

DISCLAIMER:

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GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT OTHERWISE SHOWN.
- NO SNOW LOADS HAVE BEEN CONSIDERED IN THIS DESIGN.
- THIS DESIGN IS FOR WIND SPEED 180KMPH & SUITABLE FOR INLAND 60KM AWAY FROM COAST LINE.
- RECENT CODAL PROVISIONS ARE BEING REFERRED TO FOR VARIOUS PARAMETERS. HOWEVER, THEY SHALL BE APPLICABLE AS REVISED FROM TIME TO TIME IN FUTURE.
- IN CASE OF ANY DEVIATION IN PROVISIONS OF THESE DRAWINGS WHEN COMPARED TO RDSO B&S DIRECTORATE GUIDELINES ISSUED VIDE CBS/R/DRT/TCAS DATED 1.1.2021, THE PROVISIONS ADOPTED IN CURRENT DRAWINGS SHALL PREVAIL.
- ALL THREE CIP MEMBER TOPS TO MATCH FOR PERFECT LEVELS BEFORE STARTING ERECTION OF SUBSEQUENT TOWER MEMBERS.
- PLATFORMS SHOULD NOT BE PROVIDED WITHIN 300MM LOCATION FROM PANEL JOINT.
- ENVIRONMENTAL EXPOSURE CONDITION FOR FOUNDATION HAS BEEN CONSIDERED AS "MODERATE" AS PER TABLE 3 OF IS 456.
- ALL THE NECESSARY COMPLIANCE OF INSTRUCTIONS ISSUED FROM CIVIL AVIATION, DOT ETC. SHALL BE ENSURED.
- FABRICATION TO BE PLANNED SUCH THAT THERE IS NO WELDING AFTER GALVANISATION.
- ALL FLANGE BOLTS SHALL BE WITH TWO NUTS AND TWO WASHERS. ALL OTHER BOLTS SHALL BE WITH ONE NUT AND TWO WASHERS.

STANDARDS OF MATERIALS

- THE MATERIALS & HARDWARES SHALL CONFORM WITH FOLLOWING:
 - PIPES SHALL CONFORM TO IS 1161: 2014 WITH YST -310 MPa (HT)/240 MPa.
 - STRUCTURAL STEEL CHANNELS, ANGLES, PLATES & FLATS ETC. SHALL CONFORM TO IS 2062: 2011 WITH GRADE DESIGNATION E - 250, A/B QUALITY AS PER IS 12427:2001 AND IS 1367 (PART 3):2002.
 - BOLTS AND NUTS FOR MAIN STRUCTURE CONNECTIONS SHALL BE OF 8.8 GRADE AS PER IS 12427:2001 AND IS 1367 (PART 3):2002.
 - BOLTS AND NUTS FOR LADDER AND ACCESSORIES SHALL BE OF 5.6 GRADE AS PER IS 12427:2001 AND IS 1367 (PART 3):2002.
 - U BOLT CLAMPS TO CONFORM TO IS 2062 AND IS 1367.
 - REINFORCEMENT FOR FOUNDATION SHALL BE MINIMUM Fe-500 & SHALL CONFORM TO IS 1786: 2008.
 - COARSE / FINEAGGREGATE SHALL CONFORM TO IS 383:2016.
 - CEMENT SHALL BE OPC & SHALL CONFORM TO IS 269: 1989.
 - CEMENT SHALL NORMALLY BE OPC. IN CASE OF NON- AVAILABILITY OF OPC, FLY ASH BASED PPC CEMENT CAN BE USED. PPC CEMENT SHALL CONFORM TO IS 1489: 1991 (PART 1).
 - CONCRETE SHALL BE EITHER IN - SITU OR READYMIX CONCRETE. IN - SITU CONCRETE SHALL BE AS PER IS 456: 2004 & READYMIX CONCRETE SHALL BE AS PER IS 4926: 2003.
- HOT DIP ZINC GALVANISATION FOR ALL TOWER MEMBERS SHALL CONFORM TO IS 4759: 1996 & AVERAGE THICKNESS OF COATING SHALL BE AS PER TABLE BELOW

ARTICLE & THICKNESS	MEAN COATING in MICRONS (μ m)
STEEL > 5mm	85 (610 G/SQ.M.)
STEEL > 2mm to < 5mm	65 (460 G/SQ.M.)
STEEL > 1.2mm to < 2mm	50 (340 G/SQ.M.)
STRUCTURAL BOLTS > 10mm	45 (300 G/SQ.M.)
STRUCTURAL BOLTS < 10mm	40 (270 G/SQ.M.)

14. DESIGN SPECIFICATIONS SHALL BE AS PER TABLE BELOW

DESCRIPTION	SPIRE 407RH
TOWER HEIGHT	40M
BASIC WIND SPEED	180 KMPH
OPERATIONAL WIND SPEED (ANSI TIA -222G :2006)	135 KMPH
ANTENNA LOADING (EFFECTIVE PROJECTED AREA)	6.50 SQM
CENTRE OF DIPOLE ANTENNA - ELEVATION	38M
4 UNITS OF COPLANAR DIPOLE ANTENNAS 3.08M X 0.046M Ø	
CENTRE OF LTE ANTENNA - ELEVATION	34M
4 UNITS OF LTE ANTENNAS 2.60M X 0.35M	
DESIGN STANDARDS - TOWER	IS 800: 2007
DESIGN STANDARDS - FOUNDATION	IS 456: 2000 IS 1233: 1985
DEAD LOAD, LIVE LOAD, WIND LOADS	IS 675
SWAY LIMITS	+0.5 DEGREES FOR OP WIND HT/200 FOR BASIC WIND
MEAN PROBABLE DESIGN LIFE	50 YEARS
TERRAIN CATEGORY	2
TOPOGRAPHY CATEGORY	1 (FLAT TERRAIN)
WIND DIRECTIONALITY FACTOR	0.9
AREA AVERAGING FACTOR; COMBINATION FACTOR	1.0
FACTOR OF SAFETY	2.0
FULL EQUIPMENT PLATFORM (EPF) Ø3M	1 NO.
REST / HALF EQUIPMENT PLATFORM (RPF) Ø1.6M	1 NO.
WORK PLATFORMS (WPF) IN TOP 10M HEIGHT (PLEASE READ NOTE 7 ABOVE)	2 NOS
FENCING	3M HT BETWEEN TOWER LEGS

- WELDING SHALL BE GMW WELDING/MIG WELDING WITH WELD THICKNESS AS SPECIFIED IN DRAWINGS. WELDING ROD/SPool TO CONFORM TO IS 6419, GRADE S3.
- TOLERANCES FOR CONCRETING, STEEL FABRICATION AND ERECTION SHALL BE ENSURED AS PER RELEVANT CODES FOR DIFFERENT COMPONENTS.
- AFTER GALVANISATION, PRIMING COAT OF ZINC CHROME RED OXIDE CONFORMING TO IS:104 IS TO BE APPLIED FOLLOWED BY TWO OR MORE COATS OF SYNTHETIC ENAMEL PAINTS IN ACCORDANCE WITH IS 1477 PART I AND II TO REMAIN IN GOOD CONDITION BEFORE THE NEXT TIME PAINTING AS PER PAINTING SCHEDULE. PAINTING SHALL BE DONE IN BANDS OF GRAY AND WHITE FOLLOWING THE SCHEME PRESCRIBED IN 'CIVIL AVIATION REQUIREMENTS' AND OTHER GOVERNING DOCUMENTS/CONDITIONS.
- FOR PAINTING FREQUENCY AND MAINTENANCE PLEASE REFER TO 'GUIDELINES ON DISASTER RESISTANT TELECOM BUILDINGS AND TOWERS' ISSUED BY DEPT. OF TELECOM VIDE LETTER NO. 800-4/2001-VAS DATED 24.10.2005 AND OTHER RELATED GUIDELINES ISSUED FROM TIME TO TIME.
- BOTTOM MOST NUTS SHALL BELOCKED WITH EITHER TACK WELDING OR SUITABLE THREADLOCK CHEMICAL.
- LIGHTNING ARRESTOR SHALL BE OF GALVANIZED ROD.
- AIRCRAFT WARNING LIGHTS (ACWL) SHALL BE OF LOW INTENSITY WITH INPUT VOLTAGE OF 24VOLTS/48VOLTS/110VOLTS+15% CONFORMING TO ICAO STANDARDS - IP RATING 65 AS PER CODE 13947 PART -1: 1993.
- EARTHING STRIP SHALL BE OF SIZE 25X6.
- THREE EARTHING SHALL BE DONE FOR BODY EARTHING, EQUIPMENT EARTHING & ONE SPARE SLOT.
- FORCES FROM TOWER TO FOUNDATION TOP FOR DESIGN OF FOUNDATION ARE AS FOLLOW:

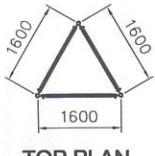
LEG FORCES (UNFACTORED)		
COMPRESSION(C)	489.4 KN	
TENSION(T)	435.0 KN	
SHEAR(V)	55.7 KN	

LIST OF DRAWINGS

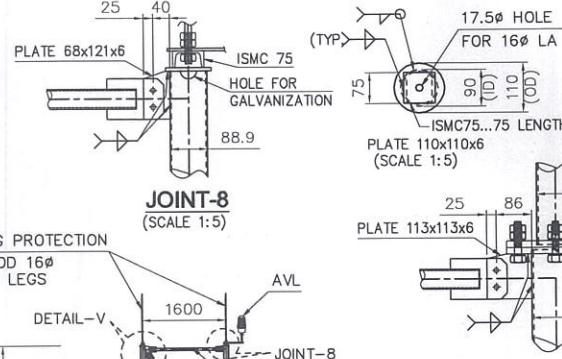
DRAWING NO.	SHEET NO.	DESCRIPTION
2021-PACS-SPIRE 407RH-001	001	GENERAL ARRANGEMENT DRAWING
2021-PACS-SPIRE 407RH-001	002	ELEVATION OF TOWER & CONNECTION DETAIL
2021-PACS-SPIRE 407RH-001	003	ELEVATION OF TOWER & CONNECTION DETAIL
2021-PACS-SPIRE 407RH-001	004	LADDER DETAILS
2021-PACS-SPIRE 407RH-001	005	EPF DETAILS
2021-PACS-SPIRE 407RH-001	006	EPF DETAILS
2021-PACS-SPIRE 407RH-001	007	CAST-IN PART DETAILS & WPF DETAILS
2021-PACS-SPIRE 407RH-001	008	ANTENNA ARRANGEMENT, ACWL DETAILS & LIGHTNING PROTECTION DETAILS
2021-PACS-SPIRE 407RH-40M-100KPA-GBT-NWT_FDN-001	SH. 1 OF 3 SH. 2 OF 3 SH. 3 OF 3	FOUNDATION DETAIL FOR 40M GBT (100KPA-NO WATER TABLE)
2021-PACS-SPIRE 407RH-40M-100KPA-GBT-WT_FDN-001	SH. 1 OF 2 SH. 2 OF 2	FOUNDATION DETAIL FOR 40M GBT (100KPA-WATER TABLE)

SUBMITTED FOR	APPROVAL	INFORMATION	REFERENCE	RECORD	FABRICATION
TCAS TOWER-TUBULAR LATTICE-3LEGGED 40M-180KMPH WIND SPEED					
Principle ACS Engineering And Services					
CONSULTANT: Principle ACS Engineering India Pvt. Ltd. Hyderabad, India					
DRAWN	B.P.	SPIRE 407RH			
CHECKED AND VERIFIED	A.R.J.				
APPROVED	P.M.	SCALE - 1: 40	GENERAL ARRANGEMENT DRAWING		
DATE	19.12.2021	2021-PACS-SPIRE 407RH-001			



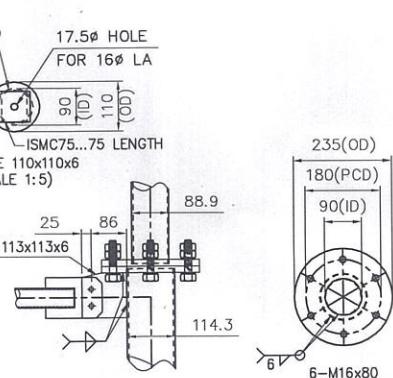


TOP PLAN

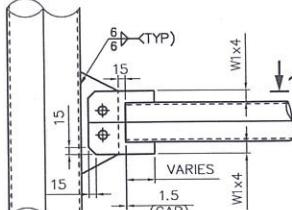


JOINT-8

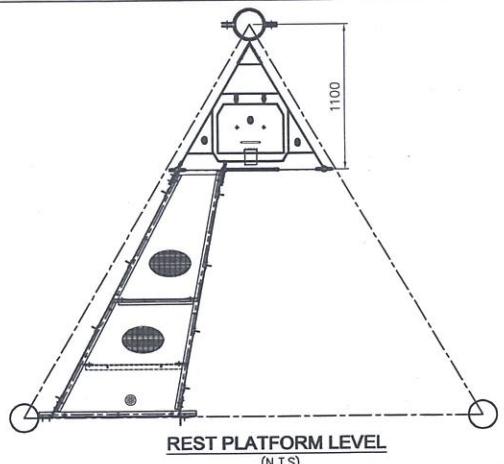
LIGHTNING PROTECTION



WORKING PLATFORM ARRANGEMENT



CONNECTION ARRANGEMENT



REST PLATFORM LEVEL

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 4. RECENT CODAL PROVISIONS ARE BEING REFERRED TO FOR VARIOUS PARAMETERS. HOWEVER, THEY SHALL BE APPLICABLE AS REVISED FROM TIME TO TIME IN FUTURE.
 5. IN CASE OF ANY DEVIATION IN PROVISIONS OF THESE DRAWINGS WHEN COMPARED TO RDSO B&S DIRECTORATE GUIDELINES ISSUED VIDE CBS/R/RT/TCAS DATED 1.01.2021, THE PROVISIONS ADOPTED IN CURRENT DRAWINGS SHALL PREVAIL.
 6. ALL THREE CIP MEMBER TOPS TO MATCHFOR PERFECT LEVELS BEFORE STARTING ERECTION OF SUBSEQUENT TOWER MEMBERS.
 7. PLATFORMS SHOULD NOT BE PROVIDED WITHIN 300MM LOCATION FROM PANEL JOINT.
 8. ENVIRONMENTAL EXPOSURE CONDITION FOR FOUNDATION HAS BEEN CONSIDERED AS "MODERATE" AS PER TABLE 3 OF IS 456.
 9. ALL THE NECESSARY COMPLIANCES OF INSTRUCTIONS ISSUED FROM CIVIL AVIATION, DOT ETC. SHALL BE ENSURED.
 10. FABRICATION TO BE PLANNED SUCH THAT THERE IS NO WELDING AFTER GALVANISATION.
 11. ALL FLANGE BOLTS SHALL BE WITH TWO NUTS AND TWO WASHERS. ALL OTHER BOLTS SHALL BE WITH ONE NUT AND TWO WASHERS.

STANDARDS OF MATERIALS

12. THE MATERIALS & HARDWARES SHALL CONFORM WITH FOLLOWING:

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 - BOLTS AND NUTS FOR LADDER AND ACCESSORIES SHALL BE OF 5.6 GRADE AS PER IS 12427:2001 IS 1367 (PART 3):2002.
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 - CONCRETE SHALL BE EITHER IN - SITU OR READYMIX CONCRETE. IN - SITU CONCRETE SHALL BE AS PER IS 456: 2000 & READYMIX CONCRETE SHALL BE AS PER IS 4926: 2003.

13. HOT DIP ZINC GALVANISATION FOR ALL TOWER MEMBERS SHALL CONFORM TO IS 4759: 1996 & AVERAGE THICKNESS OF COATING SHALL BE AS PER TABLE BELOW

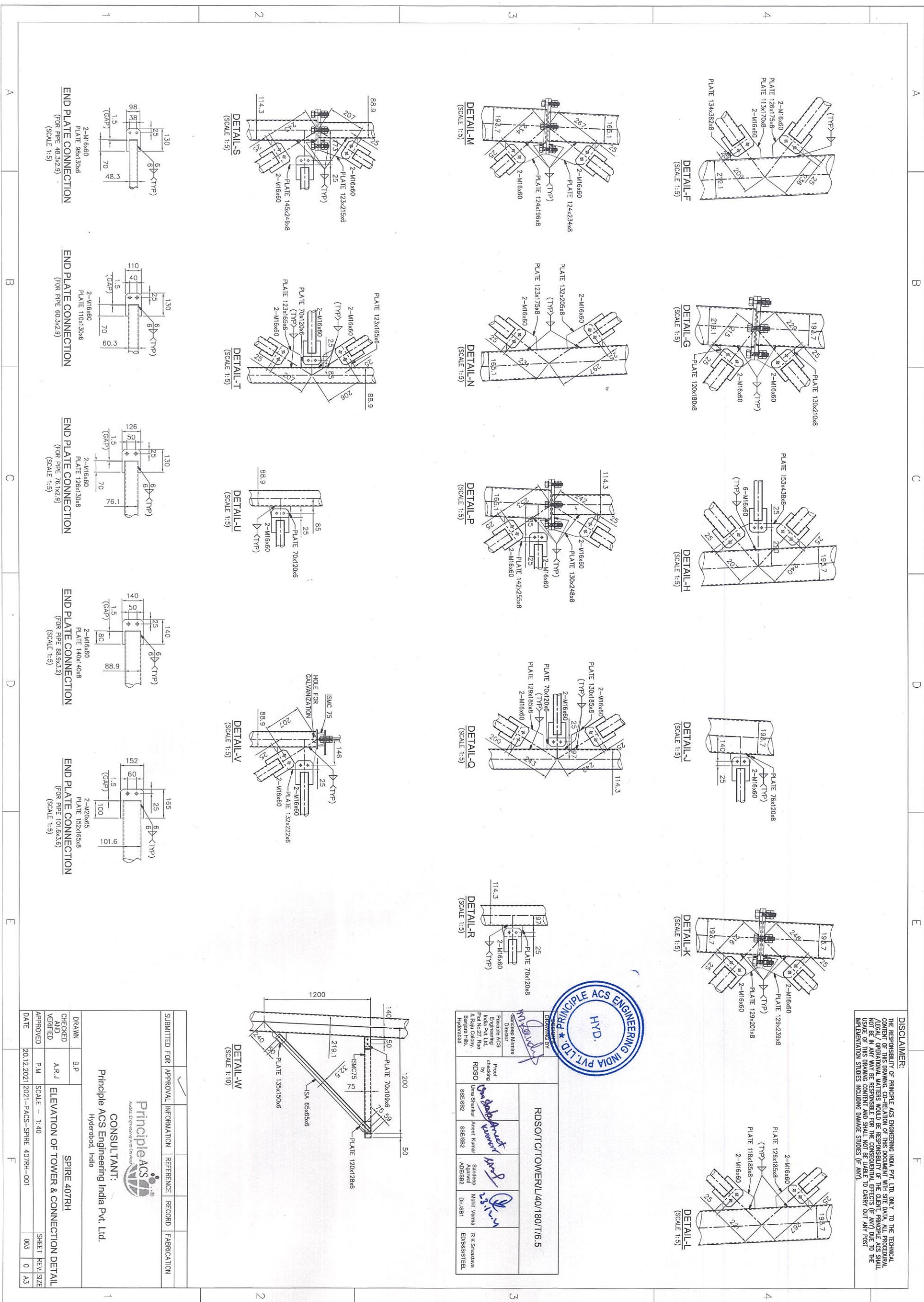
ARTICLE & THICKNESS	MEAN COATING in MICRONS (μ M)
STEEL > 5mm	85 (610 G/SQ.M.)
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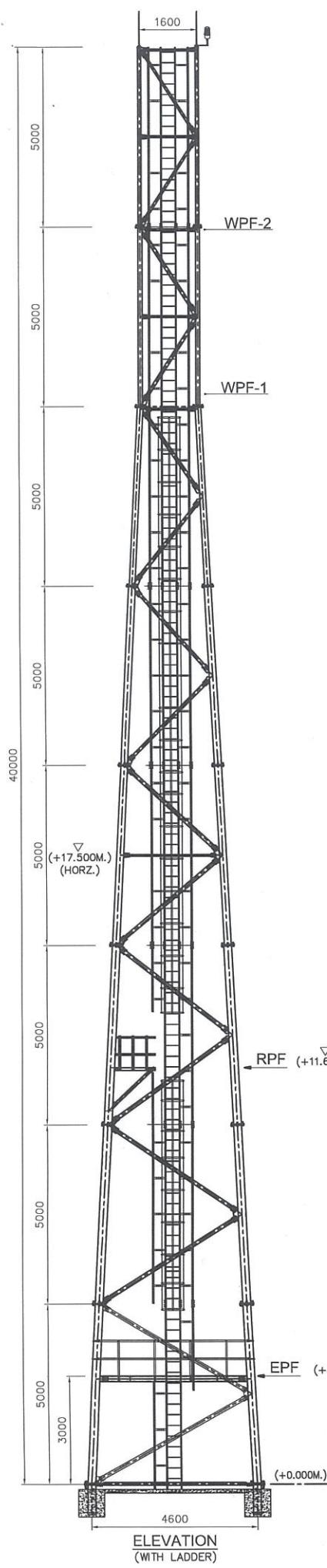
14. DESIGN SPECIFICATIONS SHALL BE AS PER TABLE BELOW

DETAIL-B (SCALE 1:5)		14. DESIGN SPECIFICATIONS SHALL BE AS PER TABLE BELOW	
219.1	PLATE120x180x8	DESCRIPTION	SPIRE 407RH
219.1	2-M16x60	TOWER HEIGHT	40M
219.1	PLATE 132x160x8	BASIC WIND SPEED	180 KMPH
222	2-M20x65	OPERATIONAL WIND SPEED (ANSI TIA -222G :2006)	135 KMPH
219.1	(TYP)	ANTENNA LOADING (EFFECTIVE PROJECTED AREA)	6.50 SQM
25		CENTRE OF DIPOLE ANTENNA - ELEVATION	38M
25		4 UNITS OF CLINEAR DIPOLE ANTENNAS 3.08M X 0.046M Ø	
25		CENTRE OF LTE ANTENNA - ELEVATION	34M
25		4 UNITS OF LTE ANTENNAS 2.60M X 0.35M	
25		DESIGN STANDARDS - TOWER	IS 800:2007
25		DESIGN STANDARDS - FOUNDATION	IS 456: 2000 IS 11233: 1985
25		DEAD LOAD, LIVE LOAD, WND LOADS	IS 875
25		SWAY LIMITS	+0.5 DEGREES FOR OP WIND HT/200 FOR BASIC WIND
25		MEAN PROBABLE DESIGN LIFE	50 YEARS
25		TERRAIN CATEGORY	2
25		TOPOGRAPHY CATEGORY	1 (FLAT TERRAIN)
25		WIND DIRECTIONALITY FACTOR	0.9
25		AREA AVERAGING FACTOR; COMBINATION FACTOR	1.0
25		FACTOR OF SAFETY	2.0
25		FULL EQUIPMENT PLATFORM (EPF) @3M	1 NO.
25		REST / HALF EQUIPMENT PLATFORM (RPF) @1.6M	1 NO.
25		WORK PLATFORMS (WPF) IN TOP 10M HEIGHT (PLEASE READ NOTE 7 ABOVE)	2 NOS
25		FENCING	3M HT BETWEEN TOWER LEGS

15. WELDING SHALL BE GMAW WELDING /MIG WELDING WITH WELD THICKNESS AS SPECIFIED IN DRAWINGS. WELDING ROD/SPool TO CONFORM TO IS 6419, GRADE S3.
 16. TOLERANCES FOR CONCRETING, STEEL FABRICATION AND ERECTION SHALL BE ENSURED AS PER RELEVANT CODES FOR DIFFERENT COMPONENTS.
 17. AFTER GALVANISATION ,PRIMING COAT OF ZINC CHROME RED OXIDE CONFORMING TO IS:104 IS TO BE APPLIED FOLLOWED BY TWO OR MORE COATS OF SYNTHETIC ENAMEL PAINTS IN ACCORDANCE WITH IS 1477 PART I AND II TO REMAIN IN GOOD CONDITION BEFORE THE NEXT DUE PAINTING AS PER PAINTING SCHEDULE .PAINTING SHALL BE DONE IN BANDS OF ORANGE AND WHITE FOLLOWING THE SCHEME PRESCRIBED IN 'CIVIL AVIATION REQUIREMENTS' AND OTHER GOVERNING DOCUMENTS/CONDITIONS .
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 20. LIGHTENING ARRESTOR SHALL BE OF GALVANISED ROD.
 21. AIRCRAFT WARNING LIGHTS (ACWL) SHALL BE OF LOW INTENSITY WITH INPUT VOLTAGE OF 24VOLTS/48VOLTS/110VOLTS +15% CONFORMING TO ICAO STANDARDS -IP RATING 65 AS PER IS CODE 13947 PART-1: 1993.
 22. EARTHING STRIP SHALL BE OF SIZE 25X6.
 23. THREE EARTHINGS SHALL BE DONE FOR BODY EARTHING, EQUIPMENT EARTHING & ONE SPARE

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SUBMITTED FOR	APPROVAL	INFORMATION	REFERENCE	RECORD	FABRICATION
 CONSULTANT: Principle ACS Engineering India Pvt. Ltd. Hyderabad, India					
DRAWN	B.P	<u>SPIRE 407RH</u>			
CHECKED AND VERIFIED	A.R.J	ELEVATION OF TOWER & CONNECTION DETAIL			
APPROVED	P.M	SCALE – 1:40	SHEET	REV.	SIZE
DATE	20.12.2021	2021-PACS-SPIRE 407RH-001	002	0	A3



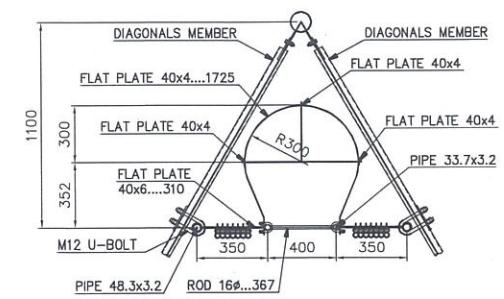


LADDER ELEVATION
(SCALE 1:20)

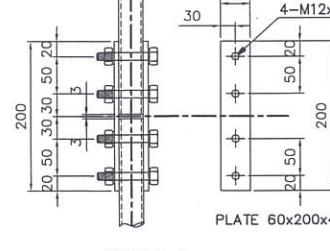


DESIGN & DRAWING BY  Sundeep Mirmiro Director Principle ACS Engineering India Pvt. Ltd., Plot No:27, Rao & Raja Colony, Banjara Hills, Hyderabad - 500034.	RDSO/TC/TOWER/L/40/180/T/6.5			
Proof checking by  Uma Shankar SSE/SB2	 Aneet Kumar SSE/SB2	 Sandeep Agarwal ADF/SB2	 Mohit Verma Dir/SB1	R K Srivastava ED/B&S/STE
 23-11-14				

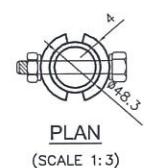
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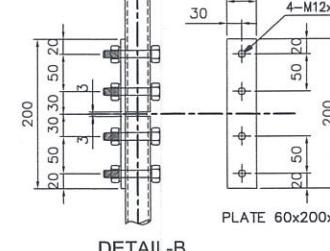
LADDER ASSEMBLY
(SCALE 1:10)



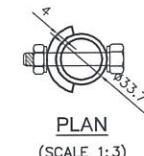
DETAIL-A
(SCALE 1:5)



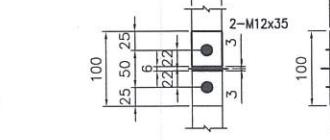
PLAN



DETAIL-E
(SCALE 1:5)

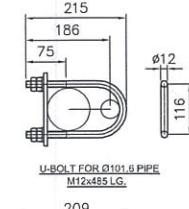


PLAN
(SCALE 1:3)

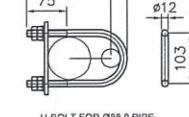


DETAIL-C
(SCALE 1:5)

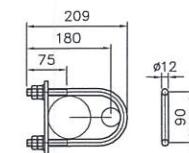
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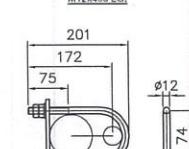
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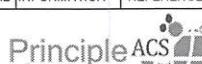
M12x465 LG.



J-BOLT FOR Ø76.1 PIPE
M12x4601G



1000

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SUBMITTED FOR	APPROVAL	INFORMATION	REFERENCE	RECORD	FABRICATION
 <p>CONSULTANT: Principle ACS Engineering India Pvt. Ltd. Hyderabad, India</p>					
DRAWN	B.P	<u>SPIRE 407RH</u> <u>LADDER DETAILS</u>			
CHECKED AND VERIFIED	A.R.J				
APPROVED	P.M	SCALE - 1:40	SHEET	REV.	SIZE
DATE	20.12.2021	2021-PACS-SPIRE 407RH-001	004	0	A3

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