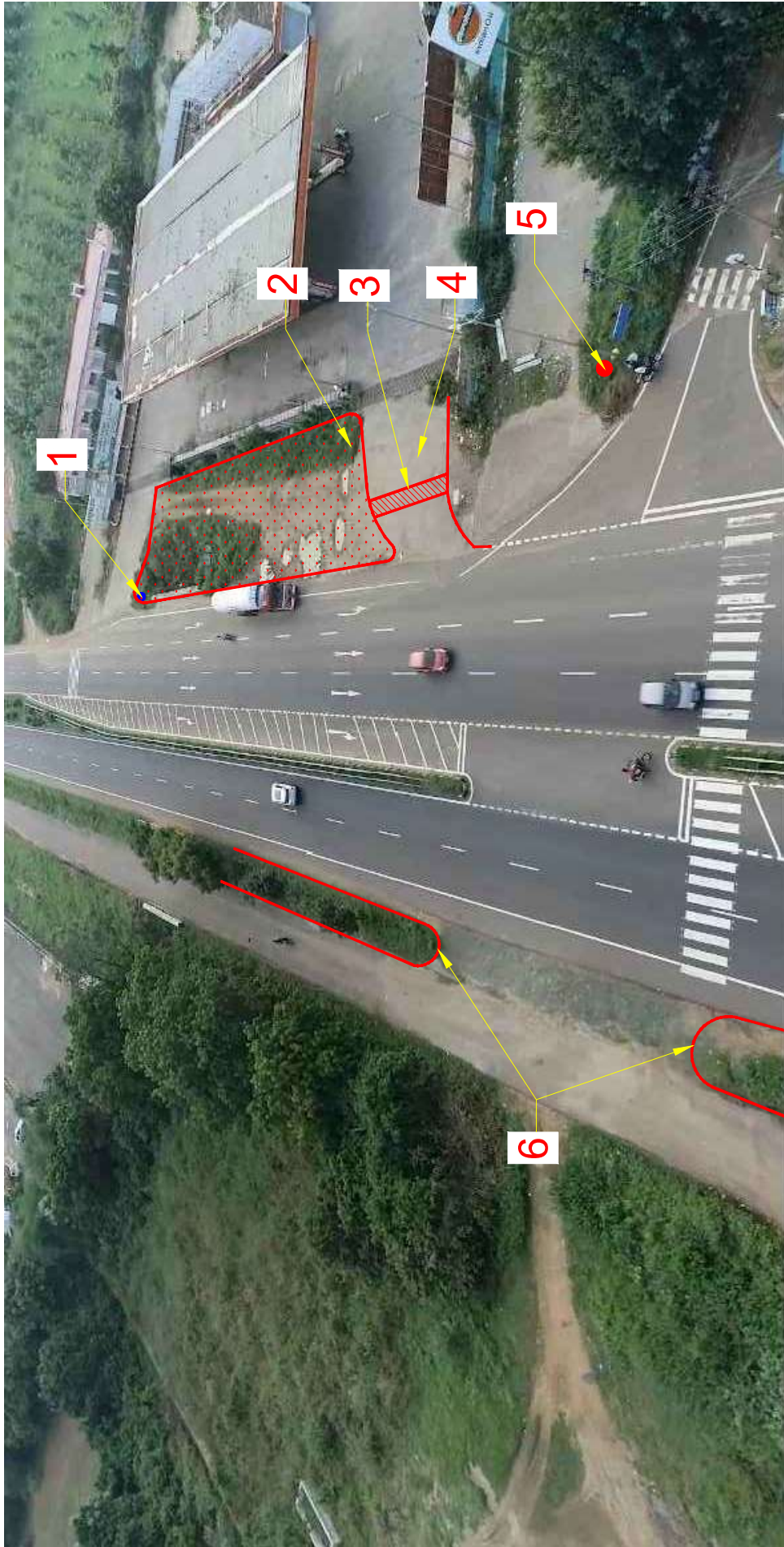
@ CH. 189+500

**Recommended safety improvement :-**

1. Add 3 set of TBM.
2. Provide pedestrian crossing with sign board.
3. Provide paver block as a walkway and kerb stone along hard shoulder edge.
4. Turning radius of cross road should be tightened by providing ghost shoulder markings with studs.




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Recommended safety improvement :-

1. Provide hazard marker.
2. Redesign petrol pump entry/exit with channelizing island.
3. Provide speed hump.
4. Repair damaged pavement.
5. Provide High mast light.
6. Provide kerb stone along separator.

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				Purpose of Issue :- SCHEMATIC DRAWINGS	Date :- DECEMBER 2023				
				Scale :- NTS	Issue Date DEC. 2023				
								Rev.	Date
								ISSUE FOR SCHEMATIC DRAWING	
								Description of Revisions	