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 - 60KL CAPACITY RIMMA AT INDERVELLY MANDAL

DOC./DRG. No.

L	E	1	5	0	8	8	3	-	C	-	W	S	-	R	W	-	D	C	-	1	3	5	2

SIZE	REV.
A4	A

RELEASED FOR

☐ PRELIMINARY	☐ INFORMATION	☑ APPROVAL	☐ CONSTRUCTION

Submitted sir,

Sub:RWS&S-TDWSP- Rimma 60KL clear water sump in Indervelly Mandal– Komarambheem Asifabad Segment-Adilabad District-Designs -Approval-Reg.

*****

Kindly pursue theDesigns of the following 60KL Clear Water sump at Rimma(V) ,Indervelly (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 : 2.75 mts
- 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)	DEE (Designs)	Superintending Engineer,
TDWSP,Nirmal Circle	TDWSP,Nirmal Circle	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/m²	
Capacity		v					60 KL	
Free Board		fb					0.30 m	
Dead Storage		ds					0.30 m	
Dia of sump		d			ps=d/16 to d/8		5.00 m	
Projection of Bottom slab from side wall				Uplift check required			0.35 m	ok
Depth of tank above GL		dgl					0.80 m	
Depth of tank below GL		GL	WI				0.90 m	
Depth of the tank		h					3.70m	
Thickness of Slab		td		Min 150mm thick		ok	0.150 m	0.121m
Th. Of Bottom Slab		bsth		Min 150mm thick		ok	0.150 m	0.110m
Th. Of Side wall		slh		Min 150mm thick	thickness is sufficient	ok	0.25 m	0.185m
Top slab								side projection
Radius of Top slab		rs					2.5	0.3 m
Thickness of Slab		td		Min 150mm thick		ok	0.15 m	0.121 mm required
Effective depth of slab		dl					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/sqm	
Area of steel required		ast		(bm/(astjd)			463 sqmm/m	
				ast		N/mm²	130.00 N/sqmm	
				j=1-k/3			0.86	
				k=1/1+ast/macbc			0.42	
				m=280/3acbc			9.33	
				acbc			10 N/sqmm	
				Grade of steel		Fe415,σst	130 N/sqmm	
				Grade of concrete		M 30		
Dia of reinforcement		db			10mm			
spacing	required	min of			150mm	170mm	floor to	10mm
spacing	provided					ok	150 mm	c/c

provide 10 mm dia Tor @ 150 mmC/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		0.150 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 mm²	10 mm	150 mm	50
	Horizontal			276.5 mm²	10 mm	150 mm	50
Outer face	Vertical		(Min 10mm dia)	387 mm²	10 mm	150 mm	50
	Horizontal			276.5 mm²	10 mm	150 mm	

Bottom Slab			Min 150mm thick				
Safe bearing capacity		sbc			100 Kn/m²		
Th. Of Bottom Slab		bsth		thickness 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		
			Ast (Min 10mm dia)		Dia	Spacing provided	floor to
Reinforcement	Top mesh		557 mm²		12 mm	175 mm	25
	Bottom mesh		300 mm²		10 mm	125 mm	50
						300 mm²	
Area of steel		Astru	mru*10^6/(130*0.86*de)			557 mm²	
Spacing							
Top steel spacing		Asllpu		pi*(dbbs^2/4)*1000?max(Astmn,astr)		204 mm	
Provide 12 mm dia TOR @175 mm c/c in the form of mesh at top							
Check For Uplist							
Depth of water uplift		dw	h-hgl-wl=bsth	``	2.25 m		
Wt of sump		we	wbs=wbsl	with top slab	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		f	we/pu			1.25	
					safe against uplift		

Asst. Executive Engineer
TDWSP Asifabad

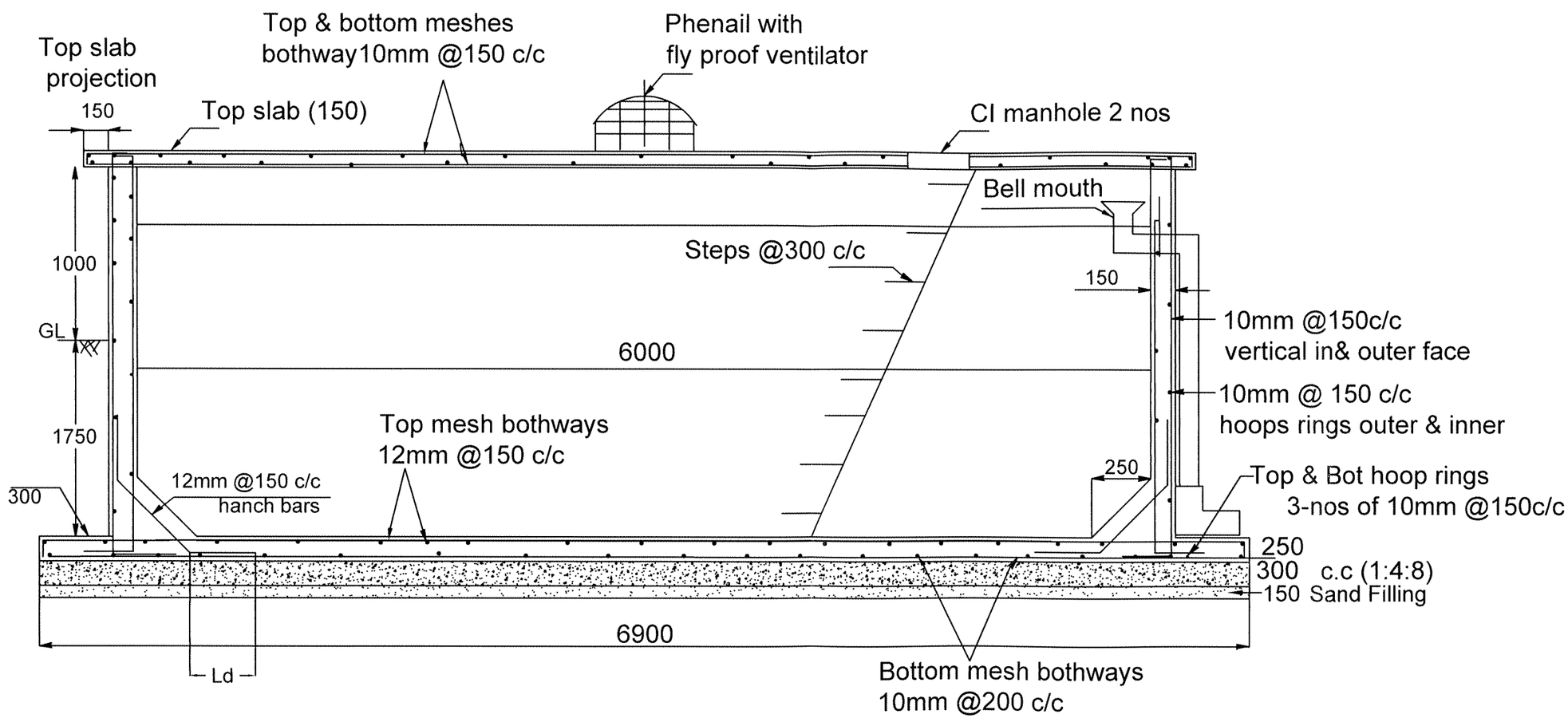
Dy. Executive Engineer
TDWSP Asifabad

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

Asst. Executive Engineer
TDWSP Asifabad

Dy. Executive Engineer
TDWSP Asifabad

"APPROVED"
SE, TDWSP
NIRMAL

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 : RIMMA AT INDERVELLY MANDAL
SUMP - 60KL

SCALE

PROJECTION

CHECKED BY	SIGN	DATE
CIVIL & STRUCTURAL		
MECHANICAL		
ELECTRICAL		
INSTRUMENTATION		

DRAWING No. LE150883-C-WS-RW-DC-1352

SIZE A3 | REV. A

RELEASED FOR ☐PRELIMINARY ☐ TENDER ☐INFORMATION ☑APPROVAL ☐CONSTRUCTION