

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

TELANGANA WATER GRID



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

CLIENT: RURAL WATER SUPPLY AND SANITATION DEPARTMENT (WATER GRID), TELUNGANA.			CONSULTANT : 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			TITLE :				
	NAME	SIGN	DATE	DESIGN OF SUMP - 120KL CAPACITY SIRPANCHAGUDA AT TRIYANI MANDAL			
DSGN							
CHKD							
APPD							
DOC./DRG. No.						SIZE	REV.
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Submitted sir,

Sub:RWS&S-TDWSP- Sirpanchaguda 120KL clear water sump in Triyani Mandal-
Komarambheem Asifabad Segment-Adilabad District-Designs -Approval-Reg.

Kindly peruse the Designs of the following 120KL Clear Water sump at Sirpanchaguda(V) , Triyani (M); submitted by the Executive Engineer TDWSP Asifabad Division , Adilabad district for approval.

1. 120 KL Clear Water Sump.

The Executive Engineer TDWSP Asifabad Division has submitted Structural Designs & Drawings of 120KL 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 : 120KL
- 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 :3.20 mts
- Sidewall Thickness:150mm
- Top Slab thickness: 150 to 100 mm tapered
- RaftSlab 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)
TDWSP, Nirmal Circle


DEE (Designs)
TDWSP, Nirmal Circle


Superintending Engineer,
TDWSP, Nirmal Circle

Design Of 120 KL Capacity Sump at

Data

Location				
Safe bearing Capacity	sb	Safe	100 Kn/m ²	
Capacity	v		120 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		3.2 m	
Depth of tank above GL	dgl		0.50 m	
Depth of tank below GL			2.70 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	0.14 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		3.2 m	
Th. Of Side wall	sth		0.150 m	130 mm
Depth of tank above GL	dgl		0.50 m	

Moments

Inner Side	4.35 Kn-m
Outer Side	5.623 Kn-m

Hoop force

Inner Side	85.84 Kn	(Tension)
Outer Side	107.07 Kn	(Compression)

Reinforcement

			Dia	Spacing Provided	Required
Inner face	Vertical	385 mm ²	10 mm	150 mm	150
	Horizontal	331 mm ²	10 mm	150 mm	150
Outer face	Vertical	498 mm ²	10 mm	150 mm	150
	Horizontal	331 mm ²	10 mm	150 mm	150

Bottom slab

Safe bearing Capacity	sb		100 Kn/m ²		
Th. Of Bottom Slab	bsth	Provided th is Sufficient	0.250 m	0.14 m	
Dia of Bottom Slab	db		8.10 m		
Size of Haunch	bh		0.20 m		
effective cover to reinforcement for raft slab	covraft		65 mm		
Moments	Radial		4.93 Kn-m		
	Circumferential		6.66 Kn-m		
Reinforcement	Top mesh	Ast	Dia	spacing Provided	Required
		319 mm ²	10 mm	125 mm	130
	Bottom mesh	240 mm ²	10 mm	125 mm	150

Max Ring Tension	bmcfps	0.0051	0.00479	0.0038	
	rtcfs	0.643	0.65596	0.697	
Max. -ve BM	mbms	(bmcfs*pas*hbgl ²)		5.62 Kn-m	
Max +ve BM	mpbms	(bmcfps*pas*hbgl ²)		1.52 Kn-m	
Max. Ring compression	mrts	rtcfs*pas*d/2		107.07 Kn	
Th. Of Side Wall		(MAX(mbm,mbms)*10 ⁶ *6/(2*1000)) ^{0.5}		130 mm	
					Th. Provided is Sufficient
Eff Th. Of Side wall	edswi				100 mm
Max Inner face moment	bmi	MAX(mpbms,mbm)		4.35 Kn-m	
Max outer face moment	bmo	MAX(mpbm,mbms)		5.62 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* ϵ		385 mm ²	on each side
Area of steel outer face	Astpbm	MAX(pt*sth*10 ⁴ ,(bmo*10 ⁶ /(130*0.87* ϵ		498 mm ²	on each side
Area of Steel for Hoop	Asth	MAX(pt*sth*10 ⁴ ,CEILING(mrt*1000/13		661 mm ²	for two sides
Vertical Steel Spacing					
<u>inner face</u>	vsp				
Spacing		FLOOR(pi*dbj ² /4*1000/Astm,25)		150 mm	
Provide 10 mm dia TOR @ 150 mm C/c					
<u>Outer face</u>	vspo				
Spacing		FLOOR(pi*dbo ² /4*1000/astpbm,25)		150 mm	
Provide 10 mm dia TOR @ 150 mm C/c spacing					
<u>Horizontal Steel</u>					
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	dbb	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		265.86 Kn	
Wt of Haunch		pi*(d-bh)*bh ² /2*25		11.47 Kn	
Total Load	wbs			548.55 Kn	
				5.49 sq m	0.15555
Max Pr on Soil	prb	Wbs/(pi*(d)*1)		23.28 Kn/m ²	
Bottom Slab is designed as circular Slab loaded with UDL and Simply Supported on edges					
				r	3.825
Radial moment	mri	3/16*prb*((dbb/2) ² -((d+sth)/2) ²)-wbs/		-1.14 mrb	4.93 Kn-m
Circuferential Moment	mti	1/16*prb*(3*(dbb/2) ² -((d+sth)/2) ²)-wb		4.51 mtb	4.93 Kn-m
for uplift	Net uplift load on bottom slab				3.25 Kn/m ²
for uplift	max Radial moment				6.66
	max Circuferential Moment				6.66
Max Radial Moment	mr	IF(wl>hbgl,0,CEILING(3*prb*(dbb/2) ² /		4.93 Kn-m	6.66 Kn-m
Max Circumferential moment	mt	IF(wl>hbgl,0,CEILING(prb*(dbb/2) ² /16		4.93 Kn-m	6.66 Kn-m

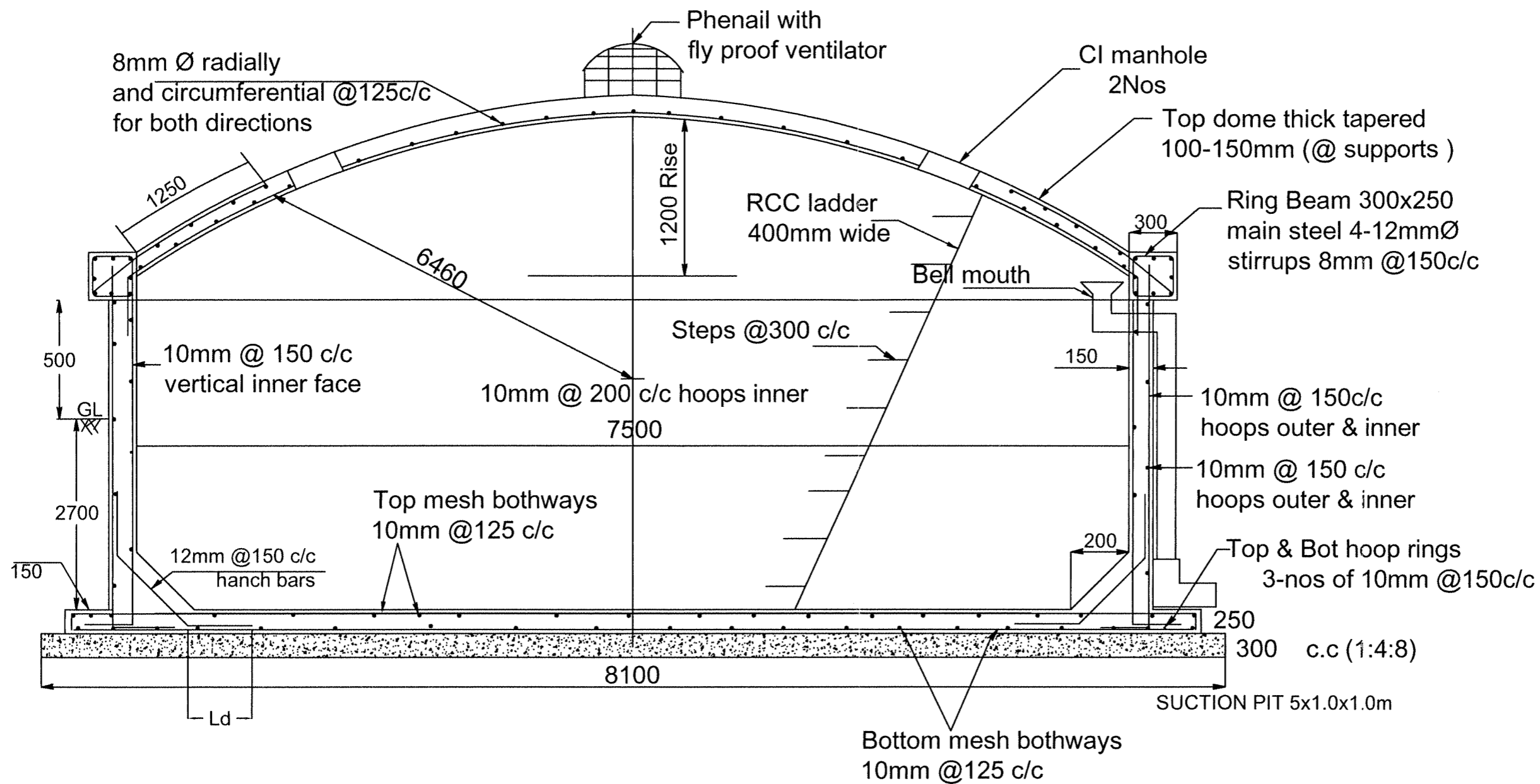
Yasir Ahmed
Asst. Executive Engineer
 TDWSP Asifabad

Abdullah
Dy. Executive Engineer
 TDWSP Asifabad

Abdullah
Executive Engineer
 TDWSP Asifabad

" APPROVED "
 3/4
Abdullah
SE, TDWSP
NIRMAL

120KL SUMP



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

[Signature]
 Asst. Executive Engineer
 TDWSP Asifabad

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 Dy. Executive Engineer
 TDWSP Asifabad

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 Executive Engineer
 TDWSP Asifabad

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 SE, TDWSP
 NIRMAL

CHECKED BY	SIGN	DATE
CIVIL & STRUCTURAL		
MECHANICAL		
ELECTRICAL		
INSTRUMENTATION		

A		FOR INFORMATION					
REV.NO.	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED		
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	TITLE	SCALE				
NAME	SIGN	DATE	SIRPANCHAGUDA AT TRIYANI MANDAL				
			SUMP - 120KL				
			PROJECTION				
DRAWING No. LE150883-3-C.W.S.R.W-DC-1262		SIZE	REV.				
		A3	A				
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