



**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
DSGN
CHKD
APPD
**DESIGN OF SUMP - 60KL CAPACITY
NAYAKAPPURGUDA AT TRIYANI MANDAL**

DOC./DRG. No. LE 1 5 0 8 8 3 - C - W S - R W - D C - 1 3 7 2 SIZE A4 REV. A

RELEASED FOR PRELIMINARY INFORMATION APPROVAL CONSTRUCTION

Submitted sir,

Sub:RWS&S-TDWSP- Nayakappurguda 60KL clear water sump in Triyani Mandal–
KomarambheemAsifabad Segment-AdilabadDistrict-Designs -Approval-Reg.

Kindly pursue the Designs of the following 60KL Clear Water sump at Nayakappur(V)
,Triyani (M), submitted by the Executive Engineer TDWSP Asifabad Division ,Adilabad district
for approval.

1. 60 KL Clear Water Sump.

The Executive Engineer TDWSP Asifabad Division has submitted Structural Designs &
Drawings of 60KL 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:

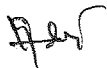
- Capacity : 60kL
- Net SBC of Soil : 10.0 t/sqm
- Grade of concrete & Steel : M 30 & Fe 415
- Dia of sump Inner to Inner : 6.00m
- Sidewall Height : 2.75mts
- Sidewall Thickness:150mm
- Top Slab thickness: 150 mm
- RaftSlab thickness: 250mm

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 60 KL Capacity Sump at (WITH FLAT TOP SLAB) Not more than 5m Span

Data

Location						
Safe bearing Capacity	sbc		safe for sbc			100 Kn/m ²
Capacity	v					60 KL
Free Board	fb					0.30 m
Head Storage	ds					0.30 m
Dia of sump	d					5.00 m
Projection of Bottom slab from side wall				ps = d/16 to d/8		0.35 m
Depth of tank above GL	dgl		Uplift check required			0.80 m
Depth of Water table below GL	wl			Safe Against Uplift		0.90 m
Depth of the tank	h					3.70 m
Thickness of Slab	td	Min 150mm thick		OK		0.150 m
Th. Of Side wall	sth	Min 150mm thick		OK		0.150 m
Th. Of Bottom Slab	bsth	Min 150mm thick	thick is Sufficient	OK		0.25 m

Top Slab

Radius of Top slab	rs				slab projection	
Thickness of Slab	td	Min 150mm thick		OK	0.15 m	0.3 m
Effective depth of slab	d				100 mm	0.121 m is required
Total Load on slab		Self wt			3.75 kN/sqm	
		Live load			1.5 kN/sqm	
		Finishings			1 kN/sqm	
		Total load			<u>6.25 kN/sqm</u>	
Bending Moment	bm	(2/16*w*rs ²)			4.88 kN-m/m	
Area of Steel required	ast	(bm/(σsljd))			436 sqmm/m	
		σsl	N/mm ²		130.00 N/sqmm	
		j=1-k/3			0.86	
		k=1/1+σsl/mσcbc			0.42	
		m=280/3σcbc			9.33	
		σcbc			10 N/sqmm	
		Grade of steel	Fe 415, σst=		130 N/sqmm	
		Grade of Concrete	M 30			
Dia of Reinforcement	db	10mm				
Spacing required	min of	150 mm	170 mm	floor to	10mm	
Spacing provided			OK	150 mm	c/c	
		Provide 10 mm dia Tor @ 150 mm C/c both radially and in the form of circular rings				

Side Wall

Depth of the tank	h					3.7 m
Th. Of Side wall	sth	Min 150mm thick				0.15 m
Depth of tank above GL	dgl					0.80 m

Moments

	Inner Side					4.00 Kn-m
	Outer Side					4.368 Kn-m

Top force

	Inner Side					71.78 Kn (Tension)
	Outer Side					86.75 Kn (Compression)

Reinforcement

				Dia	Spacing Provided	floor to
Inner face	Vertical	(Min 10mm dia)	354 mm ²	10 mm	150 mm	50
	Horizontal		276.5 mm ²	10 mm	150 mm	50
Outer face	Vertical	(Min 10mm dia)	387 mm ²	10 mm	150 mm	50
	Horizontal		276.5 mm ²	10 mm	150 mm	

Bottom slab

		Min 150mm thick				
Safe bearing Capacity	sbc					100 Kn/m ²
Th. Of Bottom Slab	bsth		thick is Sufficient			0.250 m
Th. of Bottom Slab	db					0.185 m
Th. of Haunch	bh					6.00 m
Effective cover to reinforcement for raft slab			covraft			0.25 m
Moments	Radial					67 mm
	Circumferential					5.20 Kn-m
		Ast (Min 10mm dia)				5.15 Kn-m
Reinforcement Top	mesh			Dia	Provided	floor to
		557 mm ²		12 mm	175 mm	25
Reinforcement Bottom	mesh			10 mm	200 mm	50

Area of Steel	Astru	$mru \cdot 10^6 / (130 \cdot 0.86 \cdot de)$	300 mm ²
Spacing			557 mm ²
Top Steel spacing	Asttpu	$\pi \cdot (dbbs^2 / 4) \cdot 1000 / \max(Astmn, astr)$	204 mm

Provide 12 mm dia TOR @ 175 mm c/c in the form of mesh at top

Check For Uplift

Depth of Water uplift	dw	h-hgl-wl+bslh	2.25 m
Wt of Sump	We	wbs+wbsi	
Wt of soil backfilling above the bottom slab projection		with topslab	503 Kn
Wt of Sump including refilled soil			288 Kn
			<u>792 Kn</u>
Uplift Pr	Pu	$\pi \cdot dbbs^2 / 4 \cdot dw \cdot 10$	636 Kn
Factor of Safety against IF	We/Pu		1.25
			Safe Against Uplift

[Signature]
Asst. Executive Engineer
 TDWSP Asifabad

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Dy. Executive Engineer
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Executive Engineer
 TDWSP Asifabad

" APPROVED "

SE, TDWSP
NIRMAL

[Signature]

