

**DEVELOPED APPROACH ELEVATION (PART 3)**  
(LEFT HAND SIDE WALL - KALIABOR TINIALI END)

Bridge Engineer  
Stup Consultants Pvt. Ltd.  
Nagaon-782001 (Assam)



— SERVICE ROAD EMBANKMENT FILL SHALL BE COMPLETED BEFORE STARTING OF RE WALL WORK.

CLIENT :-  
**NATIONAL HIGHWAYS  
& INFRASTRUCTURE  
DEVELOPMENT  
CORPORATION LIMITED**

AUTHORITY'S ENGINEER:-  
STUP CONSULTANTS Pvt. Ltd.  
&  
AYOLEEZA CONSULTANTS Pvt. Ltd.

PROOF CHECKED CONSULTANT:-  
**CETEST**  
CE TESTING  
Company Pvt. Ltd.

DESIGN CONSULTANT:-  
**AECOM**

PROJECT:-  
Four Lining of NH-37 from Rangagara  
to Kaliabor Tiniali (CH. 297.000 Km to  
CH 315.315 Km) in Nagaon District in  
the state of Assam under SARDP-NE,  
Phase A on EPC Mode.

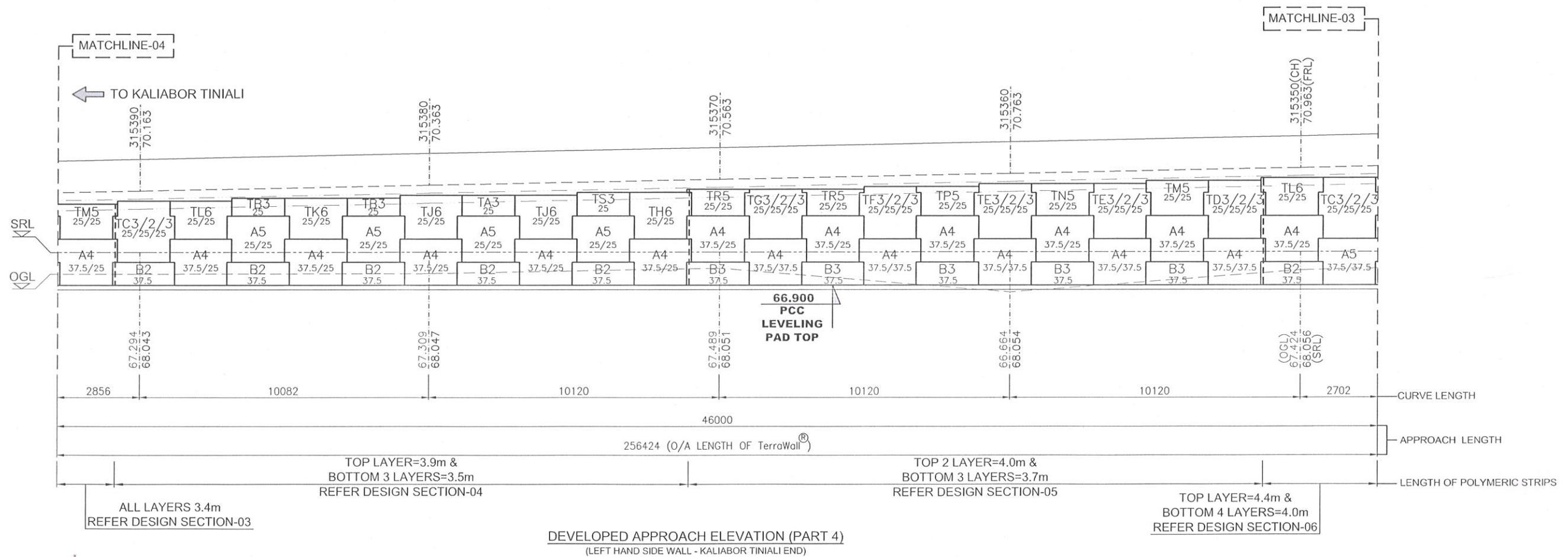
EPC CONTRACTOR:-  
**SIMPLEX INFRASTRUCTURES LTD**  
27, SHAKESPEARE SARANI, KOLKATA-17, INDIA

PREPARED BY:-  
**REINFORCED EARTH INDIA PVT. LTD.**  
E-11, BLOCK-B1 EXTENSION, (OPPOSITE NTPC BADARPUR),  
MOHAN CO-OPERATIVE INDUSTRIAL ESTATE,  
MATHURA ROAD, NEW DELHI-110044  
Tel: +91 11 46457600-7601, F: +91 11 46457630  
www.reinforcedearthindia.com

SCALE:-  
1:150  
DATE:-  
30/11/2020  
SHEET NO.:-  
03/06

Rev.	Date	Description on Revisions
		Revisions
		STRUCTURE:- FLYOVER AT CH. 314+992
		TITLE:- GENERAL ARRANGEMENT OF APPROACH RAMP
		(LEFT HAND SIDE WALL - KOHIMA END)
		DRG NO.:- TAInd-E/19759/FLY/314+992/GA-04
		REV.
		DRAWING STATUS:- ISSUED FOR APPROVAL
		00





Bridge Engineer  
Stup Consultants Pvt. Ltd.  
Nagson-724001 (Assam)



Kumar

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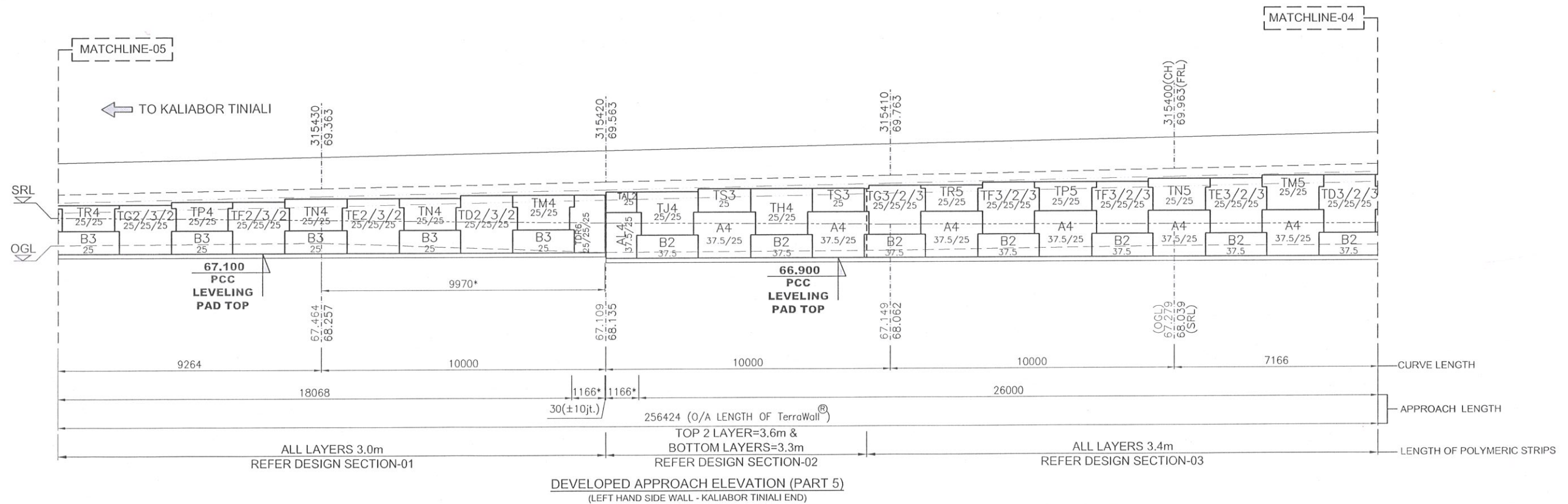
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DRAWN CHECKED BY APPROVED BY

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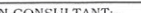






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Nagaon-782001 (Assam)



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<div><div>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED</div></div>										<div><div>AUTHORITY'S ENGINEER:- STUP CONSULTANTS Pvt. Ltd. &amp; AYOLEEZA CONSULTANTS Pvt. Ltd.</div></div>		<div><div>PROOF CHECKED CONSULTANT:- CETEST CE TESTING Company Pvt. Ltd.</div></div>		<div><div>DESIGN CONSULTANT:-</div></div>		<div>PROJECT:- Four Laning of NH-37 from Rangagara to Kaliabor Tiniali (CH. 297.000 Km to CH 315.315 Km) in Nagaon District in the state of Assam under SARDP-NE, Phase A on EPC Mode.</div>		<div><div>EPC CONTRACTOR:- SIMPLEX INFRASTRUCTURES LTD 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA</div></div>		<div><div><div>THIS DRAWING CONTAINS INFORMATION PROPRIETARY AND CONFIDENTIAL TO M/S REINFORCED EARTH INDIA PVT. LTD. POSSESSION OF THIS DRAWING NEITHER AUTHORIZE USE OF THE INFORMATION CONTAINED THEREIN NOR COPYING OF THE DRAWING IN WHOLE OR IN PART, NOR TRANSMISSION OF THE DRAWING OR OF THE INFORMATION CONTAINED THEREIN TO PERSONS NOT CONNECTED WITH THE PROJECT</div><div>Rev.</div><div>Date</div><div>Description on Revisions</div></div><div>Revisions</div><div>STRUCTURE:- FLYOVER AT CH. 314+992</div><div>TITLE:- GENERAL ARRANGEMENT OF APPROACH RAMP (LEFT HAND SIDE WALL - KOHIMA END)</div><div>DRG NO.:- TAnd-E/19759/FLY/314+992/GA-04</div><div>REV.</div><div>DRAWING STATUS:- ISSUED FOR APPROVAL</div><div>00</div></div>									
										<div>PREPARED BY:- <div>REINFORCED EARTH INDIA PVT. LTD. B-11, BLOCK-B, EXTENSION, (OPPOSITE NTPC BACKPUMP), MOHAN CO-OPERATIVE INDUSTRIAL ESTATE, MATHURA ROAD, NEW DELHI-110048 Tel: +91 11 46457600-7401 / P: +91 11 46457630 www.terraindia.com</div></div>		<div>SCALE:- 1:150</div>		<div>DATE:- 30/11/2020</div>		<div>SHEET NO.:- 05/06</div>													
										<div>SG DRAW</div>		<div>INITIAL SDG</div>		<div>FINAL KS</div>		<div>AA</div>		<div>CHECKED BY APPROVED BY</div>											







# NOTE :-

-THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG. NO. TAlnd-E/19759/FLY/314+992/DET-01  
 -FOR PANEL DETAIL REFER PANEL REINFORCEMENT DRAWINGS.  
 -ANY UNSUITABLE SOIL BENEATH THE RAMP PORTION SHALL BE REMOVED AND REPLACED WITH SELECTED BACK FILL.

\*THESE DIMENSIONS, CHAINAGES & LEVELS SHALL BE VERIFIED AT THE SITE WELL BEFORE COMMENCEMENT OF WORK AND ANY VARIATION (IF FOUND) SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE & THIS OFFICE.

LET'S SAVE THE ALL SMALL CUT PIECES OF SOIL REINFORCING ELEMENT WHICH CONTRIBUTES TO WASTAGE SHALL SUITABLY BE PLACED IN DIFFERENT LAYERS EITHER IN REINFORCED OR IN RETAINED ZONE, NONE OF THE PIECES SHALL BE DISPOSED OR LEFT IN A MANNER THAT MAY LEAD TO LAND CONTAMINATION AND SOLID WASTE GENERATION.

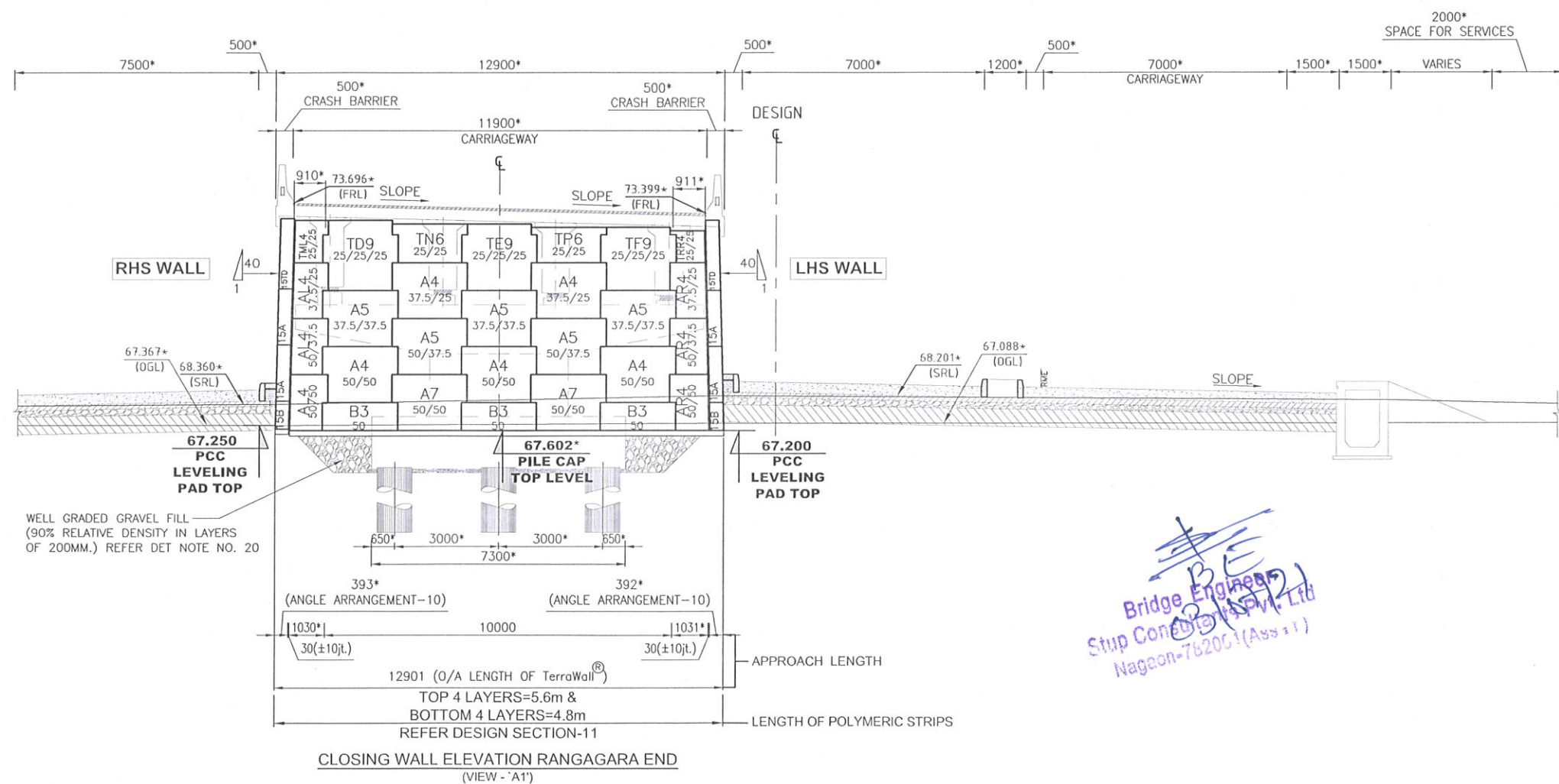
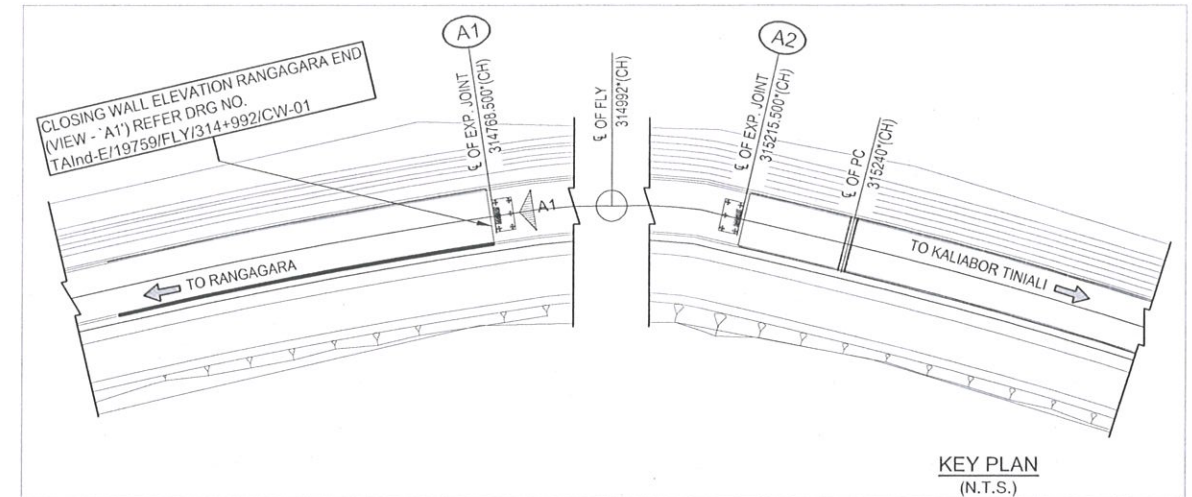
## CAUTIONS :-

MOVEMENT OF HEAVY MACHINERIES OR COMPACTION PLANTS ( MASS >1 MT ) WITH IN 1.5 M DISTANCE FROM PANELS COULD LEAD TO MISALIGNMENT/STRUCTURAL DAMAGE OF THE WALL FACING AND OVERSTRESSING OF THE REINFORCEMENT LAYERS.

- SERVICE ROAD EMBANKMENT FILL SHALL BE COMPLETED BEFORE STARTING OF RE WALL WORK.

## LEGEND:

PANEL TYPE  
 A4  
 50/50  
 NUMBER OF CONNECTOR  
 POLYMERIC STRIPS (TOP)  
 POLYMERIC STRIPS (BOTTOM)



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Rev.	Date	Description on Revisions
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		TITLE:- GENERAL ARRANGEMENT OF CLOSING WALL
		(VIEW A1 - RANGAGARA END)
		DRG NO:- TAlnd-E/19759/FLY/314+992/CW-01
		DRAWING STATUS:- ISSUED FOR APPROVAL
		REV. 00



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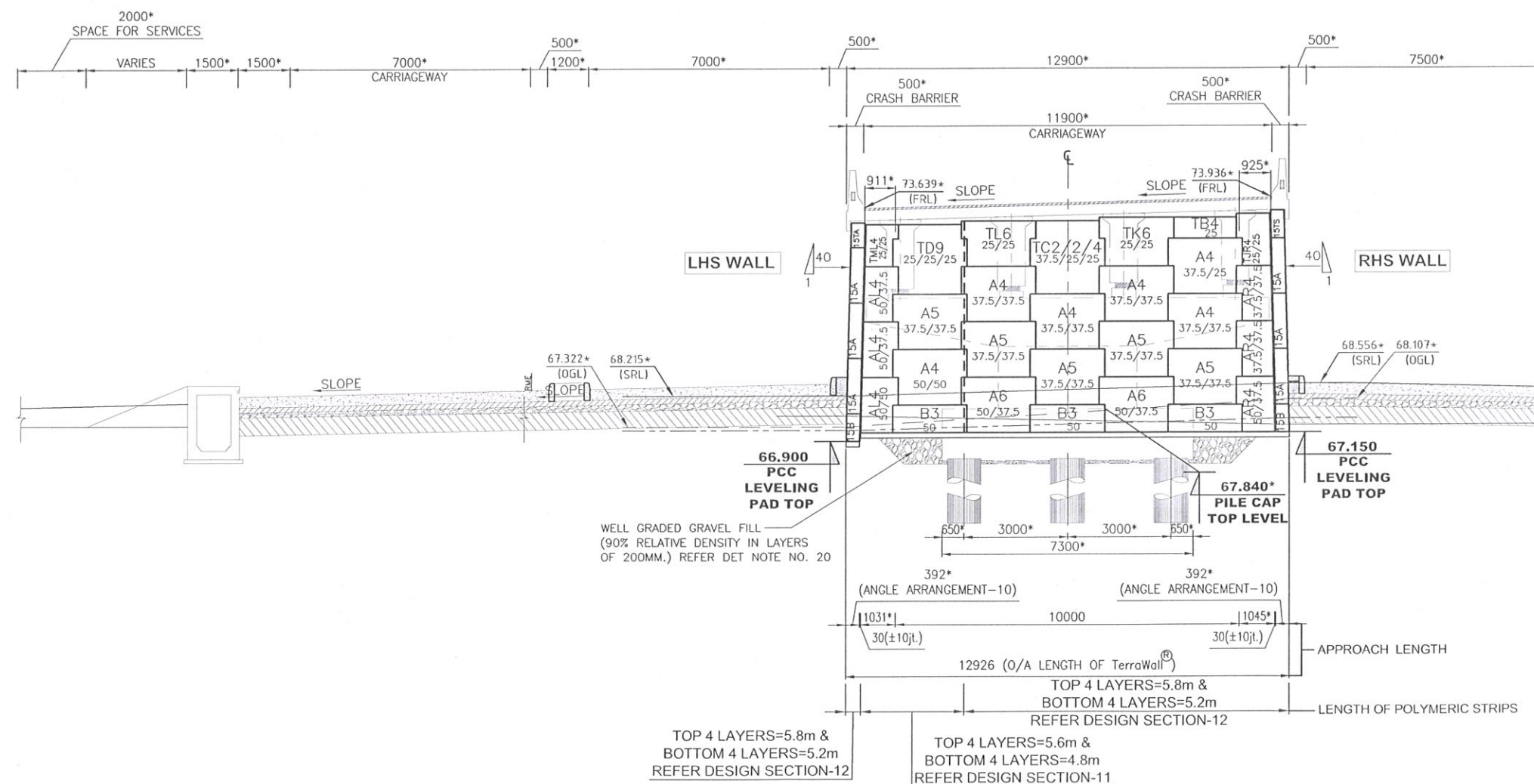
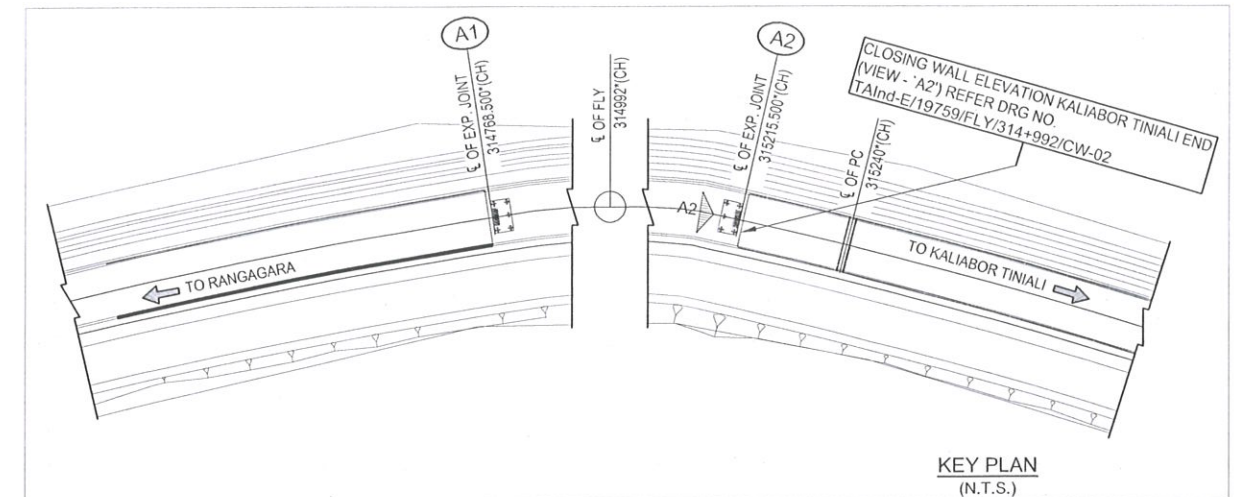
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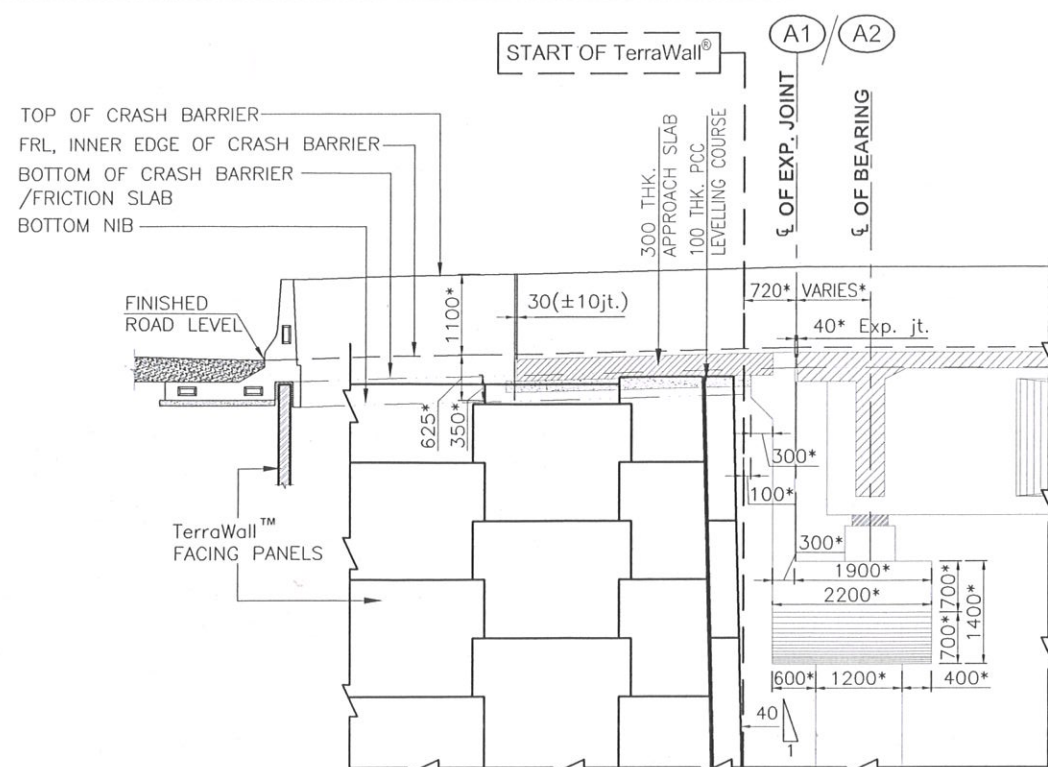
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## LEGEND:

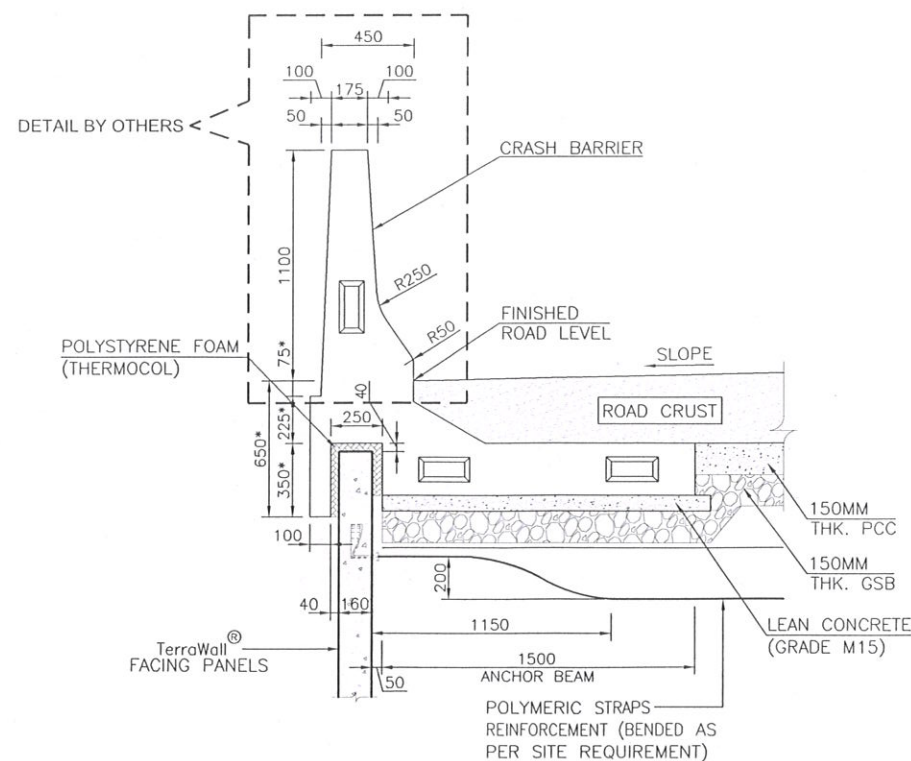
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POLYMERIC STRIPS (TOP)  
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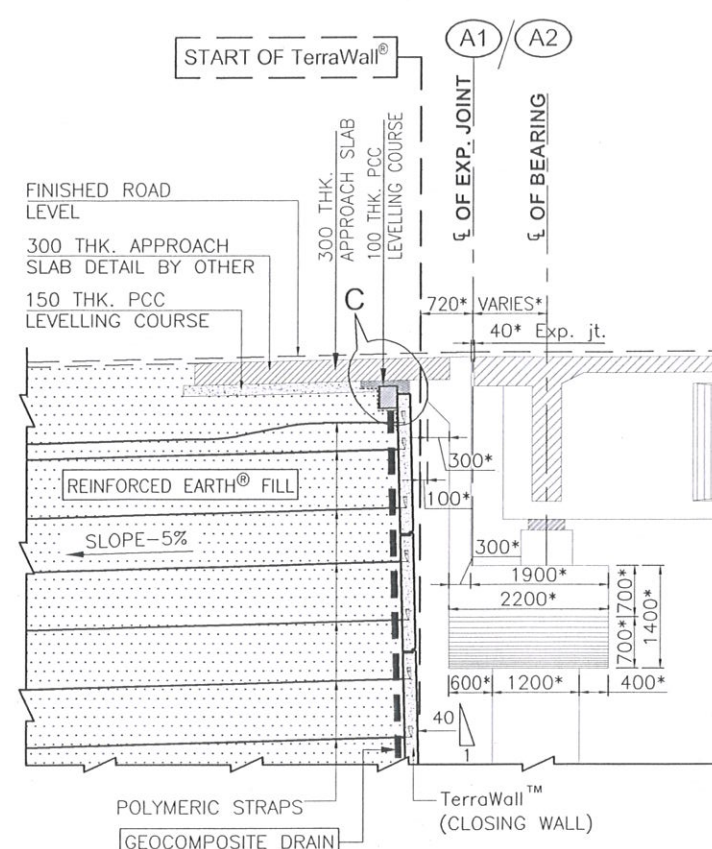




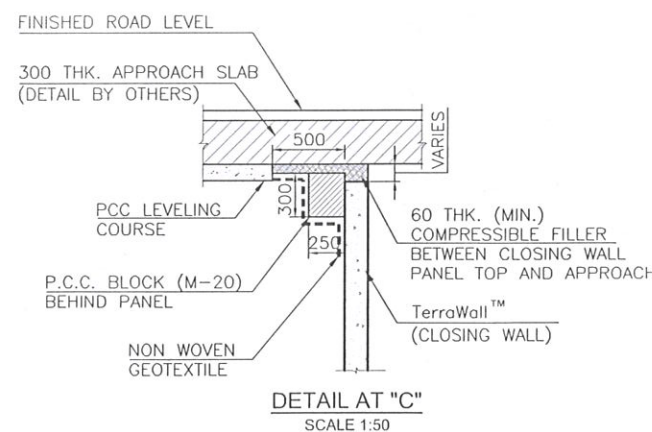
REFERENCE OF VARIOUS POINTS IN ELEVATION VIEW  
WITH RESPECT TO THE CRASH BARRIER  
SCALE 1:100



CRASH BARRIER DETAIL  
(SCALE 1:35)



TYPICAL SECTIONAL DETAIL BETWEEN  
ABUTMENT & CLOSING WALL  
SCALE 1:100



DETAIL AT "C"  
SCALE 1:50

#### NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METER UNLESS OTHERWISE STATED.
  - DO NOT SCALE THE DRAWING, ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
  - REINFORCED AND RETAINED SOIL FILL SHALL BE AS PER FOLLOWING MINIMUM SHEAR STRENGTH AND PHYSICAL PROPERTIES.
- | REINFORCED EARTH™ FILL PROPERTIES        | RETAINED BACKFILL PROPERTIES             |
|--|--|
| <b>A. REINFORCED EARTH™ FILL</b>         | <b>B. RETAINED EARTH FILL</b>            |
| $\phi_1 \geq 34^\circ$                   | $\phi_2 \geq 34^\circ$                   |
| $\gamma_{1max} \leq 20.0 \text{ KN/m}^3$ | $\gamma_{2max} \leq 20.0 \text{ KN/m}^3$ |
- MAXIMUM PARTICLE SIZE = 100MM.
  - IF SUPPLY OF MOULDS IS DONE BY M/S TERRE ARMEE, IT WILL BE ON RETURNABLE BASIS.
  - SUPPLY OF POLYMERIC STRAPS, LIFTING ANCHOR & EPDM PAD BY TERRE ARMEE.
  - FACING PANEL DESIGNATION:  
BASIC STANDARD TYPE - A,B,T,TA,TB,TC,TD,TE,TF,TG,TH,TJ,TK,TL,TM,TN,TP,TR,TS
  - CUT (VERTICAL STRAIGHT) - SUFFIX R (RIGHT HAND)  
L (LEFT HAND)
  - LEVELING PAD, MASS CONCRETE M-15 GRADE TO BE SMOOTH AND LEVEL TO WITHIN  $\pm 3\text{MM}$  OF THE LEVELS SHOWN ON DRAWING.
  - ALL FACING PANELS ARE 160MM THICK (NOMINAL), M-35 GRADE CONCRETE.
  - POLYMERIC STRAPS REINFORCEMENT SHALL BE AS PER TECHNICAL SPECIFICATION MENTIONED ELSE WHERE IN THE DETAILED DESIGN REPORT.
  - FRL'S AND FOUNDING RL'S TO BE RE-VERIFIED AT SITE.
  - END CUT PANELS/SLIP JOINTS/JOINTS MAY VARY AS PER ACTUAL SITE CONDITION.
  - FOR CONSTRUCTION SEQUENCE, REFER TO CONSTRUCTION GUIDELINES DOCUMENT.
  - ANY UNSUITABLE SOIL BELOW TerraWall SHALL BE REPLACED WITH SELECTED EARTH FILL BEFORE START OF CONSTRUCTION.
  - THESE DRAWINGS ARE PREPARED BASED ON SERVICE ROAD LEVELS AND OGL PAD TOP LEVELS SHOULD BE ALWAYS BELOW 1M. FROM SRL'S / OGL.
  - ADEQUATE BEARING CAPACITY SHALL BE ENSURED BY THE MAIN CONTRACTOR BEFORE START OF TerraWall ERECTION.
  - NO EXCAVATION SHALL BE DONE ADJOINING THE TerraWall DURING THE DESIGN LIFE OF THE STRUCTURE.
  - THE BATTER 1 IN 40 (1 HORIZONTAL AND 40 VERTICAL) AS MENTIONED IN DRAWING MAY VARY FROM 1 IN 40 (SLOPE) TO VERTICAL DEPENDING ON SITE CONDITIONS AND TYPE OF FILL SOIL TO BE USED AND THIS SHALL NOT BE CONSIDERED AS THE FINAL BATTER.
  - ALL THE EXCAVATED GROUND BELOW TerraWall APPROACH SHALL BE BACKFILLED IN LAYERS (MAX. THICKNESS OF ONE LAYER SHALL BE 200MM.) WITH WELL GRADED GRAVEL (COMPACTED TO 90% RELATIVE DENSITY) DIMENSION DETAIL OF BACKFILLED GRAVEL MAY VARY AS PER SITE CONDITIONS.

#### POLYMERIC STRAP REINFORCEMENT SPECIFICATION

Properties	Test Method	Unit	Minimum average roll value		
Ultimate Tensile Strength	ASTM D6637	kN	25	37.5	50
Width		mm	49	49	49

#### REFERENCES:

- DRAWING IS PREPARED ON THE BASIS OF FOLLOWING CLIENT DRG. NO.
- FRLs, OGLs & SRLs DETAILS ARE TAKEN FROM MS-EXCEL SHEET RECEIVED BY E-MAIL DATED 13.12.2018.
  - PLAN & PROFILE DETAILS RECEIVED BY HAND DATED 27.11.2018.
  - GAD DETAILS ARE TAKEN FROM DRG. NO. AECOM-DELD15159-DD-DWG-FO-314+992-GAD-01, REV. R1 DATED 10.08.2018 RECEIVED BY E-MAIL DATED 05.06.2019.
  - ABUTMENT & ABUTMENT STRUCTURE DETAILS ARE TAKEN FROM DRG. NO. AECOM-DELD15159-DD-DWG-FO-314+747-SUB-01, REV. R1 DATED 29.08.2018 RECEIVED BY E-MAIL DATED 05.06.2019.
  - UTILITY DETAILS ARE TAKEN FROM DRG. NO. SIL-DD-DWG-PC-315+240/01 RECEIVED BY E-MAIL DATED 12.06.2019.
  - CROSS SECTIONAL DETAILS ARE TAKEN FROM DRG. NO. AECOM-DELD15159-DD-DWG-TCS-005, REV. R2 DATED JULY 2018 RECEIVED BY HAND DATED 27.11.2018.
  - CRASH BARRIER & FRICTION SLAB DETAILS ARE AS PER SIMPLEX INFRA'S STANDARDS.
  - CONFIRMATION ON PRELIMINARY DRAWING RECEIVED BY EMAIL DATED 09/11/2020
  - PCC LEVelling PAD TOP LEVEL HAVE BEEN MODIFIED FROM CLIENT'S END BY EMAIL DATED 07/11/2020

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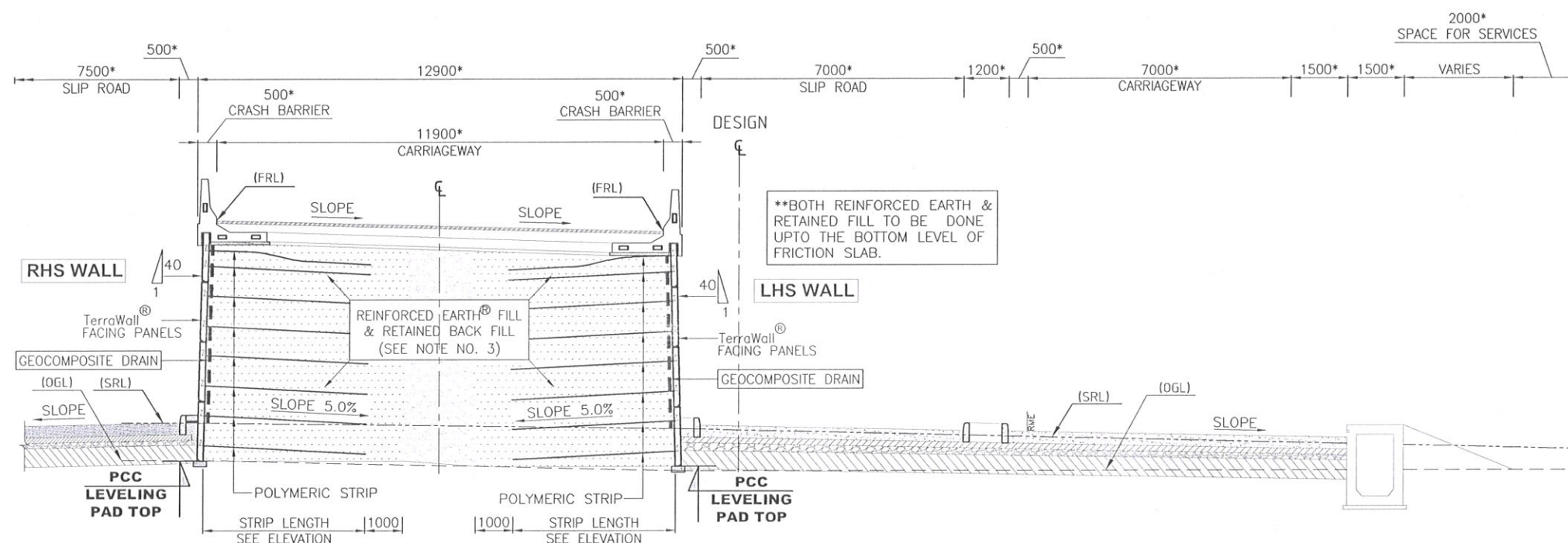
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						<b>SHEET NO.:-</b> 01/03	<b>DRG NO.:-</b> TAlnd-E/19759/FLY/314+992/DET-01 <b>REV.:</b>	<b>DRAWING STATUS:-</b> ISSUED FOR APPROVAL <b>00</b>



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TYPICAL CROSS SECTION

Bridge Engineer  
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03/11/20



Kunal

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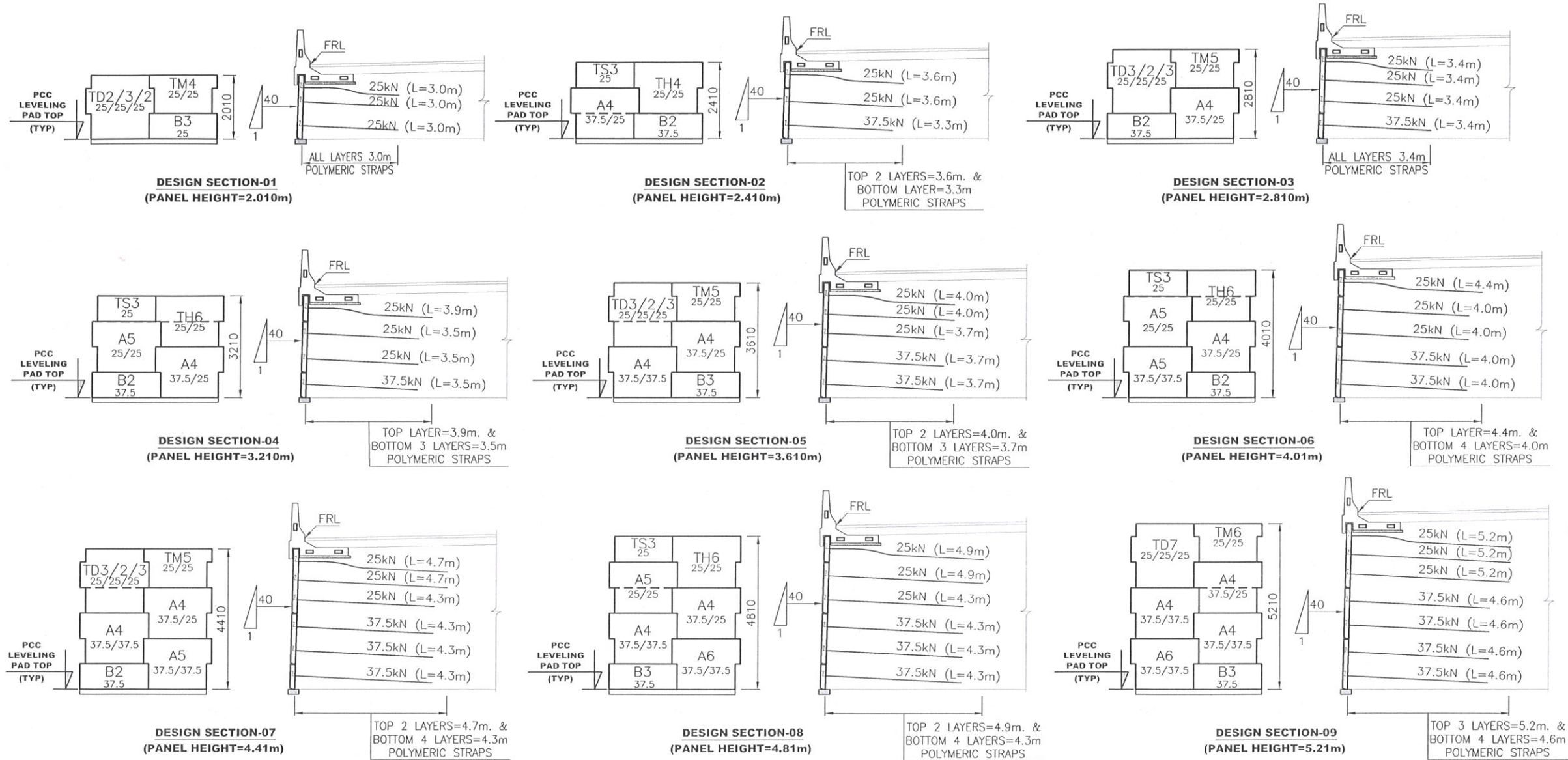
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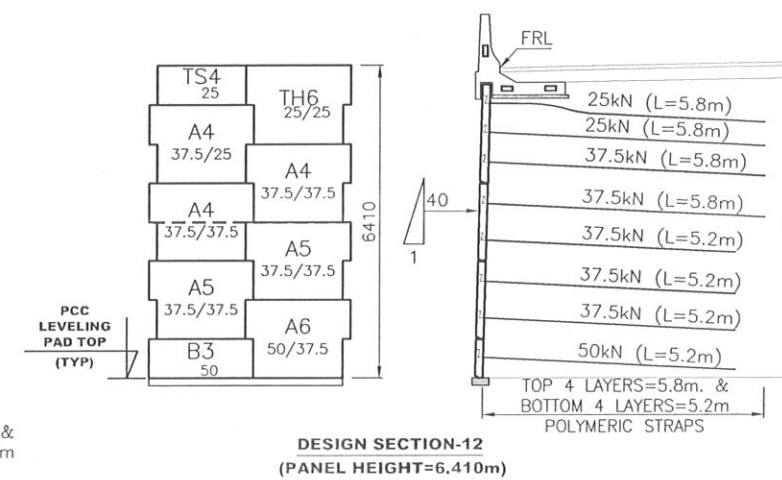
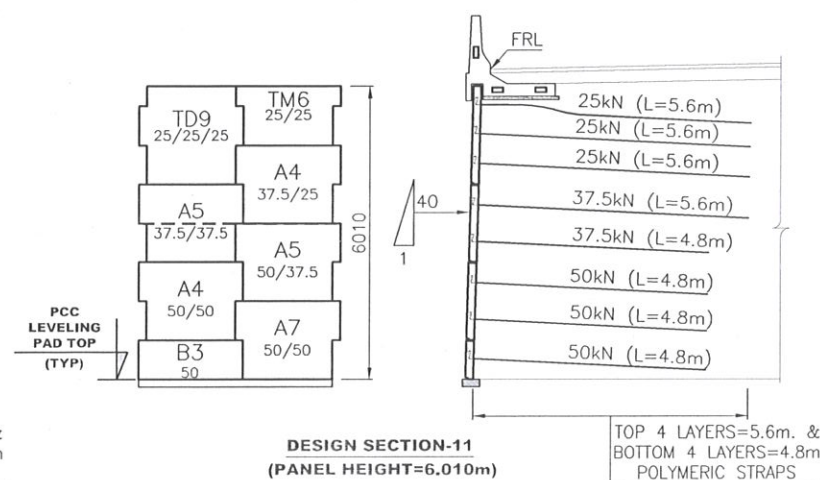
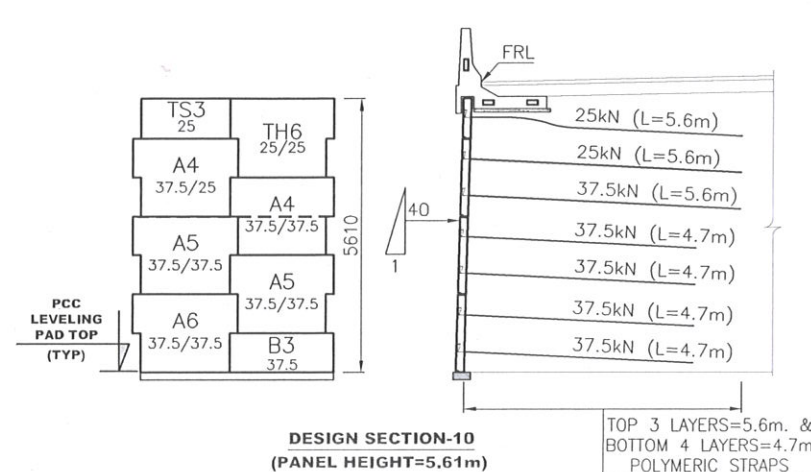
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<p>CLIENT :-</p> <p>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED</p>	<p>AUTHORITY'S ENGINEER:-</p> <p>STUP CONSULTANTS Pvt. Ltd.</p> <p>AYOLEEZA CONSULTANTS Pvt. Ltd.</p>	<p>PROOF CHECKED CONSULTANT:-</p> <p>CETEST</p> <p>CE TESTING Company Pvt. Ltd.</p>	<p>DESIGN CONSULTANT:-</p> <p>AECOM</p>	<p>PROJECT:-</p> <p>Four Laning of NH-37 from Rangagara to Kaliabor Tinali (CH. 297.000 Km to CH 315.315 Km) in Nagaon District in the state of Assam under SARDP-NE, Phase A on EPC Mode.</p>	<p>EPC CONTRACTOR:-</p> <p>SIMPLEX INFRASTRUCTURES LTD</p> <p>27, SHAKESPEARE SARANI, KOLKATA-17, INDIA</p>	<p>THIS DRAWING CONTAINS INFORMATION PROPRIETARY AND CONFIDENTIAL TO W/S REINFORCED EARTH INDIA PVT. LTD. POSSESSION OF THIS DRAWING NEITHER AUTHORIZES NOR IMPLIES ANY ENDORSEMENT OR RECOMMENDATION BY W/S REINFORCED EARTH INDIA PVT. LTD. FOR THE INFORMATION CONTAINED THEREIN NOR COPYING OF THE DRAWING IN WHOLE OR IN PART, NOR TRANSMISSION OF THE DRAWING OR OF THE INFORMATION CONTAINED THEREIN TO PERSONS NOT DIRECTLY CONNECTED WITH THE PROJECT.</p> <p>PREPARED BY:-</p> <p>REINFORCED EARTH INDIA PVT. LTD.</p> <p>E-11, BLOCK-B1 EXTENSION, (OPPOSITE NTPC BADARPURI), MOHAN CO-OPERATIVE INDUSTRIAL ESTATE, MATURBA ROAD, NEW DELHI-110044</p> <p>Tel: +91 11 46457600-7601, F: +91 11 46457630</p> <p>www.reinforcedearthindia.com</p> <p>SCALE:-</p> <p>1:150</p> <p>DATE:-</p> <p>30/11/2020</p> <p>SHEET NO.:-</p> <p>01/02</p>	<p>Rev. Date Description on Revisions</p> <p>Revisions</p> <p>STRUCTURE:- FLYOVER AT CH. 314+992</p> <p>TITLE:- DESIGN SECTIONS</p> <p>DRG NO.:- TAInd-E/19759/FLY/314+992/DS-01</p> <p>DRAWING STATUS:- ISSUED FOR APPROVAL</p> <p>REV. 00</p>
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Bridge Engineer  
Stup Consultants Pvt. Ltd.  
Nagaon-782001 (Assam)



Kunal






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										Revisions					
										STRUCTURE:- FLYOVER AT CH. 314+992					
										TITLE:- DESIGN SECTIONS					
										SHEET NO.:- 02/02		DRG NO.:- TAInd-E/19759/FLY314+992/DS-01			
										DRAWING STATUS:- ISSUED FOR APPROVAL		REV. 00			

CLIENT :- <div></div> NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED		AUTHORITY'S ENGINEER:- STUP CONSULTANTS Pvt. Ltd & AYOLEEZA CONSULTANTS Pvt. Ltd <div></div>		PROOF CHECKED CONSULTANT:- <div></div> CETEST CE TESTING Company Pvt. Ltd		DESIGN CONSULTANT:- <div></div> AECOM		PROJECT:- Four Laning of NH-37 from Rangagara to Kaliabor Tiniali (CH. 297.000 Km to CH 315.315 Km) in Nagaon District in the state of Assam under SARDP-NE, Phase A on EPC Mode.		EPC CONTRACTOR:- <div></div> SIMPLEX INFRASTRUCTURES LTD 27, SHAKESPEARE SARANI, KOLKATA-71, INDIA	
AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		DESIGN DIRECTOR		DATE	



## DO & DON'T

Do



**DON'T**



a i). PEDESTALS OF GOOD QUALITY      b i). POOR QUALITY PEDESTALS  
ii). OPEN AND CLEAR AREA IN CASTING YARD.      ii). IMPROPER UPKEEP OF ASSETS  
(FIGURE 1)

## SAFETY RULES FOR MOULDS

80

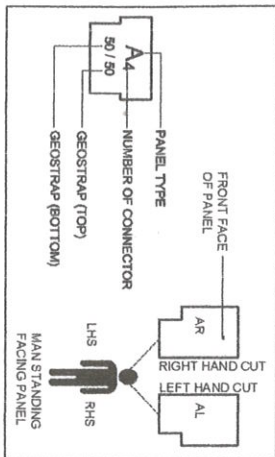
## DO & DON'T

**DON'T**



a). PROPERLY OILED MOULD

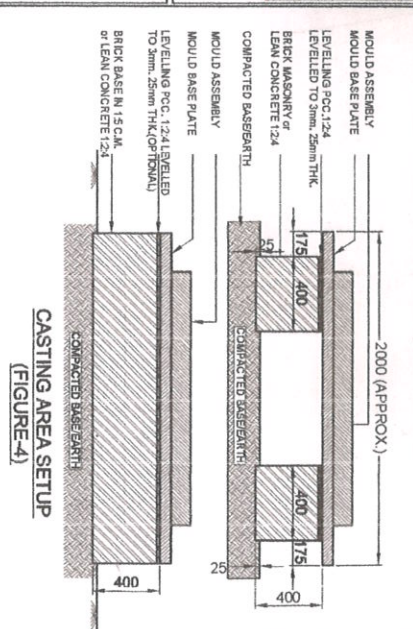
(FIGURE 2)



(FIGURE - 3)



**PURPOSE** THIS CONSTRUCTION AND QUALITY CONTROL PROCEDURE MANUAL HAS BEEN PREPARED AS A GUIDE IN BUILDING TERRACE REINFORCED EARTH STRUCTURES. ITS CONTENTS SHOULD BE THOROUGHLY REVIEWED BY THE CONTRACTOR, THE SUPERINTENDENT AND THE FOREMAN RESPONSIBLE FOR CONSTRUCTION OF THE STRUCTURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REINFORCED EARTH (R.E.) (R.E.C. INDIA) WILL PROVIDE CONSTRUCTION ADVICE TO ASSIST THE CONTRACTOR IN THE IMPLEMENTATION OF CORRECT CONSTRUCTION PROCEDURES. HOWEVER, IN THE EVENT OF ANY CONFLICT BETWEEN THE PLANS, SPECIFICATIONS OR CONTRACT DOCUMENTS, IN THIS MANUAL, THE FOREMAN WILL PREVAIL. IF THERE IS AN DISCREPANCY WITH REGARD TO ANY ASPECT OF THE CONSTRUCTION OF THE STRUCTURE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE CORRECTING OR CONTINUING WORK COMPLIANCE WITH THE SPECIFICATIONS. THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL TALL, PROTECTIVE, SAFETY PLANS, STANDARDS AND PROCEDURES AT THE JOB SITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIPING OR CRACKING DURING THE ERECTION PROCESS.



**CASTING AREA SETUP**  
**(FIGURE-4)**



TYPICAL CASTING AREA  
(FIGURE - 5)

### A SAFETY RULES FOR HOUSE KEEPING OF CASTING AREA :- (Fig.1

1. KEEP THE WORK AREA FREE OF CUTTER AND PILES THAT COULD CAUSE A SLIP-OR-FALL OR ACCIDENT.
  2. REJECT/SCRAP MATERIAL TO BE KEPT AT A DESIGNATED PLACE MARKED AS "SCRAP."
  3. WATER STAGNATION SHALL BE AVOIDED BY PROPER DRAINAGE ARRANGEMENT TO AVOID BREEDING OF MOSQUITOES.
  4. REMOVE WASTE CONCRETE REGULARLY FROM THE AREA AROUND PERISTALS.
- SAFETY RULES FOR MOUNDS. - (Fig. 2)**

A SAFETY RULES FOR MOULDS :- (Fig. 2)

1. KEEP THE MOULDS COMPLETELY REDDED ON THE SPECIFIED SIZE PREDERESTRINED BEAMS.
2. STICKING OF THE CONCRETE ON THE MOLD SHOULD BE AVOIDED BY APPLYING THE FORMWORK OIL ON THE OUTER SURFACE OF THE MOULDS.
3. HANDLING OF MOULD, WEIGHT & LIFTING.

INTRODUCTION:- (Fig. 3)

STANDARD OR FULL-HEIGHT "A" PANEL OF SIZE 1.9M X 2.0M (WHERE 1.9 IS THE NORMAL HEIGHT AND OTHER 2.0M IS THE DISTANCE BETWEEN CENTER LINE OF PANELS). THE LETTER "A" INDICATES THE TYPE OF PANEL, AND THE NUMBER, WHICH INDICATES THE QUANTITY OF CONNECTORS AND ALSO THE TYPE OF GEOSTRIP ATTACHMENT WITH A PARTICULAR PANEL. A CUT PANEL IS A PANEL, WHICH HORIZONTAL/VERTICAL DIMENSION IS REDUCED. FOR THIS PURPOSE, HORIZONTAL/VERTICAL SPLITTER EXISTS FOR EVERY TYPE OF PANEL. TO DETERMINE IF A PANEL IS RIGHT OR LEFT CUT THE RULE IS TO ALWAYS CONSIDER THE EXTENSION SIDE OF THE PANEL. THE HORIZONTAL DIMENSION IS GIVEN AS THE LAST LETTER OF THE PANEL. THE VERTICAL DIMENSION IS GIVEN AS THE FIRST LETTER OF THE PANEL. LEFT/RIGHT CUT PANEL OF THE RULE (RIGHT CUT PANEL) TO THE SHOULDER, LEFT/RIGHT CUT PANEL OF THE RULE (RIGHT CUT PANEL) TO THE EDGE OF THE PANEL. CONTINUOUS SUPPORT BEAM MINIMUM 40 CM UNDER EACH SUPPORT OF THE BASE PLATES OF THE MOUNTS. THEIR PURPOSE IS TO PREVENT THEM MOVING FROM UNDERSIDE DEFORMATION, AS WELL AS TO PROVIDE BETTER WORKING CONDITIONS.

SETTING UP OF CASTING YARD:- (Fig. 4)

THE FOLLOWING FACILITIES SHALL BE SET UP IN ORDER TO IMPLEMENT THE CDS IN THE MOST EFFICIENT WAY, AS WELL AS TO PROVIDE THE BEST POSSIBLE QUALITY OF WORK:

CASTING AREA :- (Fig. 5)

CASTING YARD SHOULD NOT BE LOCATED IN AREA WHERE BASINS OR LOW LAND COULD GIVE RISE TO PONDING OF WATER IN RAINY SEASON. IN THE CASTING AREA, PRECAUTIONS ARE TO BE TAKEN UP TO PREVENT CASTED UNITS FROM SETTING SPILLTAMAGE FROM EFFECTS OF RAIN, SLOUGHET ETC. A CONCRETE, BRICK OR SIMILAR HARD FLOOR WITH PEDSTALS ASSURES THAT THE BASE PLATES OF THE CASTING ARE HORIZONTAL, PROVIDING FIRM SUPPORT TO BEAR THE REPAIRED CASTING STRESSES. SUPPORT MEMBERS, BEAM OF MINIMUM 40 CM DIA SHAFT SUPPORT THE BASE PLATES OF THE MOUNDS, THEIR PURPOSE IS TO PREVENT THEM CURING AREA -

**CURING AREA :-**

AFTER CURING ON THE BASE PLATE OF THE MOLD, THE PANELS SHALL BE TRANSPORTED TO THE CURING AREA WHERE THEY SHALL BE KEPT FOR 14 DAY MINIMUM. IN THE CURING AREA AS SHOWN IN LAYOUT PLAN OF THE PRE-CASTED PANELS MOST TO MINIMIZE THE WASTAGE OF WATER THERE SHOULD BE PROVISION TO RECYCLE THE CURING WATER AS SUGGESTED IN THE CASTING AREA LAYOUT DRAWING. THE PANELS SHALL BE ON FOUR WOODEN OR CONCRETE SPACER BLOCKS (10 x 10 x 10 CM) THE SPACER BLOCKS SHALL BE PLACED NEARLY 10 CM FROM EACH OTHER. THE PANELS SHALL BE KEPT IN THE CURING AREA UNTIL THE DATED PRODUCTION OF PANELS AS A FUTURE REFERENCE. THE SPACER BLOCKS SHALL BE REQUIRED FOR TERRAZZO AND TERRAZZO FINISH. THE ACCESS AREA SHALL ALLOW AN EASY MOVEMENT OF THE PANELS DURING THE CASTING SHOPS AND THOSE GOING TO THE STACKING AREA.

**NOTE:-**

1. PHOTOGRAPHIC CONTENTS ARE STANDARD FOR DEPENDING VARIOUS ACTIVITIES FOR GENERAL UNDERSTANDING ONLY. ACTUAL ARRANGEMENTS AT SITE MAY VARY AS PER LOCAL SITE REQUIREMENT.
2. WIDTH OF THE GEOSTRAP ARE SPECIFIED IN THE DESIGN REPORT.


**THE**

1531  
6/21/21

**CLIENT -**

**NATIONAL HIGHWAYS  
& INFRASTRUCTURE  
DEVELOPMENT  
CORPORATION LIMITED**

**CLIENT:**

AUTHORIZED ENGINEER- STUP CONSULTANTS PCL LD & AVOLKEZA CONSULTANTS PCL LD	 AVOLKEZA CONSULTANTS PCL LD
AUTHORIZED SIGNATORY	DATE

PROOF CHECKED CONSULTANT:	CE TESTING Company P.L. Ltd
AUTHORIZED SIGNATORY	DATE

DESIGN CONSULTANT	
<b>AECOM</b>	
DESIGN DIRECTOR	DATE

PROJECT-  
Four lanes of NH-37 from Panganga to  
Kaliabor Tinali CH. 297.000 Km to CH  
315.315 Km in Nagoan District in the state of  
Assam under SARDP-NE, Phase A on EPC  
Mode.

**EPC CONTRACTOR-**



**SIMPLEX INFRASTRUCTURES LTD.**  
27, SHAKTI BEHAR, KOLKATA-7, INDIA

[illegible]

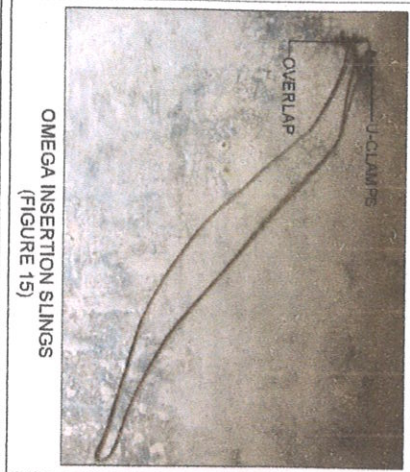












OMEGA INSERTION SLINGS  
(FIGURE 15)

STEP 1. CROSS THE PACKING STRIP THROUGH THE INSERTION SLING



STEP 2. INSERT THE PACKING STRIP IN ONE OPENING OF OMEGA SLEEVE AND PULL OUT FROM THE OTHER OPENING HOLDING THE INSERTION SLING.

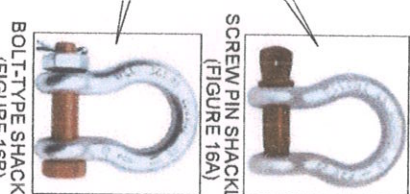


LIFTING SLINGS  
(FIGURE 16)

STEP 3. REPEAT THE PROCESS FOR ALL EXTREME CORNER OMEGA SLEEVES



STEP 4. CROSS THE LIFTING HOOKS THROUGH THE BOTH CLOSED ENDS OF INSERTION SLING AND REPEAT THE PROCESS FOR ALL EXTREME CORNER SLINGS.



BOLT-TYPE SHACKLE  
(FIGURE 16B)

STEP 5. LIFT THE PANEL WITH HYDRA CRANE



LIFTING SEQUENCE (FIGURE 17)



# OMEGA SLEEVE PANEL LIFTING ARRANGEMENT SEQUENCE

## SAFETY CAUTION :-

1. LIFTING OPERATIONS WILL BE UNDER THE CONTROL OF AN APPROPRIATE PERSON.
2. CRANE WILL BE POSITIONED ON FIRM GROUND WITH STABLES EXISTING.
3. NO PERSON WILL ENTER THE CRANE OPERATING AREA WITHOUT PERMISSION.
4. LOAD WILL NOT BE SWUNG OVER PERSONNEL.
5. LIFTING EQUIPMENT'S WILL BE SELECTED CONSIDERING THE WEIGHT AND STABILITY OF THE LOAD.
6. GUIDE ROPE WILL BE USED ON LARGE LOADS TO GUIDE THE STEADY LIFT.
7. ALL PERSONNEL INVOLVED WITH LIFTING OPERATIONS WILL WEAR SAFETY HELMETS, GLOVES AND SAFETY FOOTWEAR.
8. TELEPHONE/RADIO COMMUNICATION OR THE SYSTEM OF HAND SIGNALS WILL BE USED BETWEEN THE DRIVER AND THE SLINGERS/OPERATOR.
9. WHEN ADJUSTABLE SIGNALS WILL BE FUNCTIONING CORRECTLY AT ALL TIMES.
10. MAKE SURE THAT ALL LIFTING OPERATIONS WILL BE UNDER THE CONTROL OF AN APPROPRIATE PERSON.
11. ENSURE THAT SUPERFICIENT TRAINED BANKSMEN/SLINGERS WILL BE AVAILABLE.
12. ENSURE THAT THE AREA WITHIN THE ARC OF OPERATIONS WILL BE CLEARED OF PERSONNEL, AND PERSONNEL WILL NOT BE ALLOWED TO STAND BENEATH A SUSPENDED LOAD.
13. ENSURE THAT ALL THE EQUIPMENT USED WILL BE DATE FOR SERVING AND STATUTORY INSPECTION.
14. ENSURE THAT SUPERVISORS WILL BE TRAINED TO THE SAME IN ADDITION.
15. ENSURE THAT THE MOVEMENT OF CRANE AND HEAVY MACHINES WILL BE DONE BY TRAINED DRIVER.
16. RETRESS BEEP OF CRANE AND MACHINES SHOULD WORK PROPERLY.
17. WEAR SAFETY SHOES, HAT AND JACKET, HAND GLOVES ETC.
18. THE SLING MAY HAVE SNAPPED WIRE OR STRAND, WHICH CAN DO HARM.
19. HYDRA CRANE TO BE IN OFFSET POSITION FROM THE WORKER.
20. CHECK SLINGS FOR WEAR AND TEAR ON DAILY BASIS (BMP).

## EQUIPMENT / ACCESSORIES REQUIRED

1. HYDRA CRANE (ONE)
2. OMEGA INSERTION SLINGS (FOUR)
3. LIFTING SLINGS (TWO)
4. PACKING STRAP
5. D-SHACKLES AND HOOKS

## OMEGA INSERTION SLINGS :- (Fig. 15)

CUTTING LENGTH	=	2500 MM
SLING LENGTH	=	05 MM
OVERLAP	=	100 MM
LIFE SPAN	=	25-30 DAYS WHILE LIFTING 10 PANELS PER DAY

## LIFTING SLINGS :- (Fig. 16)

CUTTING LENGTH	=	4000 MM
ONE LIFT LENGTH	=	2000 MM
SLING DIAMETER	=	08 MM
LIFE SPAN	=	42-50 DAYS WHILE LIFTING 10 PANELS PER DAY

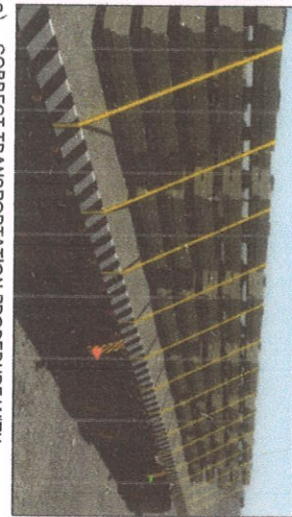
Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

CLIENT - NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED		AUTHORITY'S ENGINEER - STUP CONSULTANTS PVT. LTD. ADVISEE'S CONSULTANTS Pvt. Ltd.		PROJECT - BROAD BASED CONSTRUCTION - CESTEST - CB TESTING Company Pvt. Ltd.		DESIGN CONSULTANT - AECOM		PROJECT - Four Lanes of NH-37 from Rangapara to Kishinor Tinsukhi, 297.000 Km to CH 315.315 Km) in Nagaon District in the state of Assam under SARDU-NB, Phase A on EPC MODE.		EPC CONTRACTOR - SUMITEX INFRASTRUCTURES LTD 27, Bakshi's Road, Nagaon, Assam-781001	
APPROVED BY AUTHORITY		APPROVED BY ADVISEE		APPROVED BY PROJECT		APPROVED BY DESIGN		APPROVED BY EPC		APPROVED BY STUP	
DATE		DATE		DATE		DATE		DATE		DATE	





**FIGURE - 18)**  
**LIFTING OF PANELS**  
**NOTE: USE OF FOUR POINT SLING IS MANDATORY TO AVOID DIAGONAL CRACKING)**



**a) CORRECT TRANSPORTATION PROCEDURE WITH ADEQUATE SAFETY HARNESS**



**b) INCORRECT TRANSPORTATION PROCEDURE**  
**(FIGURE - 19)**

DO ☒

**SAFETY RULES FOR TRANSPORTATION**

DO & DON'T

DON'T ☒

- A) CONCRETE PANELS (FIG. 18)**
1. EXPOSURE TO CURING CONCRETE DUST CAN IRRITATE EYES, NOSE, THROAT AND THE UPPER RESPIRATORY SYSTEM. SHUN CONTACT MAY RESULT IN MODERATE IRRITATION TO THE SKIN. AVOIDING CONTACT OF SKIN TO SEVERE SKIN DAMAGE FROM CHEMICAL BURNS. SELECT EXPOSURE CAN LEAD TO LUNG DAMAGE. AVOID BREATHING CONCRETE DUST.
  2. NO HORSEPLAY WHILE HANDLING CONCRETE PANELS.
  3. CHECK SLINGS REGULARLY BEFORE USAGE.
  4. AVOID PROLONGED POOLING OF WATER TO AVOID BREEDING OF MOSQUITOES.
  5. PANELS SHALL BE STICKED ON FIRM GROUND.
  6. HOODS/CONCRETE BLOCKS BETWEEN PANELS SHALL HAVE PLAN.
  7. NO ONE SHOULD LAY ON THE STACK OF THE PANEL.
  8. CORRECT LIFTING METHOD SHALL BE ADOPTED REFER FIG. 18).
  9. SAFETY DISTANCE SHALL BE MAINTAINED DURING LIFTING AND TRANSPORTATION. (HANDLING CAN BE FATAL).

**HANDLING OF FACIA PANELS:- (FIG. 19)**

**DEMOULDING :-**

SIDE SHUTTER WILL BE REMOVED AFTER 6 HOURS (MAY BE EXTENDED DURING WINTER CONDITIONS) AND THE PANELS WILL BE LIFTED FROM THE BASE PLATE AFTER 20 HOURS OR ATTAINING OF CURING STRENGTH OF MINIMUM 10 MPa.

**REMOVAL OF THE PANEL FROM THE BASE PLATE :-**

- THE PANEL SHALL BE LIFTED BY MEANS OF A FOUR POINT SLING USING AN APPROPRIATE CAPACITY OVERHEAD GANTRY. FOR LEFT-HAND CRANE IT IS TO BE NOTED THAT THE PANELS SHALL BE LIFTED HORIZONTALLY ONLY WITH CONNECTOR TO AVOID ANY POSSIBLE DAMAGE TO GEOMEGA CONNECTOR AND SHIFTING AT THIS STAGE SHALL BE AVOIDED. THE EFFECTIVE LENGTH OF SLING USED FOR HANDLING PANELS SHALL BE MINIMUM 3 TO 4M.

**SAFETY RULES FOR TRANSPORTATION :- (FIG. 19)**

1. OVERALL WORKING CONDITION, FITNESS CERTIFICATE OF THE TRAILER AND OPERATOR LICENSE SHOULD BE CHECKED PRIOR TO USE IT FOR TRANSPORTATION.
  2. THE NUMBER OF PANELS TO BE SHIPPED IN ONE TRIP SHOULD BE FINALISED BASED ON THE LOAD CAPACITY OF THE VEHICLE/TRAILER.
  3. PLACED SHOULD BE FREE FROM ANY DAMAGE WHICH THE PANEL STICKS TO BE PROPER WOODEN DUNNAGE SHOULD BE PROVIDED ON THE TRAILER BED BEFORE PLACING THE PANEL STACK.
  5. ONCE A STACK IS PLACED ON THE TRAILER BED IT SHOULD BE TIED TO THE MOUNTED LOAD.
  6. FLAMMABLE MATCHES BELT / SLING, NEVER USE GEOTEXTILE FOR TIED THE MOUNTED LOAD.
  7. MINIMUM STICK MAXIMUM THE NUMBER OF PANELS SHALL BE USED. IN NO CIRCUMSTANCES THE PANEL IN SINGLE STACK SHALL BE MORE THAN FIVE.
- SAFETY RULES FOR STACKING:-**
1. THE STACKS OF PANELS SHOULD BE PLACED ON A LEVEL AND FIRM GROUND TO AVOID ANY DIAGONAL CRACKING.
  2. PROPER DRAINAGE AND RECTIFICATION OF CURING WATER SHOULD BE ENSURED IN CURING AREA TO AVOID ANY WATER STAGNATION.

**STACKING AREA:-**

ENSURE STACKING AREA IS WELL COMPACTED TO PREVENT UNEVEN SETTLEMENT AND DAMAGES CAUSED DURING TRANSPORTATION. THE DIMENSIONS OF THIS AREA SHALL DEPEND UPON THE DAILY PRODUCTION OF CONCRETE PANELS, AS RECOMMENDED BY THE LOCAL AUTHORITY. THE AREA SHALL BE FENCED OFF AND RECOMMENDED THE WHOLE AREA SHALL BE MARKED WITH RED LINES. THE EFFORT MUST BE TAKEN IN CALCULATION OF REQUIRED STOCK OF PANELS BASED ON FRONT AVAILABILITY FOR AVOIDING SHORTAGES AT A LATER STAGE. THE STACKING AREA MAY BE DIVIDED INTO AS MANY SECTIONS AS THERE ARE TYPES OF PANELS FOR EASY IDENTIFICATION AND TRANSPORTATION.

**STACKING OF FACIA PANELS:-**

STACKING IN THE CURING AREA :- (FIG. 20 & 21)

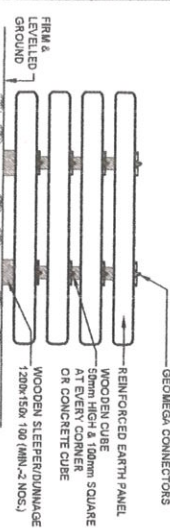
THE STACKS OF PANELS SHALL BE PLACED ON A HORIZONTAL CONCRETE SURFACE. THE SURFACE SHALL HAVE BEEN PREVIOUSLY COMPACTED. THE MAXIMUM NUMBER ALLOWED IS 4 (FOUR) PANELS IN ONE STACK. PANELS SHALL BE PLACED IN ORDER TO PREVENT THE CONNECTION OF RUBBER PADS OR DUE TO IS DESIRABLE THAT SOME PLASTIC / RUBBER PADS SHALL BE FIXED ON THE TOP OF WOODEN BLOCKS TO PREVENT SPOTS ON THE FACE OF THE PANELS (OPT).

**STACKING IN THE YARDS :-**

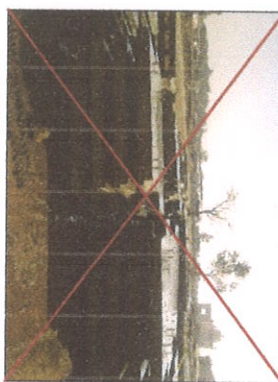
THE STACKS OF PANELS MUST BE PLACED ON A HORIZONTAL COMPACTED SURFACE. THE USE OF RUBBER/PLASTIC PADS IS RECOMMENDED IF THERE IS ANY RISK OF RAIN DURING THE STORAGE PERIOD, WHICH IS THE MOST PROBABLE CASE (OPTIONAL IF VISIBLE MARKS ARE SEEN). THE PANELS CAN BE STORED IN STACKS LESS THAN 400S.

**TRANSPORTATION OF FACIA PANELS:-**

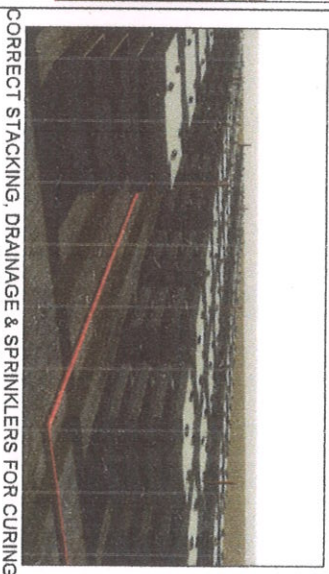
THE PANELS SHOULD BE TRANSPORTED BY A VEHICLE WITH A RATCHET BELT OR RACKING, AS WELL AS TO PREVENT ANY DAMAGE TO THE PANELS DURING TRANSPORTATION. SEPARATING EACH BY SUITABLE PADDING TO PREVENT BRUISES/TRANSIT DAMAGES. PRIOR TO THEIR ERECTION THE PANELS SHALL BE STOKED IN A SAFE AND SECURE AREA. EACH STACK OF PANELS SHOULD BE TIED WITH VEHICLE BY A RATCHET BELT TO PREVENT ANY SLIPAGE OR TIPPING.



**STACKING OF PANELS**



**STACKING AT STACKING YARD**



**CORRECT STACKING, DRAINAGE & SPRINKLERS FOR CURING**  
**(FIGURE - 21)**

KEEP A NOMINAL GAP BETWEEN TWO STACKS OF PANELS SO THAT CURING WIND CAN MOVE EASILY WITH WATER FROM ONE SIDE TO ANOTHER SIDE OF THE STACKED PANELS.

DON'T ☒

DO ☒

<b>CLIENT :-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED		<b>AUTHORITY'S EMPLOYER:-</b> STPD CONSULTANTS PVT. LTD. AVAREZZA CONSULTANTS PVT. LTD.		<b>PROJECT:-</b> Four Laning of NH-37 from Rangagum to Kolibor Tinalich, 297,000 km to CH 313.313 km in Nagpur District in the state of Assam under SANDP-NB, Phase A on EPC Mode.	
<b>AUTHORITY'S SIGNATORY</b>		<b>DESIGN CONSULTANT:-</b> AECOM		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LTD	
<b>APPROVED SIGNATORY</b>		<b>DESIGN DIRECTOR</b>		<b>APPROVED SIGNATORY</b>	
<b>DATE</b>		<b>DATE</b>		<b>DATE</b>	
<b>APPROVED SIGNATORY</b>		<b>DATE</b>		<b>DATE</b>	

Resident Engineer  
Nagpur Division  
11/06/2019

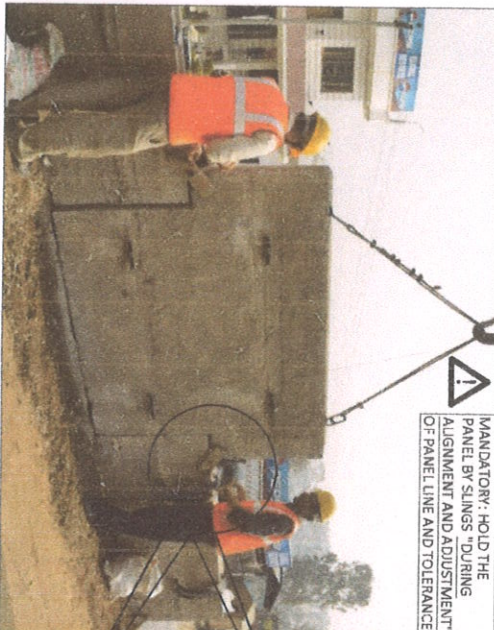




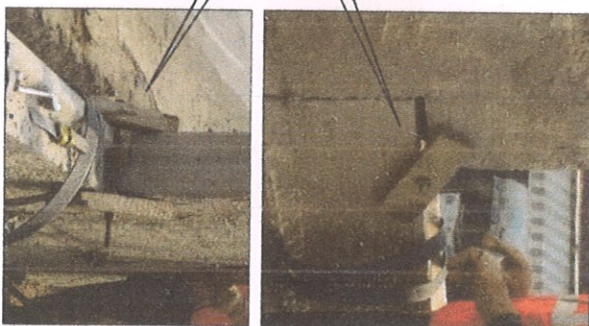




a). INSTALLATION OF PANELS



a). FIXING WOODEN CLAMPS / ALIGNMENT OF PANEL WHILE CRANE HOLDING THE PANEL.



(FIGURE - 24)

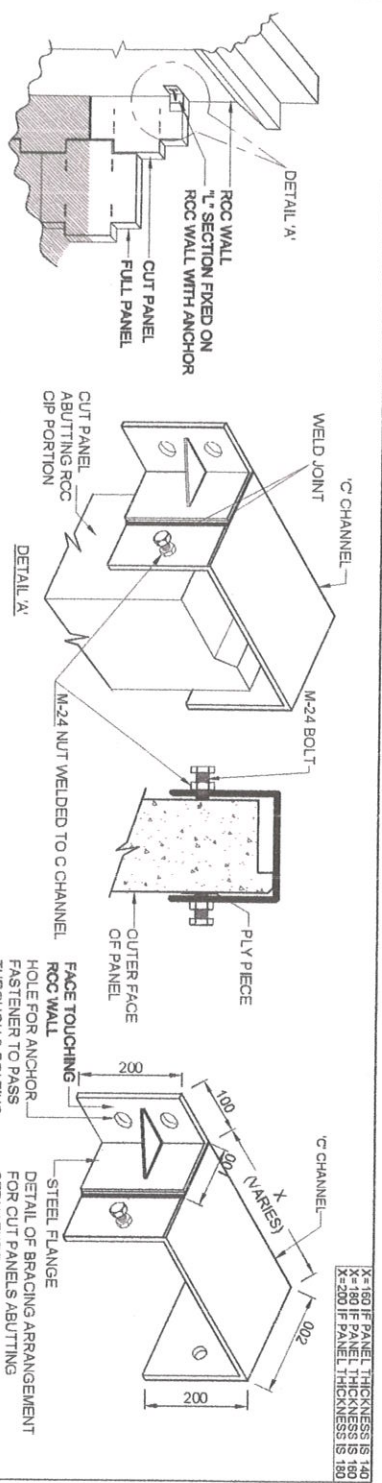
MANDATORY: HOLD THE PANEL BY SLINGS "DURING ALIGNMENT AND ADJUSTMENT" OF PANEL LINE AND TOLERANCES

SAFETY RULES TO BE FOLLOWED AT SITE

THE SAFE WAY IS THE ONLY WAY

NOTES:-

1. THE WORKER SHOULD STAND ON EITHER SIDE OF THE PANEL, WHILE INSTALLATION (FIG. 23).
2. THE WORKERS SHOULD HOLD THE PANEL, TO PLACE IT IN CORRECT POSITION. NO ONE SHOULD ALLOWED TO STAND IN FRONT OF PANEL OR REAR FACE OF THE PANEL.
3. AS SOON AS THE PANEL IS PLACED IN POSITION, THE WOODEN CLAMPS SHALL BE FIXED ON BOTH SIDES OF THE PANEL, THE CRANE SHOULD KEEP HOLDING THE PANEL THROUGH SLINGS (FIG. 23).
4. IN ANY CIRCUMSTANCES SLING SHALL NOT BE DETACHED FROM THE PANEL DURING THIS ACTIVITY.
5. FURTHER THE ALIGNMENT AND IS RELAY OF PANEL SHOULD BE DONE WITH THE HELP OF CHAINMAN WITHOUT DETACHING THE WOODEN CLAMPS. THE CRANE SHOULD BE RELEASED ONLY AFTER COMPLETION OF ALIGNMENT AND THE CLAMPS ARE FULLY TIGHTENED TO SECURE THE PANEL AS SHOWN IN (FIG. 23).
6. DURING ALIGNMENT THE WOODEN CLAMPS SHALL NOT BE REMOVED FROM ITS ORIGINAL POSITION.
7. THE PANEL SHOULD BE KEPT HELD BY CRANE ALL THE TIME DURING ALIGNMENT PROCESS.



ARRANGEMENT FOR RESTRICTION OF INWARD / OUTWARD PANEL FALL FOR CUT PANEL-ABUTTING ANY STRUCTURE (FIGURE - 25)

Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

CLIENT -		NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED	
AUTHORITATIVE ENGINEER -		STUP CONSULTANTS PVT. LTD.	
PROJECT CONSULTANT -		AYOJEYA CONSULTANTS PVT. LTD.	
PROJECT -		Four Lanes of NH-37 from Rangapara to Ishabari Tinaluchi, 297.000 Km to CH 315.315 Km in Nagaon District in the state of Assam under SARDP-NR, Phase A on EPC Mode.	
PROJECT CONTRACTOR -		SIMPLEX INFRASTRUCTURES LTD	
DESIGN CONSULTANT -		AECOM	
DESIGNER -		LATE	
CHECKER -		LATE	
APPROVER -		LATE	
DATE		11.05.2019	
REVISION NO.		07/12	
REVISION		DRO. NO. - TANDITTEGOMEGACHAD1	
REVISION		REVISION	



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**DON'T**



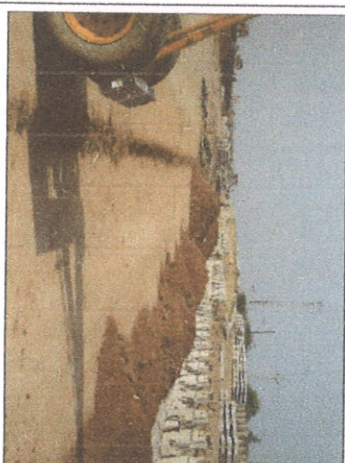
a). CORRECT PLACEMENT OF BACKFILL AT LEAST 3-4 m AWAY FROM PANELS.



b). INCORRECT BACKFILL CLOSE TO PANELS



**LAYING OF PET POLYMERIC STRIP AND  
BACKFILL & WINDROWING  
(FIGURE - 36)**



**TYPICAL BACKFILL PLACING AND SPREADING  
(FIGURE - 38)**



COMPACTION OF SOIL BEYOND 1.5m  
WIDE ZONE FROM PANELS  
(FIGURE - 37)

1. MOVEMENT OF HEAVY MAINTENANCE OR CONSTRUCTION PLANTS (MASS  $\geq 10$  T) WITH IN 1.5 M DISTANCE FROM PANELS COULD BE ALLOWED.
2. STRUCTURAL DAMAGE OF THE WALL FACING AND OVERSTRESSING OF THE REINFORCEMENT LAYERS.
3. THE GRADING SHALL SHOW A SLOPE OF 5% (FROM WALL TO INSIDE) IN ORDER TO ENSURE PROPER DRAINAGE OF THE EXISTING SIDE OF THE PANELS, A MINIMUM OF 1% SLOPE OF 10% AT OPTIMUM SLOPE, WAS REQUIRED TO OBTAIN THE REQUIRED DRAINAGE.
4. WITH FRESH WATER, FOR DETAIL REFER TO WALL CROSS-SECTIONAL ELEVATION DRAWINGS.
5. IN NO CIRCUMSTANCES WALL SHOULD BE PUSHED TOWARD THE PANELS OR DAMAGED IN THE AREA IMMEDIATELY BEYOND THE PANELS BY DRIPPING FROM ABOVE.
6. BEFORE STARTING ANY COARSE PANEL PLACEMENT, CHECK THE PREVIOUS COURSE FOR ANY MISALIGNMENTS, UNIFORM PANEL MOVEMENT AND ITS CORRECTION.
7. DO NOT START ACTIVITIES ON WET BACKFILL (E.G. DUE TO HEAVY RAIN); THE BACKFILL SHALL BE ALLOWED TO DRY TO OPTIMUM MOISTURE CONTENT (OMC) AND THEN TESTED FOR ADEQUATE COMPACTION REQUIREMENT.

**COMPACTION :-** (Fig. 36,37 & 38)

1. BEFORE DECOMPRESSION IS STARTED PLACED RIGIDS SO AS NOT TO ALLOW ANY OUTWARD MOVEMENT OF PANELS FOR 2 LAYERS, WEIGHS MUST ALSO BE APPLIED TO THE COMPRESSOR EQUIPMENT.
2. THE COMPRESSOR EQUIPMENT SHALL BE POSITIONED 15 M OF THE WALL, SHOULD BE A VIBRATORY ROLLER OR PLATE WEIGHING NOT MORE THAN 15 T, CAPACITY ENSURING DENSITY OF MIN. 90% OF MAXIMUM ROLLER OR DENSITY AS PER MINOR CLAUSE NO. 31163.
3. BEYOND 15m ROLLER SHALL BE USED SUBJECT TO SATISFACTORY PERFORMANCE.
4. BACKFILL COMPACTOR SHALL BE PERFORMED IN SUCH A WAY THAT THE COMPACTOR SHALL MOVE IN A DIRECTION PARALLEL TO THE WALL, FACING PANELS AND WORK TOWARD THE END OF THE SOIL, REINFORCEMENT MAY PROCEED BY WORKING IN 20' TO ACHIEVE MIN. 95% OF MAXIMUM MODIFIED PROCTOR DENSITY.
5. THE COMPACTOR EQUIPMENT ROLLS PARALLEL TO THE WALL, FACING THE COMPACTOR STARTS AT LEAST 1.5 M FROM THE WALL, AND WORKS TOWARDS THE END OF THE REINFORCEMENT.
6. REINFORCEMENT TIES UNTIL THE TOP OF THE WALL IS REACHED, AS SOON AS THE REINFORCEMENT TIES ARE REACHED, THE COMPACTOR SHALL BE BACKFILLED. THERE SHOULD NOT BE A LEAD OF MORE THAN TWO SHOULDER STRUCTURE, SINCE THE DEPLY MAY LEAD TO DRYING OF SOIL, DEB AND THE COMPACTOR MAY BE LOST. FURTHER MOVEMENT IN PANELS MAY BE OBSERVED IF LEFT UNATTENDED EXCESS OF TWO DAYS.
7. CONSTRUCTION TOLERANCE FOR VERTICAL PANELS:
  - A) VERTICALLY
    - ± 2mm PER METER HEIGHT
  - B) BOUNG VERTICALLY & BOWING
    - ± 2mm IN 4.5 M TEMPLATE
  - C) STEPS AT JOINTS
    - ± 10mm
  - D) ALIGNMENT ALONG TOP (HORIZONTAL)
    - ± 5mm FROM REFERENCE ALIGNMENT.
  - E) VERTICAL ROTATION
    - ± 15° FROM REFERENCE ALIGNMENT.
  - F) JOINTS
    - ± 15° FROM HORIZONTAL, 2mm

**NOTE:**

1. PHOTOGRAPHIC CONTENTS ARE TYPICAL FOR DEEPENING VARIOUS ACTS MAY BE OBSERVED. UNDERSTANDING ONLY, ACTUAL ARRANGEMENTS AT SITE MAY VARY.
2. TOP TO BOTTOM PER FOR EACH ELEMENT, ELEMENT SHALL BE REMOVED BY 200 mm PER FOR EACH ELEMENT.
3. AT A DISTANCE OF 1125 mm FROM REAR FACE OF PANEL, IN ALL THE LAYERS SOIL REMOVED ELEMENT SHALL BE LAD WITH A TRENCH WHICH SHALL BE LATER BE FILLED WITH SOIL. THIS PROCESS WILL HELP IN RETAINING THE REINFORCING ELEMENT AND PROVIDE ADDITIONAL RESISTANCE TO PULLOUT.

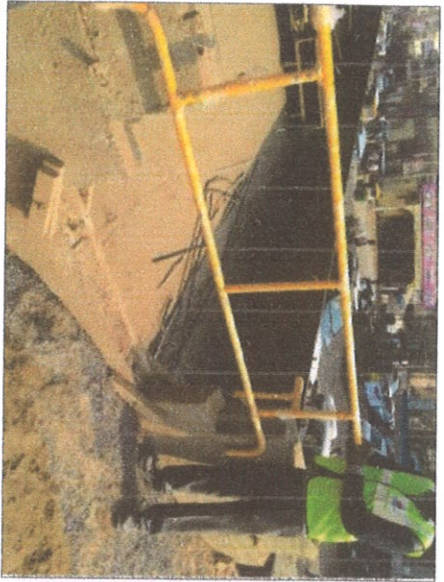
Resident Engineer  
STUP Consultants Pvt  
Nagpur, M.S.

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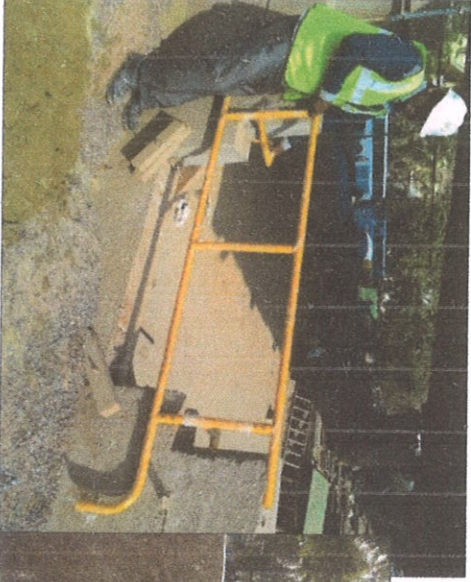


# PROTECTION AGAINST FALLING OF THE WORKERS FROM HEIGHT :

DURING THE INSTALLATION OF THE FACING PANELS THERE IS A RISK OF FALL OF THE WORKERS. THIS IS WHY THE USE OF SAFETY BARRIERS IS MANDATORY ALONG WITH THE USE OF A LIFELINE AND SAFETY HARNESS.



PLACE THE WALL PROTECTION BARRIER IN BETWEEN THE TWO HALF FILLED PANELS IN SUCH A WAY SO THAT ITS SIDE PIPES SHOULD REST ON THE SHOULDERS OF THOSE PANELS.

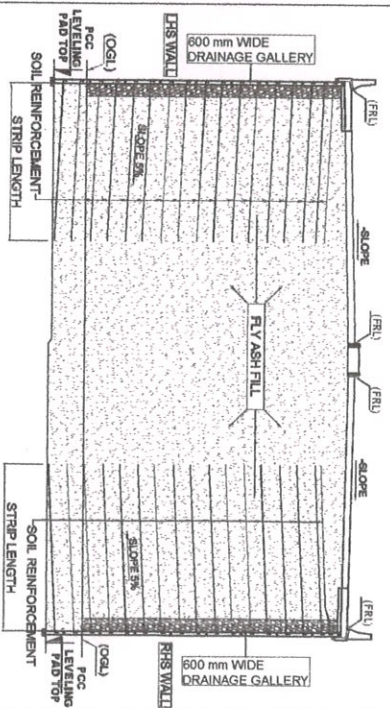


TYPICAL SAFETY BARRIER-PLACING AT SITE

FIGURE - 39

Resident Engineer  
Srip Consultants Pvt. Ltd.  
Nagaon, Assam

# SAFETY NOTES IN CASE OF FLY ASH AS FILL MATERIAL



TYPICAL CROSS SECTION  
FIGURE - 40

1. LAYING AND COMPACTION ACTIVITY MUST BE DONE WHILE THE MATERIAL IS SATURATED.
2. FLY ASH SHALL NOT BE DRY IN ANY CONDITION. IN SUCH SITUATIONS, NO WORKERS SHOULD BE ALLOWED TO CONTINUE WITH THEIR WORK. WORK CAN RESTART ONLY AFTER WATER SPRINKLING IS DONE.
3. ENSURE THAT EVERY EMPLOYEE MUST WEAR FFP2 DUST MASK BEFORE COMMENCING ACTIVITIES IN PROXIMITY/ADJACENCY OF FLY ASH. IT IS A MANDATORY REQUIREMENT NOT TO START WORK WITHOUT FFP2 DUST MASK.

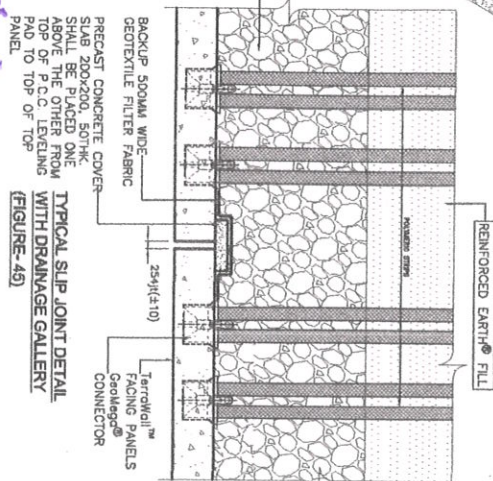
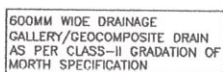
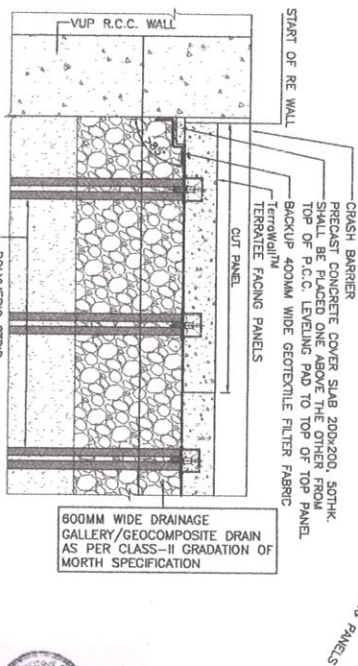
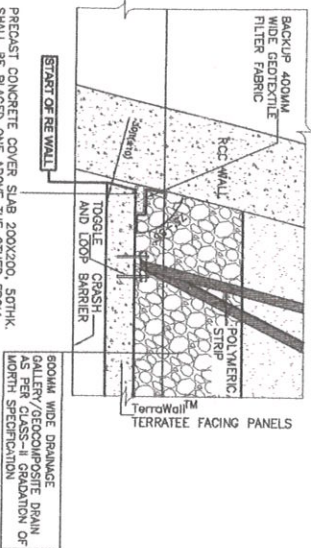
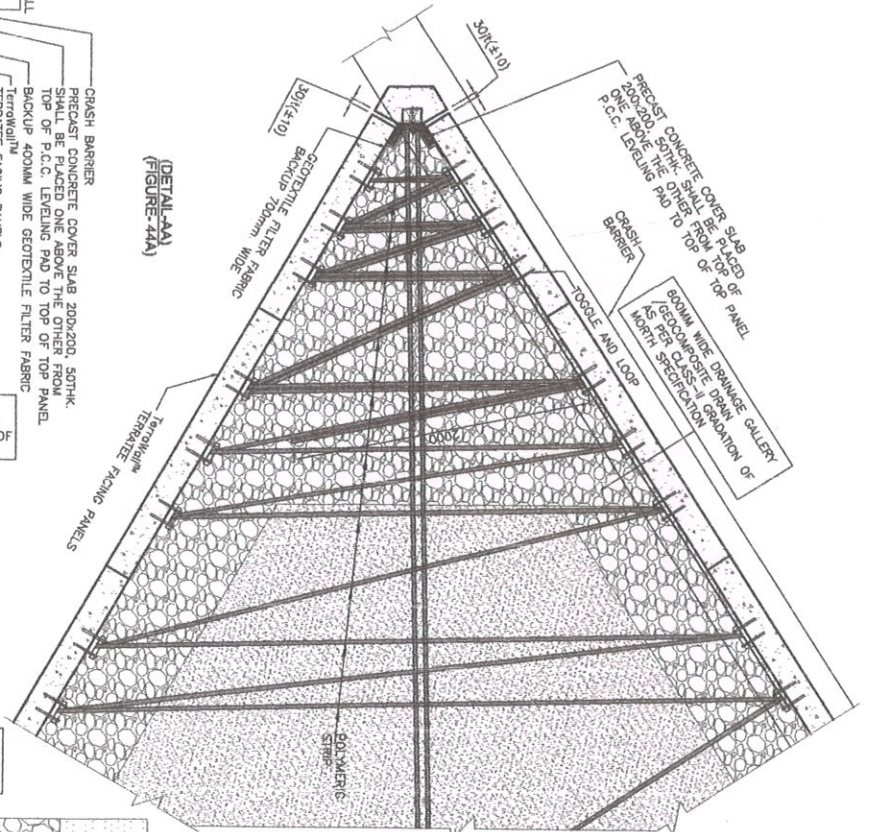
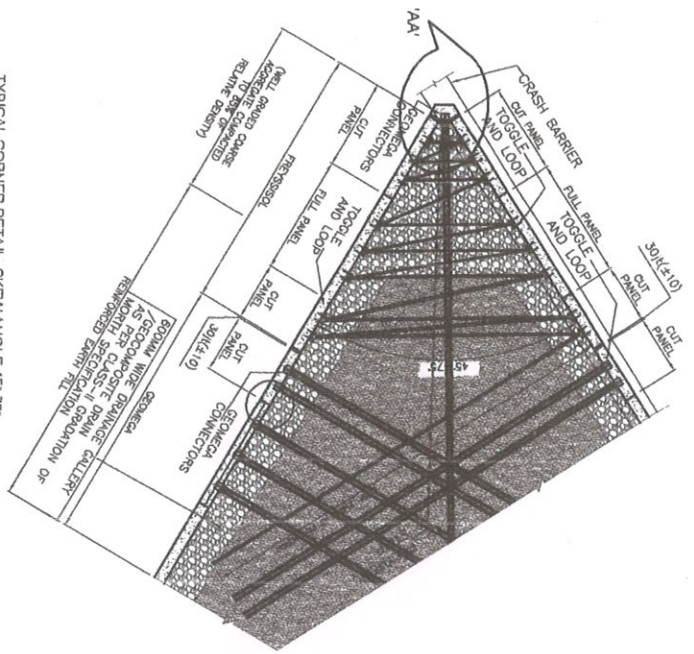


FFP2 DUST MASK  
FIGURE - 41

CLIENT :-		NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED	
AUTHOIRTY ENGINEER:-		Srip Consultants Pvt. Ltd.	
SPECIALIST ENGINEER:-		Srip Consultants Pvt. Ltd.	
PROJECT ENGINEER:-		Srip Consultants Pvt. Ltd.	
DESIGN CONSULTANT:-		AECOM	
EPC CONTRACTOR:-		SIMPLEX INFRASTRUCTURES LTD	
PROJECT:-		Four Lanes of NH-37 from Bongaigaon to Kailash Tinsukhi, 297.000 Km to CH 315.315 Km in Nagpur District in the state of Madh.	
DRAWING NO:-		11/02/2018	
DRAWING STATUS:-		ISSUED FOR APPROVAL	







- NOTE:-**
1. IF THE ANGLE BETWEEN RE WALL PANEL OF APPROACHES AND CLOSING WALL/ ROC WALL OF STRUCTURE IS GREATER THAN 85° STANDARD ARRANGEMENT OF GEOWEBA & GEOSTRAP WILL BE PROVIDED AS SHOWN IN FIGURE NO. 42
  2. IF THE ANGLE BETWEEN RE WALL PANEL OF APPROACHES AND CLOSING WALL/ ROC WALL OF STRUCTURE IS LESS THAN 85° AND GREATER THAN 75° (RE/SSLO & GEOWEBA ARRANGEMENT) WILL BE PROVIDED AS SHOWN IN FIGURE NO. 43
  3. IF THE ANGLE BETWEEN RE WALL PANEL OF APPROACHES AND CLOSING WALL/ ROC WALL OF STRUCTURE IS LESS THAN 75° AND GREATER THAN 45° (RE/SSLO & GEOWEBA ARRANGEMENT) WILL BE PROVIDED AS SHOWN IN FIGURE NO. 44
- IN THIS ARRANGEMENT DUMMAY WALL SHALL BE BUILT ADJACENT TO WALL. IN THIS ARRANGEMENT GEOSTRAP WILL PASS FROM ONE CONNECTOR OF APPROACH WALL AND THEN ONE CONNECTOR OF CLOSING DUMMAY WALL. THEN AGAIN FROM APPROACH WALL AND THEN CLOSING / DUMMAY WALL TILL THE REQUIRED LENGTH OF GEOSTRAP WILL BE ACHIEVED AS PER DESIGN REQUIREMENT. THIS PROCESS WILL BE REPEATED FOR EACH LAYER FROM BOTTOM PANEL TO TOP PANEL. PLEASE ENSURE THAT FREE LENGTH OF GEOSTRAP OUT SIDE THE CONNECTOR SHALL BE MINIMUM 3 MTRS AS SHOWN IN FIGURE NO. 44A
- SLIP JOINT SHALL BE CONSTRUCTED AS PER FIGURE NO. 44B



# QUALITY ASSURANCE PLAN

## ANNEXURE-1

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>CONCRETE</b>					
A	Workability/Slump Test	25-75 mm	Every Batch of concrete at point of delivery	Main Contractor	IS 456:2000
B	Compressive Strength	As per Grade of concrete	Three test specimen for every batch of concrete	Main Contractor	IS 456:2000
C	Assessment of Lifting Strength	10 Mpa	One test every fortnight	Main Contractor	IS 516:1959
<b>II STEEL REINFORCEMENT (PRECAST PANEL)</b>					
A	Tensile Strength	As per Grade of Steel	On approval of Source/ Starting of Work, New test should be conducted on every change of source	Main Contractor	IS 1786:2008
B	Elongation	As per Grade of Steel	On approval of Source/ Starting of Work, New test should be conducted on every change of source	Main Contractor	IS 1786:2008
C	Chemical Composition	As per Grade of Steel	On approval of Source/ Starting of Work, New test should be conducted on every change of source	Main Contractor	IS 1786:2008

## ANNEXURE-2

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>III a) Geo-Composite</b>					
1	Tensile Strength	≥ 16 N/m	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Armee/As per contract	RECO India Specification in general Arrangement of Panel Accessories Drawing
2	CRI Puncture Resistance	≥ 3000 N			
3	Mass per unit area	2.710 g/m <sup>2</sup>			
4	In-Plane Permeability (Hydraulic Gradient, I=1 at 100 KPa pressure)	≤ 0.055 l/m			
5	In-Plane Permeability (Hydraulic Gradient, I=1 at 200 KPa pressure)	≤ 0.45 l/m			

## ANNEXURE-3

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
1	Ultimate Tensile Strength in Machine Direction	As per Manufacture's Specification	One Test for 10000 Sqm of RE Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of RE Wall, Four Test for More than 50000 Sqm of RE Wall	Terre Armee/As per contract	ASTM D 4595
2	Strain at maximum load	As per Manufacture's Specification			ASTM D 6537

## ANNEXURE-4

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
1	Angle of Internal Friction	As Per Design/Contract	Two test for every structure (two approaches) collected randomly or every change of source	Main Contractor	IS 2720
2	Gradation	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
3	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
4	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
5	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720

## b) Geo textile for Geo-Composite

1	Permeability	≥ 0.5 per sec	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Main Contractor	ASTM D4491 or IS 14324
2	Apparent Opening Size	≤ 0.43 mm			ASTM 4751 or IS 14294
<b>IV Non-woven polypropylene (Geotextile)</b>					
A	Tear Strength	0.18 KN	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Armee/As per contract	ASTM D 6533
B	CRI Puncture	1178 N			ASTM D 6241
C	Permeability	2.00 s <sup>-1</sup>			ASTM D 4491

## V Geotextile Shearers

A	Physical Dimension	Refer to tolerance	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Armee/As per contract	RECO India Specification in general Arrangement of Panel Accessories Drawing
B	Leakage	No Leakage of water			Not Applicable

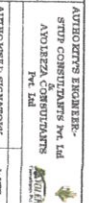
## ANNEXURE-5

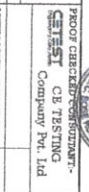
S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
1	Ultimate Tensile Strength in Machine Direction	As per Manufacture's Specification	One Test for 10000 Sqm of RE Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of RE Wall, Four Test for More than 50000 Sqm of RE Wall	Terre Armee/As per contract	ASTM D 4595
2	Strain at maximum load	As per Manufacture's Specification			ASTM D 6537

## ANNEXURE-6

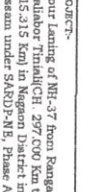
S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
1	Angle of Internal Friction	As Per Design/Contract	Two test for every structure (two approaches) collected randomly or every change of source	Main Contractor	IS 2720
2	Gradation	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
3	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
4	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720
5	Angle of Internal Friction	As Per Design/Contract	One test for every 3000 m <sup>2</sup> OR every change of source	Main Contractor	IS 2720

CLIENT -  
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

APPROVED BY:   
Resident Engineer  
STUP Consultants Pvt. Ltd.

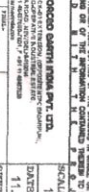
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STUP Consultants Pvt. Ltd.

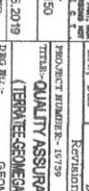
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Resident Engineer  
STUP Consultants Pvt. Ltd.

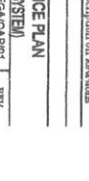
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STUP Consultants Pvt. Ltd.

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Resident Engineer  
STUP Consultants Pvt. Ltd.

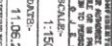
APPROVED BY:   
Resident Engineer  
STUP Consultants Pvt. Ltd.

Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

  
Resident Engineer  
STUP Consultants Pvt. Ltd.

REVISIONS

Sl. No.	Date	Description
1	11.06.2019	ISSUED FOR APPROVAL

DATE: 11.06.2019  
BY:   
TITLE: QUALITY ASSURANCE PLAN  
PROJECT: STUP Consultants Pvt. Ltd.  
DRAWING NO.: STUP/CONS/001/001  
REV: 01/01



# QUALITY ASSURANCE PLAN

## ANNEXURE-1

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>I CONCRETE</b>					
A	Workability/Slump Test	25-75 mm	Every Batch of concrete at point of delivery	Main Contractor	IS 456:2000
B	Compressive Strength	As per Grade of concrete	Three Test specimen for every batch of concrete	Main Contractor	IS 456:2000 IS 516:1959
C	Assessment of Lifting Strength	10 Mpa	One Test every fortnight	Main Contractor	IS 456:2000 IS 516:1959
<b>II STEEL REINFORCEMENT (PRECAST PANEL)</b>					
A	Tensile Strength	As per Grade of Steel	On approval of source/ Starting of Work. New Test should be conducted on every change of source	Main Contractor	IS 1786:2008
B	Elongation	As per Grade of Steel	On approval of Source/ Starting of Work. New Test should be conducted on every change of source	Main Contractor	IS 1786:2008
C	Chemical Composition	As per Grade of Steel	On approval of Source/ Starting of Work. New Test should be conducted on every change of source	Main Contractor	IS 1786:2008

## ANNEXURE-2

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>I Lifting Anchor</b>					
A	Tensile Strength	420 Mpa	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Amee/As per contract	Tand Specification in General Arrangement of Panel Accessories Drawing
B	Yield strength	300 Mpa			
C	Elongation	15%			
<b>II EPDM Pad</b>					
A	Shore hardness	85 ± 5 IRDH	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth	Terre Amee/As per contract	Tand Specification in General Arrangement of Panel Accessories Drawing
<b>III Non-woven polypropylene (Geotextile)</b>					
A	Tear Strength	0.18 KN	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Amee/As per contract	ASTM D 4533
B	CBR Puncture	1178 N			ASTM D 6241
C	Permeability	2.00 S <sup>-1</sup>			ASTM D 4491

<b>IV GeoOmega Sleeves</b>					
A	Physical Dimension	Refer Tolerance in Panel Reinforcement Drawing	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Amee/As per contract	Tand Specification in General Arrangement of Panel Reinforcement drawing
B	Leakage	No Leakage of water			

## ANNEXURE-3

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>I Polymer Strip</b>					
1	Ultimate Tensile Strength in Machine Direction	Polymeric strip strength as per Manufacturer's specification	One Test for 10000 Sqm of Reinforced Earth Wall, Two Test for More than 10000 Sqm but less than 50000 Sqm of Reinforced Earth Wall, Four Test for More than 50000 Sqm of Reinforced Earth Wall	Terre Amee/As per contract	ASTM D 6637 or ISO 10319
2	Strain at maximum load	As per Manufacturer's Specification			ASTM D 6637 or ISO 10319

## ANNEXURE-4

S/No	Testing Parameters	Acceptable Limits	Frequency	Responsibility	Code Applicable
<b>I Selected Fill material (Soil)</b>					
1	Angle of Internal Friction	As Per Design/Contract (Approaches) collected randomly or every change of Source	Two test for every structure (Two approaches) collected randomly or every change of Source	Main Contractor	IS 2720
2	Gradation	≥ 2	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
a	Coefficient of uniformity	≤ 15%	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
b	75 μ passing	≤ 10%	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
c	Plasticity Index	≤ 6	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
3	Bulk Density of Soil (T <sub>max</sub> )	As Per Design/Contract	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
4	pH	≤ 5.5	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
<b>II Filter Media</b>					
1	Gradation	As per NORTH Table 300-3 Grade II	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720
2	pH	≤ 5.5	One test for every 3000 M <sup>3</sup> OR every change of Source	Main Contractor	IS 2720

**CLIENT -**  
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

**AUTHORIZING ENGINEER -**  
9700 CONSULTANTS Pvt. Ltd  
AVDLEZA, CHENNAI  
Pvt. Ltd

**PROJECT CHECKED/CONSENTED -**  
CB TESTING Company Pvt. Ltd

**DESIGN CONSULTANT -**  
**AECOM**

**PROJECT -**  
Four Lanes of NH-37 from Bangalore to Kollahur Taluk, 497.000 Km to CH 315.315 Km in Nagpur District in the state of Madh.

**APPROVED SIGNATORY** **LATE** **AUTHORIZED SIGNATORY** **LATE** **DESIGN DIRECTOR** **LATE** **Modr.**

**ERC CONTRACTOR -**  
SINPLEX INFRASTRUCTURES LTD  
27, BAKKAPALLE ROAD, CHENNAI-600042, INDIA

**QUALITY ASSURANCE PLAN**  
11.06.2019  
SINPLEX INFRASTRUCTURES LTD  
CHENNAI

**REVISIONS**  
NO. DATE BY REASON

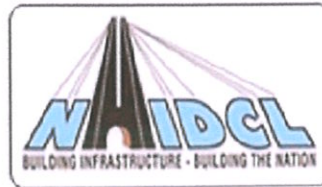
**APPROVED BY**  
01/01

Resident Engineer  
SINPLEX INFRASTRUCTURES LTD  
CHENNAI



Simplex letter No - 75, 08/03/18

Approved letter No - 78, 05/05/18



## NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

09.03.2018

Four Laning of NH – 37 from Rangagara to Kaliabor Tiniali (Ch: 297.000 Km to Ch:315.315 Km of NH-37) in Nagaon District in the State of Assam  
under SARDP – NE, Phase A, on EPC Basis

PSC Grinder  
Approved.



Bridg Engineer

Design approved by STUP(HO)

Drawing is to be reviewed  
as per design

7.5.2018

Received on 07/05/2018

Chatter  
07/05/2018

### FLYOVER

(AT DESIGN CH.314+992)

SUPERSTRUCTURE DWGS

CONTRACTOR:-



SIMPLEX INFRASTRUCTURES LIMITED

AUTHORITY'S ENGINEER:-



STUP Consultants P.Ltd

&

Ayoleeza Consultants P.Ltd

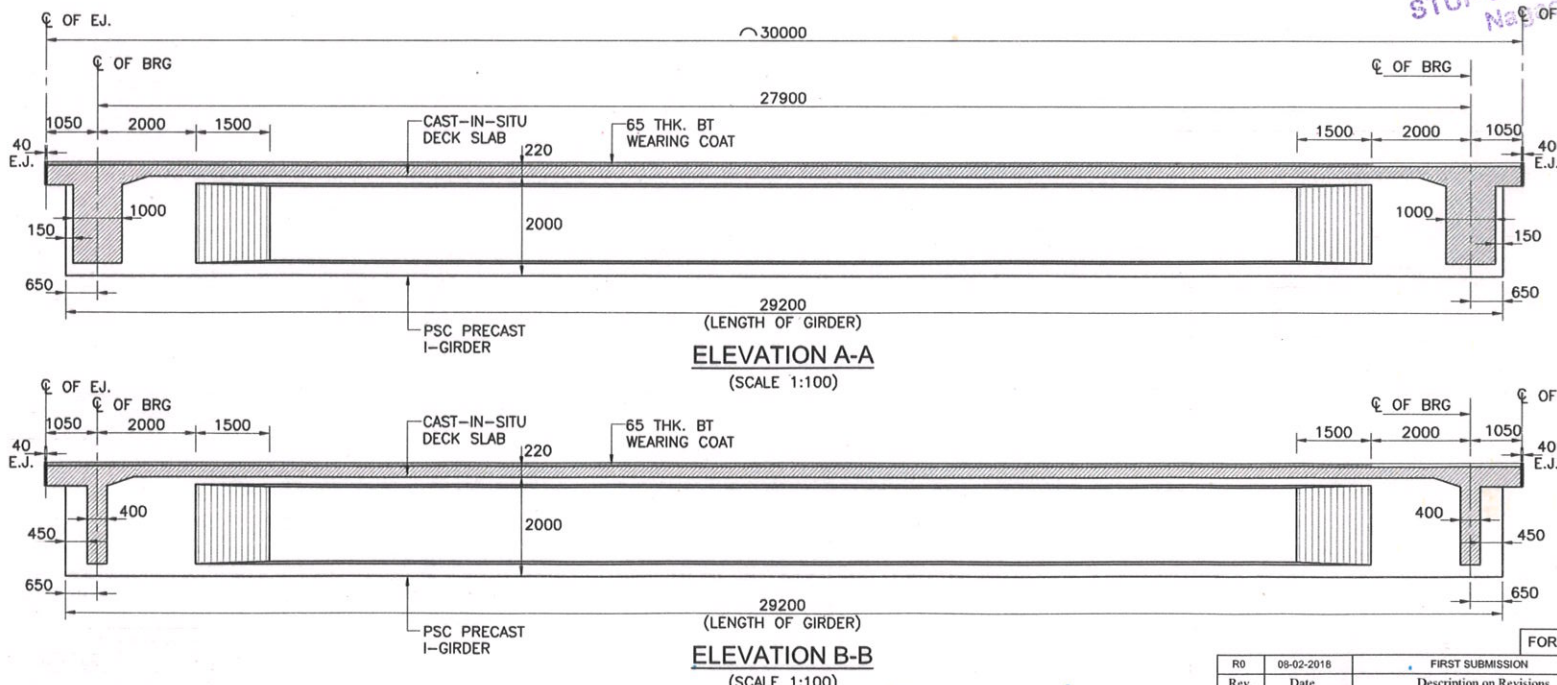
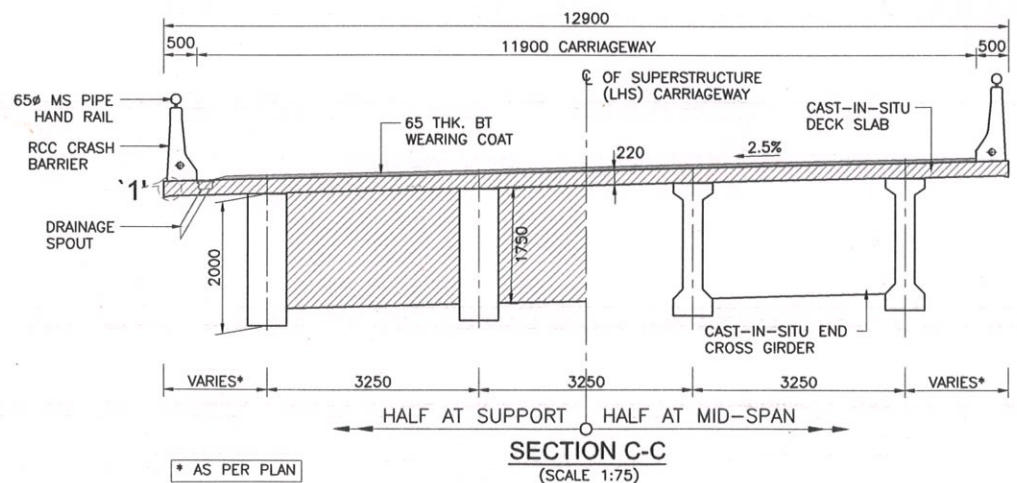
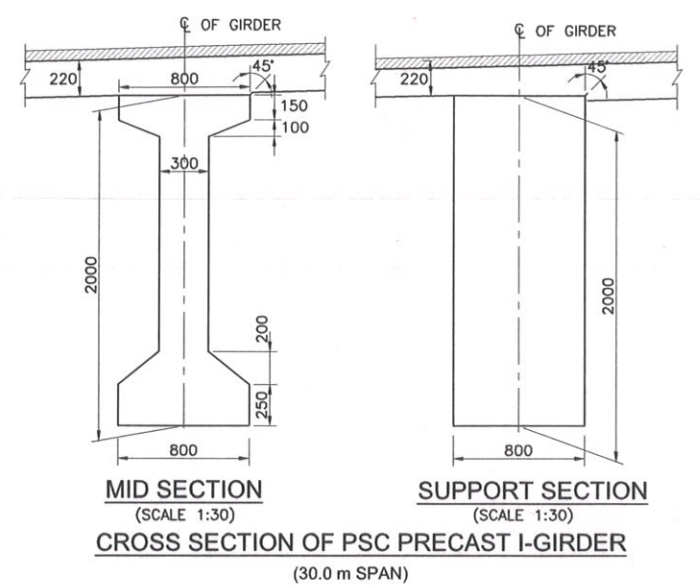
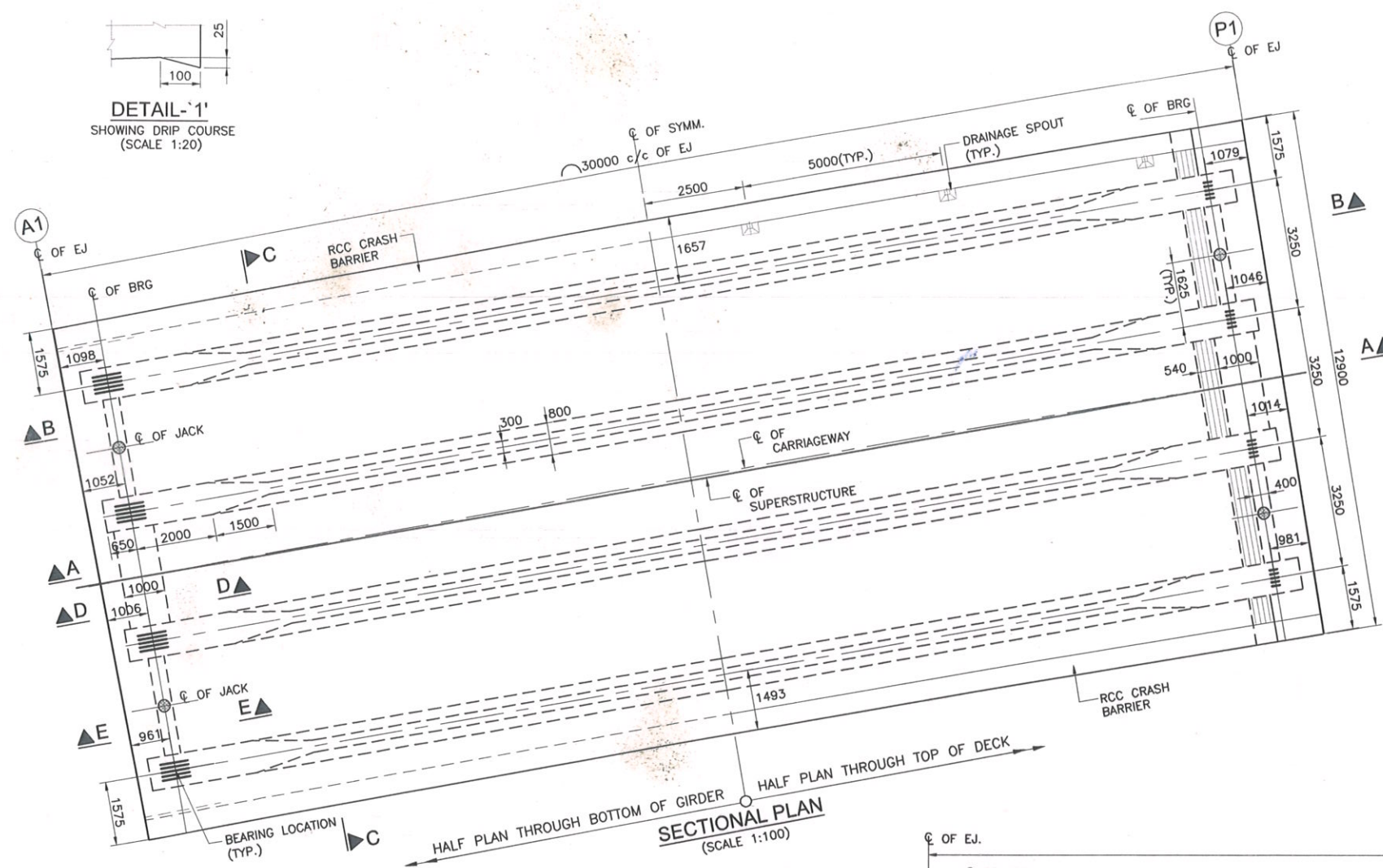
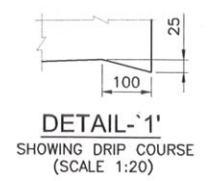
CONSULTANTS:-

**AECOM**

AECOM India Private Limited

FEBRUARY 2018





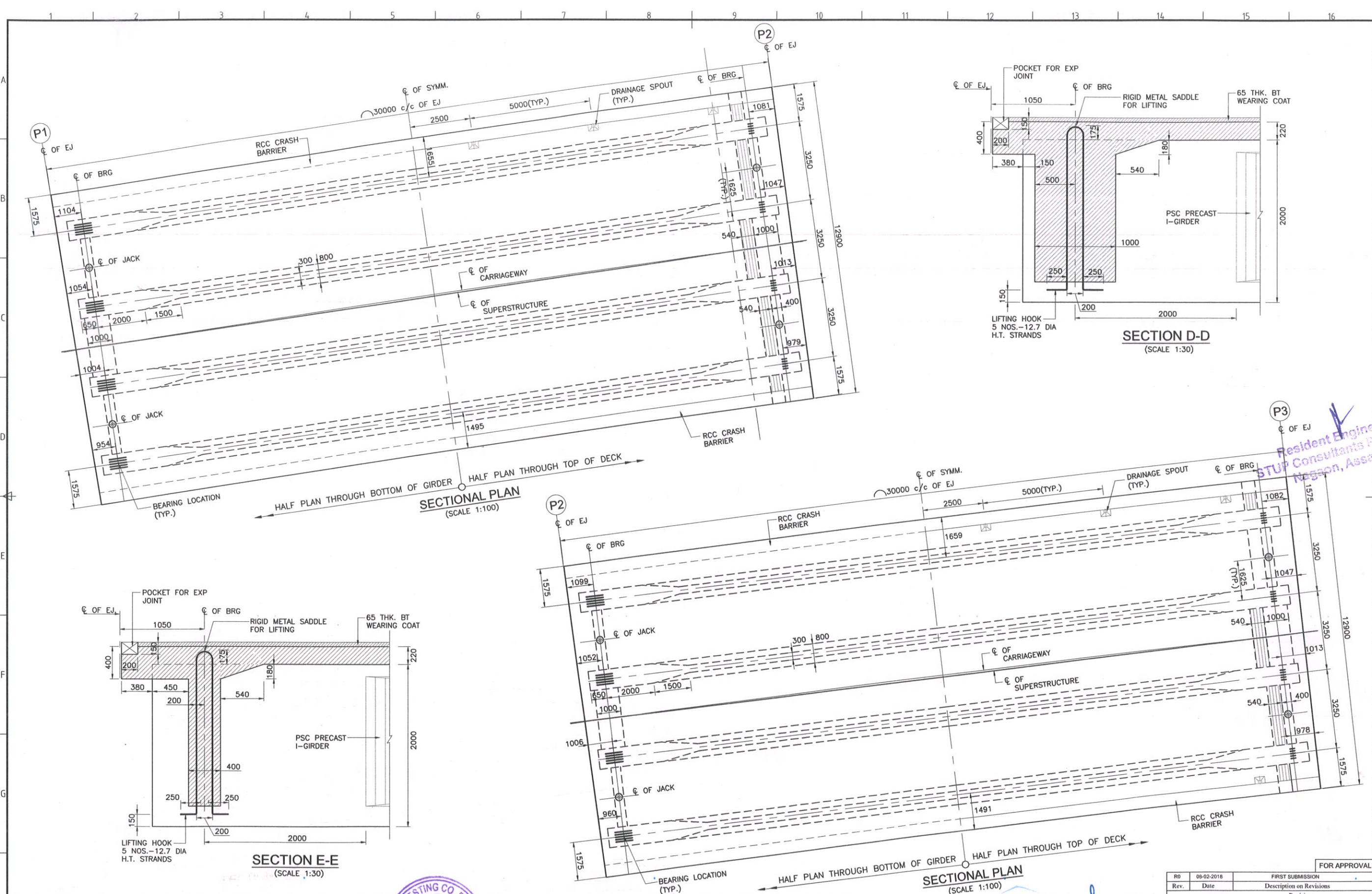
Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagapada Assam

<p>CLIENT:- <b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE</b> (Development Corporation Ltd)</p>	<p>AUTHORITY'S ENGINEER: <b>STUP Consultants P. Ltd.</b> &amp; <b>Ayoleeza Consultants P. Ltd.</b></p>	<p>PROOF CHECK CONSULTANT: <b>AYOLEEZA</b></p>	<p>SAFETY CONSULTANT:- <b>Chaitanya Projects Consultancy Pvt. Ltd.</b></p>	<p>PROJECT: FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE</p>	<p>EPC CONTRACTOR:- <b>SIMPLEX INFRASTRUCTURES LIMITED</b> 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA</p>	<p>CONSULTANTS:- <b>AECOM</b> 4th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India</p>	<p>SCALE:- AS SHOWN</p>	<p>TITLE:- DIMENSION, CABLES, PRESTRESSING &amp; REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)</p> <p>DRAWING NO:- AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 1 OF 16)</p>
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Rev.	Date	Description on Revisions
R0	09-02-2018	FIRST SUBMISSION

FOR APPROVAL

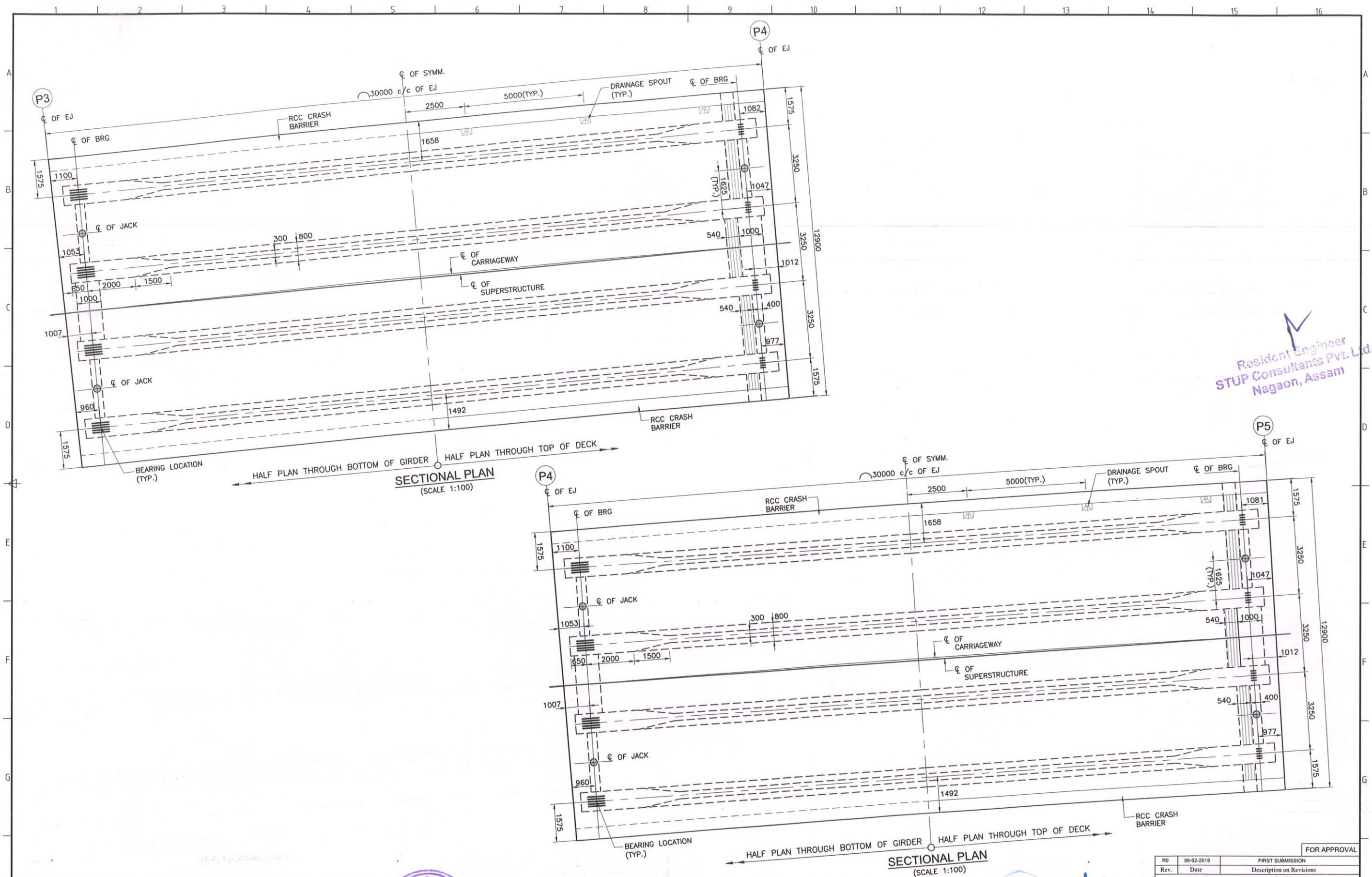




Resident Engineer  
STUP Consultants P. Ltd.  
Nagason, Assam

CLIENT:-		AUTHORITY'S ENGINEER:		PROOF CHECK CONSULTANT:-		SAFETY CONSULTANT:-		PROJECT:		EPC CONTRACTOR:-		CONSULTANTS:-		SCALE:-		TITLE:-	
 NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd.)		STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd.		 AYOLEEZA CONSULTANTS P. LTD.		 Chaitanya Projects Consultancy Pvt. Ltd.		FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		 SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		 AECOM 9th Floor, Infinity Towers C, DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India		AS SHOWN		DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)	
		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		DRAWING NO.:- AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 2 OF 16)		REV. R0	

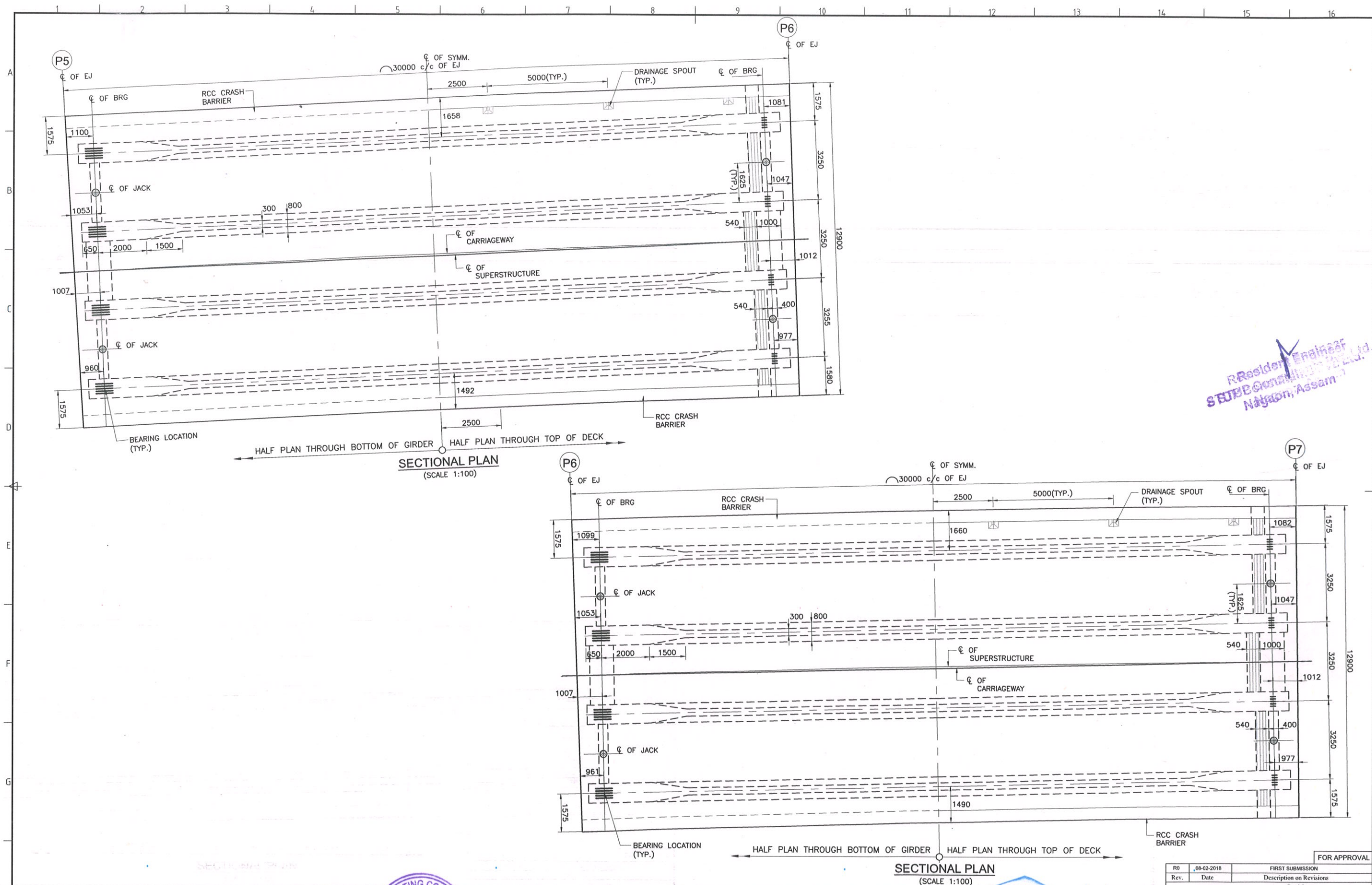




Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

CLIENT:- NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)	AUTHORITY'S ENGINEER: STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd.	PROOF CHECK CONSULTANT: AYOLEEZA	SAFETY CONSULTANT:- Chaitanya Projects Consultancy Pvt. Ltd.	PROJECT: FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE	EPC CONTRACTOR:- SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-71, INDIA	CONSULTANTS: AECOM 9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India	SCALE:- AS SHOWN	FOR APPROVAL Rev. 09-02-2018 FIRST SUBMISSION
								TITLE:- DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)
AUTHORIZED SIGNATORY 	DATE 04/12/2018	AUTHORIZED SIGNATORY 	DATE 04/12/2018	AUTHORIZED SIGNATORY 	DATE 04/12/2018	DRAWING NO:- AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 3 OF 16)	REV. RD	





Resident Engineer  
STUP Consultants P. Ltd.  
Nagaon, Assam

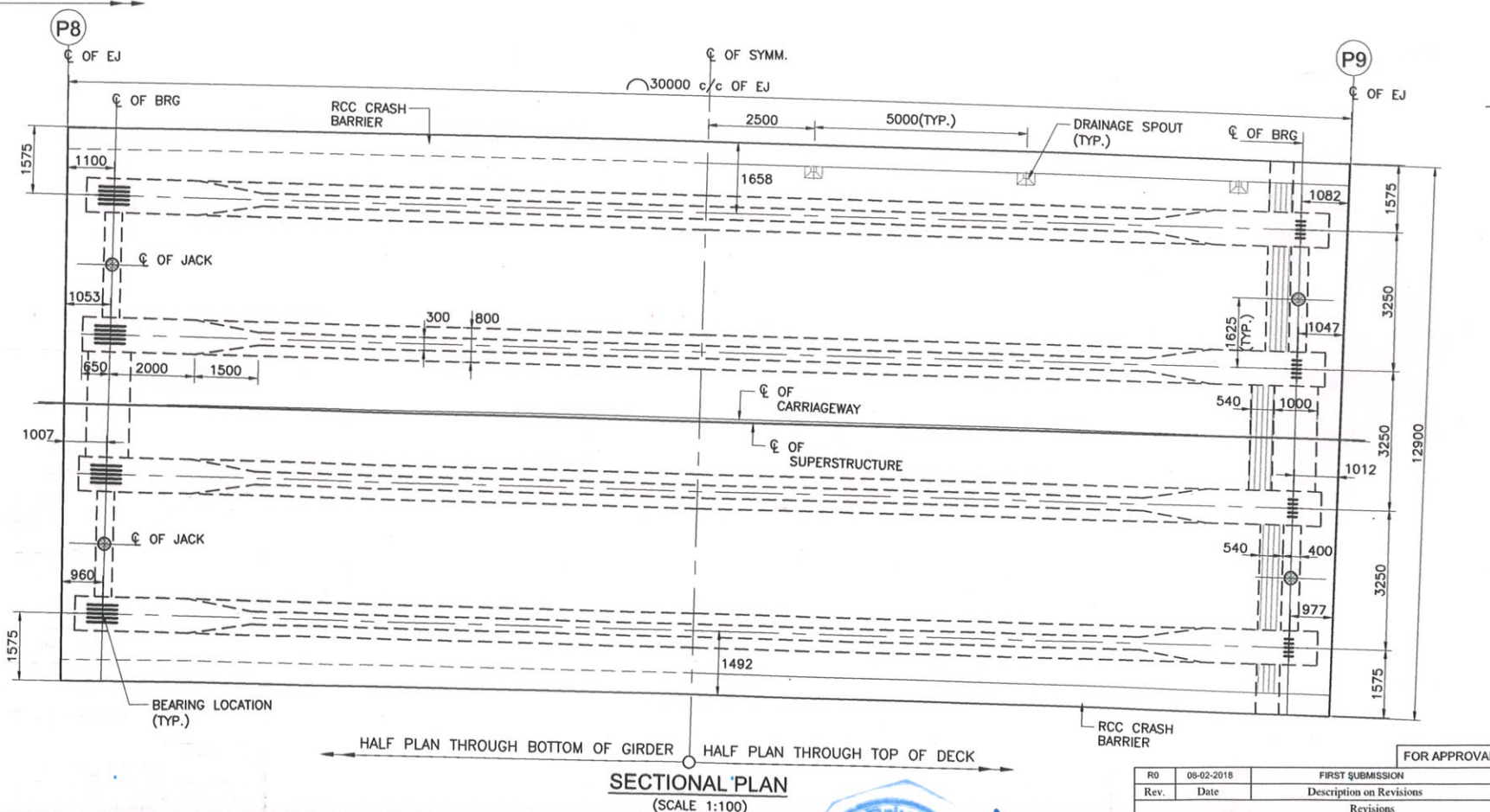
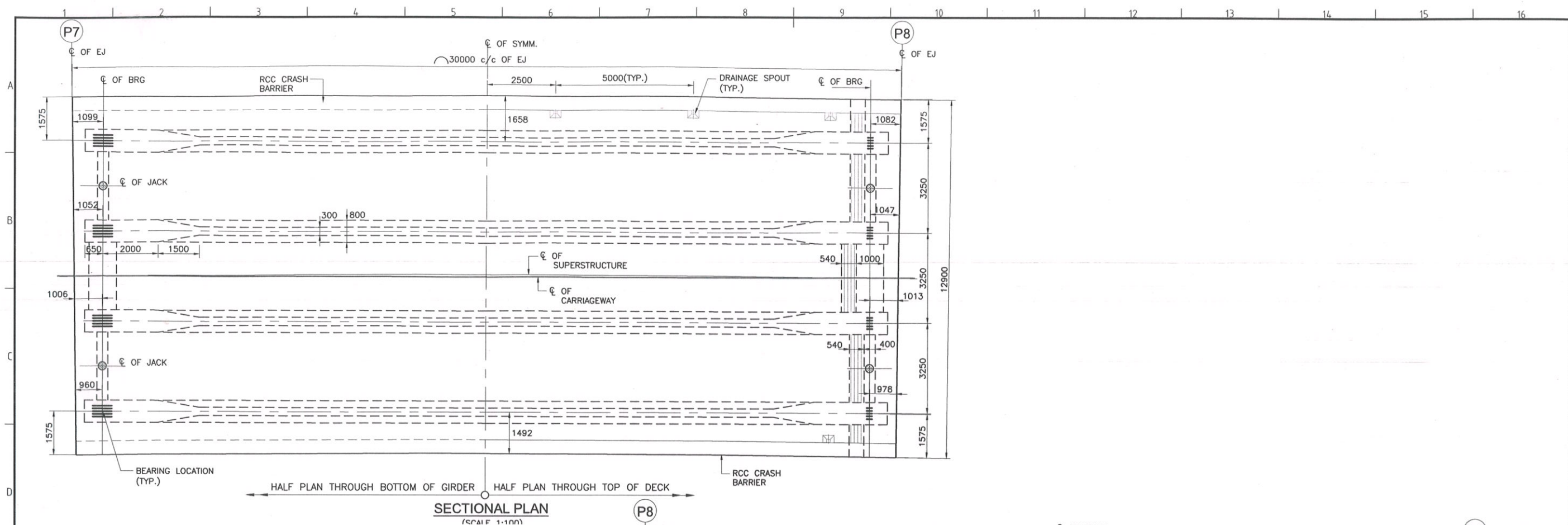
<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd. 		<b>PROOF CHECK CONSULTANT:-</b> 		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd.		<b>PROJECT:-</b> FOUR LANE OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> AECOM NH Flow, Infinity Tower & DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+892 (SCH-B CH. 314+747) (DIMENSION DETAILS)					
<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>DRAWN</b>		<b>DESIGN</b>		<b>CHECKED BY</b>		<b>APPROVED BY</b>		<b>REV.</b>	

Rev.	Date	Description of Revisions
R0	08-02-2018	FIRST SUBMISSION
		Revisions

FOR APPROVAL

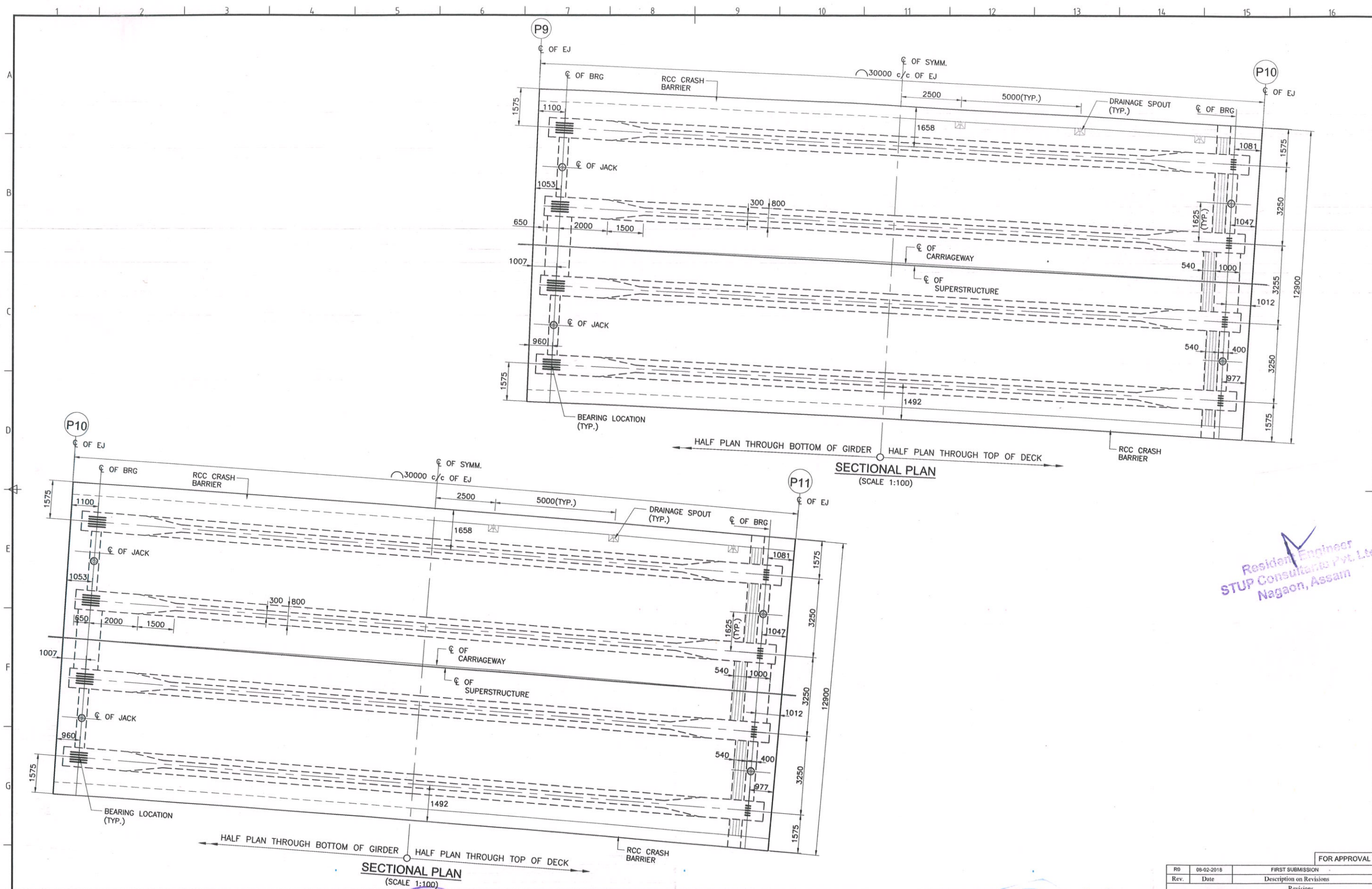
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 REV. R0











<b>CLIENT:-</b>  NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)	<b>AUTHORITY'S ENGINEER:</b> STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd.	<b>PROOF CHECK CONSULTANT:</b>  AYOLEEZA CONSULTANTS P. LTD. KOLKATA 700 092	<b>SAFETY CONSULTANT:-</b>  Chaitanya Projects Consultancy Pvt. Ltd.	<b>PROJECT:</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-N, PHASE A ON EPC MODE	<b>EPC CONTRACTOR:-</b>  SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA	<b>CONSULTANTS:-</b>  AECOM 9th Floor, Infinity Tower C, DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India	<b>SCALE:-</b> AS SHOWN	<b>FOR APPROVAL</b> R0 09-02-2018 FIRST SUBMISSION Rev. Date Description on Revisions Revisions
								<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)
<b>AUTHORISED SIGNATORY</b>	<b>DATE</b>	<b>AUTHORISED SIGNATORY</b>	<b>DATE</b>	<b>AUTHORISED SIGNATORY</b>	<b>DATE</b>	<b>DRAWING NO.:-</b> AECOM-DELD15159-DD-DWG-FO-314+747-SUP-01 (SH 5 OF 16)	<b>REV. R0</b>	





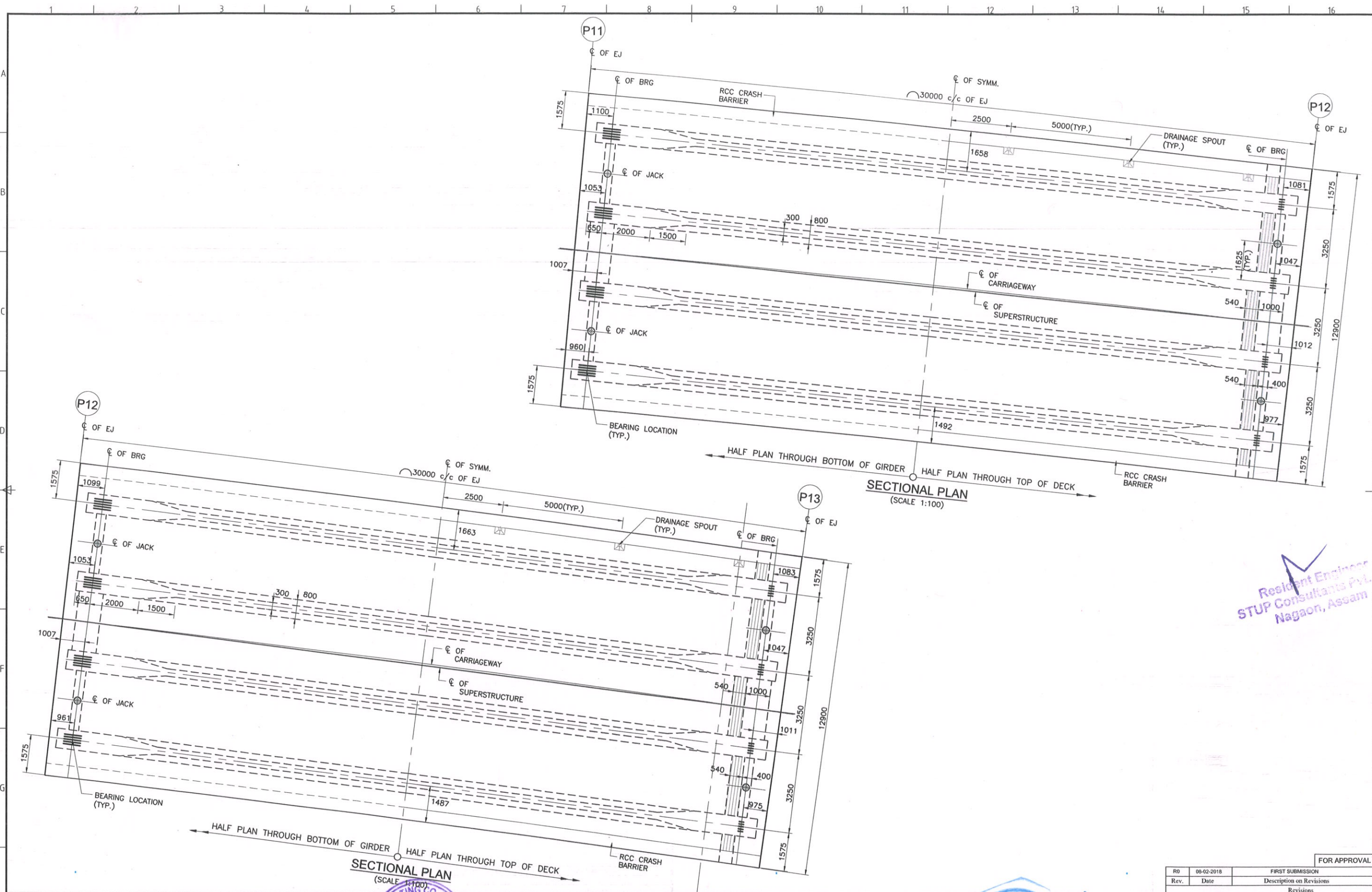
Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

CLIENT:-  <b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE</b> (Development Corporation Ltd)		AUTHORITY'S ENGINEER: STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd. 		PROOF CHECK CONSULTANT: 		SAFETY CONSULTANT:-  Chaitanya Projects Consultancy Pvt. Ltd		PROJECT: FOUR LANING OF NH-37 FROM RANGAGARA TO KALLABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		EPC CONTRACTOR:-  SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		CONSULTANTS:-  9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122006, Haryana, India		SCALE:- AS SHOWN		TITLE:- DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)		DRAWING NO.:- AECOM-DELD15159-DD-DWG-FO-314+747-SUP-01 (SH 6 OF 16)		REV. R0			
AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE	

FOR APPROVAL

Rev.	Date	Description on Revisions
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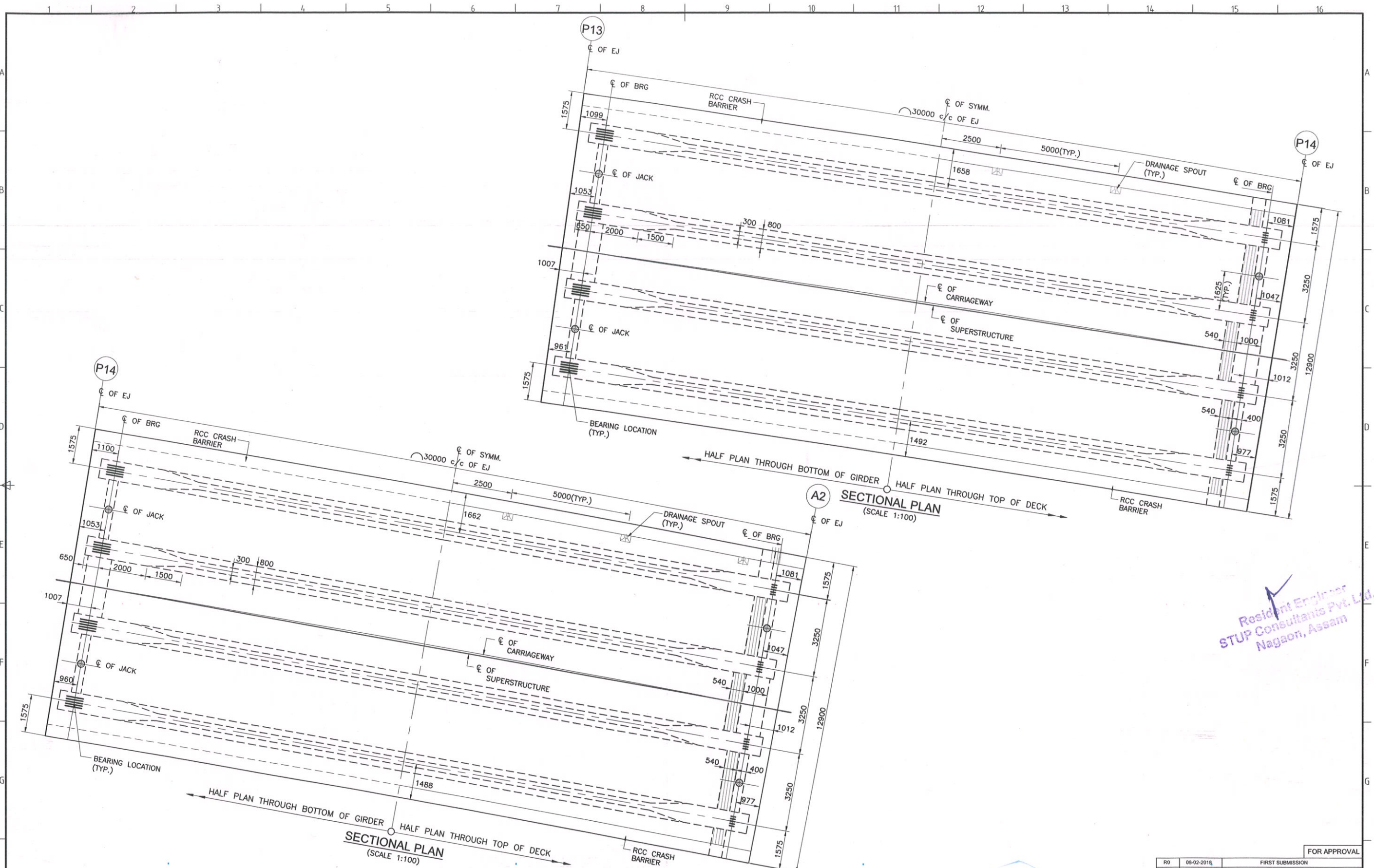




Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

<b>CLIENT:-</b> <b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE</b> (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd.		<b>PROOF CHECK CONSULTANT:-</b> <b>CEEST KOLKATA</b> 740 092		<b>SAFETY CONSULTANT:-</b> <b>Chaitanya Projects</b> Consultancy Pvt. Ltd.		<b>PROJECT:-</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> <b>SIMPLEX INFRASTRUCTURES LIMITED</b> 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> <b>AECOM</b> 9th Floor, Infinity Tower I, DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+992 (SCH-B CH. 314+747) (DIMENSION DETAILS)							
<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>AUTHORISED SIGNATORY</b>		<b>DATE</b>		<b>DRAWN</b>		<b>DESIGN</b>		<b>CHECKED BY</b>		<b>APPROVED BY</b>		<b>DRAWING NO.:-</b> AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 7 OF 16)		<b>REV.</b> RD	





Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> STUP Consultants P. Ltd. & Ayoleza Consultants P. Ltd.		<b>PROOF CHECK CONSULTANT:-</b> AYOLEZA CONSULTANTS P. LTD.		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd.		<b>PROJECT:-</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> AECOM 7th Floor, Infiniti Tower, 6 DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+892 (SCH-B CH. 314+747) (DIMENSION DETAILS)			
<b>AUTHORISED SIGNATORY</b> 		<b>DATE</b> 		<b>AUTHORISED SIGNATORY</b> 		<b>DATE</b> 		<b>AUTHORISED SIGNATORY</b> 		<b>DATE</b> 		<b>DRAWN</b> 		<b>DESIGN</b> 		<b>CHECKED BY</b> 		<b>APPROVED BY</b> 	
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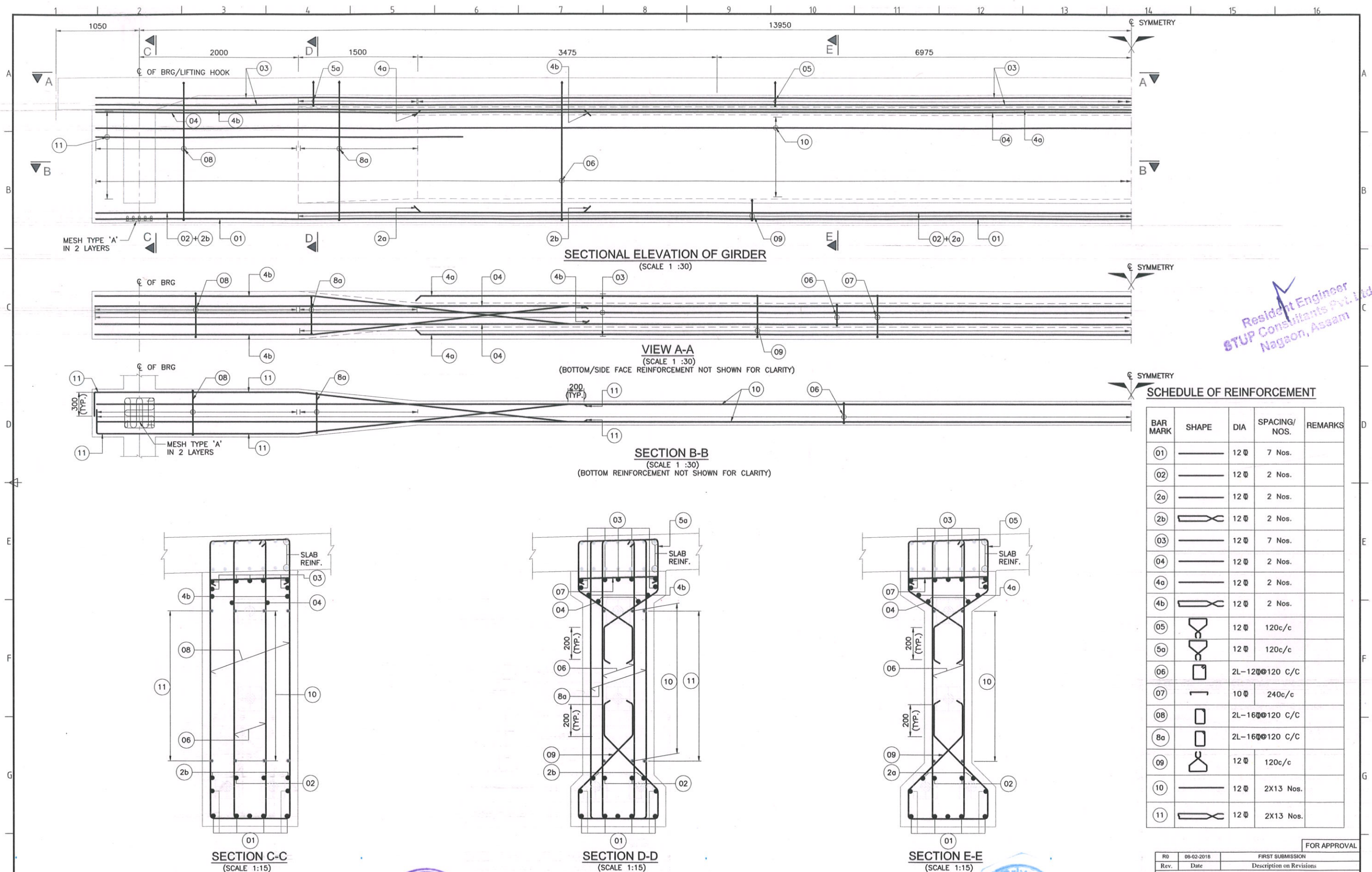
FOR APPROVAL

Rev.	Date	Description on Revisions
01	08-02-2018	FIRST SUBMISSION





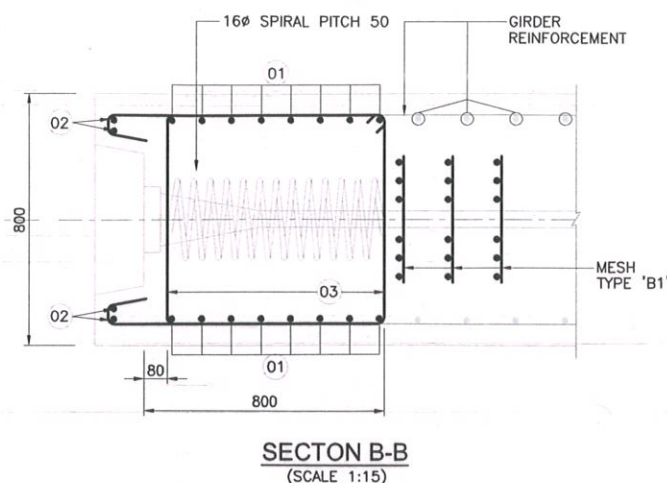
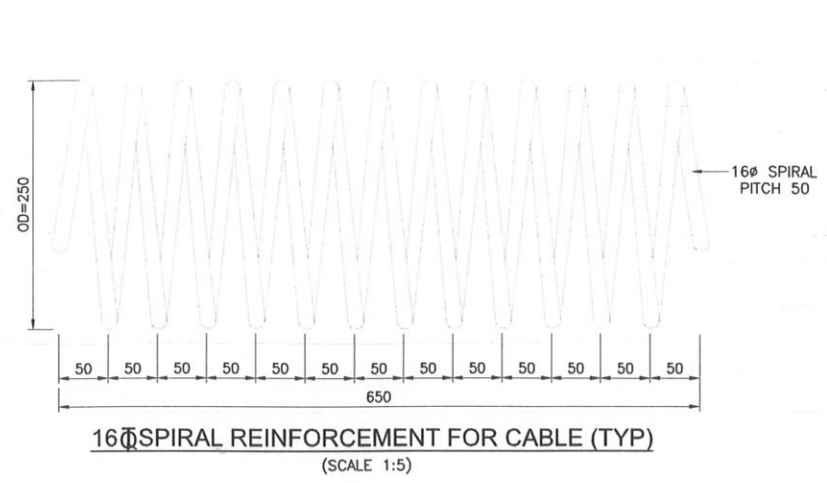




Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:</b> STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd. 		<b>PROOF CHECK CONSULTANT:</b> 		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd		<b>PROJECT:</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:</b> AECOM 9th Floor, Infinity Tower C DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+998 (SCH-B CH. 314+747) (LONGITUDINAL GIRDER-MIN. REINF.)	
<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>REVISIONS:</b> R. BERAVAL, S. P. SINGH, S. YADAV, S. RASTOGI DRAWN, DESIGN, CHECKED BY, APPROVED BY		<b>DRAWING NO.:-</b> AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 10 OF 16)		<b>REV. R0</b>					





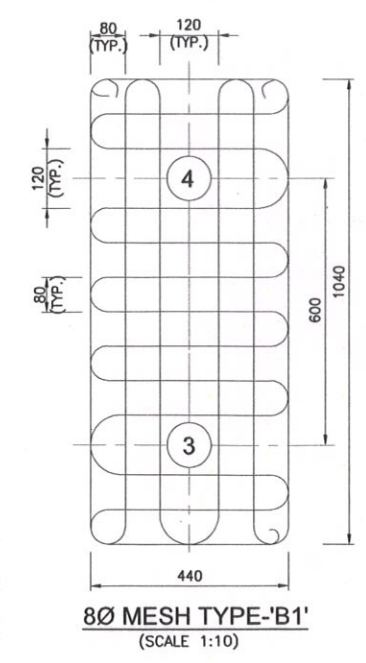
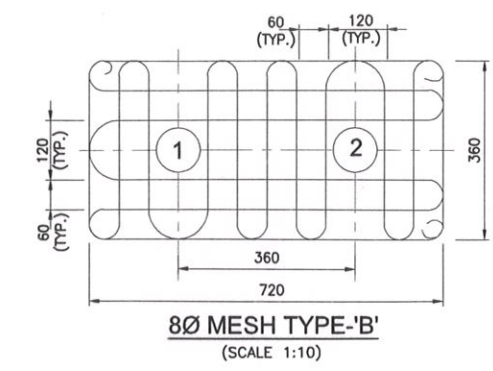
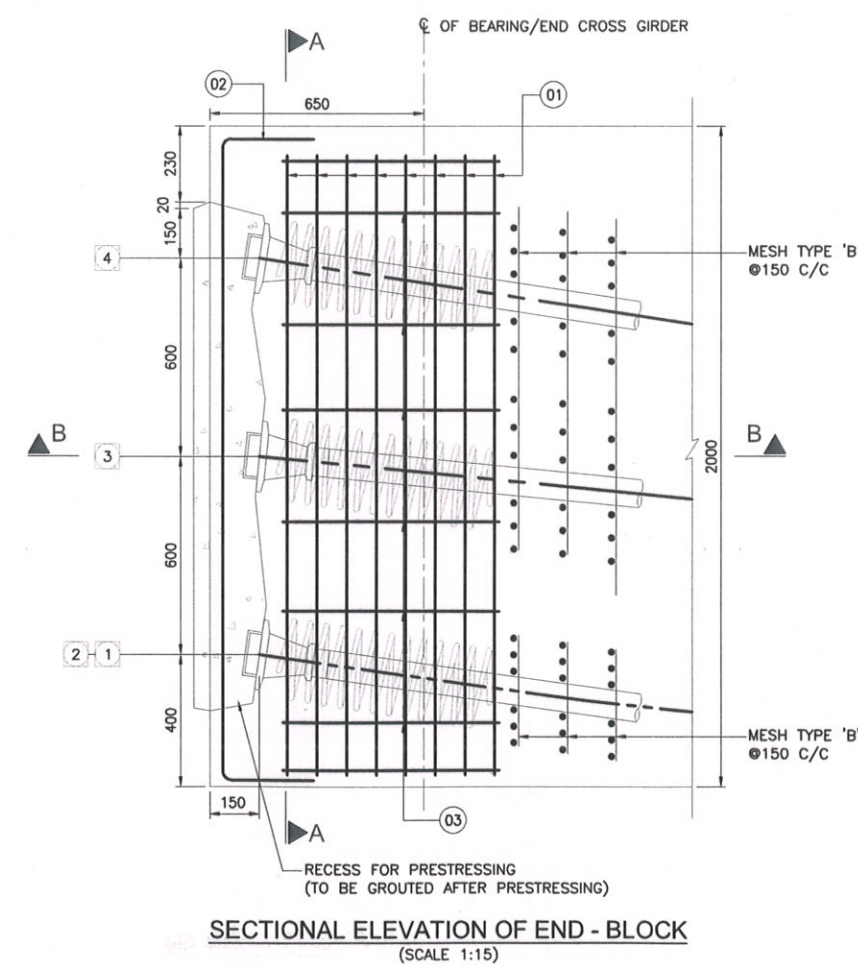
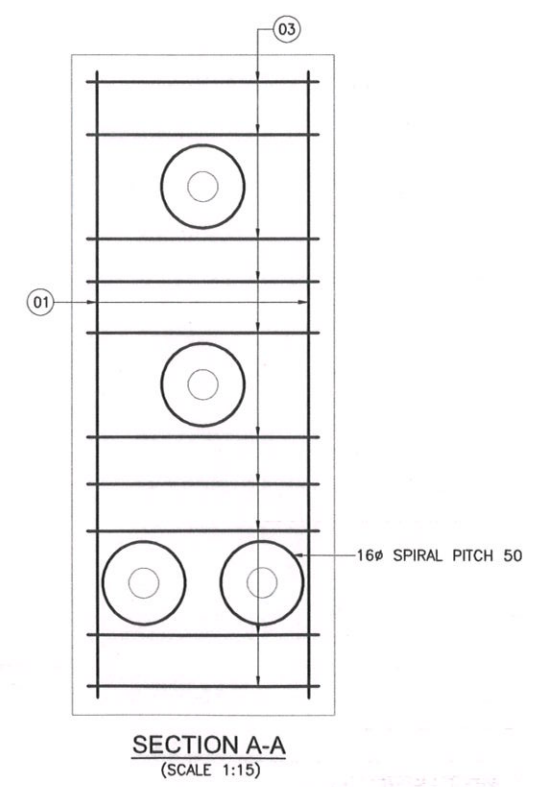
**IMPORTANT NOTES:**

- ANCHORAGE RECESSES SHALL BE SEALED WITH PREPACKAGED NON-SHRINK MORTAR. END FACES OF GIRDERS TO BE COATED WITH TWO COATES OF EPOXY.
- THE ANCHORAGE DETAILS SHALL BE CONFIRMED WITH PRESTRESSING AGENCY.

**SCHEDULE OF REINFORCEMENT**  
(FOR EACH ANCHORAGE END)

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
01	20	8 NOS.	
02	16	2x2 NOS.	
03	20	10 NOS.	

**LEGEND:-**  
OD - OUTER DIAMETER



*Resident Engineer*  
*STUP Consultants Pvt. Ltd.*  
*Nagaon, Assam*

<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:</b> STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd. AUTHORIZED SIGNATORY: _____ DATE: _____		<b>PROOF CHECK CONSULTANT:-</b> CEEST KOLKATA AUTHORIZED SIGNATORY: _____ DATE: 24/09/18		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd. AUTHORIZED SIGNATORY: _____ DATE: _____		<b>PROJECT:</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> AECOM 9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India R. BERNAL (Dd) S. P. SINGH (E.P. Design) S. YADAV (S. Design) S. RASTOGI (S. Design) DRAWN DESIGN CHECKED BY APPROVED BY		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+996 (SCH-B CH. 314+747) (ANCHORAGE DETAILS)		<b>DRAWING NO.:-</b> AECOM-DELD15159-DD-DWG-FO-314+747-SUP-01 (SH 11 OF 16)		<b>REV.:</b> R0	
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FOR APPROVAL

Rev.	Date	Description on Revisions
R0	08-02-2018	FIRST SUBMISSION



## NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH FOR DIFFERENT ELEMENTS AS FOLLOWS:
  - PSC PRECAST I-GIRDER - M45
  - RCC CAST-IN-SITU DECK SLAB - M40
  - RCC CAST-IN-SITU END CROSS GIRDER - M40
- SUITABLE HOLES SHALL BE LEFT IN PRECAST GIRDER FOR SUPPORTING THE DECK SLAB SHUTTERING.
- THE REINFORCEMENT OF CRASH BARRIER SHALL BE PROPERLY ANCHORED IN THE DECK SLAB BEFORE CASTING THE DECK SLAB.
- BEAMS SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN LOCATION & RESPECTIVE ENDS BEFORE REMOVAL FROM CASTING BED.
- TOP SURFACE OF PRECAST BEAM & VERTICAL EDGES OF END TO BE LEFT ROUGHENED FOR EFFECTIVE BONDING.
- THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786-2008.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOME UNAVOIDABLE, LAP LENGTH SHALL BE PROVIDED AS PER CLAUSE 15.2.5 IRC:112-2011.
- ANCHORAGE LENGTH SHALL BE AS PER CLAUSE 15.2.3 & 15.2.4, IRC:112-2011.
- PRESTRESSING SYSTEM
  - ALL PRESTRESSING STRANDS SHALL HAVE 7 PLY UNCOATED STRESS RELIEVED LOW RELAXATION HIGH TENSILE STRANDS OF 12.7MM DIA. CONFORMING TO CLASS 2 OF IS 14268-1995.
  - THE PARAMETERS ADOPTED FOR DESIGN ARE AS FOLLOWS:-
    - ANCHORAGE TYPE - 19-T-13
    - SLIP AT EACH END (ASSUMED) - 6MM
    - CO-EFFICIENT OF FRICTION ( $\mu$ ) - 0.17/RADIAN
    - WOBBLE CO-EFFICIENT (K) - 0.0020/M
    - NOMINAL AREA OF EACH STRAND - 98.8 sq.MM
    - NOMINAL ULT. BREAKING LOAD OF EACH STRAND - 183.7KN
    - MODULUS OF ELASTICITY OF HIGH TENSILE STEEL -  $1.95 \times 10^5$  MPa
    - SHEATHING THICKNESS - 2.5 MM
  - CORRUGATED HDPE SHEATHING DUCT OF 85MM DIA (INTERNAL) SHALL BE USED FOR ALL CABLES CONFORMING TO CODAL STANDARDS.
  - ALL THE DESIGN PARAMETERS ADOPTED SHALL BE VERIFIED AT SITE.
- PRESTRESSING OPERATIONS
  - ALL CABLES SHALL BE LAID IN SMOOTH PROFILE PASSING THROUGH THE GIVEN ORDINATES. FIRM SUPPORT SHALL BE INSTALLED AT EVERY METRE AS SHOWN.
  - CABLE LENGTHS MENTIONED IN THE DRAWING ARE INCLUSIVE OF 1000 MILLIMETRE EXTRA AT EACH END. THE TOTAL LENGTH OF CABLE SHALL BE VERIFIED AT SITE.
  - ABSCISSA (DISTANCE "X") OF CABLE GIVEN IN THE DRAWING ARE EVALUATED WITH REFERENCE TO END OF GIRDER. ORDINATES DISTANCE "Y" ARE WITH REFERENCE TO SOFFIT OF THE GIRDER.
  - ALL STRANDS OF CABLES SHALL BE STRESSED FROM BOTH ENDS SIMULTANEOUSLY. THE RATE OF INCREASE OF STRESS IN THE TENDON AT BOTH ENDS SHALL BE EQUAL. ONLY MULTIPLE JACKS SHALL BE USED FOR STRESSING.
  - EXTRA LENGTH OF STRAND PROJECTING BEYOND END BLOCK SHALL NOT BE CUT JUST AFTER THE STRESSING. THESE SHALL BE CUT ONLY AFTER INSTRUCTIONS OF GROUTING ARE ISSUED BY THE ENGINEER.
  - GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFIRM TO TECHNICAL SPECIFICATIONS. ANCHORAGE POCKET SHALL BE FILLED WITH EPOXY MORTAR AFTER STRESSING & GROUTING.
  - TIME LAG BETWEEN STRESSING OF EACH CABLE SHALL BE AVOIDED.
  - EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE. IN CASE OF EXCESSIVE SLIPPAGE THE MATTER SHALL BE REPORTED TO THE ENGINEER-IN-CHARGE.
  - EXTENSIONS ARE GIVEN FOR HALF CABLE LENGTHS INCLUSIVE OF 600 MILLIMETER GRIP LENGTH AT EACH END. LOSS UPTO 6mm DUE TO SLIP OF ANCHORAGES ARE NOT TO BE COMPENSATED DURING SITE OPERATIONS. JACK PRESSURE AND EXTENSIONS OF CABLES AT EACH END GIVEN IN THE DRAWING SHALL BE VERIFIED AT SITE.
  - INITIAL SLACKNESS IN CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION AND CORRECTION SHALL BE APPLIED AS PER CL. 12.2.1.3 OF IS:1343-1980.
  - IN CASE THE CALCULATED ELONGATION AND THE JACK PRESSURE ARE NOT ACHIEVED SIMULTANEOUSLY DURING PRESTRESSING OPERATION STRESSING SHALL BE CONTINUED / DISCONTINUED AS PER NOTE NO. 15 GIVEN BELOW.
  - EXCESS/DUMMY STRANDS AS SHOWN IN TABLE-2 SHALL BE STRESSED IF ANY SHORTFALL IN PRESTRESSING.
- THE EXTENSIONS GIVEN IN TABLE SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRANDS 'A' AND MODULUS OF ELASTICITY 'E' VARIES FROM THOSE ASSUMED IN DESIGN. (AS MENTIONED IN NOTE NO. 10 ABOVE) REVISED EXTENSION SHALL BE CALCULATED AS UNDER:  

$$\text{REVISED EXTENSION} = (98.8 \times 195 \times 10^{-5}) / (\text{NEW AREA} \times \text{NEW MODULUS}) \times \text{ORIGINAL EXTENSION}$$
- EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE OF VALUE OF  $\mu$  AND K ARE FOUND TO BE DIFFERENT THAN THOSE CONSIDERED FOR DESIGN, EXTENSION SHALL BE SUITABLY MODIFIED AFTER APPROVAL OF DESIGN OFFICE.
- THE GRIP LENGTH FROM ANCHORAGE FACE UPTO GRIPPING POINT IN JACK ASSUMED IN EXTENSION CALCULATIONS IS 600MM AND THE ADDITIONAL LENGTH TAKEN FOR CUTTING IS 400MM. IN CASE GRIP LENGTH VARIES THAN THOSE CONSIDERED, THE EXTENSIONS SHALL BE MODIFIED AS UNDER:  

$$Ex(\text{NEW}) = Ex(\text{OLD}) + \text{JACK FORCE} \times (\text{GRIP LENGTH} - 600) / (\text{AREA} \times E_s)$$

## 15. SPECIAL NOTE FOR PRESTRESSING

- IF THE CALCULATED ELONGATION IS REACHED BEFORE THE CALCULATED GAUGE PRESSURE IS OBTAINED, CONTINUE TENSIONING TILL ATTAINING THE CALCULATED GAUGE PRESSURE PROVIDED THE ELONGATION DOES NOT EXCEED 1.05 TIMES THE CALCULATED ELONGATION. IF THE CALCULATED ELONGATION HAS NOT BEEN REACHED CONTINUE TENSIONING IN INTERVALS OF 5 kg/sqcm UNTIL THE CALCULATED ELONGATION IS REACHED PROVIDED THE GAUGE PRESSURE DOES NOT EXCEED 1.05 TIMES THE CALCULATED GAUGE PRESSURE. IF THE ELONGATION AT 1.05 TIMES THE CALCULATED GAUGE PRESSURE IS LESS THAN 0.95 TIMES THE CALCULATED ELONGATION THE FOLLOWING MEASURES MUST BE TAKEN :
- RECALIBRATE THE PRESSURE GAUGE
  - CHECK THE CORRECT FUNCTIONING OF THE JACK PUMP AND LEADS
  - DE-TENSION THE CABLE SLIDE IT IN ITS DUCT TO CHECK THAT IT IS NOT BLOCKED BY MORTAR WHICH HAS ENTERED THROUGH THE SHEATHING. RE-TENSION THE CABLE IF FREE. IF THE REQUIRED ELONGATION IS NOT OBTAINED FURTHER FINISHING OPERATION SUCH AS CUTTING OR SEALING SHOULD NOT BE UNDERTAKEN WITHOUT THE APPROVAL OF THE ENGINEER-IN-CHARGE.
16. THE GAUGE PRESSURE FOR PRESTRESSING SHALL BE WORKED OUT PRIOR TO ANY STRESSING OPERATION DULY TAKING IN TO ACCOUNT THE RAM AREA OF THE JACK AND THE JACK EFFICIENCY. THE STRESSING EQUIPMENTS SHALL BE WELL MAINTAINED AND THE CALIBRATION CHARTS SHALL BE AVAILABLE AT SITE.
17. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.

## REFERENCE DRAWINGS:

- GENERAL ARRANGEMENT DRAWING:-  
AECOM-DELD15159-DD-DWG-FO-314+996-GAD-01 (SH1 TO 6)
- SUBSTRUCTURE:-  
AECOM-DELD15159-DD-DWG-FO-314+996-SUB-01 (SH1 TO 5)
- MISCELLANEOUS DWGS.  
AECOM-DELD15159-DD-DWG-MISC.-01

## LEGENDS

FRL	FINISHED ROAD LEVEL
GL	GROUND LEVEL
LVL	LEVEL
IL	INVERT LEVEL
E.J.	EXPANSION JOINT
	CAST-IN-SITU PORTION
	PRECAST PORTION
	ON EARTH FACE/BOTTOM FACE
	ON OUTER FACE/TOP FACE
$\phi$	DIAMETER
MS	MILD STEEL
HT	HIGH TENSION

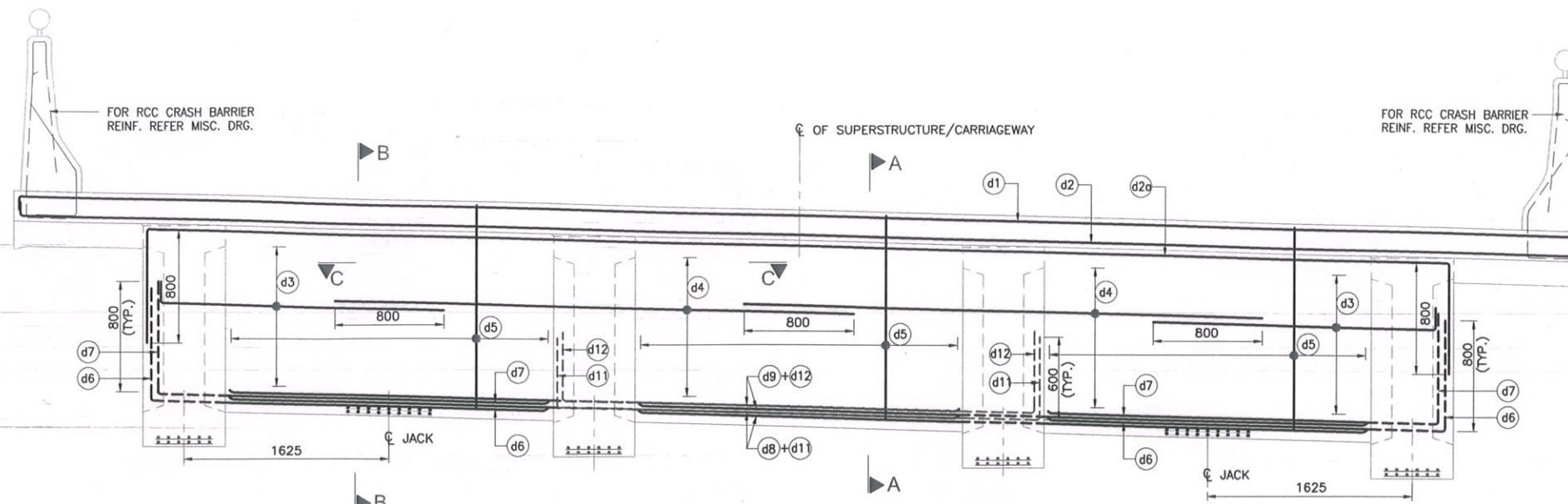
Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

## CONSTRUCTION SEQUENCE OF GIRDERS

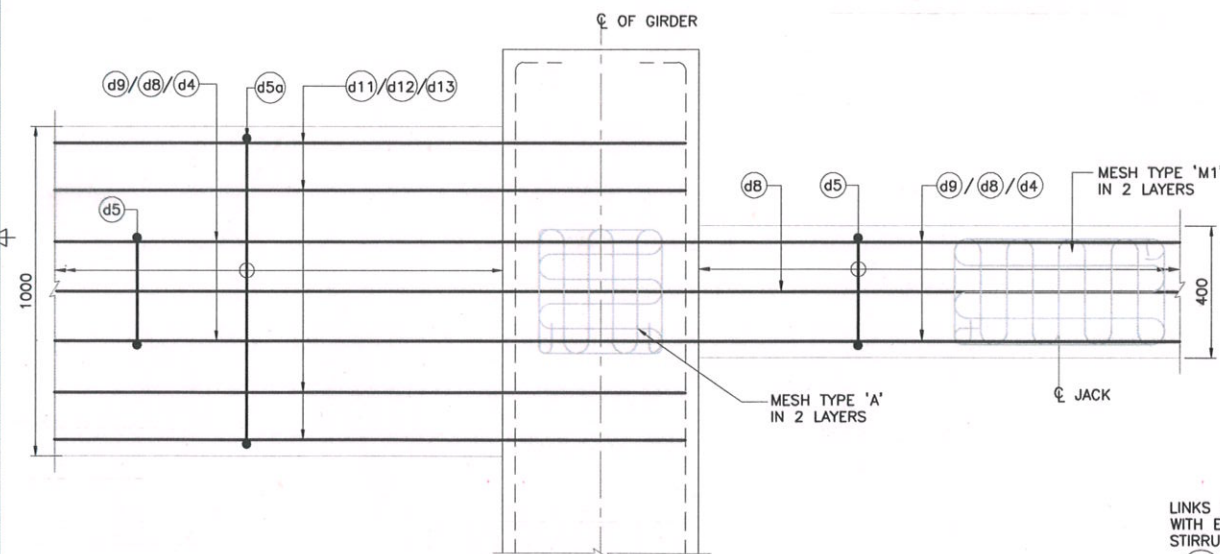
- AT '0'TH DAY, GIRDER SHALL BE CASTED ON CASTING BED.
- STRESSING SHALL BE CARRIED OUT IN TWO STAGES. BOTH THE STAGES SHALL BE ON GROUND (BEFORE PLACING ON ABUTMENT / PIER CAP).
- FIRST STAGE PRE-STRESSING:
  - CABLE NO. 3 & 4 SHALL BE STRESSED AT 7TH DAY OR WHEN CONCRETE CUBE STRENGTH IS 35MPa, WHICHEVER IS LATER. AFTER THIS STAGE OF STRESSING, THE GIRDER CAN BE LIFTED FROM THE CASTING BED.
  - ALL STRANDS OF CABLES SHALL BE STRESSED FROM BOTH ENDS SIMULTANEOUSLY. THE RATE OF INCREASE OF STRESS IN THE TENDON AT BOTH ENDS SHALL BE EQUAL. ONLY MULTIPLE JACKS SHALL BE USED FOR STRESSING.
- SECOND STAGE PRE-STRESSING:
  - CABLE NO. 1 & 2 SHALL BE STRESSED AT 28TH DAY OR WHEN CONCRETE CUBE STRENGTH IS 50MPa, WHICHEVER IS LATER.
  - STRANDS OF CABLE NO. 1 SHALL BE STRESSED UP TO 50% OF JACKING FORCE.
  - AFTER STRESSING CABLE NO. 1, CABLE NO. 2 SHALL BE STRESSED UP TO 100% OF JACKING FORCE.
  - AFTER STRESSING CABLE NO. 2, CABLE NO. 1 SHALL BE STRESSED UP TO 100%.
- GIRDERS SHALL THEN BE PLACED ON TEMPORARY SUPPORTS ON PIER CAP.
- PERMANENT BEARINGS SHALL BE INSTALLED ON PEDESTALS.
- WEDGE SHALL BE CAST OVER THE BEARING AS PER RELEVANT WEDGE DETAILS.
- TEMPORARY SUPPORT SHALL BE REMOVED SO THAT GIRDER CAN BE PLACED OVER STEEL WEDGE AND PERMANENT BEARINGS.
- DECK SLAB SHALL BE CAST AFTER 28 DAYS OF CASTING OF GIRDER.
- CRASH BARRIER/RAILING SHALL BE ERECTED/CAST 28 DAYS AFTER CASTING THE DECK SLAB OR AFTER THE DECK SLAB ATTAINS A STRENGTH OF 40MPa, WHICHEVER IS LATER.
- WEARING COAT SHALL BE LAID AFTER REMOVAL OF SHUTTERING OF DECK AND CASTING OF CRASH BARRIER/RAILING.

<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd.		<b>PROOF CHECK/CONSULTANT:-</b> CEEST		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd.		<b>PROJECT:-</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> AECOM 9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+996 (SCH-B CH. 314+747) (NOTES)	
<b>DRAWN:</b> R. BHOWAL <b>DESIGN:</b> S. P. SINGH <b>CHECKED BY:</b> S. YADAV <b>APPROVED BY:</b> S. RASTOGI		<b>DRAWING NO.:-</b> AECOM-DELD15159-DD-DWG-FO-314+747-SUP-01 (SH 12 OF 16)		<b>REV.:</b> RD													

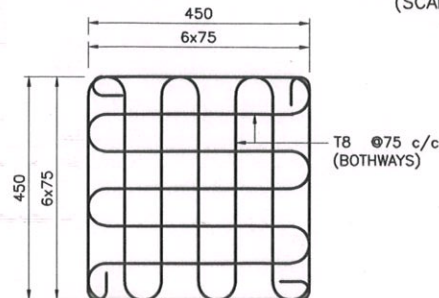




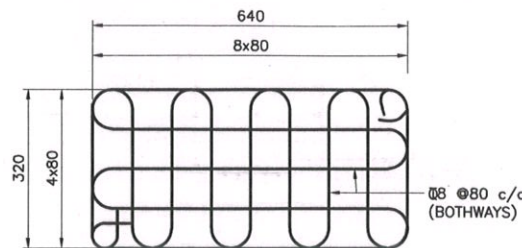
REINFORCEMENT DETAIL OF END CROSS GIRDER  
(SCALE 1:30)



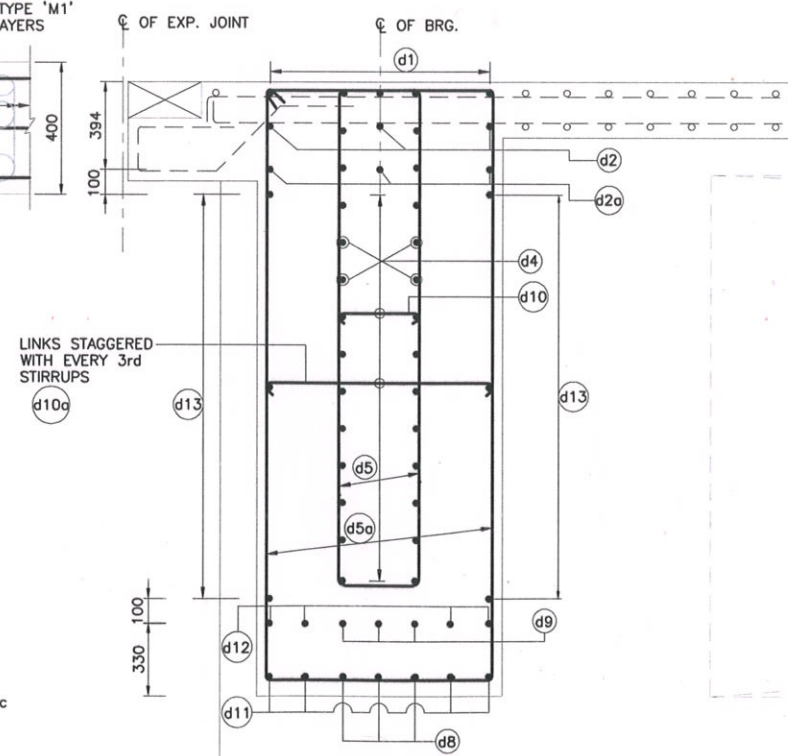
SECTION C-C  
(SCALE 1:15)



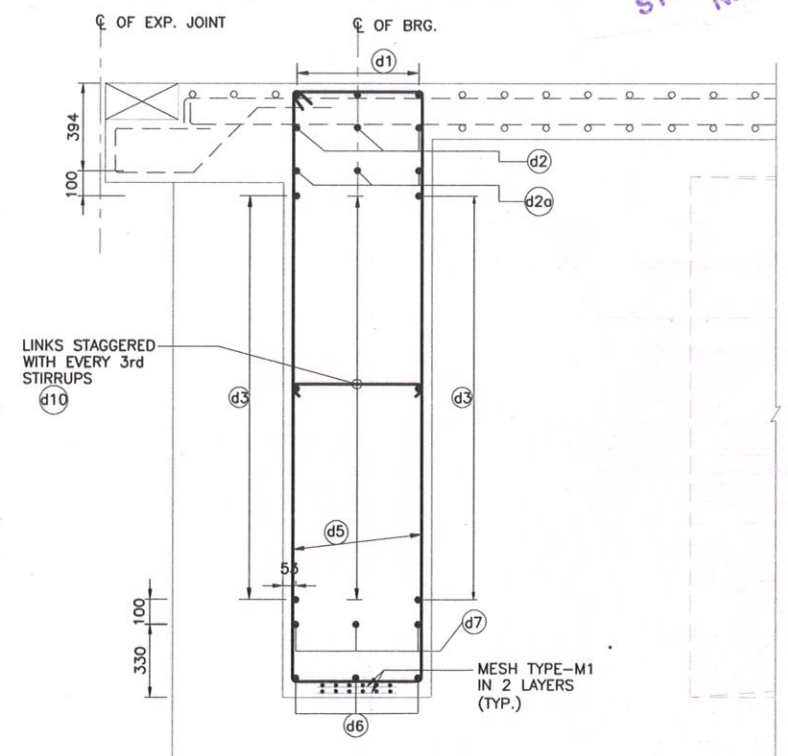
8# MESH TYPE-A  
(SCALE 1:10)



8# MESH TYPE-M1  
(AT JACK LOCATION TWO LAYERS  
ONE AT 20MM & ANOTHER AT  
80MM FROM BOTTOM)  
(SCALE 1:10)



SECTION A-A  
(SCALE 1:20)



SECTION B-B  
(SCALE 1:20)

# SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
d1		25#-3 Nos.
d2		25#-3 Nos.
d2a		25#-3 Nos.
d3		12#-10 Nos. (EACH FACE)
d4		12#-10 Nos. (EACH FACE)
d5		2L-12#@150 C/C
d6		16#-3 Nos.
d7		16#-3 Nos.
d8		16#-3 Nos.
d9		16#-3 Nos.
d10		10#@200 C/C
d11		16#-4 Nos.
d12		16#-4 Nos.
d13		12#-10Nos. (EACH FACE)

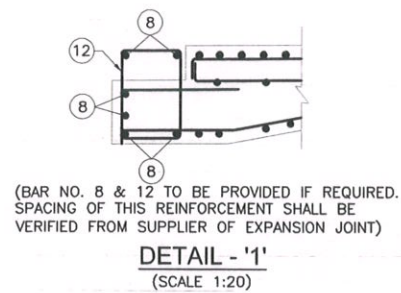
## IMPORTANT NOTES:

- SUITABLE DOWEL BARS SHALL BE PLACED IN LONGITUDINAL GIRDER (WHILE CASTING IN YARD) FOR CAST-IN-SITU CROSS GIRDER.

Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

<b>CLIENT:-</b> <b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE</b> (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> <b>STUP Consultants P. Ltd</b> & <b>Ayoleeza Consultants P. Ltd.</b>		<b>PROOF CHECK CONSULTANT:-</b> <b>AYOLEEZA</b> CONSULTANTS P. LTD.		<b>SAFETY CONSULTANT:-</b> <b>Chaitanya Projects Consultancy Pvt. Ltd</b>		<b>PROJECT:-</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> <b>SIMPLEX INFRASTRUCTURES LIMITED</b> 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> <b>AECOM</b> 9th Floor, Infinity Tower C, DLF Cyber City, DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN	
<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>		<b>AUTHORISED SIGNATORY</b>			
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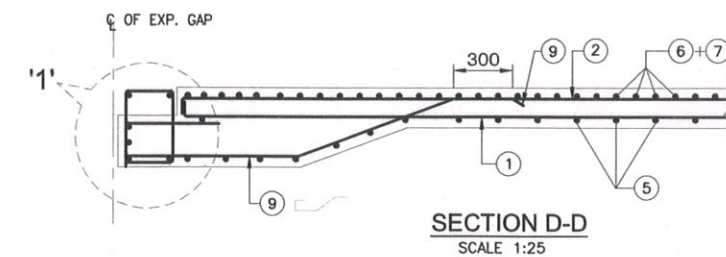
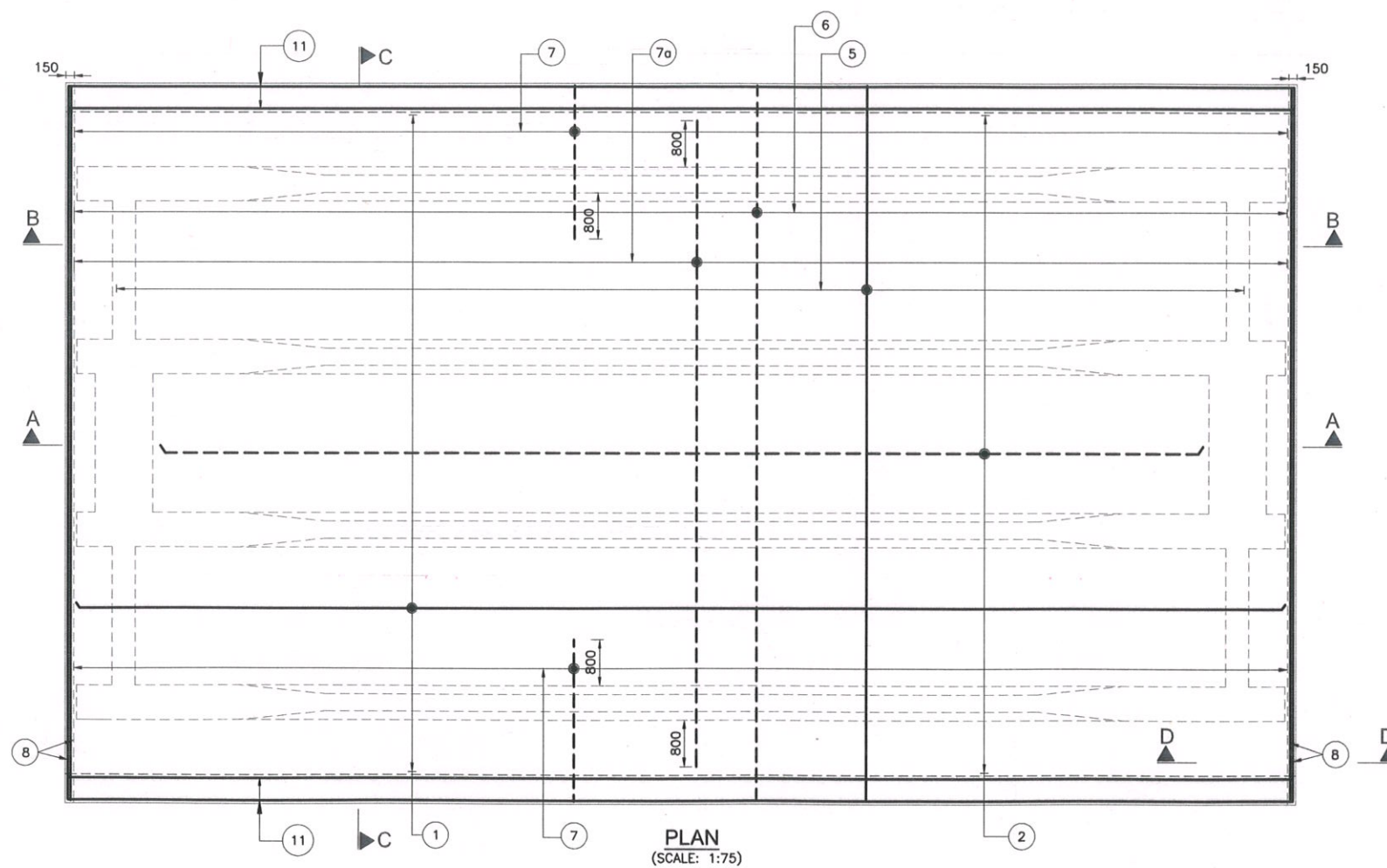


# SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
01	100 100	12 $\Phi$ 200 C/C
02	100 100	12 $\Phi$ 200 C/C
03	NOT USE	
04	NOT USE	
05	100 100	12 $\Phi$ 180 C/C
06	100 100	12 $\Phi$ 180 C/C
07	100	16 $\Phi$ 180 C/C
7a		12 $\Phi$ 180 C/C
08	100 100	2x(16 $\Phi$ -4NOS.)

## LEGEND:-

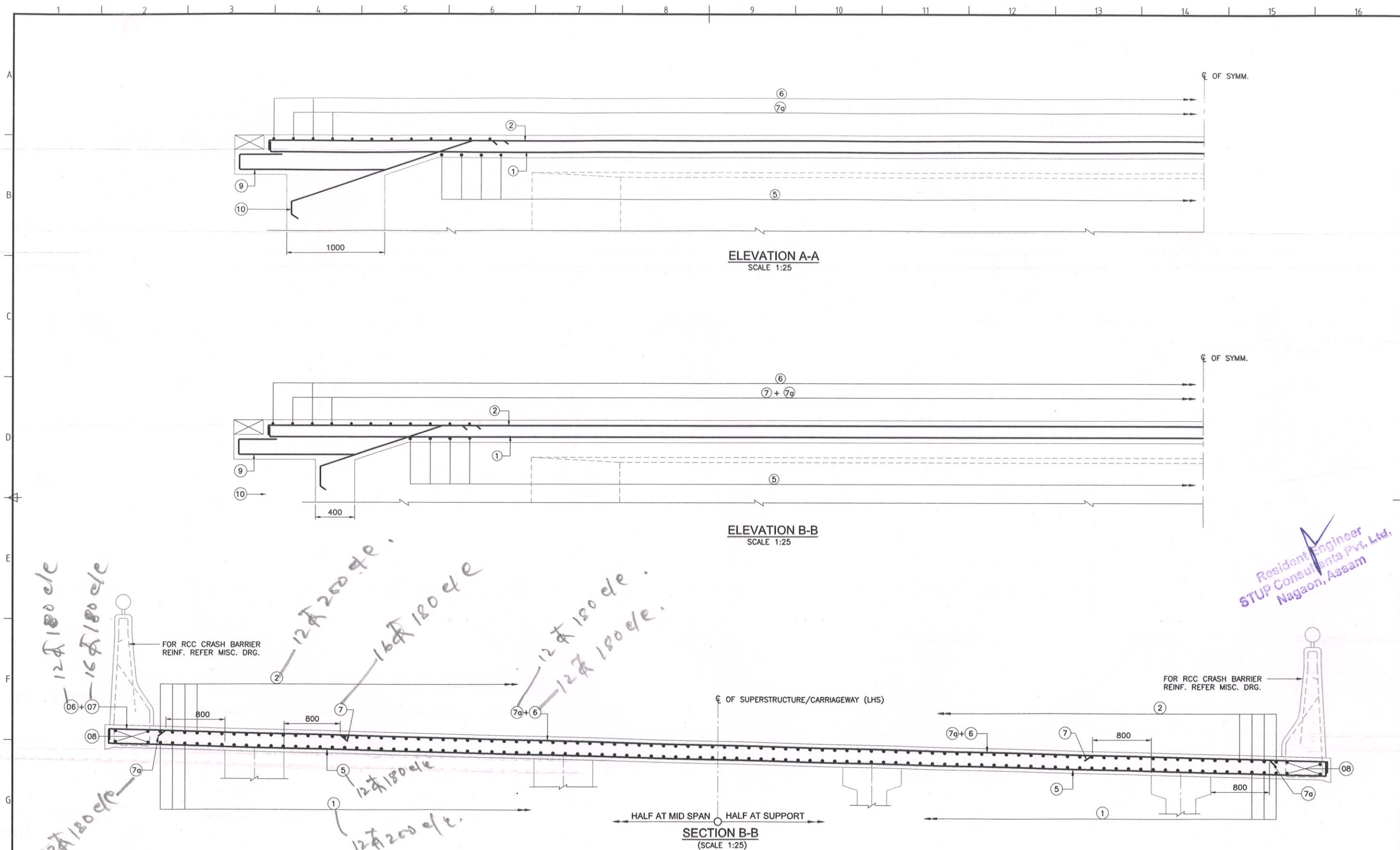
— ON BOTTOM FACE  
- - - ON TOP FACE








Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

<b>CLIENT:-</b>  NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		<b>AUTHORITY'S ENGINEER:</b> STUP Consultants P. Ltd. & Ayoleeza Consultants P. Ltd. AUTHORIZED SIGNATORY: _____ DATE: _____		<b>PROOF CHECK CONSULTANT:</b>  AYOLEEZA CONSULTANTS P. LTD. AUTHORIZED SIGNATORY: _____ DATE: _____		<b>SAFETY CONSULTANT:-</b>  Chaitanya Projects Consultancy Pvt. Ltd. AUTHORIZED SIGNATORY: _____ DATE: _____		<b>PROJECT:</b> FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b>  SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:</b>  AECOM 9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India R. SENAPATI, S. P. SINGH, S. YADAV, S. RASTOGI DRAWN, DESIGN, CHECKED BY, APPROVED BY		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+896 (SCH-B CH. 314+747) (RCC DECK SLAB)		<b>DRAWING NO.:-</b> AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 14 OF 16)		<b>REV.:</b> FOR APPROVAL Rev. Date Description on Revisions 01 08-02-2018 FIRST SUBMISSION 02 15-02-2018 Revisions	
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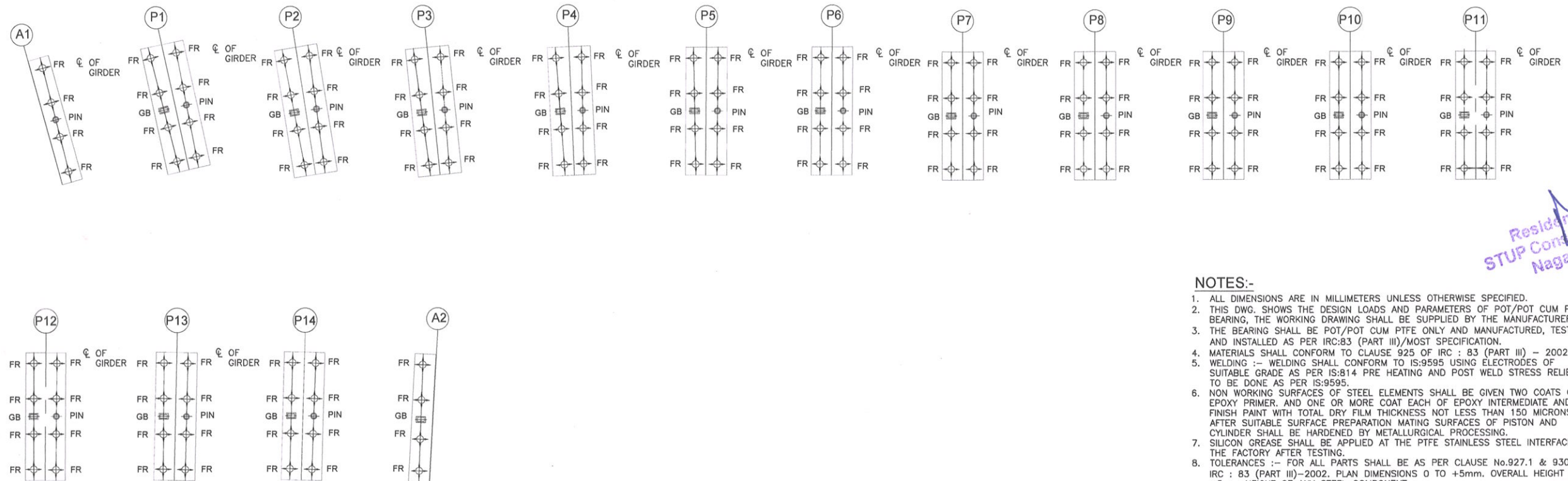




Resident Engineer  
STUP Consultants Pvt. Ltd.  
Nagaon, Assam

CLIENT:-		AUTHORITY'S ENGINEER:		PROOF CHECK CONSULTANT:-		SAFETY CONSULTANT:-		PROJECT:		EPC CONTRACTOR:-		CONSULTANTS:		SCALE:-		TITLE:-			
		NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Corporation Ltd)		STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd.						FOUR LANING OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE				SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA				DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+996 (SCH-B CH. 314+747) (RCC DECK SLAB)	
		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AUTHORISED SIGNATORY		DATE		AS SHOWN		DRAWING NO.:- AECOM-DELD15159-DD-DWG-FO-314+747-SUP-01 (SH 15 OF 16)			
																REV. R0			





Resident Engineer  
STUP Consultants  
Nagaon, Assam

#### NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- THIS DWG. SHOWS THE DESIGN LOADS AND PARAMETERS OF POT/POT CUM PTFE BEARING. THE WORKING DRAWING SHALL BE SUPPLIED BY THE MANUFACTURER.
- THE BEARING SHALL BE POT/POT CUM PTFE ONLY AND MANUFACTURED, TESTED AND INSTALLED AS PER IRC:83 (PART III)/MOST SPECIFICATION.
- MATERIALS SHALL CONFORM TO CLAUSE 925 OF IRC : 83 (PART III) - 2002.
- WELDING :- WELDING SHALL CONFORM TO IS:9595 USING ELECTRODES OF SUITABLE GRADE AS PER IS:814 PRE HEATING AND POST WELD STRESS RELIEVING TO BE DONE AS PER IS:9595.
- NON WORKING SURFACES OF STEEL ELEMENTS SHALL BE GIVEN TWO COATS OF EPOXY PRIMER, AND ONE OR MORE COAT EACH OF EPOXY INTERMEDIATE AND FINISH PAINT WITH TOTAL DRY FILM THICKNESS NOT LESS THAN 150 MICRONS AFTER SUITABLE SURFACE PREPARATION MATING SURFACES OF PISTON AND CYLINDER SHALL BE HARDENED BY METALLURGICAL PROCESSING.
- SILICON GREASE SHALL BE APPLIED AT THE PTFE STAINLESS STEEL INTERFACE IN THE FACTORY AFTER TESTING.
- TOLERANCES :- FOR ALL PARTS SHALL BE AS PER CLAUSE No.927.1 & 930 OF IRC : 83 (PART III)-2002. PLAN DIMENSIONS 0 TO +5mm. OVERALL HEIGHT 0 TO +3mm HEIGHT OF ANY STEEL COMPONENT  
a. MACHINED 0 TO +1mm.  
b. UNMACHINED CLASS 2 OF IS-4897
- THE STAINLESS STEEL PLATES SHALL BE WELDED ON THE BACKING PLATES.
- ALL BEARINGS SHALL BE LOAD TESTED IN THE FACTORY TO 1.1 TIMES THE DESIGN LOAD INCLUDING SEISMIC FORCE. TWO BEARINGS SELECTED AT RANDOM WILL BE TESTED FOR PERMISSIBLE ROTATION. PAIR OF BEARINGS SELECTED AT RANDOM SHALL BE TESTED FOR CO-EFFICIENT OF FRICTION. CO-EFFICIENT OF FRICTION SHALL BE 0.05 AT THE DESIGN LOAD.
- CERTIFICATE FOR ACCEPTANCE TEST ON BEARINGS SHALL BE FURNISHED.
- SUITABLE ERECTION CLAMPS FOR SAFE TRANSPORTATION AND HANDLING ALONG WITH TEMPLATE FOR ALIGNMENT SHALL BE PROVIDED BY THE MANUFACTURER. THESE SHALL BE REMOVED AFTER INSTALLATION AT AN APPROPRIATE TIME.
- THE BEARING CYLINDER BASE PLATE SHALL BE OF CAST STEEL OF GRADE 280-520 W OF IS:1030-1989 AND THE MATERIAL AND FINISHED PRODUCT SHALL SATISFY ALL THE RELEVANT "IS" TEST & "IS" SPECIFICATIONS SUCH AS:-  
a. THE SURFACE HARDNESS SHALL BE TO BRINELL HARDNESS NUMBER MINIMUM 350 BHN AS PER MOST SPECIFICATION (4th REVISION 2001). TOP PLATE AND PISTON WILL BE AS PER IS: 2062 GRADE B - 1992.  
b. CASTING TAPER FILLETS ROUNDOFF OF EDGES TO MATCHING ALLOWANCE TO BE AS PER STANDARD PRACTICE.  
c. TESTING SPECIFIED IN IS:1030 i.e. TENSILE TEST IMPACT TEST AND BOND TEST SHALL BE CONDUCTED.  
d. CASTING SHALL BE ULTRASONICALLY TESTED AND CERTIFICATES SHALL BE SUBMITTED.  
e. QUALITY LEVEL OF CASTING AS PER IS:9565 SHALL BE LEVEL 3.  
f. RECERTIFICATION OF CASTING BY WELDING SHALL BE DONE AS PER IS:1030 AND IS:5530.
- THE GROUT/BEDDING MORTAR SHALL BE A HIGH STRENGTH FREE FLOWING NON SHRINK GROUT.
- THE PTFE MAY BE PROVIDED AS SINGLE DIMPLED SHEET OR WITH SMALLER MODULES IN INDIVIDUAL POCKETS WITH 10mm.GAP BETWEEN MODULES FILLED WITH SILICON GREASE.THE PTFE SHALL BE OF UNFILLED PURE VIRGIN QUALITY (MOST SPECIFICATION 2001)
- SUITABLE TAPER FOR THE PRESS FIT GUIDE KEY AS REQUIRED MAY BE PROVIDED BY THE MANUFACTURER.
- BEARING SHOULD BE PROCURED FROM THE MANUFACTURER AND APPROVED BY ENGINEER.
- THE DESIGN LATERAL LOAD:-  
a. SHALL NOT BE LESS THAN 10% OF DESIGN VERTICAL LOAD AS PER CLAUSE 926.1.4 OF IRC 83 PART-III 2002.  
b. SHALL NOT BE MORE THAN 25% OF DESIGN VERTICAL LOAD AS PER CLAUSE 926.1.4 OF IRC 83 PART-III 2002.

#### LOAD FOR BEARING (FOR 30.0M SPAN)

TYPE OF BEARING		NORMAL CASE			SEISMIC LONG. CASE			SEISMIC TRANS. CASE			LONG. MOVEMENT (mm)	DESIGN ROTATION (RADIAN)	TOTAL NO. OF BEARINGS (SPANxNos.)
		VERTICAL LOAD (t)	LONG. FORCE (t)	TRANS. FORCE (t)	VERTICAL LOAD (t)	LONG. FORCE (t)	TRANS. FORCE (t)	VERTICAL LOAD (t)	LONG. FORCE (t)	TRANS. FORCE (t)			
PINNED	PIN	0	7	0	0	387	58	0	137	200	0	0.01	15x1
LONG. GUIDED	GB	0	0	0	0	0	58	0	0	200	-38/11	0.01	15x1
FREE	FR	160	7	0	160	7	0	160	7	0	-38/11	0.01	15x8

#### LEGENDS:

- PIN  
RESISTS NO VERTICAL LOAD, RESTRAINED IN BOTH DIRECTION & ROTATION PERMITTED.
- FR  
RESISTS VERTICAL LOAD, FREE IN BOTH DIRECTION AND ROTATION PERMITTED.
- GB  
GUIDED BEARING; RESISTS NO VERTICAL LOAD FREE IN LONGITUDINAL DIRECTION, RESTRAINED IN TRANSVERSE DIRECTION AND ROTATION PERMITTED.

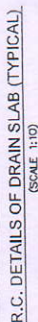
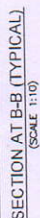


<b>CLIENT:-</b> NATIONAL HIGHWAYS & INFRASTRUCTURE (Development Cooperation Ltd)		<b>AUTHORITY'S ENGINEER:-</b> STUP Consultants P. Ltd & Ayoleeza Consultants P. Ltd.		<b>PROOF CHECK CONSULTANT:-</b> CETEST		<b>SAFETY CONSULTANT:-</b> Chaitanya Projects Consultancy Pvt. Ltd		<b>PROJECT:-</b> FOUR LANE OF NH-37 FROM RANGAGARA TO KALIABOR TINIALI (CH: 297.000 KM TO CH: 315.315 KM) IN NAGAON DISTRICT IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE A ON EPC MODE		<b>EPC CONTRACTOR:-</b> SIMPLEX INFRASTRUCTURES LIMITED 27, SHAKESPEARE SARANI, KOLKATA-17, INDIA		<b>CONSULTANTS:-</b> AECOM 9th Floor, Infinity Tower C DLF Cyber City DLF Phase II, Gurgaon-122002, Haryana, India		<b>SCALE:-</b> AS SHOWN		<b>TITLE:-</b> DIMENSION, CABLES, PRESTRESSING & REINFORCEMENT DETAILS OF PSC GIRDER OF SPAN 30.0M FOR FLYOVER AT CH. 314+996 (SCH-B CH. 314+747) (RCC DECK SLAB)	
<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>AUTHORISED SIGNATORY</b> _____ <b>DATE</b> _____		<b>FOR APPROVAL</b> Rev. 08-02-2018 FIRST SUBMISSION Description on Revisions		<b>DRAWING NO.:-</b> AECOM-DEL15159-DD-DWG-FO-314+747-SUP-01 (SH 16 OF 16)		<b>REV.</b> <b>NO.</b>					







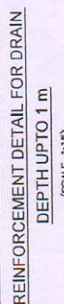
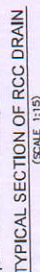
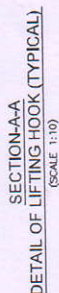
**NOTES:-**

1. ALL DIMENSIONS ARE IN mm. AND LEVELS IN METERS UNLESS ALLOWED OTHERWISE.
2. GRADE OF CONCRETE :-  
M20 - FOR RCC DRAIN & COVER SLAB.
3. ALL REINFORCING STEEL SHOULD BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS OF (GRADE-FY 500).
4. LAPS IN REINFORCEMENT :-  
(i) MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE  
(a) FOR M20 GRADE OF CONCRETE - 66 $\phi$   
(b) CLEAR COVER TO REINFORCEMENT IS 40mm.



### SCHEDULE OF REINFORCEMENT FOR DRAIN & DRAIN SLAB

BAR MARK	SHAPE OF BARS	DEPTH VARIES 500-1500 mm DIA - SPACING
①		10Φ - 150 c/c
②		8Φ - 200 c/c
③		10Φ - 150 c/c
④		10Φ - 150 c/c



**Acting Team Leader**  
**Acting Consultants Pvt. Ltd.**  
**STUP Consolan, Assam**

[illegible]