Design Of 60 KL Capacity Sump at

(WITH FLAT TOP SLAB)

Data Not more than 5m Span

Location						
Safe bearing Capacity	sbc	safe for sbc		100	Kn/m^2	
Capacity	v			60	KL	
Free Board	fb			0.30	m	
Dead 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,	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	0.121 m
Th. Of Side wall	sth	Min 150mm thick	OK	0.150	m	0.110 m
Th. 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		6.25	kN/sqm	
Bending Moment	bm	(2/16*w*rs^2)		4.88	kN-m/m	
Area of Steel required	ast	(bm/(σstjd)		436	sqmm/m	
		σst	N/mm2	130.00	N/sqmm	
		j=1-k/3		0.86		
		k=1/1+σst/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	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

Hoop 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	0.185 m
Dia of Bottom Slab	dbs			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	

				Dia	Spacing Provided	floor to
		Ast (Min 10mm dia)				
Reinforcemei Top	mesh	557 mm^2		12 mm	175 mm	25
Bottom	mesh	300 mm^2		10 mm	200 mm	50

				300 mm^2
Area of Steel	Astru	mru*1C*Di(130*0.86*dr)		557 mm^2
Spacing				
Top Steel spacing	Astpu	pi*(dtbs*2/4)*1000/max(Astmin astr)		284 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-wt+bath	2.25 m	
Wt of Sump	We	wbs+wbs	with topslab	503 Kn
Wt of soil backfilling above the bottom slab projection				288 Kn
Wt of Sump including refilled soil				792 Kn
Uplift Pr	Pu	pi*dbs*2/4*dw*10		636 Kn
Factor of Safety against UF		We/Pu		1.25

Safe Against Uplift

AEE/TDWSP/ASF
Asst. Executive Engineer
TDWSP Asifabad

Dy.E.E (TDWSP) Asifabad

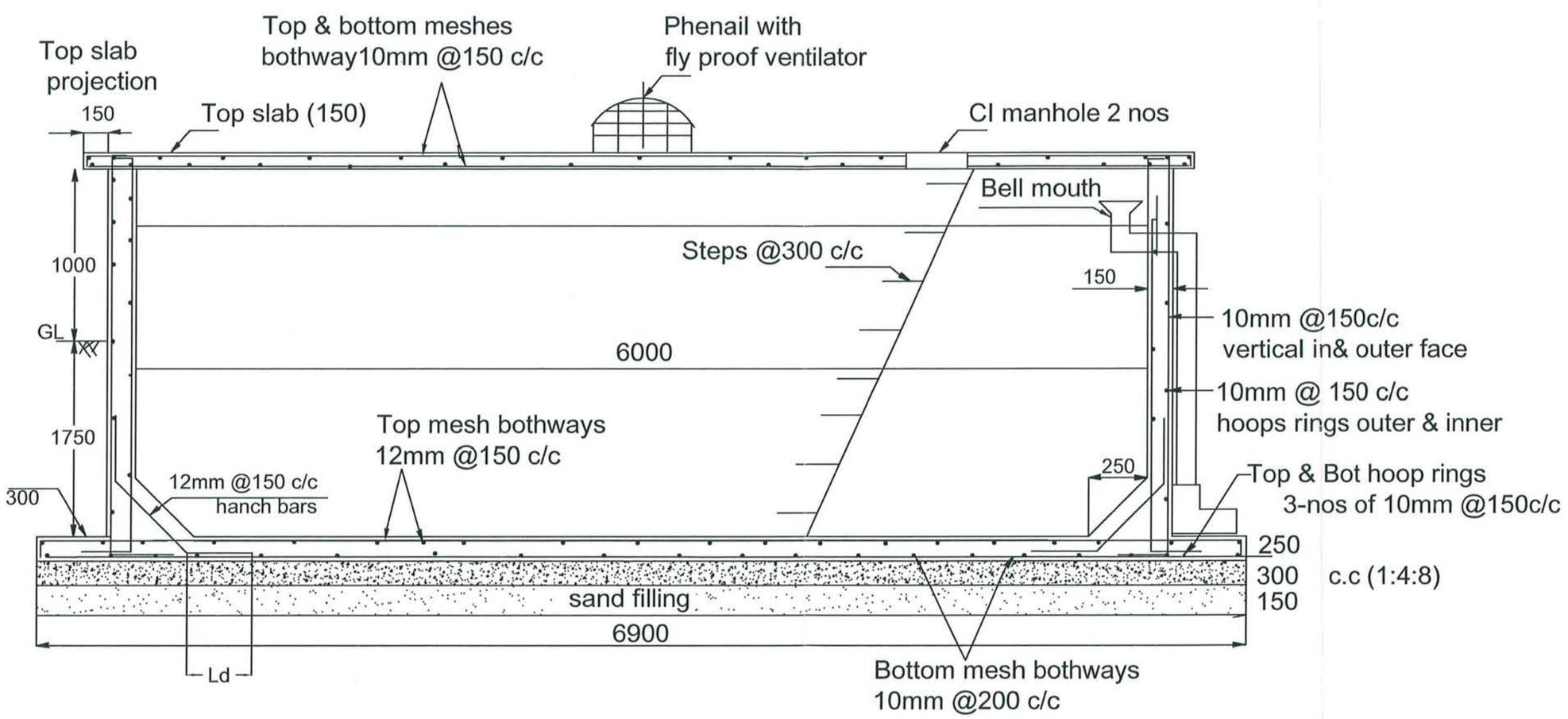
Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

" APPROVED "

SE, TDWSP
NIRMAL

60KL SUMP



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

AEE/TDWSP/ASF
Asst. Executive Engineer
TDWSP Asifabad

Dy. Executive Engineer
TDWSP Asifabad

Executive Engineer
TDWSP Asifabad

" APPROVED "
SE, TDWSP
NIRMAL

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

TITLE: ASIFABAD MANDAL - CHIRRAKUNTA SUMP - 60KL

SCALE

PROJECTION

CHECKED BY	SIGN	DATE
CIVIL & STRUCTURAL		
MECHANICAL		
ELECTRICAL		
INSTRUMENTATION		

DRAWING No. LE150883-W-WS-WT-PP-

SIZE A1 | REV. A

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