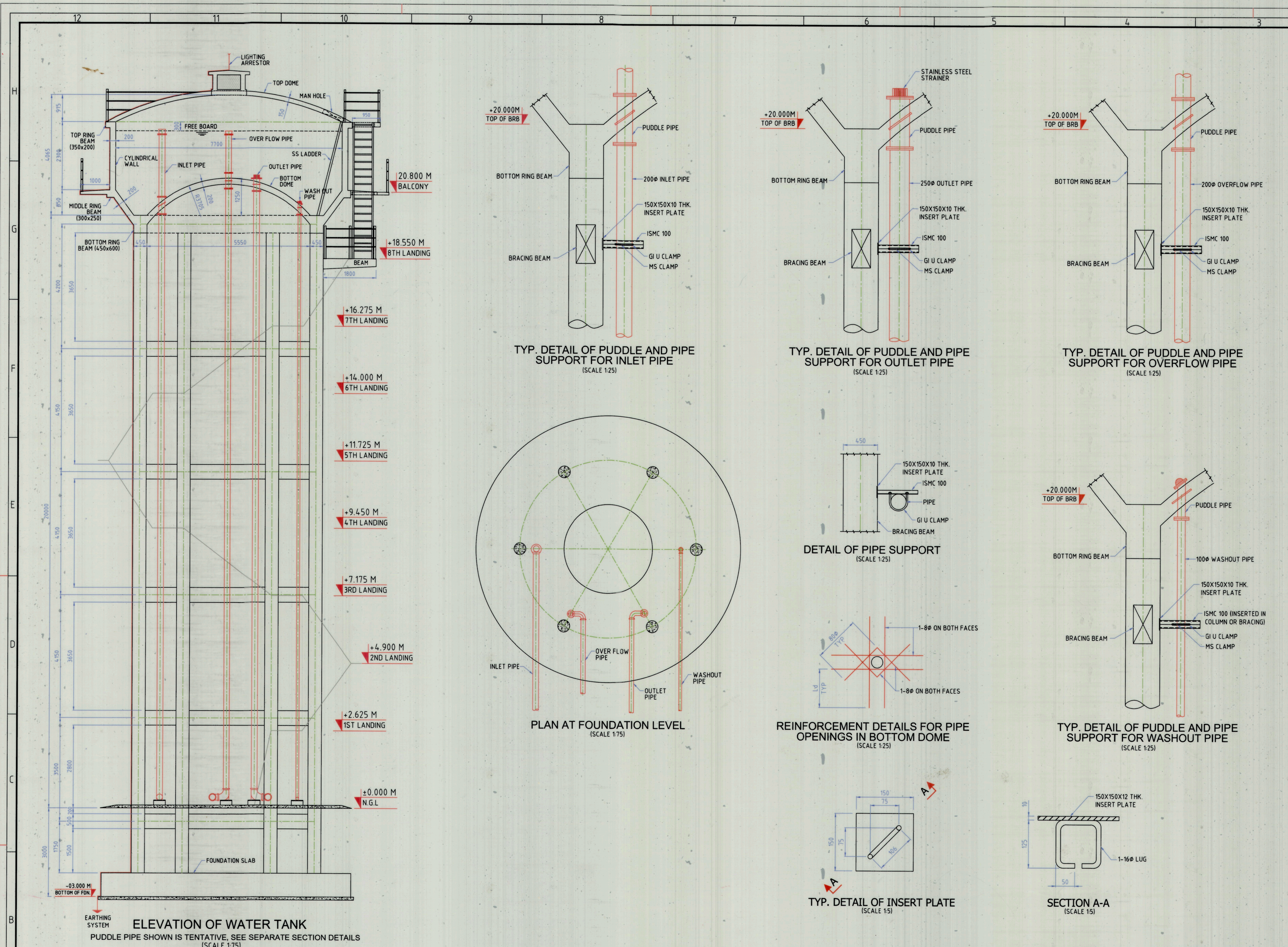




TYPE PLAN NO.: W-51
N.R.H.Q.E. PLAN NO.: HQ/01/01-2026
CANCELLED PLAN NO.:
GENERAL NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.
2. DO NOT SCALE THE DRAWING.
3. ALL R.C.C WORK SHALL BE IN DESIGN MIX CONCRETE M-35, AS PER IS 456-2000 (CODE OF PRACTICE FOR PLAIN AND REINFORCED CONCRETE).
4. Fe 500/Fe 500D REINFORCEMENT BARS CONFORMING TO IS 1786-2008 TO BE USED.
5. COVER TO REINFORCEMENT SHALL BE NO WHERE LESS THAN THAT SHOWN ON THE PLAN OR AS SPECIFIED IN IS 456-2000.
6. NO SAG OCCURS IN THE REINFORCING BARS DURING CONSTRUCTION.
7. STIRRUPS ARE EFFECTIVELY TIED WITH WIRE TO THE MAIN REINFORCING BARS.
8. ALL R.C.C WORK MUST BE CARRIED OUT UNDER THE PERSONAL SUPERVISION OF AN SSE/WORKS.
9. PROPER CURING OF CONCRETE SHALL BE ENSURED TO ACQUIRE HARDNESS, STRENGTH AND OTHER PROPERTIES, ESSENTIAL FOR SATISFACTORY SERVICE.
10. ALL CONCRETE SHALL BE MECHANICALLY MIXED AND VIBRATED.
11. THE DESIGN HAS BEEN PREPARED FOR SEISMIC FORCES AS PER LATEST CODE IS 1893: PART 1 2016 & PART-2 2014 FOR SEISMIC ZONE-IV.
12. BASIC WIND SPEED IS CONSIDERED AS 50 M/SEC.
13. ALL LAPS SHALL BE STAGGERED. LAP LENGTH SHALL BE 50D, WHERE D = DIA OF BAR.
14. ALL DIMENSIONS ARE TO BE CHECKED & VERIFIED BEFORE EXECUTION IN CONSISTENCY IF ANY SHOULD BE BROUGHT TO THE NOTICE OF ENGINEER - IN CHARGE IMMEDIATELY, BEFORE EXECUTION.
CONTAINER:
1. ALL EDGES SHALL BE ROUNDED OR CHAMFERED.
2. HOOP BARS IN WALL, RING BEAM SHALL BE TWICE THE LAP LENGTH (2xLd).
3. LAPS IN ALL CIRCULAR BARS IN CONTAINER PORTION SHALL BE SO STAGGERED THAT NOT MORE THEN 1/4 OF THE TOTAL BARS ARE LAPPED IN ONE PLACE.
4. STEEL CHAIRS SHALL BE PROVIDED TO KEEP TOP REINFORCEMENT IN PROPER AND CORRECT POSITION.
5. CONTAINER PROPER SHOULD BE KEPT DAMP DURING CONSTRUCTION TO PREVENT SHRINKAGE.
BEAMS NOTES:
1. Ld- DEVELOPMENT LENGTH OF THE BARS SHALL BE 50D.
2. SPACER BAR SHALL BE PROVIDED OF 25D OR MAX. DIA OF BAR IN BEAM.
3. SPACING OF SPACER BAR SHALL BE BETWEEN 100MM TO 150MM.
GROUND LEVEL & SBC:
1. SBC IS CONSIDERED 10T/M², 12T/M² AND 15T/M² AT 3M DEPTH FROM N.G.L. IF WATER TABLE IS FOUND OR SBC IS LESS, THE SAME SHALL BE INFORMED TO DESIGNER.
2. IN CASE, SOIL AT SITE IS NOT SAFE FOR ASSUMED SOIL PRESSURE, SEPARATE DESIGN TO BE PREPARED.
3. ANY SOFT OR LOOSE STRATUM MET WITH UNDER FOUNDATION, BASE SLAB ETC. SHALL BE EXCAVATED AND MADE GOOD WITH COMPACTED SOIL.
4. BACK FILLING SHALL BE DONE IN UNIFORM LAYERS ALL AROUND THE STRUCTURE.
5. FILLING UNDERNEATH THE STRUCTURE ELEMENTS, WHEREVER REQUIRED, SHALL BE DONE IN LAYERS NOT EXCEEDING 150MM THICK.
IMPORTANT NOTE:
1. ALL CONSTRUCTION JOINTS SHALL BE PROVIDED WITH WATER BARS FIXED CENTRALLY IN THE CONSTRUCTION JOINTS.
2. PROPER WATER PROOFING SHALL BE DONE ON TANK BODY BY APPLYING SUITABLE ADMIXTURES TO CONCRETE.
3. EXTRA REINFORCEMENT SHALL BE PROVIDED AROUND ALL OPENINGS SUCH AS MANHOLES, INLET/OUTLET PIPES, AND OTHER CUTOUTS.
4. THREE TYPES OF FOUNDATION FOR 10T/M², 12T/M² AND 15T/M² AT 3M DEPTH) HAS BEEN PROVIDED IN SHEET 02/03. SUITABLE FOUNDATION TO BE PROVIDED CONSIDERING SOIL DATA OF SITE BY CONCERNED SR.DEN/DY.CE.
5. FOR INSULATION OF LIGHTNING CONDUCTOR IS 2309-1989 (CODE OF PRACTICE OF BUILDING AND ALLIED STRUCTURE AGAINST LIGHTNING) MAY BE REFERRED. DETAILS MAY BE WORKED OUT WITH THE CONSULTATION OF LOCAL ELECTRICAL OFFICE.
6. THE PIPE DIAMETERS ARE TENTATIVE AND TO BE FINALIZED ON APPROVAL OF HYDRAULICS.
7. FOR GENERAL REQUIREMENTS AND OTHER INFORMATION, IS 3370-2009, 2021 (PART-1 & PART-2) SHALL BE FOLLOWED.
8. DETAILING OF REINFORCEMENT BARS TO BE AS PER IS 13920-2016, IS 456-2000 & IS 11682-1985.
9. CONSTRUCTION SHALL BE STRICTLY IN ACCORDANCE WITH IS 456-2000.
10. THE FIRST LANDING LEVEL IS KEPT HIGHER BY ELIMINATING THE LANDING & STAIRCASE BELOW IT TO PREVENT INTERACTION OF LOCAL PEOPLE WITH THE TANK AND TO ENSURE THEIR SAFETY.
11. PORTABLE LADDER TO BE PROVIDED FROM GROUND LEVEL TO FIRST LANDING (RL 2.625 M).
12. FEASIBILITY OF STRUCTURE SHALL BE CHECKED BY ENGINEER-IN-CHARGE BEFORE EXECUTION OF WORK.
13. ADEN/XEN/AXEN SHOULD PERSONALLY INSPECT THE REINFORCEMENT AND SHUTTERING, IT NEEDS TO BE ENSURED THAT SHUTTERING IS WATER-PROOF.
14. SCAFFOLDING AND SHUTTERING ARRANGEMENT SHOULD BE AS PER THE DRAWING No.- NR.H.Q.- 119/02/01-2026
CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
1. TOP DOME (WATER FACE) = 45MM
2. TOP DOME (OUTER FACE) = 45MM
3. BOTTOM DOME (WATER FACE) = 45MM
4. BOTTOM DOME (OTHER FACE) = 45MM
5. CYLINDRICAL/VERTICAL WALL (WATER FACE) = 45MM
6. CYLINDRICAL/VERTICAL WALL (OUTER FACE) = 45MM
7. CONICAL WALL (WATER FACE) = 45MM
8. CONICAL WALL (OUTER FACE) = 45MM
9. RING BEAM (WATER FACE) = 45MM
10. RING BEAM (OUTER FACE) = 45MM
11. BEAM ABOVE GROUND = 40MM
12. BEAM BELOW GROUND = 40MM
13. COLUMNS = 40MM
14. WALKWAY = 30MM
15. FOUNDATION = 75MM
REFERENCES:
1. IS 456-2000- PLAIN AND REINFORCED CONCRETE.
2. IS 1893-2016- EARTHQUAKE RESISTANCE DESIGN OF STRUCTURE
3. IS 13920-2016- DUCTILE DESIGN AND DETAILING OF REINFORCED CONCRETE STRUCTURE
4. IS 11682-1985- CRITERIA FOR DESIGN OF RCC STAGING FOR ESR
5. IS 3370 - 2009, 2021- CONCRETE STRUCTURES FOR STORAGE OF LIQUID
6. IS 11089-1984- PRACTICE FOR DESIGN AND CONSTRUCTION OF RING FOUNDATION
NOTICE OF NO OBJECTION" FROM NR-HQ IS BEING ACCORDED FOR DESIGN PRINCIPLES BASED ON RECOMMENDATION OF THE PROOF CHECKING AND VETTING BY PROFESSOR RAJESH KUMAR / IIT/BHU. HOWEVER, THE RESPONSIBILITY FOR DESIGN ACCURACY LIES WITH THE DESIGNER (VIVEK KUMAR, DUCTILE DESIGN CONSULTANCY PVT.LTD, GURUGRAM). OVERALL RESPONSIBILITY FOR PROPER QUALITY WORK AND SAFETY OF THE STRUCTURE WILL BE ON THE EXECUTING AGENCY I.E. SR.DEN-3

STRUCTURAL DESIGNER		VETTED BY	
THIS STRUCTURAL DESIGN HAS BEEN PREPARED BY ME. THE RESPONSIBILITY OF CONTROL, CHECK AND VERIFICATION OF ACCURACY, CORRECTNESS, COMPLETENESS, INTEGRATION AND FULL COMPLIANCE OF RELEVANT PROVISION OF CODES AND DBR REST WITH ME.		THESE STRUCTURAL DRAWING INCLUDING ITS DESIGN AND DETAILING HAS BEEN CHECKED 100% BY ME. THE SAME IS VETTED INDEPENDENTLY AND FOUND SUITABLE FOR THE EXECUTION PURPOSE.	
 JITENDRA MALVIYA For Ductile Design Consultancy Pvt. Ltd. 21/12/2025		 VIVEK KUMAR DIRECTOR/CONSULTANT SIGNATORY 21/12/25	
DESIGNED BY	CHECKED BY	PROF. RAJESH KUMAR Department of Civil Engineering Indian Institute of Technology Gurugram Haryana-221005	
 DUCTILE DESIGN CONSULTANCY PVT. LTD. 995 SECTOR-40, GURUGRAM-122003, Mob: 9650681684 Email: ductile.dc@gmail.com Website: www.ddcindia.in		IIT/BHU	

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 MONU KUMAR	 AKASH DEEP	 SUNEEL KUMAR	 MANTESH KUMAR MEENA
J.E/DRG.	SSE/DESIGN	AEN/DESIGN/P&D	Dy. CE/P&D
NORTHERN RAILWAY			
PROJECT TYPE PLAN OF INTZE RCC OVERHEAD TANK OF CAPACITY 110KL WITH 20M HIGH STAGING FOR SEISMIC ZONE IV (SBC OF 10, 12 & 15 Ton/m ²)			
TITLE DETAILS OF WATER DISTRIBUTION AND PIPE SUPPORT			
SCALE: AS MENTIONED		SHEET SIZE: A1	
N.R.H.Q.E. PLAN NO. HQ/01/01-2026		SHEET NO. - 03/03	