

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

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	OK
Depth of tank above GL	dgl	Uplift check required		0.80 m	
Depth of Water table below GL, w/l		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	0.121 m
h. Of Side wall	sth	Min 150mm thick	OK	0.150 m	0.110 m
h. Of Bottom Slab	bsth	Min 150mm thick	thick is Sufficient OK	0.25 m	0.185 m

Top Slab					slab projection
Radius of Top slab	rs			2.50	0.3 m
Thickness of Slab	td	Min 150mm thick	OK	0.15 m	0.121 mm is required
Effective depth of slab	d			100 mm	
Total Load on slab		Self wt		3.75 kN/sqm	
		Live load		1.5 kN/sqm	
		Finishings		1 kN/sqm	
	w	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/(astjd))		436 sqmm/m	
		ast	N/mm ²	130.00 N/sqmm	
		j=1-k/3		0.86	
		k=1/1+ast/mcbc		0.42	
		m=280/3acbc		9.33	
		acbc		10 N/sqmm	
		Grade of steel	Fe 415, ast=	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	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	
h. Of Side wall	sth	Min 150mm thick		0.15 m	0.11 mm
Depth of tank above GL	dgl			0.80 m	

Moments

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

Shear 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		
h. Of Bottom Slab	bsth	thick is Sufficient		0.250 m	0.185 m	
Dia of Bottom Slab	db			6.00 m		
Size of Haunch	bh			0.25 m		
Effective cover to reinforcement for raft slab			covraft	67 mm		
Moments	Radial			5.20 Kn-m		
	Circumferential			5.15 Kn-m	Spacing	
Reinforcement	Top	mesh	Ast (Min 10mm dia)	Dia	Provided	floor to
	Bottom	mesh	557 mm ²	12 mm	175 mm	25
			300 mm ²	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	$\pi \cdot (dbbs^2 / 4) \cdot 1000 / \max(Astrmn, astr)$	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+bsth	2.25 m
Wt of Sump	We	wbs+wbsi	503 Kn
Wt of soil backfilling above the bottom slab projection		with topslab	288 Kn
Wt of Sump including refilled soil			<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

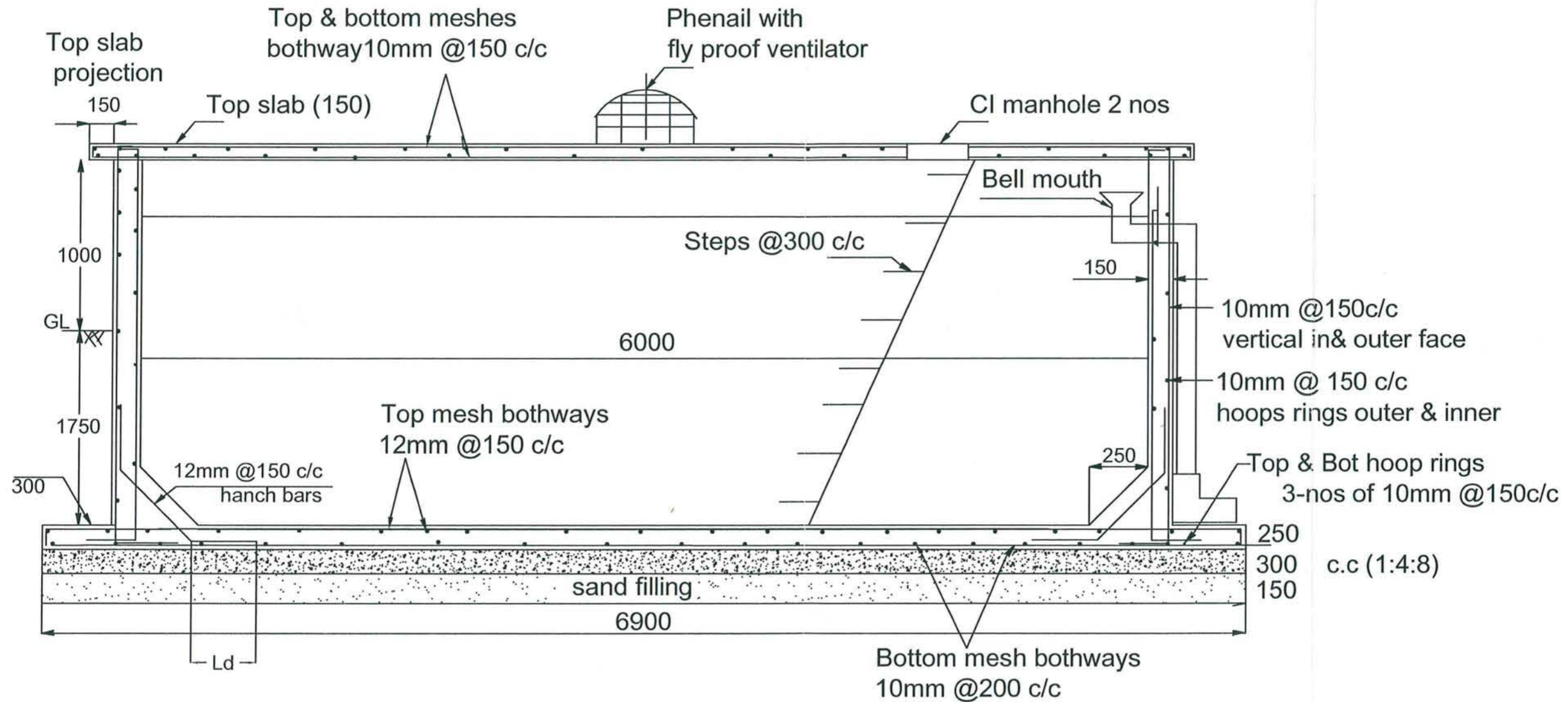
Safe Against Uplift

Gaithusd
Asst. Executive Engineer
 TDWSP Asifabad

Dr
Dy. Executive Engineer
 TDWSP Asifabad

nao
Executive Engineer
 TDWSP Asifabad

60KL SUMP



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

Asst. Executive Engineer
 AEE/TDWS/ASF
 TDWSP Asifabad

Dy. Executive Engineer
 TDWSP Asifabad

Executive Engineer
 TDWSP Asifabad

"APPROVED"
 SE, TDWSP
 NIRMAL



A FOR INFORMATION			
REV.NO.	DESCRIPTION	DESIGNED	DRAWN
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	TRİYANI MANDAL - LINGIGUDA SUMP - 60KL
CHECKED BY	SDM	DATE	
CIVIL & STRUCTURAL			
MECHANICAL			
ELECTRICAL			
INSTRUMENTATION			
DRAWING No	LE150883-C-WS-RW-DC-1382	SIZE	REV.
		A3	A
RELEASED FOR <input type="checkbox"/> PRELIMINARY <input type="checkbox"/> TENDER <input type="checkbox"/> INFORMATION <input checked="" type="checkbox"/> APPROVAL <input type="checkbox"/> CONSTRUCTION			