GOVERNMENT OF TELANGANA
TELANGANA DRINKIMG WATER SUPPLY PROJECT
Rural Water Supply & Sanitation Department

TELANGANA WATER GRID

L&T Construction - Water, Smart World & Communication
CHENNAI

CLIENT:	CONSULTANT :
RURAL WATER SUPPLY AND SANITATION DEPARTMENT (WATER GRID), TELUNGANA.	WAPCOS LIMITED

PROJECT :	PROVIDING DRINKING WATER TO HABITATIONS IN KOMARAMBHEEM ASIFABAD SEGMENT IN ADILABAD DISTRICT
SUPPLIER / CONTRACTOR:	L&T Construction, Water, Smart World and Communication

JOB Ref. No. : LE150883

	NAME	SIGN	DATE
DSGN			
CHKD			
APPD			

TITLE :

DESIGN OF SUMP - 100KL CAPACITY
SEDWAI LAMBADITHANDA AT NARNOOR MANDAL

DOC./DRG. No.

LE150883-C-WS-RW-DC-1312

SIZE: A4

REV.: A

RELEASED FOR

- ☐ PRELIMINARY
- ☐ INFORMATION
- ☑ APPROVAL
- ☐ CONSTRUCTION

Submitted sir,

Sub: RWS&S-TDWSP- Sedwai Lambadithanda 100KL clear water sump in Narnoor Mandal– Komarambheem Asifabad Segment-Adilabad District-Designs -Approval-Reg.

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Kindly pursue the Designs of the following 100KL Clear Water sump at Sedwai Lambadithanda(V) , Narnoor (M), submitted by the Executive Engineer TDWSP Asifabad Division , Adilabad district for approval.

1. **100 KL Clear Water Sump.**

The Executive Engineer TDWSP Asifabad Division has submitted Structural Designs & Drawings of 100KL Clear Water sump based on the field conditions and as per the estimate provisions , the structural designs & drawings for the above structure is verified with RWS&S standard Type Designs and submitted for approval.

The following design parameters were considered:

- Capacity : 100kL
- Net SBC of Soil : 10.0 t/sqm
- Grade of concrete & Steel : M 30 & Fe 415
- Dia of sump Inner to Inner: 7.50m
- Sidewall Height : 2.75 mts
- Sidewall Thickness:150mm
- Top Slab thickness: 150 to 100 mm tapered
- Raft Slab thickness: 250mm

As per the above parameters the structural design and drawings of the clear water sump is verified, as per similar Type designs available and approved by the RWS&S Department considering the SBC and type of soil , duly following IS codes, IS: 456-2000, SP:16, 34, IS:3370 and IS 1893-2002 (seismic codes).The sizes and steel proposed in the designs and drawings of all components are safe and sufficient.

The additional points noted after checking the designs are:

- Detailed Estimate of the Structure with these specifications has to be prepared and compared with the provision made in sanctioned estimate. Such that deviation if any is within authorized limits. If any deviations noticed, the Estimate should be submitted for obtaining approval from the Competent Authority.

Subject to approval a draft memo addressed to the EE, TDWSP Asifabad Division , for communicating approved Structure is put up for kind perusal and approval.

AEE (Designs)	DEE (Designs)	Superintending Engineer,
TDWSP,Nirmal Circle	TDWSP,Nirmal Circle	TDWSP,Nirmal Circle

Design Of 100 KL Capacity Sump at

Data

Location					
Safe bearing Capacity	sbc		Safe	100 Kn/m^2	
Capacity	v			100 KL	
Free Board	fb			0.25 m	
Dead Storage	ds			0.20 m	
Dia of sump	d			7.50 m	
Projection from side wall	ps			0.15 m	
Depth of the tank	h			2.75 m	
Depth of tank above GL	dgl			0.50 m	
Depth of tank below GL				2.25 m	
thickness of PCC (lean mix cc1:6:10)		couter wt		0.00 m	
Th. Of Bottom Slab	bsth	Provided th is Sufficient		0.25 m	0.12 m
Depth of Water table below GL	wl	Safe Against Uplift		2.00 m	

Top Dome

Rise of the dome				1.20	
Radius of the dome				6.46	
Thickness of Dome	td	150 to 100	0.1	0.125 m	
Dia of Reinforcement	db			8 mm	
Reinforcement					
Spacing				125 mm	c/c

Provide 8 mm dia Tor @ 125 mm C/c both radially and in the form of circular rings

Top Ring Beam

Width of ring beam	rb		300 mm		
Depth of ring Beam	dtrb	Provided size is sufficient	250 mm	101 mm	
Dia of hoop bars	dbrb		12 mm	4 Nos	
Dia of Stirrups			8 mm	150 mm	175

Side Wall

Depth of the tank	h	2.75 m		
Th. Of Side wall	sth	0.150 m	117 mm	
Depth of tank above GL	dgl	0.50 m		
Moments				
	Inner Side	3.58 Kn-m		
	Outer Side	4.499 Kn-m		
Hoop force				
	Inner Side	68.35 Kn	(Tension)	
	Outer Side	81.34 Kn	(Compression)	

Reinforcement			Dia	Spacing Provided	Required
Inner face	Vertical	317 mm^2	10 mm	150 mm	150
	Horizontal	263 mm^2	10 mm	150 mm	150
Outer face	Vertical	398 mm^2	10 mm	150 mm	150
	Horizontal	263 mm^2	10 mm	150 mm	150

Bottom slab

Safe bearing Capacity	sbc			100 Kn/m^2	
Th. Of Bottom Slab	bsth	Provided th is Sufficient		0.250 m	0.12 m
Dia of Bottom Slab	dbs			8.10 m	
Size of Haunch	bh			0.20 m	
effective cover to reinforcement for raft slab			covraft	65 mm	
Moments	Radial			4.57 Kn-m	
	Circumferential			4.57 Kn-m	

Reinforcement		Ast	Dia	spacing Provided	Required
	Top mesh	219 mm^2	10 mm	125 mm	130
	Bottom mesh	240 mm^2	10 mm	125 mm	150

	bmcfps		0.0077	**0.0068**	0.0059		
Max Ring Tension	rtcfs		0.579	**0.598**	0.617		
Max. -ve BM	mbms	(bmcfs*pas*hbgl^2)			4.50	Kn-m	
Max +ve BM	mpbms	(bmcfps*pas*hbgl^2)			1.25	Kn-m	
Max. Ring compression	mrts	rtcfs*pas*d/2			81.34	Kn	
Th. Of Side Wall		(MAX(mbm,mbms)*10^6*6/(2*1000))^0			117	mm	
					Th. Provided is Sufficient		
Eff Th. Of Side wall	edswi				100	mm	
Max Inner face moment	bmi	MAX(mpbms,mbm)			3.58	Kn-m	
Max outer face moment	bmo	MAX(mpbm,mbms)			4.50	Kn-m	
Area of Steel							
Reinforcement							
Min Steel	pt	0.24% for <15m span 0.35%		0.24	0.16	%	
Area of BendingSteel inner side	Astm	MAX(pt*sth*10^4,bmi*10^6/(130*0.87*e			317	mm^2	on each side
Area of steel outer face	Astpbm	MAX(pt*sth*10^4,(bmo*10^6/(130*0.87			398	mm^2	on each side
Area of Steel for Hoop	Asth	MAX(pt*sth*10^4,CEILING(mrt*1000/1			526	mm^2	for two sides
Vertical Steel Spacing							
inner face	vsp						
Spacing		FLOOR(pi*dbi^2/4*1000/Astm,25)			150	mm	
Provide 10 mm dia TOR @ 150 mm C/c							
Outer face	vspo	FLOOR(pi*dbo^2/4*1000/astpbm,25)			150	mm	
Provide 10 mm dia TOR @ 150 mm C/c spacing							
Horizontal Steel							
Spacing	hsp	FLOOR(pi*dbh^2/2*1000/Asth,25)			150	mm	
Provide 10 mm dia TOR @ 150 mm C/c on both faces in staggered fashion							
Design Of Bottom Slab							
Projection from side wall	ps				0.15	m	
Dia of Bottom Slab	dbs	d+2*sth+2*ps			8.10	m	
Size of Haunch	bh				0.2	m	
Dia of Bar top	dbbs				10	mm	
bottom	dbbsb				10	mm	
Load on Bottom Slab							
Wt of Top Dome		2*pi*rd*hd*wd			225.27	Kn	
Wt of Ring Beam		pi*(d+rb/1000)*rb*drb*25/10^6			45.95	Kn	
Wt Of Side wall		pi*(d+sth)*sth*(h-dtrb)*25			225.31	Kn	
Wt of Haunch		pi*(d-bh)*bh^2/2*25			11.47	Kn	
Total Load	wbs				508.00	Kn	
					5.08	sq m	0.14405
Max Pr on Soil	prb	Wbs/(pi*(d)*1)			21.56	Kn/m^2	
Bottom Slab is designed as circular Slab loaded with UDL and Simply Supported on edges							
			r		3.825		3.05
Radial moment	mri	3/16*prb*((dbs/2)^2-((d+sth)/2)^2)-wbs/			-1.06	mrb	4.57 Kn-m
Circuferential Moment	mti	1/16*prb*(3*(dbs/2)^2-((d+sth)/2)^2)-wb			4.18	mtb	4.57 Kn-m
for uplift Net uplift load on bottom slab					-1.25	Kn/m^2	
for uplift		max Radial moment			-2.56		-2.56 Kn-m
		max Circuferential Moment			-2.56		-2.56 Kn-m
Max Radial Moment	mr	IF(wl>hbgl,0,CEILING(3*prb*(dbs/2)^2/			4.57	Kn-m	2.56 Kn-m
Max Circumferential moment	mt	IF(wl>hbgl,0,CEILING(prb*(dbs/2)^2/16			4.57	Kn-m	2.56 Kn-m

Asst. Executive Engineer
TDWSP Asifabad

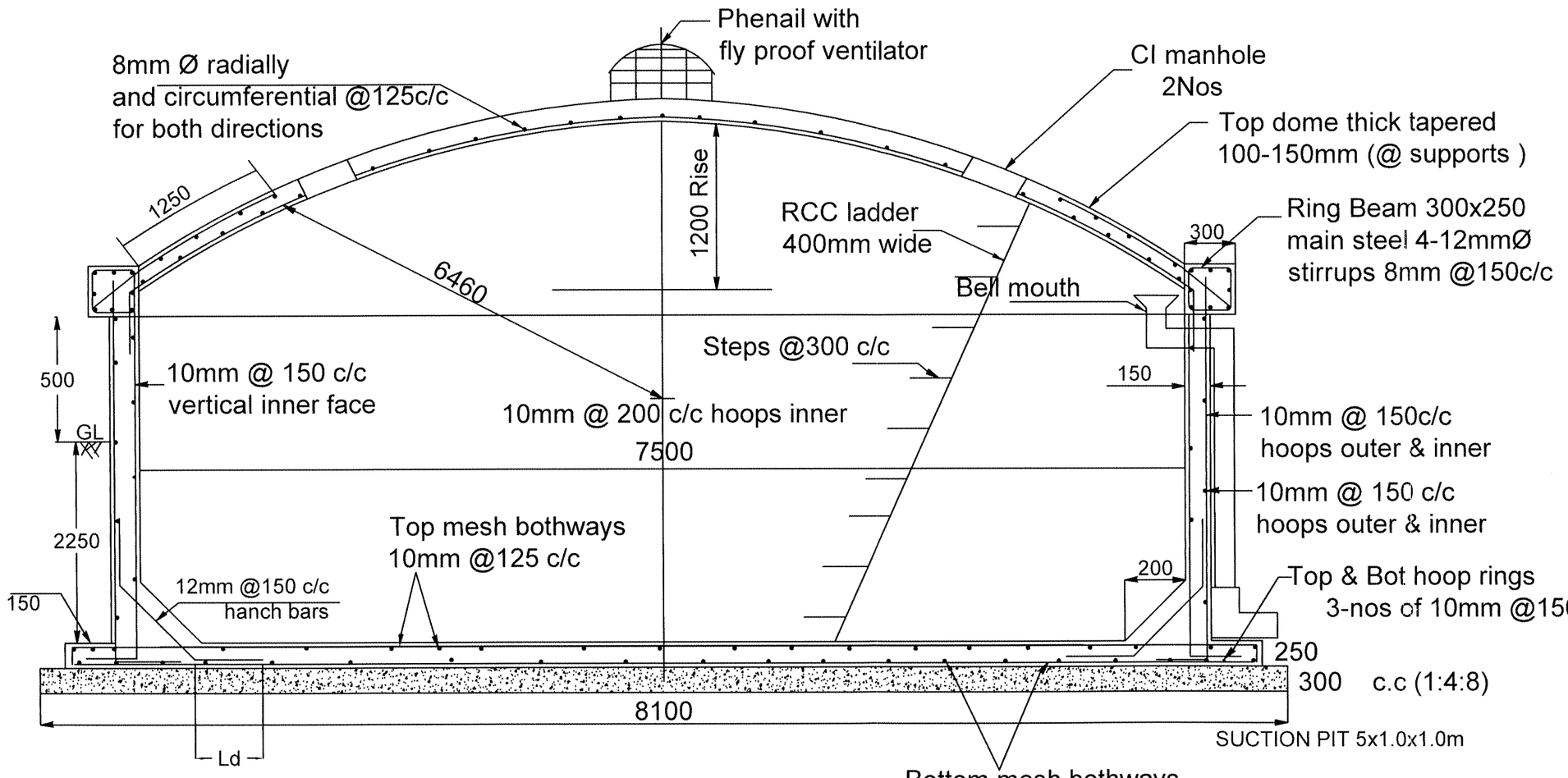
Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

"APPROVED"

SE, TDWSP

100KL SUMP



All dimenstions are in 'mm'
Concrete mix V.R.C.C M30
Steel Fe-415
Reinforcement details shall be as per IS-SP34

Asst. Executive Engineer
TDWSP Asifabad

Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

"APPROVED"
SE, TDWSP
NIRMAL

LARSEN & TOUBRO LIMITED Construction - Chennai

REV.NO.	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED
A	FOR INFORMATION				

REVISIONS

L&T Construction
Water, Smart World & Communication.

CLIENT: RURAL WATER SUPPLY AND SANITATION DEPARTMENT, TELANGANA.
CONSULTANT:

PROJECT: PROVIDING DRINKING WATER TO HABITATIONS IN KOMARAMBHEEM ASIFABAD SEGMENT IN ADILABAD DISTRICT (PRIMARY GRID)

SUPPLIER/CONTRACTOR: L&T Construction
Water & Effluent Treatment SBG

JOB No:	LE150883
NAME	SIGN / DATE

TITLE: SEDWAI LAMBADITHANDA AT NARNOOR (M)
SUMP - 100KL

SCALE
PROJECTION

CHECKED BY	SIGN	DATE
CIVIL & STRUCTURAL		
MECHANICAL		
ELECTRICAL		
INSTRUMENTATION		

DRAWING No. LE150883-C-WS-RW-DC-1312

SIZE A3 | REV A

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