

Vendor Document Review Sheet

PROJECT TITLE:

4G Project

VENDOR NAME:

RS Infra & Ganges Internationale

DOCUMENT TITLE:

Generic Square Raft Foundation Drawing of GFT12B 40m Towers_50m/s-SBC-7.5T/m2 (Full Water Table)-Square Raft

VENDOR DOCUMENT NO.

J15009-DC041-40-GFT12B-7.5FWT.PC-R0

VENDOR REVISION NO:

0

VENDOR DOCUMENT REVIEW FEEDBACK

Permission to proceed does not constitute acceptance or approval of Design Detail, Calculations, Analysis, Test Methods or Materials developed OR selected by Vendor, and does NOT relieve Vendor from FULL compliance with Contractual Obligations

☐ **1** Work may proceed.

☐ **5** Revise and Resubmit.
Work may not proceed.

☒ **2** Review not required, Work may proceed.

☐ **6** For Information Only

☐ **3** Revise & Resubmit at Final stage

☐ **SUP** Superseded

☐ **4** Revise & Resubmit. Work may proceed,
subject to incorporation of changes

☐ **CAN** Cancelled / Not required.

By: **Nikhil Bhagwat**

Date: **29-09-2015**

Discipline:

Equipment No.
(if applicable)

MR Number
(if applicable)

Project No

10070

PO No

1 1 8 - 6 3 0 0 3 9 7 5

Cat. Code

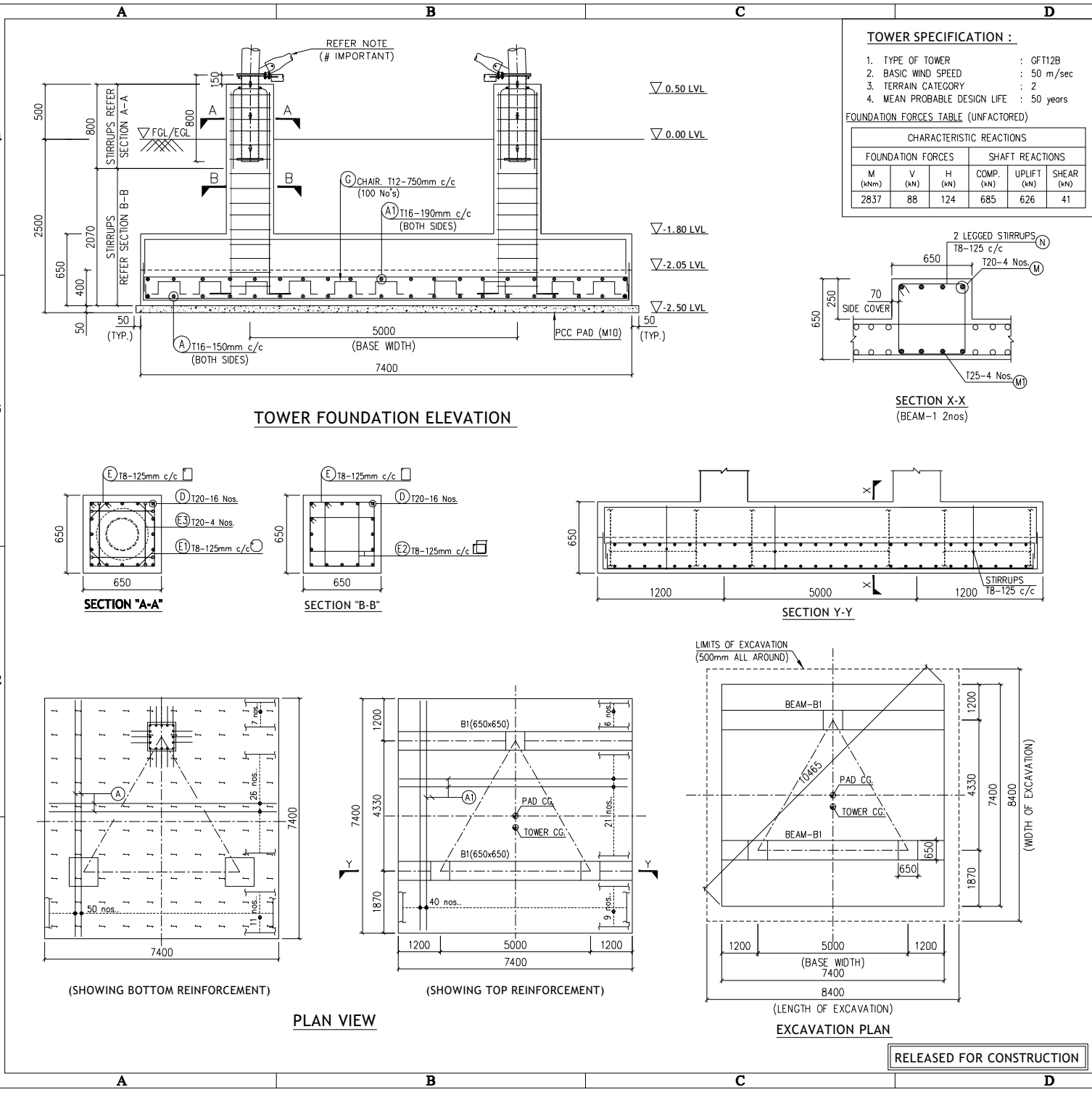
B 0 5

Seq. No.

2 2 4

Rev No

0 0



NOTES ON GENERIC FOUNDATION DRAWING

1. THIS IS A GENERIC FOUNDATION DRAWING.

2. THE FOLLOWING ARE THE ASSUMED PARAMETERS CONSIDERED DURING FOUNDATION DESIGN

NET SAFE BEARING CAPACITY (NSBC) = 7.5 T/m²

GROUND WATER TABLE = AT GROUND LEVEL

DEPTH OF FOUNDATION = 2.5m FROM FGL

DRY DENSITY OF SOIL (γ_d) = 1.7 T/m³

ANGLE OF INTERNAL FRICTION (ϕ) = 12.5°

3. BEFORE COMMENCEMENT OF CONSTRUCTION WORK USING THESE DESIGNS, THE OWNER/CLIENT/CIVIL CONTRACTOR SHALL CARRY OUT DETAILED SOIL INVESTIGATION OF EVERY SITE.

4. FURTHER, THE SOIL INVESTIGATION REPORT SHALL BE REVIEWED BY A CONSULTANT AND CERTIFICATION SHALL BE OBTAINED TO ENSURE CONFORMITY BETWEEN ASSUMED PARAMETERS AND SOIL REPORT VALUES BEFORE START OF CONSTRUCTION.

5. THE FOUNDATION DESIGN IS APPLICABLE ONLY WHEN THE CONSIDERED NSBC IS AVAILABLE AT OR WITHIN 2.5m DEPTH FROM FGL. IN BOTH CASES THE MINIMUM FOUNDATION DEPTH SHALL BE 2.5m FROM FGL.

IN CASE THE REQUIRED NSBC IS AVAILABLE BEYOND 2.5m DEPTH, THIS FOUNDATION DESIGN DOES NOT STAND APPLICABLE.

6. THIS FOUNDATION DESIGN SHALL NOT BE USED IN CASE ORGANIC SILT, ORGANIC CLAY OR PEAT LAYERS ARE FOUND AT ANY DEPTHS DURING SOIL INVESTIGATION.

7. THIS FOUNDATION DESIGN SHALL NOT BE ADOPTED AT SITES WHERE GROUND IMPROVEMENTS IS REQUIRED.

8. ANY DISCREPANCY IN THE DRAWING & SITE CONDITIONS SHALL BE BROUGHT TO THE NOTICE OF SITE ENGINEER & CONSULTANT.

9. IN CASE TOP OF PEDESTAL IS FOUND TO BE LOWER THAN THE ROAD LEVEL/HIGH FLOOD LEVEL, THEN BASE PLATE ENCASEMENT SHALL BE TAKEN UP IN CONSULTATION WITH THE SITE ENGINEER/INCHARGE/CONSULTANT.

IMPORTANT:

IT IS IMPORTANT THAT THE CAST-IN PART IS PLACED IN LEVEL AND THE CAST-IN PART TUBE IS FILLED WITH CONCRETE UP TO THE MIDDLE OF THE TOP HOLE AS SHOWN ON DRAWINGS OF CAST-IN PARTS.

DESCRIPTION	TOWER FOUNDATION	D.G PLATFORM	TOTAL QUANTITY
CONCRETE (cum)	27.2	4.0	31.2
PCC (cum)	2.81	0.26	3.07
REINFORCEMENT (Kg)	3450.09	481.5	3931.59
EXCAVATION (cum)	176.4	-	176.4

DISCLAIMER:

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DATE	REVISION	ISSUED FOR APPROVAL	SUBASH	SSR
09.09.15	0	ISSUED FOR APPROVAL	SUBASH	SSR
DATE	REVISION	REVISION DESCRIPTION	CHECKED	APPROVED

ENGINEERING BY:- **RAMBOLL INDIA PVT. LTD.**
Ramboll India Telecom, Hyderabad.

PLOT No. 32, KAVURI HILLS, NEAR JUBILEE HILLS ROAD No.36, HYDERABAD-500033, INDIA.
Tel:+91-40-40322000, Fax:+91-40-40322003, E mail:services@ramboll.in, www.ramboll.in

PROJECT:- **GENERIC FOUNDATION FOR GROUND BASED MW TOWER**
(TOWER TYPE : GFT12B - 50 m/s)

NAME	DATE	TITLE : GENERIC SQUARE RAFT FOUNDATION DRAWING FOR 40m TOWER	SCALE:
DSGN SUBASH	09.09.15	SBC : 7.5 T/m² (FULL WATER TABLE)	NTS.
DRWN BAS	09.09.15		
CHKD SUBASH	09.09.15		
APPD SSR	09.09.15		

DRG. No. J151009-D041-40-GFT12B-7-5FWT-PC

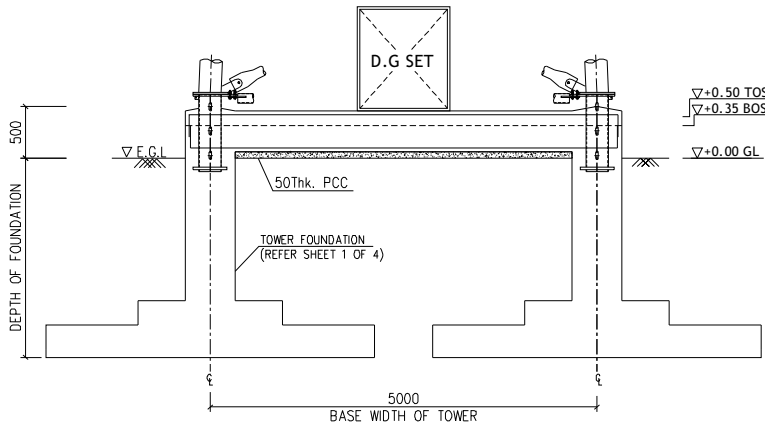
SIZE A3 **REV.** 0

RELEASED FOR CONSTRUCTION

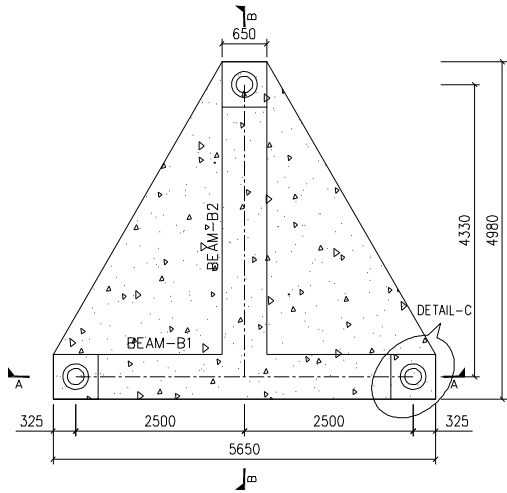
RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☒ APPROVAL ☐ CONSTRUCTION

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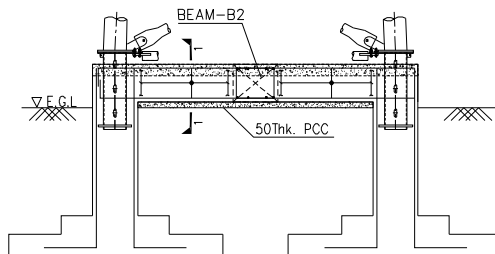
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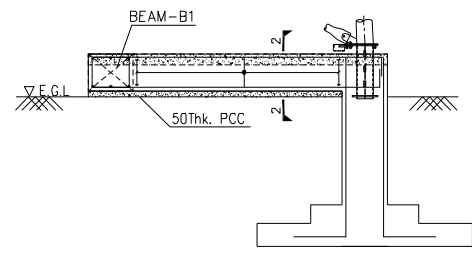
ISOLATED TOWER FOUNDATION ELEVATION (SHOWING D.G SET PLATFORM)



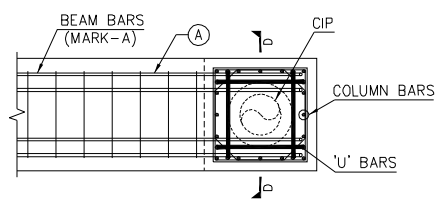
PROPOSED "T" SHAPE BEAM LAYOUT FOR D.G SET PLATFORM (INSIDE OF TOWER COLUMNS)



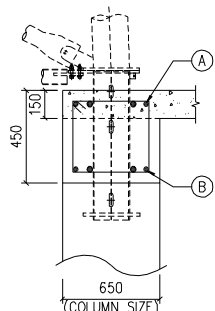
SECTION A-A (BEAM-B1 650x450)



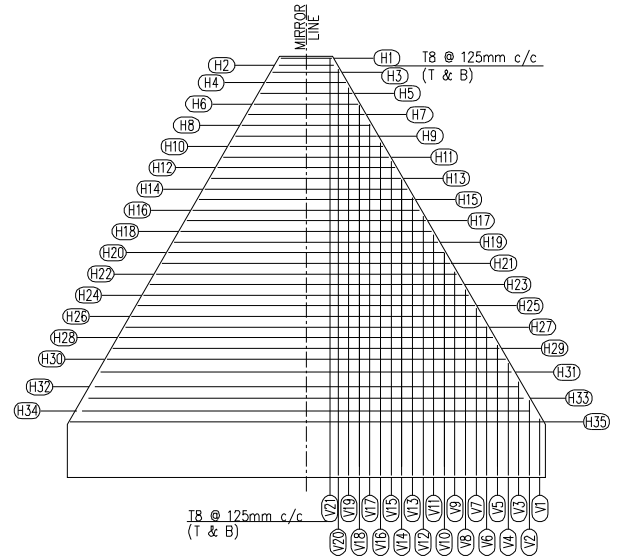
SECTION B-B (BEAM-B2 650x450)



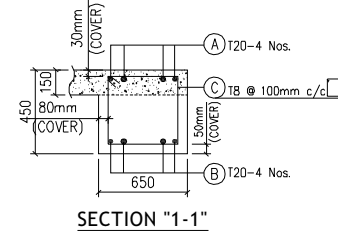
DETAIL "C" TYPICAL COLUMN-BEAM SECTION (SHOWING COLUMN & BEAM REINFORCEMENT)



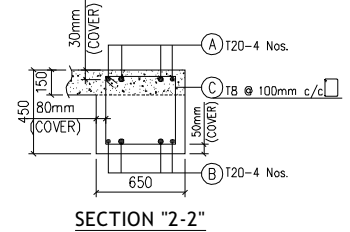
SECTION "D-D" (Typ.)



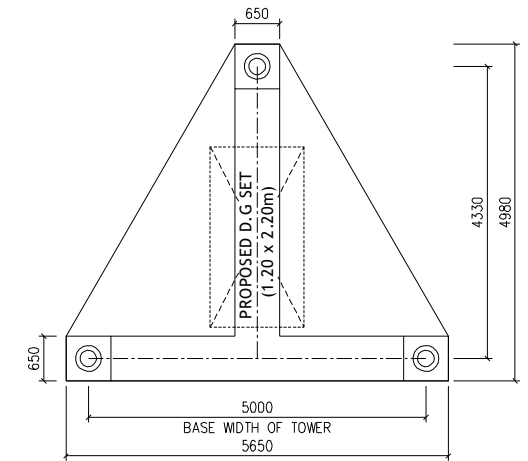
SLAB DETAIL (150mm Thk.) (SHOWING TOP & BOTTOM REINFORCEMENT)



SECTION "1-1"



SECTION "2-2"



D.G SET PLAN VIEW

RELEASED FOR CONSTRUCTION

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





































































PROJECT :-		D.G SET FOUNDATION INSIDE TOWER (TOWER TYPE : GFT12B - 50 m/s)	
DSGN	SUBASH	09.09.15	TITLE : STRUCTURAL DETAILS OF 'T' SHAPE D.G PLATFORM
DRWN	BAS	09.09.15	
CHKD	SUBASH	09.09.15	
APPD	SSR	09.09.15	

DRG. No.	J15009-DC41-40-GFT12B-D-G-CASE1	SIZE	A3	REV.	0
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A								B													
BAR BENDING SCHEDULE																					
ITEM	MARK	DIA (mm)	DESCRIPTION	LENGTH (mm)	NOS.	UNIT WT. (kg/m)	TOTAL WT. (kg)	ITEM	MARK	DIA (mm)	DESCRIPTION	LENGTH (mm)	NOS.	UNIT WT. (kg/m)	TOTAL WT. (kg)						
4	BEAM-B1	A	20		6000	4	2.47	59.3	1	SLAB	H1	8		667	2	0.39	0.5				
		B	20		6000	4	2.47	59.3			H2	8		812	2	0.39	0.6				
		c	8		1890	40	0.39	29.5			H3	8		956	2	0.39	0.7				
	BEAM-B2	A	20		5290	4	2.47	52.3	3	SLAB	H4	8		1100	2	0.39	0.9				
		B	20		5290	4	2.47	52.3			H5	8		1245	2	0.39	1.0				
		c	8		1890	38	0.39	28.01			H6	8		1389	2	0.39	1.1				
2	SLAB	H7	8		1533	2	0.39	1.2	2	SLAB	H7	8		1533	2	0.39	1.2				
		H8	8		1678	2	0.39	1.3			H8	8		1678	2	0.39	1.3				
		H9	8		1822	2	0.39	1.4			H9	8		1822	2	0.39	1.4				
		H10	8		1967	2	0.39	1.5			H10	8		1967	2	0.39	1.5				
		H11	8		2111	2	0.39	1.6			H11	8		2111	2	0.39	1.6				
		H12	8		2255	2	0.39	1.8			H12	8		2255	2	0.39	1.8				
		H13	8		2400	2	0.39	1.9			H13	8		2400	2	0.39	1.9				
		H14	8		2544	2	0.39	2.0			H14	8		2544	2	0.39	2.0				
		H15	8		2688	2	0.39	2.1			H15	8		2688	2	0.39	2.1				
		H16	8		2833	2	0.39	2.2			H16	8		2833	2	0.39	2.2				
		H17	8		2977	2	0.39	2.3			H17	8		2977	2	0.39	2.3				
		H18	8		3121	2	0.39	2.4			H18	8		3121	2	0.39	2.4				
		H19	8		3266	2	0.39	2.5			H19	8		3266	2	0.39	2.5				
		1	SLAB	H20	8		3410	2			0.39	2.7	1	SLAB	H20	8		3410	2	0.39	2.7
				H21	8		3554	2			0.39	2.8			H21	8		3554	2	0.39	2.8
H22	8				3699	2	0.39	2.9	H22	8		3699			2	0.39	2.9				
H23	8				3843	2	0.39	3.0	H23	8		3843			2	0.39	3.0				
H24	8				3987	2	0.39	3.1	H24	8		3987			2	0.39	3.1				
H25	8				4132	2	0.39	3.2	H25	8		4132			2	0.39	3.2				
H26	8				4276	2	0.39	3.3	H26	8		4276			2	0.39	3.3				
H27	8				4420	2	0.39	3.4	H27	8		4420			2	0.39	3.4				
H28	8				4565	2	0.39	3.6	H28	8		4565			2	0.39	3.6				
H29	8				4709	2	0.39	3.7	H29	8		4709			2	0.39	3.7				
	SLAB	H30	8		4853	2	0.39	3.8		SLAB	H30	8		4853	2	0.39	3.8				
		H31	8		4998	2	0.39	3.9			H31	8		4998	2	0.39	3.9				
		H32	8		5142	2	0.39	4.0			H32	8		5142	2	0.39	4.0				
		H33	8		5286	2	0.39	4.1			H33	8		5286	2	0.39	4.1				
		H34	8		5431	2	0.39	4.2			H34	8		5431	2	0.39	4.2				
		H35	8		5590	2	0.39	4.36			H35	8		5590	2	0.39	4.36				
		A																			

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GENERAL NOTES

GENERAL & MATERIAL

- ALL DIMENSIONS ARE IN "mm" U.O.S.
- RCC & PCC SHALL BE OF GRADE M20 & M10 RESPECTIVELY.
- MINIMUM CEMENT CONTENT OF M20 CONCRETE SHALL BE 300 Kg/m³ WITH WATER CEMENT RATIO OF 0.55 (27.5 LITRES/50 Kg BAG OF CEMENT).
- FOR AGGRESSIVE SOIL/EXPOSURE CONDITIONS, MINIMUM GRADE OF CONCRETE SHALL BE REFERRED AS PER IS456 2000, TABLE 3 AND 5'.
- PCC/LEAN CONCRETE SHALL BE OF GRADE M10 WITH MIX PROPORTION OF 1:3:6
- STEEL GRADE IS Fe415 U.O.S. AS PER IS 1786 / IS 1159
- IF ANY LEVEL DIFFERENCE IN EXISTING GROUND IS FOUND, THEN SOIL EXCAVATION FOR FOUNDATION SHALL BE STARTED WITH REFERENCE TO THE LOWER LEVEL AND THE SOIL SHALL BE BACK FILLED AND COMPACTED UPTO THE TOP MOST LEVEL OF NATURAL GROUND LEVEL TO AVOID SOIL EROSION.
- VERIFY THE ADJACENT SITE FEATURES BEFORE EXCAVATION, PROPER CARE SHALL BE TAKEN TO AVOID DAMAGE TO ADJACENT STRUCTURE.
- ANY DISCREPANCY IN THE DRAWING VS SITE CONDITIONS SHALL BE BROUGHT TO THE NOTICE OF SITE ENGINEER & CONSULTANT (Ramboll India Pvt. Ltd.)
- FOLLOWING CEMENT AND STEEL BRANDS TO BE USED FOR CONSTRUCTION. IF ANY DEVIATION IN THE BELOW MATERIAL PRIOR APPROVAL TO BE TAKEN FROM CLIENT.
CEMENT BRANDS : L & T, BIRLA KESORAM, CCCI,RASI,KCP,PRIYA GOLD,ZUVARI,PENNA POWER, CORAMANDEL.-(53 GRADE – OPC)
STEEL BRANDS : TATA TISCON, SAIL, KAMADHENU, VIZAG TMT, THERMAX, SARVOTHAM, SUJANA, JAYARAJ, KDM, SIMHADRI

TECHNICAL SPECS

- MINIMUM COVER TO THE MAIN REINFORCEMENT
FOR COLUMNS 50mm FOR BEAMS 30mm
FOR PAD 50mm
FOR STRIP 50mm.
- THE LAP LENGTH/DEVELOPMENT LENGTH OF BARS SHOULD BE 50ø AND STAGGERED. HOWEVER, IT IS PREFERABLE TO WELD BARS IN CHIMNEY/COLUMN. WELD SHALL BE CONTINUOUS FOR A MINIMUM LENGTH OF 450mm PER EACH BAR WITH 10mm THICK WELD ON BOTH SIDES.
- NO CONSTRUCTION JOINT SHALL BE ALLOWED OTHER THAN SPECIFIED.
- CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE TO VARIOUS PROVISIONS LAID DOWN IN IS:456/IS:800 STANDARDS.
- STRIPPING OF FORMWORK SHALL BE CARRIED OUT AFTER A MINIMUM PERIOD OF 24 HRS AFTER CONCRETING.

EXCAVATION & BACKFILLING

- THE SIDE SLOPES FOR EXCAVATION SHALL BE DIVIDED AS PER THE FOLLOWING GUIDELINES.
a) FOR SANDY SOILS, SLOPE IV:2H
b) FOR CLAYEY SOILS, SLOPE IV:1H
c) FOR HARD STRATA, VERTICAL CUT
ALTERNATIVELY, SUFFICIENT SHEET PILES/SHORING SHALL BE USED DURING EXCAVATION TO PREVENT SIDE COLLAPSE.
- SAND BEDDING/STONE BEDDING SHALL BE PROVIDED IN FOUNDATIONS OF MARSHLY AND WET BLACK COTTON SOIL.
- IN CASE OF NO GROUND WATER, ALL FOUNDATION PITS SHALL BE SOAKED WITH WATER FOR 24 HOURS AND COMPACTED WELL BEFORE PLACING P.C.C.
- LOOSE POCKETS OF SOIL, (IF ANY FOUND) IN FOUNDATION PITS SHALL BE COMPLETELY REMOVED FOR LOOSE MATERIAL AND FILLED WITH P.C.C & COMPACTED WELL BEFORE FOUNDATIONS IS LAID.
- FOUNDATION PIT SHALL BE KEPT DRY (FREE FROM WATER) DURING LAYING OF PCC & RCC AND FURTHER TO A PERIOD OF 48 HOURS (MIN.) FROM THE CONCRETE LAYING TIME.
- ALL BACK FILLING OF FOUNDATION SHOULD BE DONE WITH WELL COMPACTED MURRUM SOIL.
- THE BACK FILLING MATERIALS SHOULD BE CLEAN AND FREE FROM ORGANIC OR OTHER FOREIGN MATERIALS.
- SOIL BACK FILL SHALL BE DONE IN LAYERS OF APPROX. 150-200mm, EACH LAYERS SHALL BE DENSELY COMPACTED BY SPRINKLING MINIMUM QUANTITY OF WATER AS NECESSARY FOR PROPER COMPACTION.
- CARE SHALL BE TAKEN THAT THE BACK FILLING IS STARTED FROM THE CENTRE TOWARDS THE OUTER ENDS
- AFTER BACK FILLING 50mm HIGH EARTHEN EMBANKMENT(BUND) TO BE MADE ALONG THE SIDES OF EXCAVATED PITS AND SUFFICIENT WATER WILL BE POURED OVER THE BACK FILLED EARTH FOR ATLEAST 24HRS.

CURING

- CURING OF FOUNDATIONS SHALL BE CARRIED OUT OVER A MINIMUM PERIOD OF 7 DAYS. IN THE FOLLOWING MANNER.
a) BASE RAFT, BEAM SHALL BE KEPT CONTINUOUSLY IN DAMP OR WET CONDITION BY PONDING OR BY COVERING WITH SACKING FOR A MINIMUM PERIOD OF 2 DAYS AFTER FINAL SETTING TIME OF CONCRETE (±12 HRS)
b) BACK FILLING SHALL START AFTER 72 HRS OF CONCRETING.
c) AFTER COMPLETION OF BACK FILLING THE SOIL SHALL BE KEPT MOIST/DAMP/WET CONDITION UPTO 7 DAYS FROM CONCRETING.
- TOWER ERECTION SHALL START AFTER 7 DAYS OF CONCRETING AND OR MIN. 3 DAYS AFTER ANCHOR BOLT SETTING.
- IN CASE TOP OF PEDESTAL IS FOUND TO BE LOWER THAN THE ROAD LEVEL/HIGH FLOOD LEVEL, THEN BASE PLATE ENCASEMENT SHALL BE TAKEN UP IN CONSULTATION WITH THE SITE ENGINEER/INCHARGE/CONSULTANT.

TEMPLATE ASSEMBLY/ GROUTING

- VERIFY BOLT, NUT SIZE AND LENGTH AS PER TEMPLATE/BASE ASSEMBLY DRAWING.
- CHECK THE INTEGRITY OF BOLT AND NUT BEFORE EXECUTION AT SITE. IF ANY PLAY FOUND, CONSULT SITE ENGINEER/CONSULTANT.
- GROUTING UNDER BASE PLATE HAS TO BE DONE WITH M20 GRADE CONCRETE. (1 : 1½ : 2½) USING BABY CHIPS (5 TO 10mm).
- SURFACE OF THE GROUT SHALL BE SMOOTHLY FINISH WITH CM(1:5).
- AS MUCH AS POSSIBLE THICKNESS OF THE GROUT SHOULD BE LESS.

LEGEND

- U.O.S. – UNLESS OTHERWISE SPECIFIED.
↵ – INDICATES CHAIR LOCATIONS
F.G.L – FINISHED GROUND LEVEL
E.G.L – EXISTING GROUND LEVEL
T & B – TOP AND BOTTOM
TOS – TOP OF SLAB
BOS – BOTTOM OF SLAB

TOWER SPECIFICATION :

- TYPE OF TOWER : GFT12B
- BASIC WIND SPEED : 50 m/sec
- TERRAIN CATEGORY : 2
- MEAN PROBABLE DESIGN LIFE : 50 years
- ANTENNA LOADING TABLE

S.No.	ANTENNA TYPE (Name)	SIZE OF ANTENNA (w x b x h (or) diameter), mm	No.s	HEIGHT (m)
1.	Remote Radio Head	290 x 127 x 440	9	40
2.	eNodeB Antenna	500 x 150 x 1900	9	40
3.	Microwave antenna	2.4m	1	38.75
4.	Microwave antenna	1.8m	2	38.75
5.	Microwave antenna	1.2m	5	38.75
6.	Microwave ODU	200 x 200 x 85	4	40
7.	Grounding Bar	100 x 8 x 200	1	40
8.	WFI Antenna	312 x 229 x 163	3	15
9.	LED Light	310 x 510 x 64	4	15
10.	Surveillance camera	243 dia & 287 depth	3	10

- FOUNDATION FORCES TABLE (UNFACTORED)

CHARACTERISTIC REACTIONS					
FOUNDATION FORCES			SHAFT REACTIONS		
M (kNm)	V (kN)	H (kN)	COMP. (kN)	UPLIFT (kN)	SHEAR (kN)
2837	88	124	685	626	41

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09.09.15	0	ISSUED FOR APPROVAL	SUBASH	SSR
DATE	REVISION	REVISION DESCRIPTION	CHECKED	APPROVED

ENGINEERING BY :-

RAMBOLL

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Tel:+91-40-40322000, Fax:+91-40-40322003, E mail:services@ramboll.in, www.ramboll.in

PROJECT :-
GENERIC FOUNDATION FOR GROUND BASED MW TOWER
(TOWER TYPE : GFT12B - 50 m/s)

DSGN	SUBASH	09.09.15	TITLE : GENERIC SQUARE RAFT FOUNDATION DRAWING FOR 40m TOWER SBC : 7.5 T/m² (FULL WATER TABLE)	SCALE:
DRWN	BAS	09.09.15		NTS.
CHKD	SUBASH	09.09.15		SHEET:
APPD	SSR	09.09.15		4 OF 4
DRG. No. J15009-D0C41-40-GFT12B-7-5FWT-PC				SIZE REV.
			A3 0	

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