



**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
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PROJECT :	PROVIDING DRINKING WATER TO HABITATIONS IN KOMARAMBHEEM ASIFABAD SEGMENT IN ADILABAD DISTRICT
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SUPPLIER / CONTRACTOR:	L&T Construction, Water, Smart World and Communication
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JOB Ref. No. : LE150883	TITLE :																
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	NAME	SIGN	DATE														
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CHKD																	
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Submitted sir,

Sub: RWS&S-TDWSP- BuggaJn 400KL clear water sump in Triyani Mandal-
Komarambheem Asifabad Segment-Adilabad District-Designs -Approval-Reg.

Kindly peruse the Designs of the following 400KL Clear Water sump at BuggaJn(V), Triyani (M), submitted by the Executive Engineer TDWSP Asifabad Division, Adilabad district for approval.

1. 400 KL Clear Water Sump.

The Executive Engineer TDWSP Asifabad Division has submitted Structural Designs & Drawings of 400KL 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 : 400KL
- Net SBC of Soil : 10.0 t/sqm
- Grade of concrete & Steel : M 30 & Fe 415
- Dia of sump Inner to Inner: 12.00m
- Sidewall Height : 4.1mts
- Sidewall Thickness: 300mm
- Top Slab thickness: 150 to 100 mm tapered
- Raft Slab thickness: 300mm

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 400 KL Capacity Sump at

Data

Location				
Safe bearing Capacity	sbc	Safe	100 Kn/m ²	
Capacity	v		400 KL	
Free Board	fb		0.25 m	
Dead Storage	ds		0.30 m	
Dia of sump	d		12.00 m	
Projection from side wall	ps		0.60 m	
Depth of the tank	h		4.1 m	
Depth of tank above GL	dgl		0.80 m	
Depth of tank below GL			3.30 m	
thickness of PCC (lean mix cc1:6:10)		couter wt	0.00 m	
Th. Of Bottom Slab	bsth	Provided th is Sufficient	0.300 m	0.18 m
Depth of Water table below GL	wl	Safe Against Uplift	2.80 m	

Top Dome

Rise of the dome			1.90	
Radius of the dome			10.42	
Thickness of Dome	td	150 to 100	0.1	0.125 m
Dia of Reinforcement	db			10 mm
Reinforcement Spacing				125 mm c/c

Provide 10 mm dia Tor @ 125 mm C/c both radially and in the form of circular rings

Top Ring Beam

Width of ring beam	rb		350 mm	
Depth of ring Beam	dtrb	Provided size is sufficient	300 mm	203 mm
Dia of hoop bars	dbrb		16 mm	8 Nos
Dia of Stirrups			8 mm	200 mm 225

Side Wall

Depth of the tank	h		4.1 m	
Th. Of Side wall	sth		0.300 m	240 mm
Depth of tank above GL	dgl		0.80 m	

Moments

Inner Side	16.35 Kn-m
Outer Side	19.181 Kn-m

Hoop force

Inner Side	148.7 Kn	(Tension)
Outer Side	166.23 Kn	(Compression)

Reinforcement

			Dia	Spacing Provided	Required
Inner face	Vertical	581 mm ²	12 mm	150 mm	190
	Horizontal	572 mm ²	12 mm	150 mm	190
Outer face	Vertical	682 mm ²	12 mm	125 mm	160
	Horizontal	572 mm ²	12 mm	150 mm	190

Bottom slab

Safe bearing Capacity	sbc		100 Kn/m ²		
Th. Of Bottom Slab	bsth	Provided th is Sufficient	0.300 m	0.18 m	
Dia of Bottom Slab	db		13.80 m		
Size of Haunch	bh		0.30 m		
effective cover to reinforcement for raft slab		covraft	67 mm		
Moments	Radial		11.17 Kn-m		
	Circumferential		9.73 Kn-m		
Reinforcement	Top mesh	Ast	Dia	spacing Provided	Required
		424 mm ²	12 mm	125 mm	150
	Bottom mesh	240 mm ²	10 mm	250 mm	300

	bmcfps	0.0097	0.00964	0.0077	
Max Ring Tension	rtcfs	0.519	0.5208	0.579	
Max. -ve BM	mbms (bmcfs*pas*hbgl^2)			19.18 Kn-m	
Max +ve BM	mpbms (bmcfps*pas*hbgl^2)			5.59 Kn-m	
Max. Ring compression	mrts rtcfs*pas*d/2			166.23 Kn	
Th. Of Side Wall	(MAX(mbm,mbms)*10^6*6/(2*1000))^0.			240 mm	Th. Provided is Sufficient
Eff Th. Of Side wall	edswi			249 mm	
Max Inner face moment	bmi MAX(mpbms,mbm)			16.35 Kn-m	
Max outer face moment	bmo MAX(mpbm,mbms)			19.18 Kn-m	
Area of Steel Reinforcement					
Min Steel	pt 0.24% for <15m span 0.35%	0.24		0.12 %	
Area of Bending Steel inner side	Astm MAX(pt*sth*10^4,bmi*10^6/(130*0.87*ε			581 mm ²	on each side
Area of steel outer face	Astpbm MAX(pt*sth*10^4,(bmo*10^6/(130*0.87			682 mm ²	on each side
Area of Steel for Hoop	Asth MAX(pt*sth*10^4,CEILING(mrt*1000/13			1144 mm ²	for two sides
Vertical Steel Spacing					
<u>inner face</u>	vsp				
Spacing	FLOOR(pi*d _{bi} ^2/4*1000/Astm,25)			190 mm	
Provide 12 mm dia TOR @ 190 mm C/c					
<u>Outer face</u>	vspo				
Spacing	FLOOR(pi*d _{bo} ^2/4*1000/astpbm,25)			160 mm	
Provide 12 mm dia TOR @ 160 mm C/c spacing					
<u>Horizontal Steel</u>					
Spacing	hsp FLOOR(pi*d _h ^2/2*1000/Asth,25)			190 mm	
Provide 12 mm dia TOR @ 190 mm C/c on both faces in staggered fashion					
Design Of Bottom Slab					
Projection from side wall	ps			0.6 m	
Dia of Bottom Slab	db _s d+2*sth+2*ps			13.80 m	
Size of Haunch	bh			0.3 m	
Dia of Bar	top db _{bs}			12 mm	
	bottom db _{bsb}			10 mm	
Load on Bottom Slab					
Wt of Top Dome	2*pi*rd*hd*wd			575.53 Kn	
Wt of Ring Beam	pi*(d+rb/1000)*rb*drb*25/10^6			101.85 Kn	
Wt Of Side wall	pi*(d+sth)*sth*(h-dtrb)*25			1101.26 Kn	
Wt of Haunch	pi*(d-bh)*bh^2/2*25			41.35 Kn	
Total Load	w _{bs}			1819.99 Kn	
				18.20 sq m	0.5161
Max Pr on Soil	prb W _{bs} /(pi*(d)*1)			48.28 Kn/m ²	
Bottom Slab is designed as circular Slab loaded with UDL and Simply Supported on edges					
			r	6.15	5.9
Radial moment	m _{ri} 3/16*prb*((db _s /2)^2-((d+sth)/2)^2)-w _{bs} /			-11.17 m _{rb}	-9.71 Kn-m
Circuferential Moment	mti 1/16*prb*(3*(db _s /2)^2-((d+sth)/2)^2)-w _b			-9.73 m _{tb}	-9.71 Kn-m
for uplift	Net uplift load on bottom slab			0.5 Kn/m ²	
for uplift	max Radial moment			2.98	2.98 Kn-m
	max Circuferential Moment			2.98	2.98 Kn-m
Max Radial Moment	mr IF(wl>hbgl,0,CEILING(3*prb*(db _s /2)^2/			11.17 Kn-m	2.98 Kn-m
Max Circumferential moment	mt IF(wl>hbgl,0,CEILING(prb*(db _s /2)^2/16			9.73 Kn-m	2.98 Kn-m

" APPROVED "

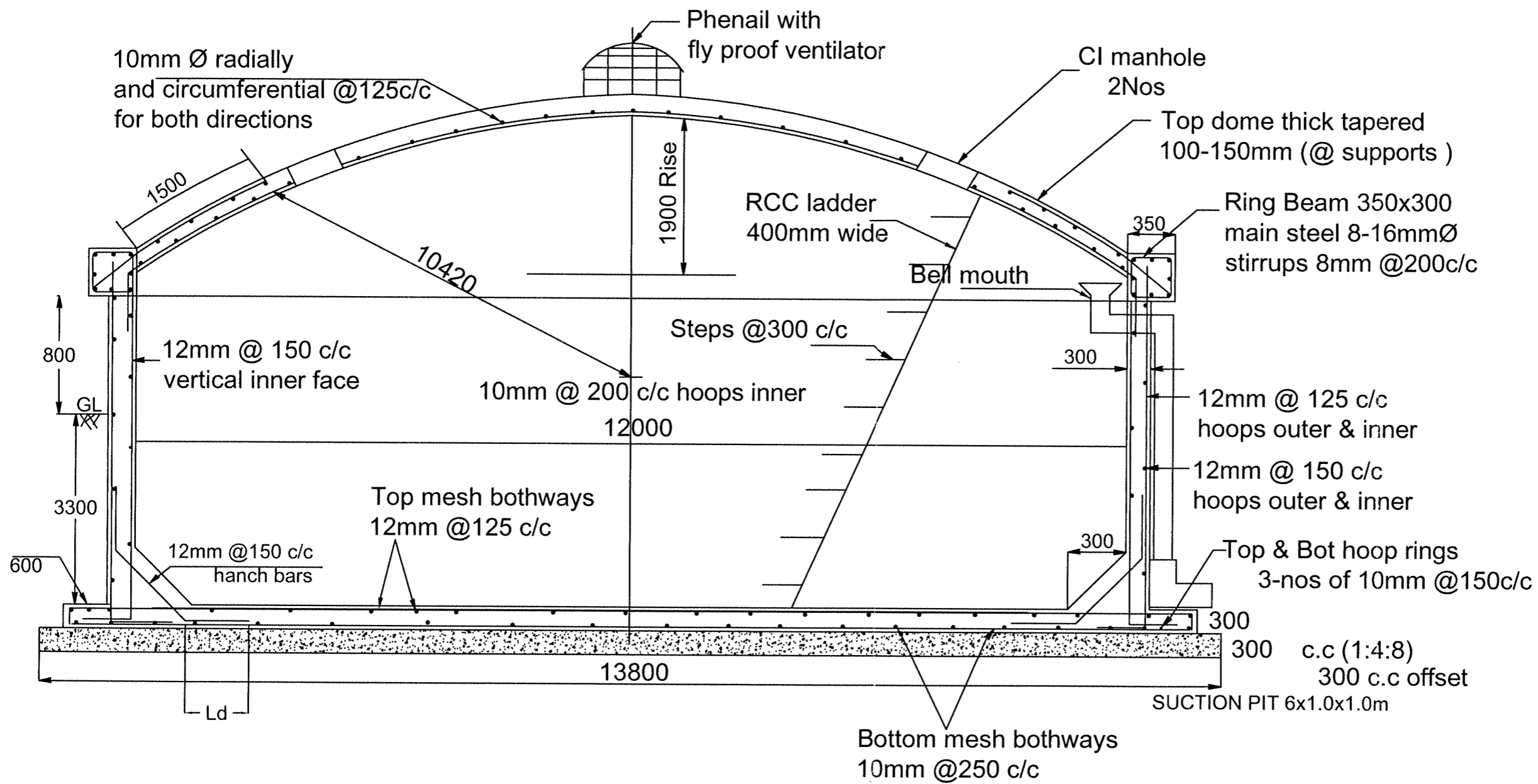
Yousaf Ahmed
Asst. Executive Engineer
TDWSP Asifabad

Qly
Dy. Executive Engineer
TDWSP Asifabad

hera
Executive Engineer
TDWSP Asifabad

SE, TDWSP
NIRMAL

400 KL 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

[Signature]
 Dy. Executive Engineer
 TDWSP Asifabad

[Signature]
 Executive Engineer
 TDWSP Asifabad

"APPROVED"
[Signature]
 SE, TDWSP
 NIRMAL

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	BUGGA JN AT TRIYANI MANDAL		PROJECTION		
			SUMP - 400KL		A		
CHECKED BY	SN	DYE	DRAWING No: LE150883-W-WS-RW-DC-11182		SIZE	REV.	
CIVIL & STRUCTURAL					A3	A	
MECHANICAL							
ELECTRICAL							
INSTRUMENTATION							
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GOVERNMENT OF TELANGANA
TELANGANA DRINKING WATER SUPPLY PROJECT
Office of the Superintending Engineer, TDWSP CIRCLE Nirmal

MemoNo.AEE/TDWSP/Adilabad- Asifabad Segment /Designs/2015-16/ , Dt.--

Sub:Adilabad District - TDWSP - "Providing drinking water to Komarambheem – Asifabad segment in Adilabad District under Telangana drinking water supply project (TDWSP) –Design of Civil Structures -Approval – Reg.


Ref: 1) PR& RD RWS-IV Dept. Memo No 11548/RWS-IV/2015 Dated 04.12.2015
2) SE TDWSP Nirmal Circle agreement no 3; Dated 27.10.2015
3) Proposals submitted by EE TDWSP Asifabad Dated 01.02.2016

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The Structural Designs and Drawings of Sumps, Pertaining to the work Providing Drinking Water to Komarambheem – Asifabad Segment, Adilabad District are Approved and here with communicated for grounding of work.

- 1.400KL capacity Sump at Bugga Jn at Triyani Mandal – Design Calculation
2. 120KL capacity Sump at Sirpanchaguda at Triyani Mandal– Design Calculation
- 3.100KL capacity Sump at Kattaguda at Narnoor Mandal – Design Calculation
- 4.100KL capacity Sump at Kodduguda at Asifabad Mandal – Design Calculation
- 5.60KL capacity Sump at Nayakappuguda at Triyani Mandal – Design Calculation

The Executive Engineer, Asifabad is requested to submit the construction program for above structures.


Superintending Engineer,
TDWSP Circle, Nirmal,

To

The Executive Engineer, TDWSP, Asifabad Division for necessary action.

Copy Submitted to the Chief Engineer TDWSP Hyderabad for favor of information

Copy Submitted to the Engineer-in-chief RWS&S Hyderabad for favor of information