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 09.02.2016

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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. 60KL capacity Sump at Rimma at Indervelly Mandal– Design Calculation

2. 100KL capacity Sump at Inkaraguda at Indervelly Mandal – Design Calculation

3. 100KL capacity Sump at Sedwai Lambaithanda at Narnoor Mandal – Design Calculation

4. 120KL capacity Sump at Lambadithanda at Narnoor 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

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 INKARAGUDA AT INDERVELLY MANDAL

DOC./DRG. No.

LE150883-C-WS-RW-DC-1282

SIZE: A4 | REV.: A

RELEASED FOR: ☐ PRELIMINARY ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION

Submitted sir,

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

*****

Kindly pursue the Designs of the following 100KL Clear Water sump at Inkaraguda(V), Indervelly (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/m²		
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		
thicknesss of PCC (lean mix cc1:6:10)		couter wt		0.00 m		
Th. Of Bottom Slab	bsth	provided th is suffficient		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				1.2		
Radius of the dome				6.46		
Thickness of the 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 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 mm²	10 mm	150 mm	150	
	Horizontal	263 mm²	10 mm	150 mm	150	
Outer face	Vertical	398 mm²	10 mm	150 mm	150	
	Horizontal	263 mm²	10 mm	150 mm	150	
Bottom Slab						
Safe bearing capacity	sbc		100 Kn/m²			
Th. Of Bottom Slab	bsth	Provided size 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			
	Ast		Dia	Spacing provided	Required	
Reinforcement Top mesh	219 mm²		10 mm	125 mm	130	
Bottom mesh	240 mm²		10 mm	125 mm	150	

sump-100KL-design.xlsx-150-sump

	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	bml	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 bending Steel inner side	Astm	MAX(pt*sth*10^4,bmi*10^6/(130*0.87*e			317 mm²	on each side

Area of steel outer facde	Astpbm	MAX(pt*sth*10^4,bmo*10^6/(130*0.87*e	398 mm²	on each side	
Area of steel for Hoop	Asth	MAX(pt*sth*10^4,CEILING(mrt@1000/13	526 mm²	on each side	
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/m²		
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 kKn-m
Circumferential Moment	mti	1/16*prb*(3*(dbs/2)^2-((d=sth)/2)^2)-wbs/	4.18	mtb	4.57 kKn-m
for uplift Net uplift load on bottom slab			-1.25	kn/m²	
for uplift		Max Radial moment	-2.56		-2.56 kKn-m
		Max Circumferential Moment	-2.56		-2.56 kKn-m
Max Radial moment	mr	IF(wl>hbgl,0,CEILING(3*PRB*(DBS/2)2/	4.57 kKn-m		2.56 kKn-m
Max Circumferential Moment	mt	IF(wl>hbgl,0,CEILING(PRB*(DBS/2)2/16	4.57 kKn-m		2.56 kKn-m

Asst. Executive Engineer
TDWSP Asifabad

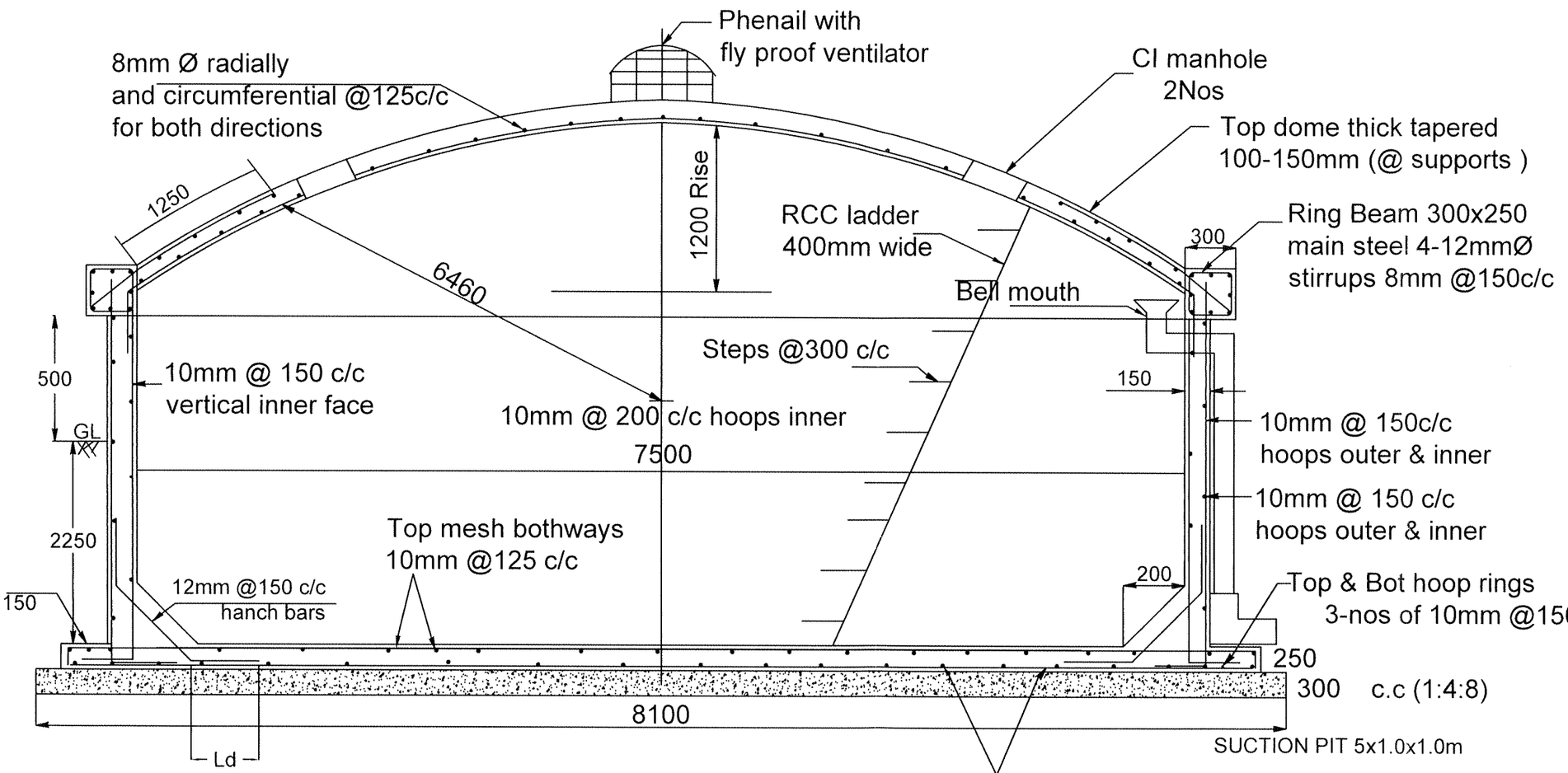
Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

"APPROVED"

SE, TDWSP
NIRMAL

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

"APPROVED"
SE, TDWSP
NIRMAL

Asst. Executive Engineer
TDWSP Asifabad

Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

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 :
INKARAGUDA AT INDERVELLY MANDAL
SUMP - 100KL

SCALE

PROJECTION

CHECKED BY	SIGN	DATE
CIVIL & STRUCTURAL		
MECHANICAL		
ELECTRICAL		
INSTRUMENTATION		

DRAWING No. LE150883-C-WS-RW-DC-1282 SIZE A3 REV. A

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