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METHODOLGY

General Observations

- Entire city
- Development pattern of the town
- Prevalent housing typologies

Sample Survey

- Sample selection criteria
- Inspection of HH level sanitation facilities
- Documentation of ground conditions

Analysis

- Laboratory testing of collected samples
- Review of relevant norms and standards
- Comparisons with standards

Conclusion

• Way forward

SAMPLE SELECTION

In this project for carrying out the above assessment, a total of 25 household surveys are to be carried out. For the initial stage only 10 households have been studied.

Process of Selecting samples:

Based on observations carried out during the CSP exercise, tentative clustering of various building typologies has been done. The prevalent housing typologies in Wai can be broadly classified into 4 types:

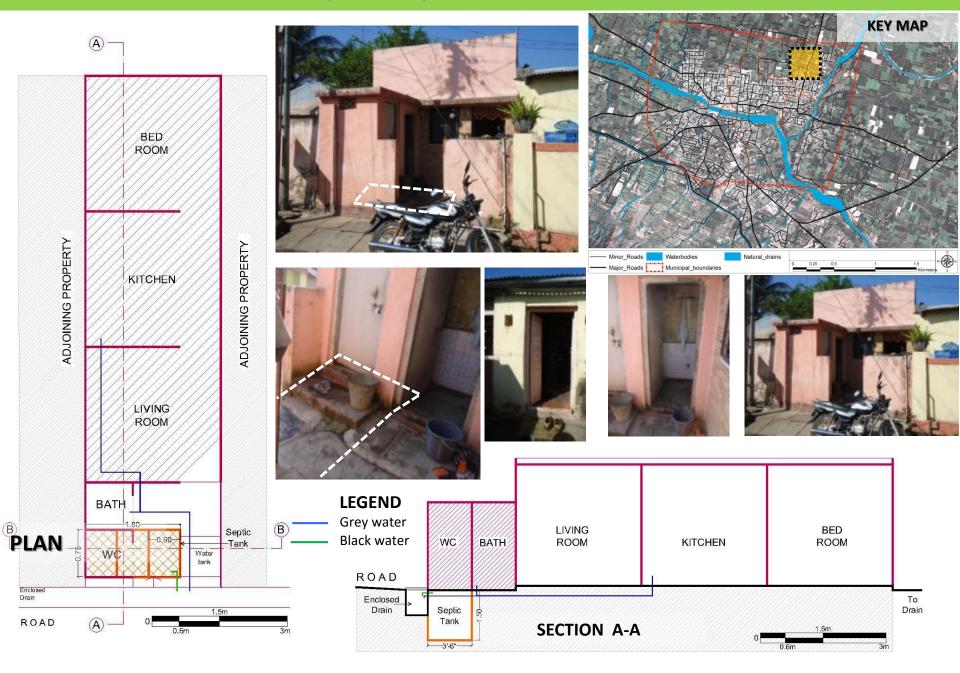
SR NO	BUILDING TYPOLOGY	DESCRIPTION	OBSERVATION
1	Old Town (Samples from this typology: 13 Numbers)	 Old Houses: Predominant in Old Wai town. Character: Narrow plots with toilets outside residence but within premise. Space constraints for constructing septic tanks. 	• The core of the city is densified due to which there is an issue of land avaibility for sanitation services.
2	New town (Samples from this typology: 7 Numbers)	 Individual Plotted Development: Such development is mainly seen in Prabhag 4. Well planned typology with proper road hierarchy. Character: Plotted layouts with uniform plot size. 	• The new town are develop at the periphery of the old city they required a proper guidance for implementation sewage treatment and should make aware about its importance.
3	Institutions (Samples from this typology: 5 Numbers)	 They are predominantly present in Prabhag 1 and 4 Toilets are constructed within the premises or outside and are not maintain properly It consist of schools, administrative, colleges, Public buildings 	

MAP SH	HOWING SAI	MPLE LC)CA	TIONS	TIONS	TIONS
	R OF SAMPLE SELE					
SR NO	BUILDING TYPE	NO OF SAMPLE		C16	C16 C17 C10	C16 C17 C10 C14 C11
1	Single storey	9		1	C15 C13 C13	C15 C13 C12 C1
2	Two storey	6			C20 C7	C20 C7 C9
3	Three storey	5			A YOUNG TO SEE THE SEE	
	TOTAL	20		C19	C19 C2	C19 C2
INSTITUTI	ONAL BUIDINGS	Prabhag			C6 C18	C6 C18 C4
Court Build		5			G C3	C3
Panchayat S	Samiti	5				
Post Office		5				
	on, Tehshil office,	5				
Vishwakosh	n office	3		THE THE STATE OF		
Hospital		2				
Navin Mara	nthi School	3				0 025 05 4
	PRABHA	4 <i>G</i> 1		PRABHAG 2	PRABHAG 2 PRABHAG 3	PRABHAG 2 PRABHAG 3 PRABHAG 4
	C10 Ganpati Ali (G+1)			C1 Nhavi Ali (G)	C1 Nhavi Ali (G) C3 Damle Ali (G+1)	C1 Nhavi Ali (G) C3 Damle Ali (G+1) C2 Dattanagar (G)
Distributio	C13 Dharmpu	ri (G+2)		C7 Nhavi Ali (G)	C7 Nhavi Ali (G) C15 Madhali Ali (G)	C7 Nhavi Ali (G) C5 Navechwadi (G)
n of HHs a	C20 Db	uri (G+2)		C9 Ravivar peth (G)	C9 Ravivar peth (G) C16 Dwarka Ali (G+2)	C9 Ravivar peth (G) C16 Dwarka Ali (G+2) C6 Shantinagar (G+2)
per PRABHAG	per			C11 Dhage Ali (G)	C11 Dhage Ali (G) C17 Dwarka Ali (G)	C11 Dhage Ali (G) C17 Dwarka Ali (G) C8 Dakbangla Rd (G+1)
TRADITAG				C12 Ravivar Peth (G+2)	C12 Ravivar Peth (G+2)	C12 Ravivar Peth (G+2) C18 Siddhnath wadi (G)
				C14 Dhage Ali (G)	C14 Dhage Ali (G)	C14 Dhage Ali (G) C19 Vishwakosh (G+1)

C19 Vishwakosh (G+1)

C14 Dhage Ali (G)

CASE 1: *NHAVI ALI,* INDIVIDUAL PLOT (PRABHAG 2)



Building When was the septic Cleaning frequency of Inputs to septic

Length

(m)

1.5

1.80

Inlet

Waste

water

Black

Water Grey

Water

Recommended Size of the

Septic tank (5 Users)

(CPHEEO)

Actual Size of the tank

Location, Area

Nhavi Ali

Nhavi Ali

WATER QUALITY

Sr No

1

2

CASE 1: *NHAVI ALI,* INDIVIDUAL PLOT (PRABHAG 2)

<u>users</u> 2-5	<u>fype</u> Ground floor	tank Black water	the tank Nil	Not yet cleaned (Since Construction year 2010)	,
	-				

been considered)

Height (m)

1.5

COD (mg/l)

70

210

(Cleaning

interval - 3 year)

1.35

Observations

Outlet |% Reduction | Inlet | Outlet

рН

7.74

7.43

Parameters

(Cleaning

interval - 2 year)

1.3

How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)

Volume of the tank (cu m)

(Liquid Capacity)

1.46 (Two year Cleaning Interval)

1.52 (Three year cleaning interval)

Volume of the tank (cu m)

(Liquid Capacity)

2.03

Oversized (34% Bigger)

Inlet

TSS (mg/l)

Outlet

14.8

117

%

Reduction

floor	Diack Water	N.	•	Construction year 2010		
			Height (m	(300mm free board has		

Breadth (m)

0.75

В

0.75

BOD (mg/l)

Outlet

26.4

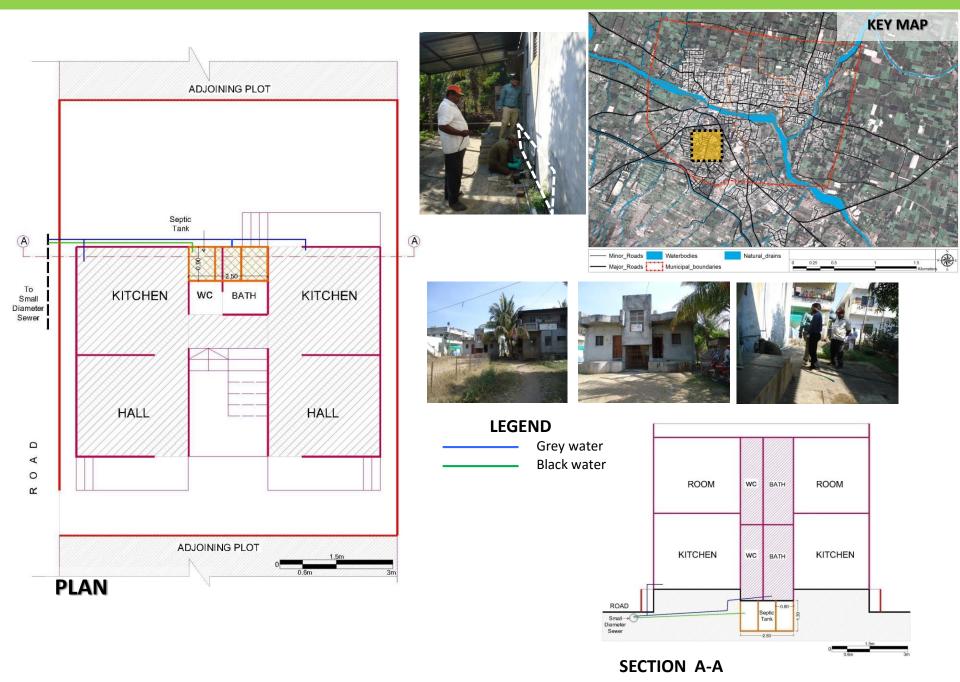
84

%

Reduction

Inlet

CASE 2: *DATTANAGAR*, BUNGLOW (G+1) (PRABHAG 4)



When was the septic tank last How toilet is cleaned? Cleaning Inputs to septic Users **Building type** Frequency of the emptied? Daily(Water) & tank Not yet cleaned (Since Weekly (Harpic/ G+1 tank **Black Water** construction year 2004-05) Nil detergent)

(Cleaning interval -

2 year)

1.3

Inlet

Height (m) (300mm free board has been considered)

Height (m)

1.30

COD (mg/l)

85

105

(Cleaning

interval - 3

year)

1.35

Observations

Hq

Outlet

7.43

7.43

Inlet

Parameters

Outlet |% Reduction Inlet |

Volume of the tank

(cu m)

1.46 (One year Cleaning Interval)

1.52 (Two year cleaning interval)

Volume of the tank

(cu m)

2.93

Oversized (93% Bigger)

TSS (mg/l)

Outlet

70

66

%

Reduction

CASE 2: DATTANAGAR, BUNGLOW (G+1) (PRABHAG 4

Length

(m)

1.5

L

2.50

Inlet

Waste

water

Grey

Water Black

Water

Recommended Size of the

Septic tank (5 Users)

(CPHEEO)

Actual Size of the tank (5

Location, Area

Datta Nagar

Datta Nagar

WATER QUALITY

Users)

Sr No

1

2

Breadth (m)

0.75

В

0.90

BOD (mg/l)

Outlet

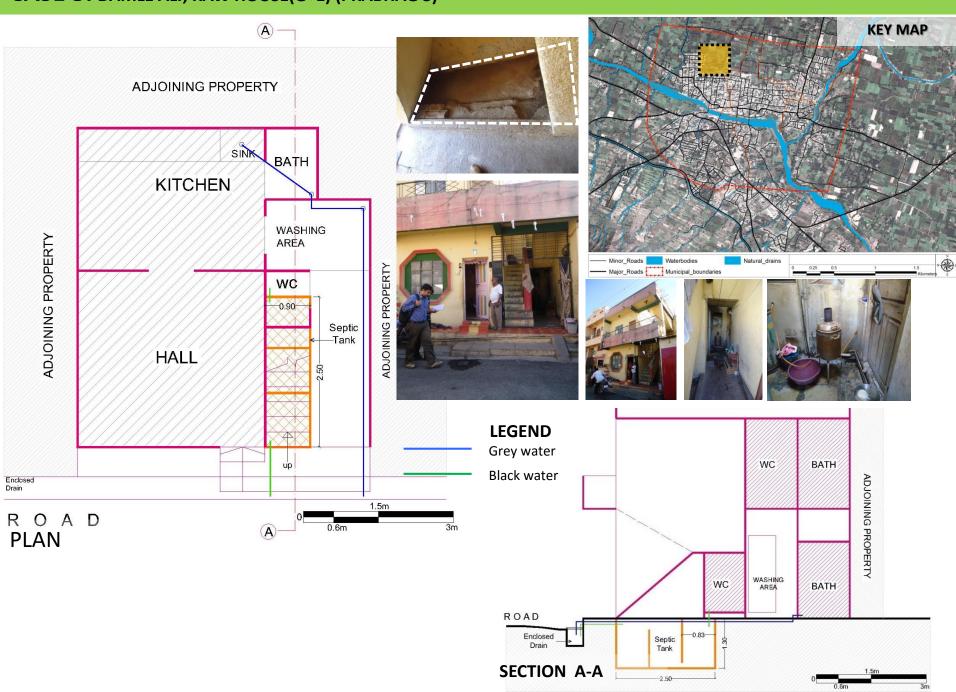
30

31.8

%

Reduction

CASE 3: *DAMLE ALI*, RAW HOUSE(G+1) (PRABHAG 3)



CASE 3: *DAMLE ALI*, RAW HOUSE(G+1) (PRABHAG 3)

<u>Users</u> 6	Building type G+1	Inputs to tan Black V	<u>k</u>	Cleaning frequency of Nil	- 1	Not y	es the septic tank la emptied? et cleaned (Since fuction year 2001)	Daily(Water) & Weekly (Harpic/ detergent)		
		Length			_	• • •	mm free board onsidered)	Volume of the tank		
		(m)	Bre	eadth (m)	,	aning - 2 year)	(Cleaning interval - 3 year)	(cu m)		
Recommended Size of the Septic tank (5 Users) (CPHEEO)		1.5		0.75	1	1.3	1.35	1.46 (One year Cleaning Interval)1.52 (Two year cleaning interval)		

Volume of the tank Height (m) В (cu m)

Actual Size of the tank 1.30 2.93 2.50 0.90 Observations Oversized (93% Bigger)

CASE 3: *DAMLE ALI*, RAW HOUSE(G+1) (PRABHAG 3)

5

WATER	WATER QUALITY														
		Parameters													
Sr No	Location, Area	Waste		BOD (mg	/I)		COD (m	ng/I)		рН		TSS (mg	g/I)		
31 140	Location, Area	water			%								%		

Sr No	Location, Area	Waste	BOD (mg/l)			COD (mg/l)				рН	TSS (mg/l)		
31 140	to Location, Area	water	Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction
1	Damle Ali	Grey Water	-	204			430		1	1	-	280	1

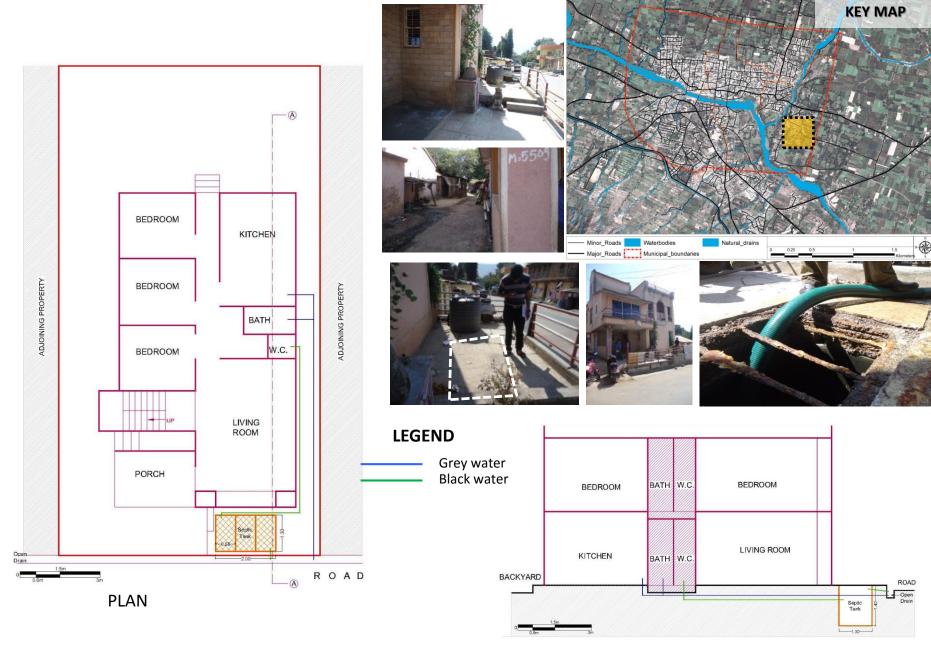
SEPTAGE SAMPLE QUALITY											
Sr No.	Parameter	Unit	Result								
1	рН	-	7.58								
2	Total Solids	%	0.864								
3	Total Nitrogen (as N)	%	4.71								
4	Phosphorus (as P)	%	<0.0001								

%

0.0084

Potassium (as K)

CASE 4: FULENAGAR, BUNGLOW(G+1) (PRABHAG 5)



SECTION A-A

CASE 4: FULENAGAR, BUNGLOW(G+1) (PRABHAG 5)

<u>Users</u> 16	Building type G+1		uts to septic tank lack Water	<u>Cleanir</u> <u>frequency</u> Nil		When was the septic tank last emptied? Not yet cleaned (Since construction year 2002)			How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)	
			Longth (m)	Duo o delo (m)	• • •		m free board has asidered)	Volume of the tank		
			Length (m)	Breadth (m)	(Cleanii interval - 2	•	(Cleaning interval - 3 year)		(cu m)	
Recommended Size of the Septic tank (15 Users) (CPHEEO)			2.0	0.90	1.6		2.3		.31 (Two year Cleaning Interval) 14 (Three year cleaning interval)	
			L	В		Heigh	t (m)		Volume of the tank (cu m)	
Actual Siz Users)	e of the tank	(16	2.0	1.3		1.	4		3.42	
Observations Undersize Smal										
WATER Q	UALITY									

Inlet

BOD (mg/l)

Outlet

186

Inlet

%

Reduction

Parameters

Outlet |% Reduction Inlet |

рΗ

Outlet

5.96

Inlet

COD (mg/l)

460

TSS (mg/l)

Outlet

216

%

Reduction

Sr No

1

Location, Area

Fule Nagar

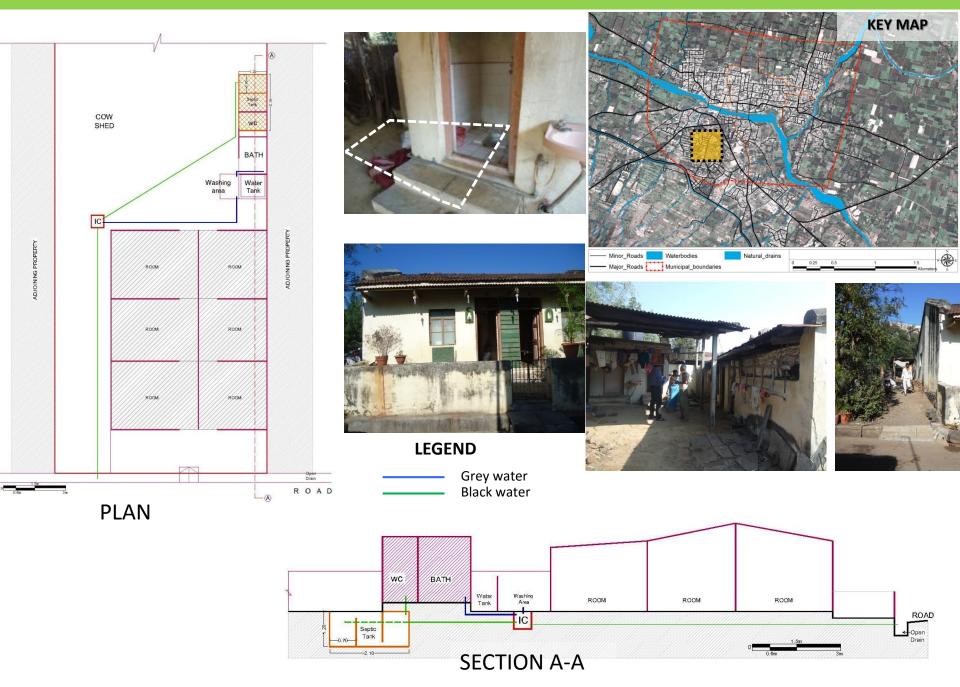
Waste

water

Grey

Water

CASE 5: *NAVECHIWADI*, INDIVIDUAL HOUSE (G+1) (PRABHAG 4)



CASE 5: NAVECHIWADI, INDIVIDUAL HOUSE (G+1) (PRABHAG 4)

CASI	CASE 3. NAVECHIWADI, INDIVIDUAL HOUSE (G+1) (PRABHAG 4)													
Users 4	Building typ Ground Floo		s to sep lack Wa	itic tank ater							Daily(Water) & Weekly (Harnic/ detergent)			
				Breadth	Height (m) (300mm free board has been considered)				S	Volume of the tank				
	Recommended Size of		h (m)	(m)	(Cleanir	ng interv year)	/al (C	leaning interv - 3 year)		(c	u m)			
the Se	nmended Size o ptic tank (5 User (CPHEEO)	Users) 1.5 0.75 1.3 1.35 1.46 (Two year Cleaning 1.45)												
		L	1	В		н	eight (m	n)		Volume of the tank (cu m)				
Actual (4 Use	Size of the tank	2.	1	1.2		1.2					3	.02		
		•	1					Observation	ons	Over	sized	(99% E	Bigger)	
WATER (QUALITY													
			Parameters											
Sr No	Location Area	Waste		BOD (mg	/I)		COD (n	ng/l)		рН		TSS (mg	g/I)	
31 110	Sr No Location, Area		Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction	
1	Navechi Wadi	(Grey+ Black)		14.1			35			7.76		29		

CASE 6: SHANTINAGAR SOCIETY, GROUP HOUSE(G+2) (PRABHAG 4)



CASE 6: SHANTINAGAR SOCIETY, GROUP HOUSE(G+2) (PRABHAG 4)

Users 60 Building type G+2		ta	nputs to septic tank Black Water		Cleaning frequency of ST More Than 8-10 times		When was the septic tar last emptied? 2012 (Cleaning frequency- Once i every year)		How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)
		Len	Length Breadth		Height (m) (300mm free board has been considered)				Volume of the tank
		(m	1)	(m)	(Cleaning interval - 2 year)		(Cleaning interval - 3 year)		(cu m)
the S	Recommended Size of the Septic tank (50 Users) (CPHEEO)		0	2.0	1.3		1.54	l	00 (Two year Cleaning Interval) 60 (Three year cleaning interval)
			L	В		Heigh	t (m)		Volume of the tank (cu m)
Actual S (Users 6	ize of the tank 0)	2	.5	1.2		1.	5		4.5
							Observations	Un	dersized (71% Smaller)

CASE 6: SHANTINAGAR SOCIETY, GROUP HOUSE(G+2) (PRABHAG 4)

WATER QUALITY															
				Parameters											
Cr No	Location, Area	Waste	BOD (mg/l)				COD (mg/l)			рΗ		TSS (mg	g/I)		
Sr No	Location, Area	water	Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction		
1	Shantinagar Society	Grey Water		78			200			7.21		69			
2	Shantinagar Society	Black Water	101.3	66	23	305	160	47	7.46	7.18	136	129	5		

· · · · · · · · · · · · · · · · · · ·										
SEPTAGE SAMPLE QUALITY										
Sr. No.	Parameter	Parameter Unit Resul								
1	рН	-	8.14							
2	Total Solids	%	0.14							
3	Total Nitrogen (as N)	%	14.42							
4	Phosphorus (as P)	%	0.002							
5	Potassium (as K)	%	0.0055							

CASE 7: NHAVI AALI, RAVIVAR PETH (PRABHAG 2)



CASE 7: NHAVI AALI, RAVIVAR PETH (PRABHAG 2)

Black

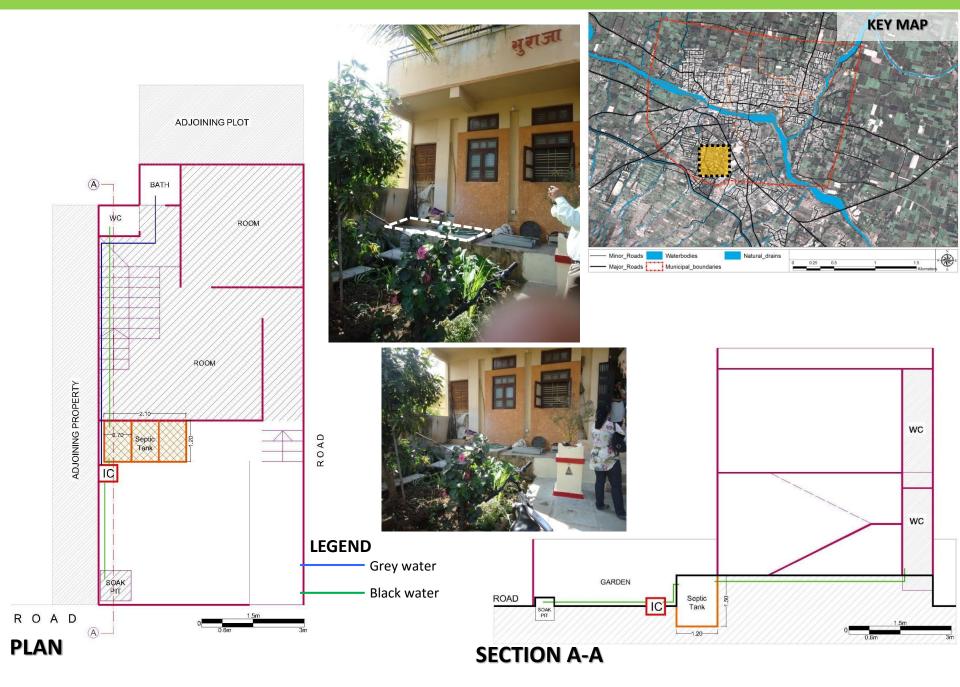
Water

Nhavi Ali

1

Users 2	Building type Ground Floor	ta	nputs to septic tank Black Water		<u>tank</u>		<u>tank</u>		<u>tank</u>				tank frequency		ency of ST					How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)			
		Len	gth	Breadth		ht (m) (300r been co		free board h dered)	as	Volume of the tank													
		(m	1)	(m)	•	ining interva - 2 year)		(Cleaning nterval - 3 yea	ar)	(cu m)													
the Se	mmended Size of ptic tank (5 User (CPHEEO)		5	0.75		1.3		1.35		1.46 (Two year Cleaning Interval) 1.52 (Three year cleaning interval)			•										
										Volume of the tank (cu m)													
		ι		В		Hei	ght ((m)		'			ınk										
Actual (Users	Size of the tank 2)	2.		B		Hei	ght ((m)			(c		ink										
						Hei		(m) Observatio	ons		(c	u m)	Bigger)										
						Hei			ons		(c	u m)											
(Users						Hei			ons		(c	u m)											
(Users	2)					Hei	1.5		ons		(c	u m)											
(Users :	2) R QUALITY				/1)		1.5	Observatio			(c	u m)	Bigger)										
(Users	2)	2.		1.3	/I) % Reduction	CO Inlet Ou	1.5 F D (m	Observation Parameters		Overs	(c	u m) .10 170%	Bigger)										

CASE 8: SURAJA (DAKBANGLA ROAD)(PRABHAG 4)



CASE 8: SURAJA (DAKBANGLA ROAD)(PRABHAG 4) When was the septic tank last Building Inputs to septic Cleaning <u>Users</u> frequency of ST <u>type</u> <u>tank</u>

2.1

Waste

water

Grey &

Black water

Inlet

(CPHEEO)

Actual Size of the tank

WATER QUALITY

Location, Area

Dakbangla Road

(Guesthouse

Road)

(Users 5)

Sr No

1

G+1	Black Water	Nil		constru	ction year 2004-05)	Weekly (Harpic/ detergent)
		-				
	Length	Breadth	Heigh	• • •	nm free board has nsidered)	Volume of the tank
	(m)	•		ng interval year)	(Cleaning interval - 3 year)	(cu m)

	Length	Breadth	been co	nsidered)
	(m)	(m)	(Cleaning interval - 2 year)	(Cleaning interval 3 year)
Recommended Size of the Septic tank (5 Users)	1.5	0.75	1.3	1.35

В

1.2

BOD (mg/l)

Outlet

135

%

Reduction

Inlet

1.46 (Two year Cleaning Interval) **1.52** (Three year cleaning interval)

Observations

рН

Outlet

5.93

Inlet

Parameters

Outlet |% Reduction Inlet |

COD (mg/l)

320

Height (m)

1.5

emptied?

Not Yet cleaned (Since

How toilet is cleaned?

Daily(Water) &

Volume of the tank

(cu m)

3.78

Oversized (149% Bigger)

TSS (mg/l)

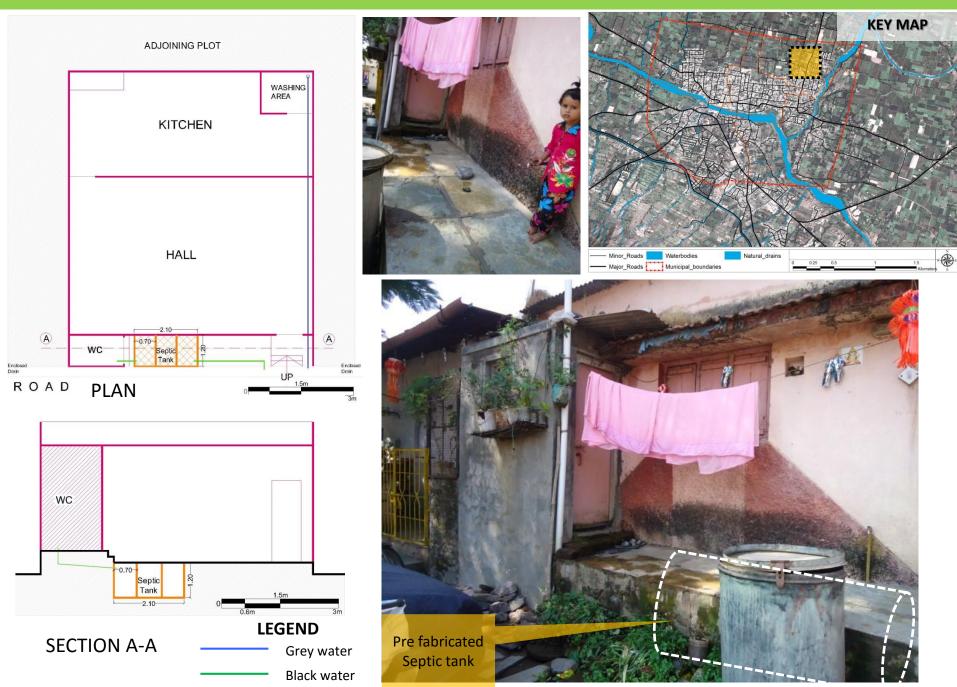
Outlet

210

%

Reduction

CASE 9: RAVIVAR PETH, DHOR GALLI (PRABHAG NO 2)



CASE 9: RAVIVAR PETH, DHOR GALLI (PRABHAG NO 2) When was the septic tank last emptied? (Precast Septic Inputs to septic Cleaning

L

2.7

Inlet

Waste water

Grey & Black Water

(Sample was

taken from the drain)

В

BOD (mg/l)

Outlet

228

%

Reduction

Inlet

Users

Building type

Actual Size of the tank

Location,

Area

Dhor

Galli

WATER QUALITY

(3 Users)

Sr No

1

3	Ground Floor	Black Wa	ter	Nil	Not Yet cleaned Since construction year 2007-0		Weekly (<i>Harpic/ detergent</i>)
	•				-		
		Length	Breadtl		•	n free board has idered)	Volume of the tank
	(m) (r		(m)	(Cleaning integral) (Cleaning integral)		(Cleaning interval - 3 year)	(cu m)
Recom	nmended Size of						1.46 (Two year Cleaning Interval)

Height (m)

1.2

COD (mg/l)

580

Observations

Outlet |% Reduction Inlet | Outlet

рН

7.23

Parameters

How toilet is cleaned?

Volume of the tank

(cu m)

3.02

Oversized (99% Bigger)

Inlet

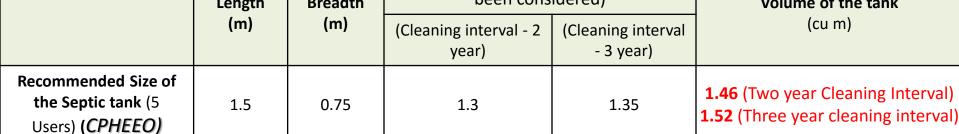
TSS (mg/l)

Outlet

294

%

Reduction

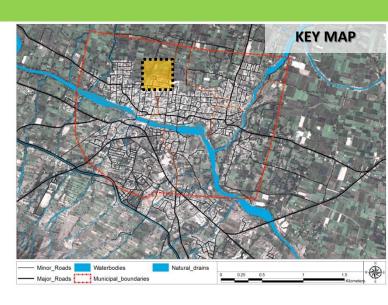


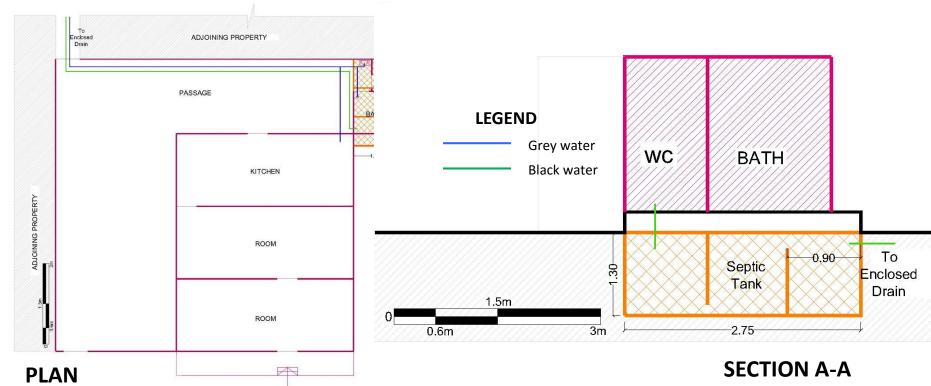
CASE 10: GANPATI ALI, INDIVIDUAL PLOT (PRABHAG NO 1)







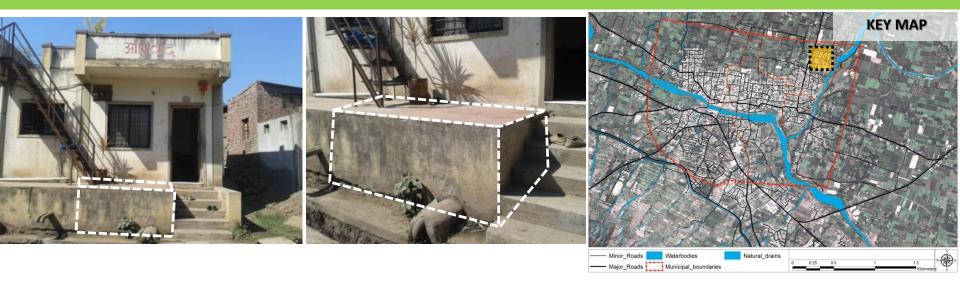


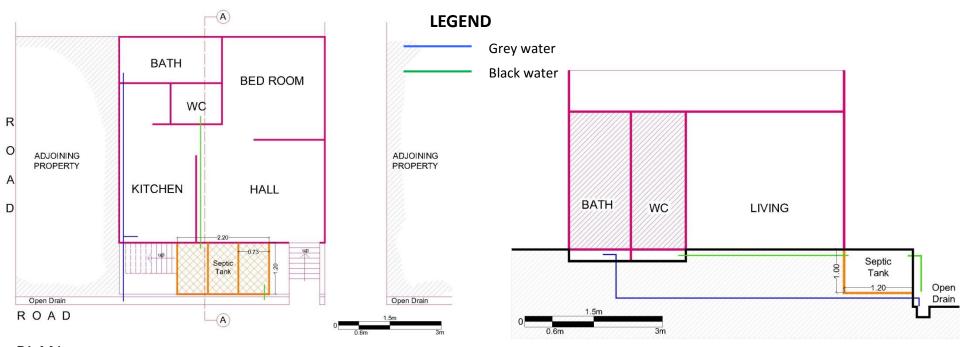


CASE 10: GANPATI ALI, INDIVIDUAL PLOT (PRABHAG NO 1)

Users 11	Building typ G+1	oe Blac	s to se tank k + Gr Vater		fred <u>c</u>	eaning quency of ST Nil		er cleane	he septic tank mptied? d (Since const r 2011-12)		n W	How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)			
		Length	(m)	Bread	dth (m	n)		en cons	n free board h idered) Cleaning inter				of the t	ank	
						-	2 year)		3 year)						
the S	nmended Size of Septic tank (10 rs) (CPHEEO)	of 2.0)	0).90		1.3		1.7		2.34(Two year Cleaning Interval 3.06(Three year cleaning interva				
		L			В			Height	(m)		Volume of the tank (cu m)			ank	
Actual (11 Use	Size of the tanlers)	k 2.7	5	1	1.35			1.3				4	1.83		
		·				·			Observa	tions	Ove	rsized	(58%	Bigger)	
WATER	QUALITY														
									Parameters						
Sr No	Location Area	Waste		ВО	D (mg,	/I)		COD (r	mg/l)		рН		TSS (mg	g/l)	
31 110	Location, Area	water	Inle	et O	utlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction	
1	Ganpati Ali	Black Wate	r	1	153			390			7.18		174		

CASE 11: *DHAGE ALI,* INDIVIDUAL PLOT (PRABHAG NO 2)





PLAN SECTION A-A

CASE 11: *DHAGE ALI,* INDIVIDUAL PLOT (PRABHAG NO 2) When was the septic tank Cleaning How toilet is cleaned? Inputs to septic Users **Building** type last emptied? Daily(Water) & tank frequency of ST **Ground Floor** Not Yet cleaned (Since 4 **Black water** Nil Weekly (Harpic/ detergent) construction year 2008) Height (m) (300mm free board has been considered) **Breadth** Length Volume of the tank (Cleaning (m) (m) (cu m) (Cleaning interval - 2 interval - 3 year) year) **Recommended Size of 1.46**(Two year Cleaning Interval) the Septic tank (5 1.5 0.75 1.3 1.35 **1.52** (Three year cleaning interval) Users) (CPHEEO) Volume of the tank Height (m) L В (cu m) Actual Size of the tank

1.0

Observations

рН

Inlet Outlet

7.02

7.66

Parameters

%

Reduction

COD (mg/l)

Outlet

240

295

2.64

Oversized (74% Bigger)

Inlet

TSS (mg/l)

Outlet

132

118

%

Reduction

(4 Users)

Sr No

1

2

WATER QUALITY

Location, Area

Dhage Ali

Dhage Ali

2.2

Waste

water

Grev Water

Black Water

Inlet

1.2

BOD (mg/l)

Outlet

88.5

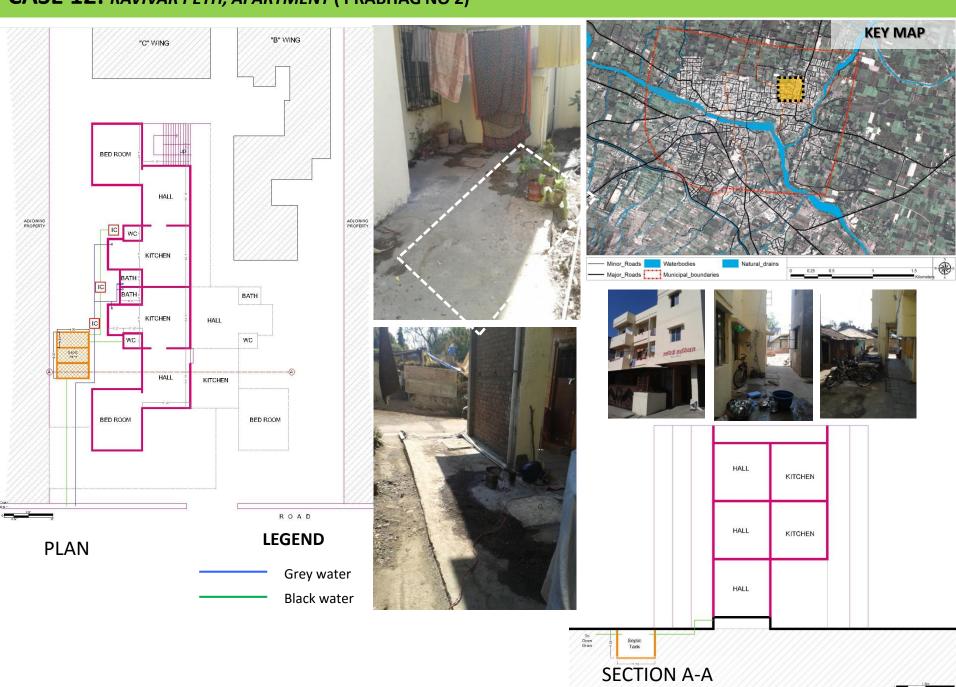
108

%

Reduction

Inlet

CASE 12: RAVIVAR PETH, APARTMENT (PRABHAG NO 2)



When was the septic tank **Building** Cleaning How toilet is cleaned? Users Inputs to septic tank last emptied? frequency of ST Daily(Water) & <u>type</u> **Not Yet cleaned (Since** 40 **Black water** G+2 Nil Weekly (Harpic/detergent) construction year 2007) Height (m) (300mm free board has been considered)

(Cleaning interval - 2

year)

1.3

Height (m)

1.7

COD (mg/l)

315

(Cleaning

interval - 3 year)

1.54

Observations

Outlet |% Reduction Inlet | Outlet

24

рΗ

7.66

7.82

Parameters

Volume of the tank

(cu m)

13.00(Two year Cleaning

15.40(Three year cleaning

Volume of the tank

(cu m)

7.23

Undersized (53% Smaller)

TSS (mg/l)

Outlet

120

Inlet

185

%

Reduction

35

Interval)

Recommended Size of

the Septic tank (50

Users) (CPHEEO)

Actual Size of the tank (40

Location, Area

Ravivar Peth

Users)

Sr No

1

WATER QUALITY

CASE 12: RAVIVAR PETH, APARTMENT (PRABHAG NO 2)

Length

(m)

5.00

2.5

Inlet

138

Waste

water

Black Water

Breadth

(m)

2.00

В

1.7

BOD (mg/l)

Outlet

112.5

%

Reduction

18

Inlet

416

CASE 13: DHARMAPURI, APARTMENT (PRABHAG NO 1)



CASE 13: DHARMAPURI, APARTMENT (PRABHAG NO 1)

Dharmpuri

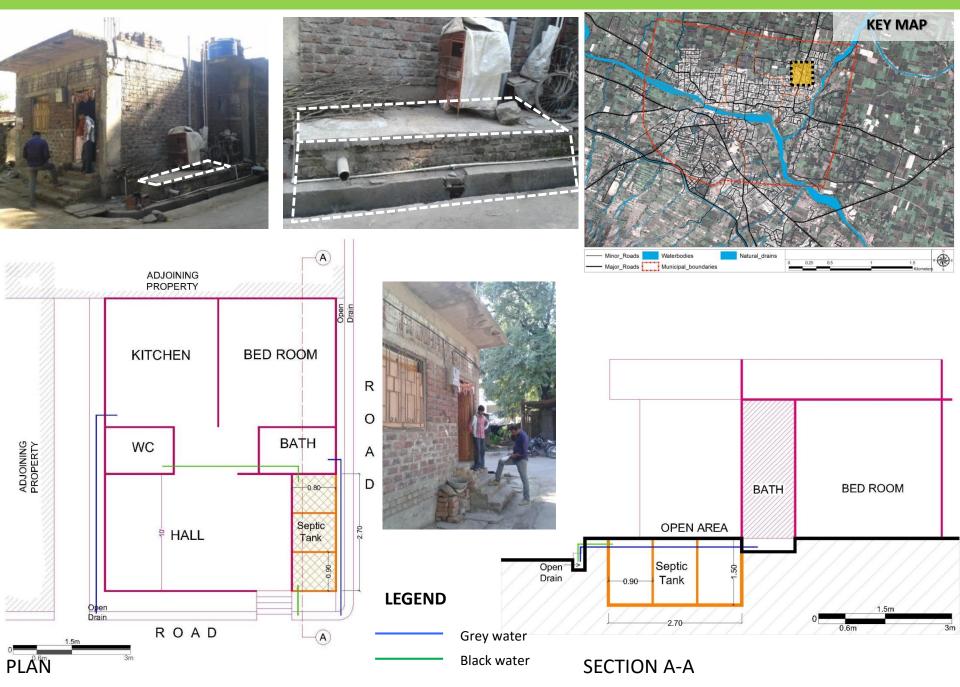
Black Water

<u>Users</u> 30	Building type G+2		o septic ck wate		Cleaning frequency of ST Once in a every year Mhen was the septic tank last emptied? In a year 2013 (Cleaning frequency -Once in a year)					Daily(Water) & Weekly (Harnic/ detergent)			
										·			
		Leng	ngth Bread		Heigh		00mm fr conside	ree board l ered)	has	Volume of the tank			
		(m)		(m)	(Cleanin	g interv year)	al (Cl	eaning inte 3 year)	rval -	(cu m)			
the S	nmended Size o Septic tank (50 rs) (<i>CPHEEO)</i>	of 5.00	0	2.00	1	3		1.54		13.00 (Two year Cleaning Interval 15.40 (Three year cleaning interval)			•
				В		Н	leight (m	1)		Volume of the tank (cu m)			ınk
							- 0 - 1				(c	<u>u m)</u>	
Actual :	Size of the tanl			1.7			1.7				,	.23	
								Observa	ations	Under	7	.23	Smaller)
								Observa	ations	Under	7	.23	Smaller)
(30 Use								Observa	ations	Under	7	.23	Smaller)
(30 Use	ers)						1.7	Observa Parameters		Under	7	.23	Smaller)
(30 Use	QUALITY				/1)		1.7	Parameters		Under	7	.23	•
(30 Use	ers)	2.5	Inlet	1.7	/I) % Reduction		1.7 FCOD (mg	Parameters			7	.23 (53% §	•

7.36

7.51

CASE 14: RAVIVAR PETH, INDIVIDUAL PLOT (PRABHAG NO 2)



CASE 14: RAVIVAR PETH, INDIVIDUAL PLOT (PRABHAG NO 2)

88.5

93

Grey Water

Black Water

1

2

Ravivar Peth

Ravivar Peth

Users 4	Building type Ground Floor	<u>t</u>	to septic ank water		Cleaning equency of Nil	<u>ST</u>	Not ye	vas the septic est emptied? et cleaned (Si uction year 20	nce		How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)			
		Leng	th E	Breadth	Heigh	Height (m) (300mm free board has been considered)					Volume of the tank			
		(m)		(m)		ng inter	val - (Cleaning inte - 3 year)	rval	(cu m)				
the	nmended Size of Septic tank (5 rs) (CPHEEO)	of 1.50)	0.75		1.3		1.35		1.42 (Two year Cleaning Inter 1.52 (Three year cleaning inte		•		
		L		В		ı	Height (ı	m)		Volume of the tank (cu m)			nnk	
Actual (4 User	Size of the tank s)	2.7		0.8			1.5				3	.24		
			·					Observat	ions	Overs	sized (113%	Bigger)	
WATER	WATER QUALITY													
							[Parameters						
				DOD /	·//\			COD (mg/l)		рН	TSS (mg/l)			
Sr No	Location, Area	Waste		BOD (mg	<u> </u>			<u> </u>		P		<u>, ee.</u>	·/ ·/	

220

210

8.36

7.68

128

134

CASE 15: *MADHALI ALI,* INDIVIDUAL PLOT (PRABHAG NO 3)



CASE 15: MADHALI ALI, INDIVIDUAL PLOT (PRABHAG NO 3) When was the septic tank last How toilet is cleaned? Inputs to septic Cleaning Users **Building type** Daily(Water) & frequency of ST emptied? tank 2 G+1 Not cleaned (Since year 2009) Weekly (Harpic/ detergent) **Black water** One time Height (m) (300mm free board has been considered) **Breadth** Volume of the tank Length (m) (m) (cu m) (Cleaning interval - 2 (Cleaning interval - 3 year) year) **Recommended Size of** 1.42(Two year Cleaning Interval) the Septic tank (5 Users) 1.3 1.35 1.52(Three year cleaning 1.50 0.75 (CPHEEO) interval) Volume of the tank Height (m) В (cu m) Actual Size of the tank (2 7.29 2.7 1.5 1.5 Users) **Observations** Oversized (380% Bigger) **WATER QUALITY Parameters**

COD (mg/l)

170

Outlet |% Reduction Inlet |

рН

Outlet

7.66

Inlet

TSS (mg/l)

Outlet

92

%

Reduction

BOD (mg/l)

Outlet

52.5

%

Reduction

Inlet

Waste

water

Black Water

Inlet

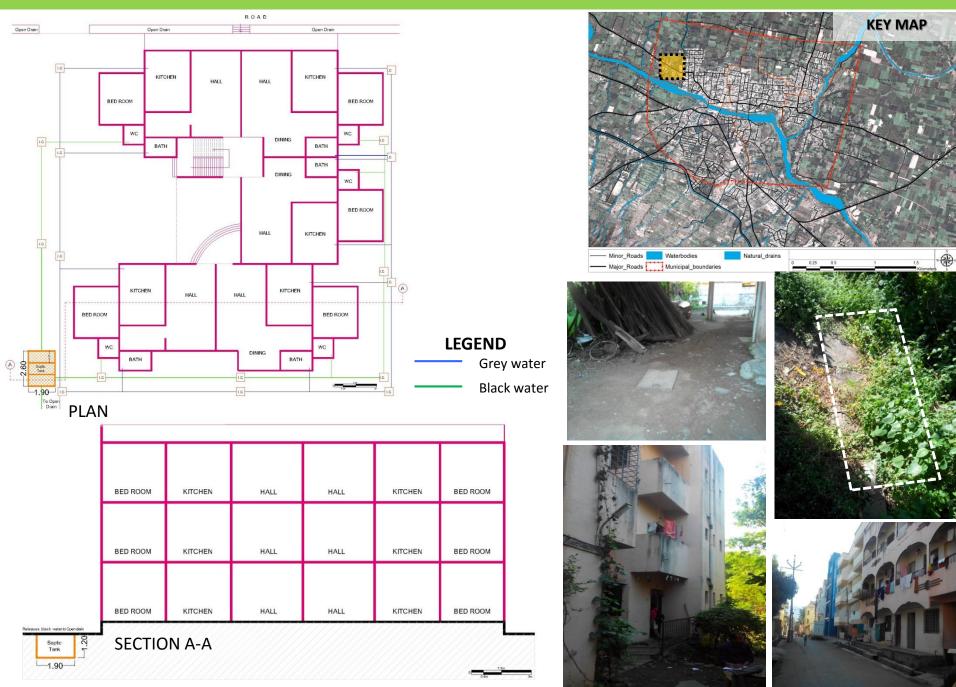
Sr No

1

Location, Area

lMadhali Ali

CASE 16: DWARKA ALI, APARTMENT (PRABHAG NO 3)



CASE 16: DWARKA ALI, APARTMENT (PRABHAG NO 3) When was the septic tank How toilet is cleaned? Inputs to septic Cleaning **Building** type last emptied? Users Daily(Water) & frequency of ST tank 80 G+2 **Not cleaned (Three years Black water** One time Weekly (Harpic/detergent) ago -2011) Height (m) (300mm free board has been considered) Length **Breadth** Volume of the tank (cu m) (m) (m) (Cleaning interval - 2 (Cleaning interval - 3 year) year) 25.84(Two year Cleaning **Recommended Size of** Interval) the Septic tank (100 7.50 2.65 1.3 1.54 **30.61**(Three year cleaning Users) (CPHEEO) interval) Volume of the tank Height (m) В (cu m) **Actual Size of the tank (80** 5.93 2.6 1.9 1.2 Users) **Undersized (81% Smaller) Observations WATER QUALITY Parameters** BOD (mg/l) COD (mg/l) TSS (mg/l) Waste рН Sr No Location, Area water % %

Inlet

428

38.2

358

Reduction

19

Outlet |% Reduction Inlet |

16

Outlet

7.66

7.67

7.43

Inlet

191

Outlet

13

154

Reduction

20

Inlet

142

Raw Swage

Black Water

1

Dwarka Ali

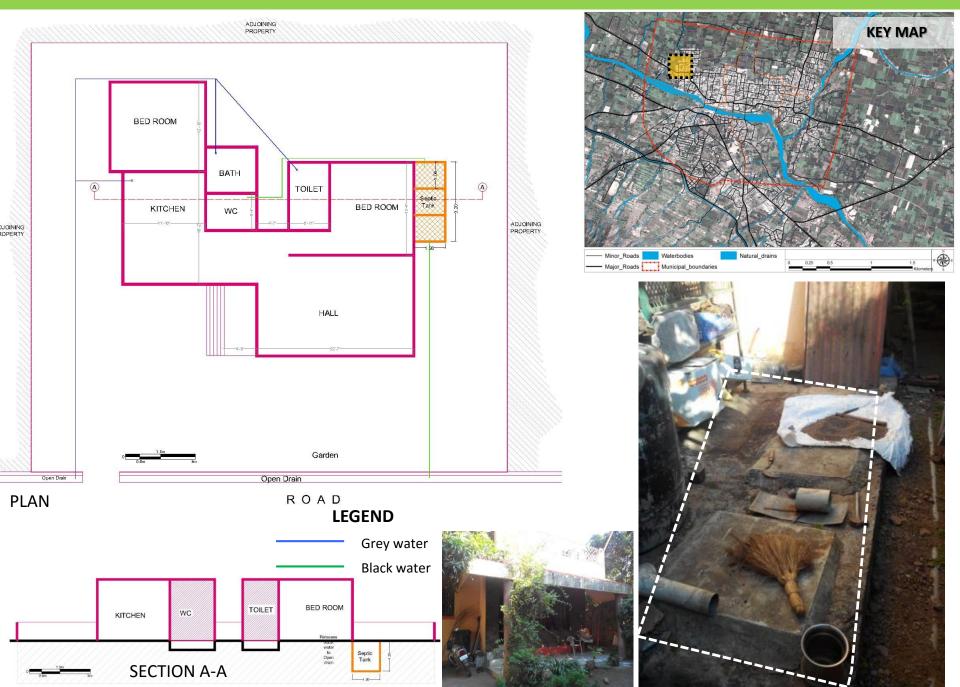
Dwarka Ali

Outlet

10.2

115

CASE 17: *DWARKA ALI, BUNGLOW* (PRABHAG NO 3)



CASE 17: DWARKA ALI, BUNGLOW (PRABHAG NO 3) When was the septic tank Cleaning How toilet is cleaned? Inputs to **Building type** last emptied? Users Daily(Water) & septic tank frequency of ST **Ground Floor** Not yet cleaned (Since **Black water** Nil Weekly (Harpic/detergent) construction year 2000) Height (m) (300mm free board has been considered) **Breadth** Volume of the tank Length (m) (Cleaning (m) (cu m) (Cleaning interval - 2 interval - 3 year) year) **Recommended Size of 1.46**(Two year Cleaning Interval) the Septic tank (5 1.50 1.3 1.35 0.75 **1.52**(Three year cleaning interval) tank Actual Size of the tank 5.98 3.2 1.4 1.2 (5 Users) **Observations** Oversized (293% Bigger) **WATER QUALITY Parameters**

COD (mg/l)

Outlet |% Reduction Inlet |

рΗ

Outlet

7.56

Inlet

TSS (mg/l)

Outlet

110

%

Reduction

Users) (CPHEEO)				
	L	В	Height (m)	Volume of the t (cu m)
Actual Size of the tank				

%

Reduction

Inlet

BOD (mg/l)

Outlet

195

Waste

water

Raw Swage

Black Water

Inlet

Sr No

1

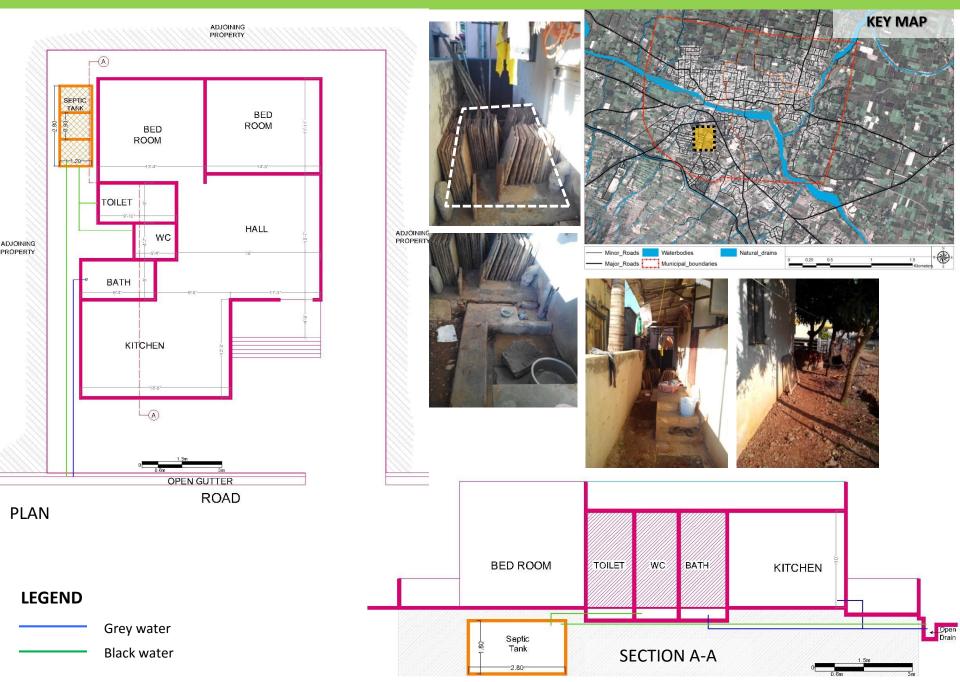
2

Location, Area

Dwarka Ali

Dwarka Ali

CASE 18: *SIDHNATH WADI, BUNGLOW* (PRABHAG NO 4)



CASE 18: SIDHNATH WADI, BUNGLOW (PRABHAG NO 4) Cleaning Inputs to septic When was the septic tank last How toilet is cleaned? Building type Users frequency Daily(Water) & tank emptied? **Ground Floor** of ST First time cleaned in March 2014 **Black water** Weekly (Harpic/ detergent) One time Height (m) (300mm free board has been considered) Length Volume of the tank Breadth (m) (m) (cu m) (Cleaning (Cleaning interval - 2 year) interval - 3 year) **Recommended Size of 1.46**(Two year Cleaning Interval) the Septic tank (5 1.3 1.35 1.50 0.75 1.52(Three year cleaning interval) Users) (CPHEEO) Volume of the tank В L Height (m) (cu m) Actual Size of the tank 5.83 2.8 1.2 1.8 (5 Users) Oversized (284% Bigger) **Observations**

Parameters

Outlet |% Reduction Inlet |

рН

Outlet

7.86

Inlet

TSS (mg/l)

Outlet

58

%

Reduction

COD (mg/l)

254

WATER QUALITY

Location, Area

Sidhnat Wadi

Sidhnath Wadi Black Water

Sr No

1

2

Waste

water

Grey Water

Inlet

BOD (mg/l)

Outlet

102

%

Reduction

Inlet

CASE 19: SIDHNATH WADI, BUNGLOW (PRABHAG NO 4)



Cleaning When was the septic tank How toilet is cleaned? Inputs to septic Users **Building type** frequency of ST last emptied? Daily(Water) & tank 2 G+1 More than two **Black water** Two years ago-2012 Weekly (Harpic/ detergent) times Height (m) (300mm free board has been considered) **Breadth** Volume of the tank Length (m) (m) (cu m) (Cleaning interval (Cleaning interval - 2 year) - 3 year) **Recommended Size of 1.46**(Two year Cleaning Interval) the Septic tank (5 1.50 0.75 1.3 1.35 **1.52**(Three year cleaning interval) Users) (CPHEEO) Volume of the tank L В Height (m) (cu m)

1.3

Observations

рН

Outlet

7.87

Inlet

Parameters

Outlet |% Reduction Inlet |

COD (mg/l)

256

3.15

Oversized (107% Bigger)

TSS (mg/l)

Outlet

116

%

Reduction

CASE 19: SIDHNATH WADI, BUNGLOW (PRABHAG NO 4)

2.2

Waste

water

Raw Swage

Inlet

1.1

BOD (mg/l)

Outlet

185

%

Reduction

Inlet

Actual Size of the tank

WATER QUALITY

Location, Area

Sidhnat Wadi

Sidhnath Wadi Black Water

(5 Users)

Sr No

1

2

CASE 20: DHARMPURI, APARTMENT (PRABHAG NO 4)



CASE 20. DUADADUDI ADADTMENT (MIXED LISE) (DRABHAG NO A)

CASE Z	. U: DHARMI	PURI, APAR	TMENT (MIX	ED USE) (PRABHAG	G NO 4)							
<u>Users</u> 20	Building type G+2		septic tank k water	Cleaning frequency of ST One time	las	as the septic tan st emptied? rears ago-2012	How toilet is cleaned? Daily(Water) & Weekly (Harpic/ detergent)					
		Length	Breadt	Height (m) (i	300mm fre en conside	Volume of the tank						
		(m)	(m)	(Cleaning into		(Cleaning interval - 3 year)	(cu m)					
the Sep	Recommended Size of the Septic tank (20 Users) (CPHEEO)		1.10	1.6	1.6		4.04 (Two year Cleaning Interval) 5.31 (Three year cleaning interval)					
		L	В		Height (m)		Volume of the tank (cu m)					
Actual Size (20 Users)	e of the tank	2.3	1.6		1.2		4.41					
	Observation						Undersized (17% Smaller)					
MATER OF	141177											
WATER QU	JALITY											
		Parameters										

Inlet

COD (mg/l)

65

TSS (mg/l)

Outlet

32.8

Inlet

%

Reduction

рΗ

7.48

Outlet |% Reduction | Inlet | Outlet

Waste

water

Raw Swage

Black Water

Inlet

Sr No

1

2

Location, Area

Dharmpuri

Dharmpuri

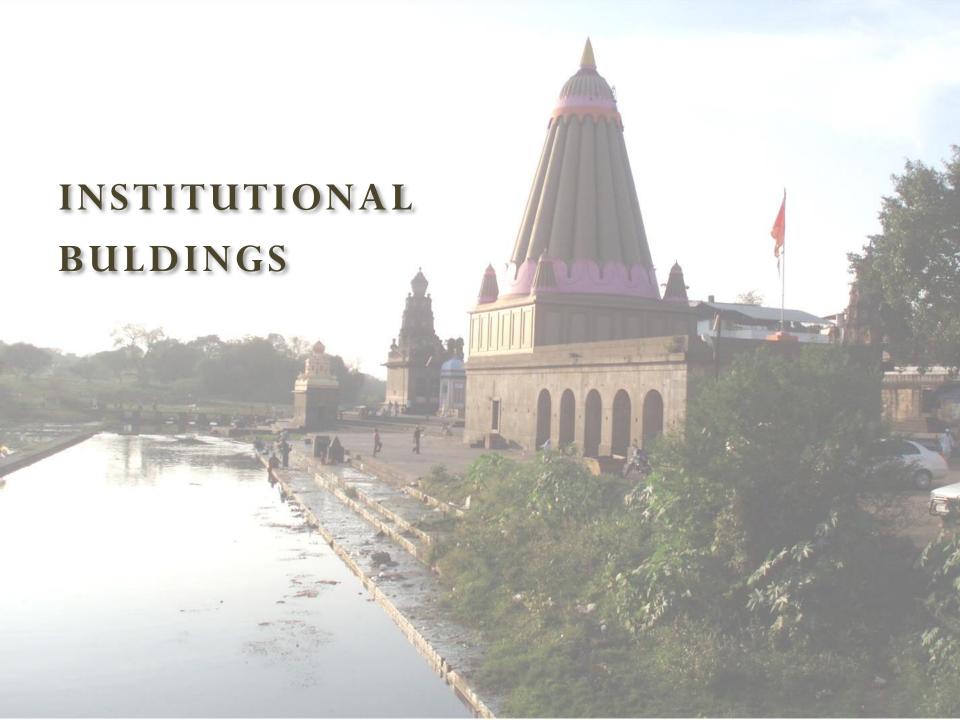
BOD (mg/l)

Outlet

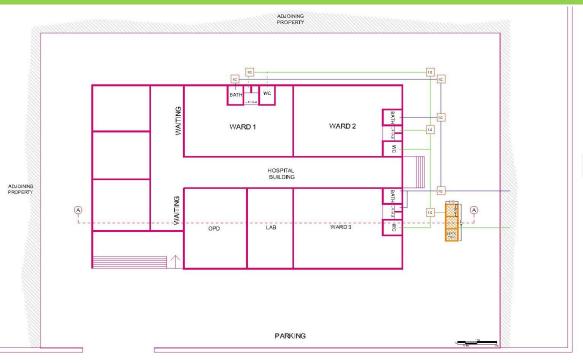
24

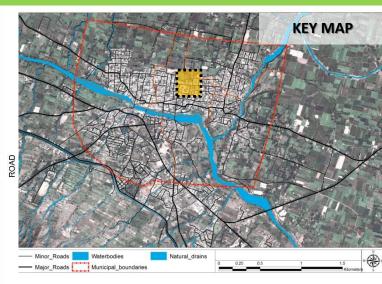
%

Reduction

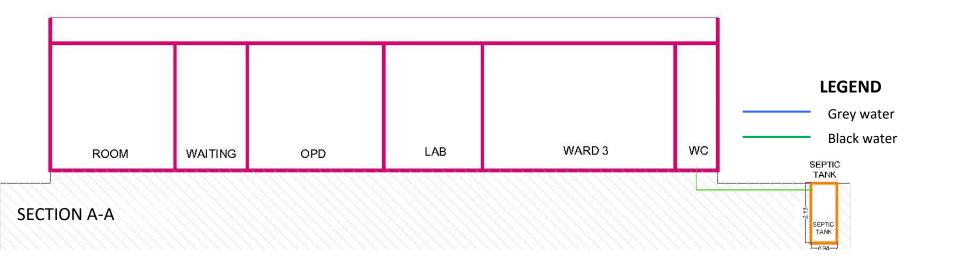


CASE 21: HOSPITAL (PRABHAG 1)





PLAN



CASE 21: HOSPITAL (PRABHAG 1)



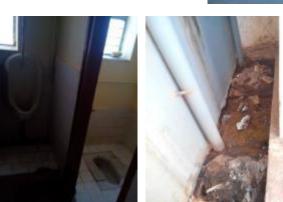


















CASE 21: HOSPITAL (Prabhag 1)

Waste

water

Black

Water

Grey

Water

Inlet

220

Wai Gene	eral Hospital										
<u>Users</u> 75	Building type G+1		uts to septic tank ack Water	Cleaning Frequency of ST Once in every year	When was the septic tank last emptied? Year ago-2013	How toilet is cleaned? Daily (Water) & Weekly (Harpic)					
			Length (m)	Breadth (m)	Height (m) (300mm free board has been considered)	Volume of the tank (Cum)					
Us	n e Septic tank (ers) (As per r t/Consultant		3.5	1.2	1.3 (Cleaning interval of one year)	5.46 (Cleaning interval of one year)					
Actual Size of the tank (75 Users)			2.77	0.94	2.13	5.54					
		·			Observation	Adequately sized					
WATER Q	WATER QUALITY										

Inlet

BOD (mg/l)

Outlet

177

%

Reduction

19.55

Parameters

%

Reduction

рΗ

Outlet

7.66

Inlet

COD (mg/l)

Outlet

450

TSS (mg/l)

Outlet

250

Inlet

350

%

Reduction

28.57

Sr No
1

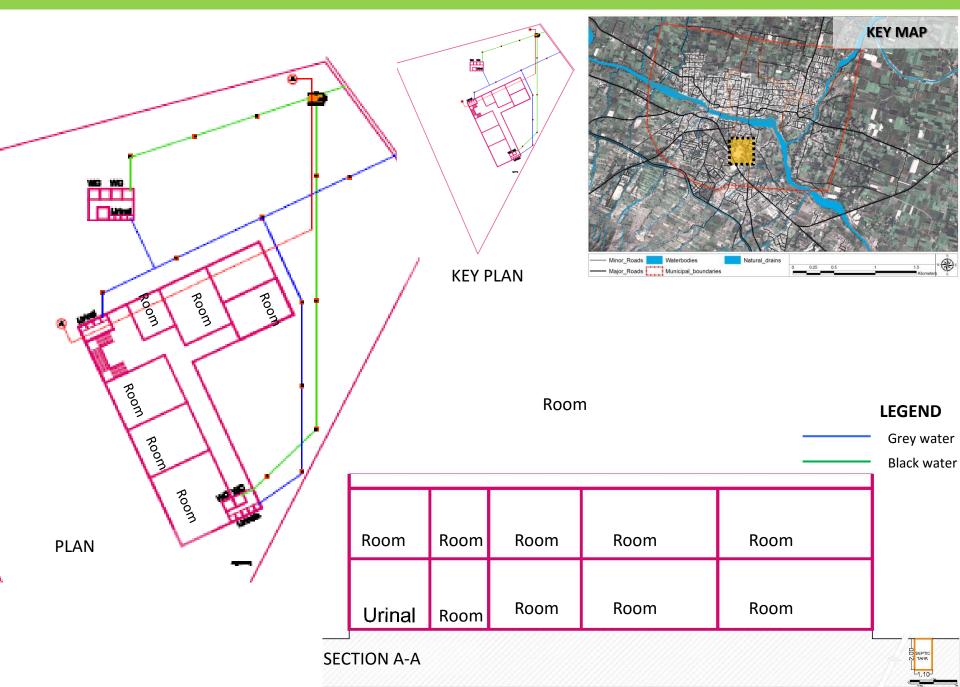
2

Location, Area

Wai Hospital

Wai Hospital

CASE 22: COURT BUILDING (PRABHAG 5)



CASE 22: COURT BUILDING (PRABHAG 5)





CASE 22: COURT BUILDING (Prabhag 5)

Grey

Water

Court building

2

Court l	building													
<u>Users</u> 121	Building type G+1		s to septic to	ank Cle	Cleaning Frequency of ST Nil			When was the septic tank last emptied? Not Cleaned (More than 10 years)			How toilet is cleaned? Daily (Water) & Weekly (Harpic)			
						-								
			Length (n	1)	Breadth (m)			Height (m) (300mm free board has been considered)			Volume of the tank (Cum)			
	f the Septic tank Users) (As per pert/Consultai	•	4.2		1.4			1.3 (Cleaning interval of one year)			7.46 (Cleaning interval of one year)			
Actua	Size of the tank Users)	k (121	2.5		1.1		2.0				5.5			
				·			•	Ob	servatio	on Unc	lersize	d (25%	Smaller)	
WATER	QUALITY													
							F	Parameters						
		Wast	e	BOD (mg	/I)		COD (mg	g/I)	ı	ЭН	TSS (mg/l)			
Sr No	Location, Area	wate			% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction	
1	Court building	Black Wate	l											

CASE 23: PANCHAYAT SAMITI (PRABHAG 5)



CASE 23: PANCHAYAT SAMITI (PRABHAG 5)

















CASE 23: PANCHAYAT SAMITI (Prabhag 5)

water

Samiti

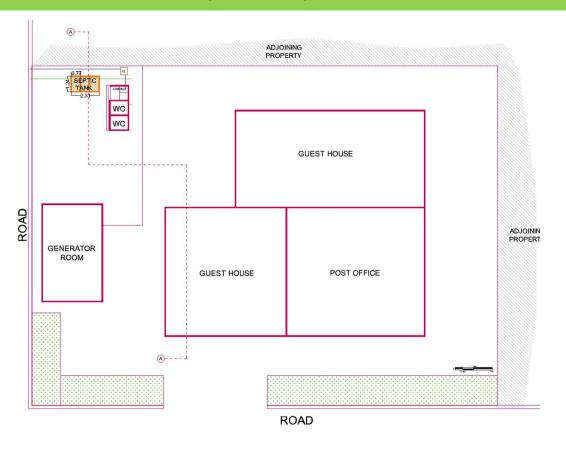
Panch	ayat Samiti													
<u>User</u> <u>\$</u> 210	Building type G+1		to septic ta	ank Clo	eaning Fred of ST Nil	quency	When was the septic tank last emptied? Not Cleaned (More than 8 years)				How toilet is cleaned? Daily (Water) & Weekly (Harpic)			
			Length (m	n) B	Breadth (m)		Height (m) (300mm free board has been considered)				Volume of the tank (Cum)			
	Users) (As per 5 1.6 1.3 10.4 (Cleaning interval of one year) (Cleaning interval of one year)						one year)							
Actua	l Size of the tanl Users)	k (121	3.4		2.22		1.5				11.32			
								Ob	servatio	on O	versize	d (9 %	bigger)	
WATER	QUALITY													
							F	Parameters						
6. 11	T 17 A	Waste		BOD (mg	/I)		COD (mg	g/I)	ı	ЭΗ		TSS (mg	g/I)	
Sr No	Location, Area	water	Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction	
2	Panchayat	Black	186	114	38	495	330	33	7.79	7.82	110	69	37	

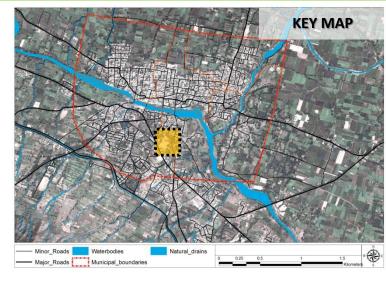
7.79

7.82

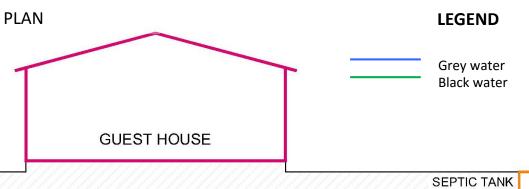
CASE 24: POST OFFICE (PRABHAG 5)

SECTION A-A









CASE 24: POST OFFICE (PRABHAG 5)













CASE 24: POST OFFICE (*Prabhag 5*)

Post O	ffice														
<u>User</u> : 75	Building t Ground F			outs to se tank Black Wa		Cleanir Frequency Nil			was the se last emptie eaned (Moi 10 years)	ed? re than	_ ,	How toilet is cleaned? Daily (Water) & Weekly (Harpic)			
			_												
			Le	ength (m)	Breadth (r	m)	Height (m) (300mm free board has been considered)			e V	Volume of the tank (Cum)			
	f the Septic tan Users) (As per pert/Consulto	•		3.5		1.2		(Clea	1.3 (Cleaning interval of one year)			5.46 (Cleaning interval of one year)			
Actua	al Size of the tar Users)	nk (75		2.31		1.24			1.31				3.75		
									Ob	servatio	on Unc	lersize	d (31%	Smaller)	
WATER	QUALITY														
								ı	Parameters						
		Was	te		BOD (mg	/I)		COD (mg	g/I)	ŀ	ЭН		TSS (mg	g/I)	
Sr No	Location, Area	wate		Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction	
1	Post Office	Blac wate													

CASE 25: POLICE STATION, TEHSHIL OFFICE, COLLECTOR OFFICE (PRABHAG 5)



CASE 25: POLICE STATION, TEHSHIL OFFICE, COLLECTOR OFFICE (PRABHAG 5)



CASE 25: POLICE STATION, TEHSHIL OFFCIE, COLLECTOR OFFICE (Prabhaa 5)

CASI	25. POLIC	FICE (P	Tub	muy 5)							
Police	station, <i>Tehshil</i>	office,	Collector off	ice							
<u>Users</u> 135	Building type Ground Floor		s to septic tank ck Water	<u>ST</u>		When was the se last emptie Not Cleaned (Mor 10 years)	d? e than 5-		How toilet is cleaned? Daily (Water) & Weekly (Harpic)		
			Length (m)	Breadth (m)		Height (m) (300mm free board has been considered)		Vo	olume of the tank (Cum)		
	f the Septic tank Users) (As per pert/Consultar		4.2	1.4		1.3 (Cleaning interv year)	al of one	7.64 (Cleaning interval of one y			
Actua	l Size of the tank Users)	(135	2.5	1.1		1.5		4.125			
•		·				Ob	servation	Und	lersized (46% Smaller		
WATER QUALITY											
Sr No Location Area Wa		Waste	ВС	DD (mg/l)		COD (mg/l)			TSS (mg/l)		
31 110	Sr No Location, Area "										

%

Reduction

21

Inlet Outlet

895

1120

Inlet

Reduction

20

Outlet

7.46

Inlet

625

Outlet

588

%

Reduction

5

rea	

Police station

1

water

Inlet

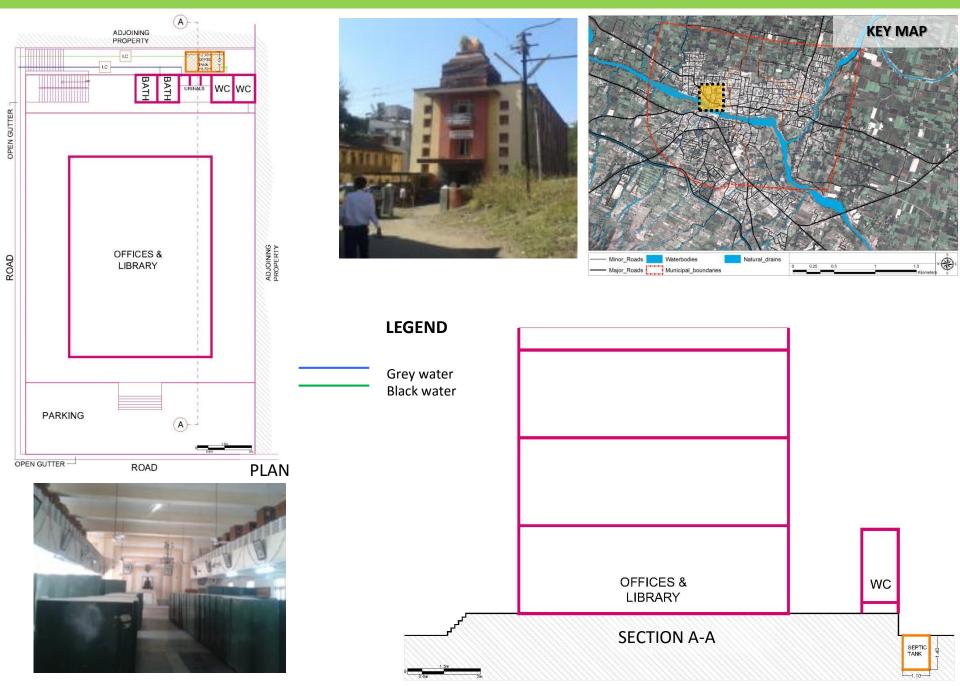
420

Outlet

330

Waste water
Black

CASE 26: VISHWAKOSH EDUCATION CENTER (PRABHAG 1)



CASE 26: VISHWAKOSH EDUCATION CENTER (PRABHAG 1)







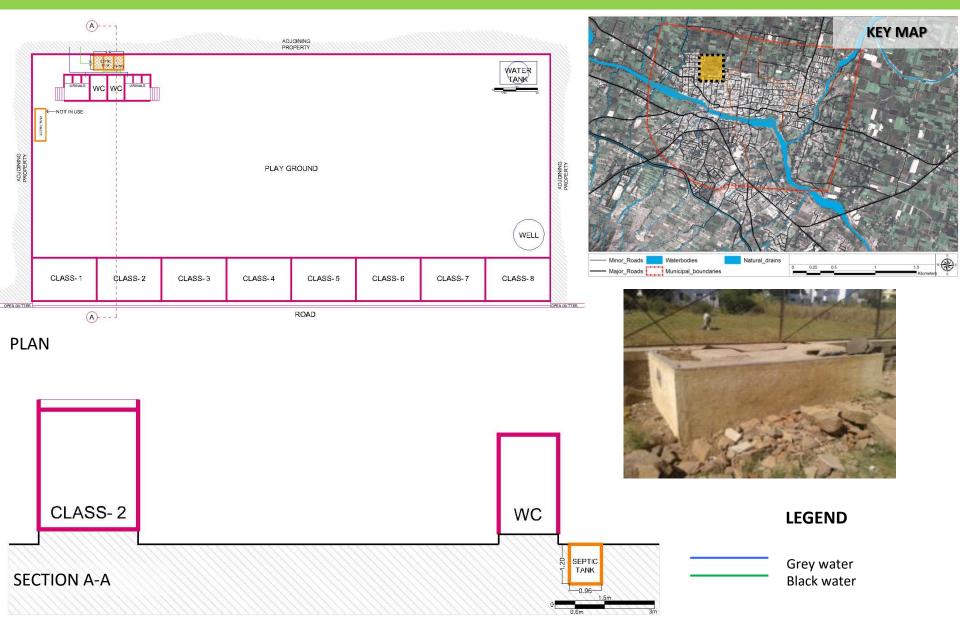


CASE 26: VISHWAKOSH EDUCATION CENTER (*Prabhag 1***)**

Police station, Tehshil office, Collector office

Users 45	Building type G+2		s to septic to ack Water	ank Cle	eaning Freq of ST Nil	ST Not Cleaned (More than 5-				_	How toilet is cleaned? Daily (Water) & Weekly (Harpic)			
	•					•								
			Length (m)	Breadth (ı	m)	Heig	g ht (m) (300 board has b considere	e v	Volume of the tank (Cum)				
	of the Septic tank Users) (As per Dert/Consultan		2.5		0.8			1.3 (Cleaning interval of one year)			2.6 (Cleaning interval of one year)			
Actual Size of the tank (45 Users)			2.5		1.1			1.4			3.2			
								Observation				d (23%	Bigger)	
WATER	QUALITY													
							ı	Parameters						
		Waste		BOD (mg	/I)		COD (mg	g/I)	Ķ	Н		TSS (mg	g/I)	
Sr No	Location, Area	Location, Area wat			Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction
1	Vishwakosh	Black water		156			205			7.45	128			

CASE 27: SCHOOL (MARATHI) (PRABHAG 1)



CASE 27: SCHOOL (MARATHI) (PRABHAG 1)









CASE 27: SCHOOL (MARATHI) (Prabhag 1)

Black

water

354

307.5

School

1

Police	station, <i>Tehshi</i>	ehshil offi	fice, Col	lector c	ffice										
<u>Users</u> 264	Building type G	— i inpi	uts to se	eptic tan <mark>Vater</mark>	K I -	Cleaning uency of ST Nil		_	equency of ned (More t years)	_	How toilet is cleaned? Daily (Water) & Weekly (Harpic)				
		-			-		-				-				
			Le	ength (m)	Breadth (m)			Height (m) (300mm free board has been considered)			Volume of the tank (Cum)			
	f the Septic tank Users) (As per pert/Consultan	00	6.0		2.06		(Clea	1.3 (Cleaning interval of one year)			15.6 (Cleaning interval of one year)				
Actual Size of the tank (264 Users)			64	2.1		0.94			1.2				2.41		
									Ob	servatio	on Und	lersize	d (85%	Smaller)	
WATER	QUALITY														
				Parameters											
Sr No	Laartian Anna	A	Vaste _		BOD (mg	/I)		COD (mg	OD (mg/l)		Н		TSS (mg/l)		
	Location, Area	vater	Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction		

935

13

865

7

8.85

8.21

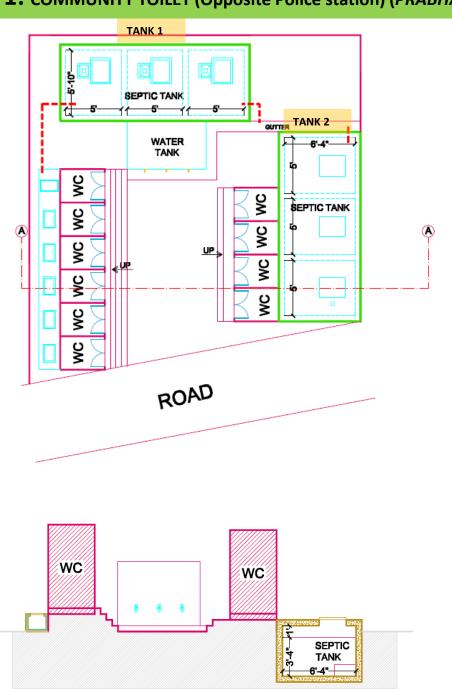
456

288

36



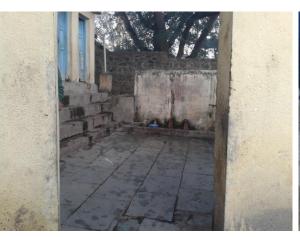
CASE 1: COMMUNITY TOILET (Opposite Police station) (*PRABHAG* 5)



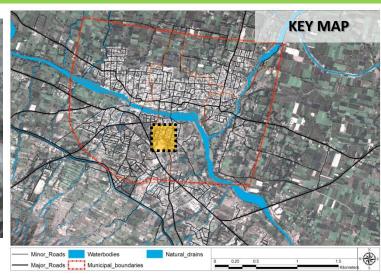




CASE 1: COMMUNITY TOILET (Opposite Police station) (*PRABHAG* 5)















CASE 1: COMMUNITY TOILET (Opposite Police station) (*PRABHAG* 5)

The following **norms** for number of seats, urinals, bathrooms and area for washing may be adopted:

Sr. No	Type of toilets	Toilet Seats	Bath units	Urinal units	Clothes Washing area
1	Community Toilet	One seat per 50 users	One unit per 50 users	One unit per 2003- 300 users	4 to 5 square meter per 10 toilet seats; Min.1.5 m x 1.2 m
2	Public toilet near railway stations (may be used at all hours)	One seat per 100 users	One unit per 70 users	One unit per 300- 500 users	4 to 5 square meter per 30 toilet seats; Min.1.5 m x 1.2 m
3	Public toilet near market place/offices (will mostly be used during working hours)	One seat per 100 users	One unit per 200- 300 users	One unit per 200- 300 users	4 to 5 square meter 10 toilet seats; Min.1.5m x 1.2 m

Source: The guidelines for community toilet, 1995, Ministry of urban affairs & employment, Government of India

Note: The numbers of toilet seats, baths, urinals and washing area given in the table have been derived from the conclusions made during and data collected from the primary survey.

Note: The number of users assumed in the further assessment is 35 persons per seat. This assumed number of users has been concluded from the experiences and data collected during the primary survey.

In all the further calculations, even though the number of users per seat have been assumed as per the learning's from the primary surveys, the methodology used for calculating the volume of septic tanks is based on the CPHEEO guidelines and the IS Code

CASE 1: COMMUNITY TOILET (Opposite Police station) (*PRABHAG* 5) Cleaning frequency of the tank Users **Building type** Inputs to septic tank

Black water

References:

BOD (mg/l)

Outlet

%

Reduction

Inlet

	Length (m)	Breadth (m)	Height(m) (300 mm free board has been considered)	Volume of the septic tank (Cu m)
Actual Size of the tank 1	4.5	1.8	1.3	10.53
Actual Size of the tank 2	4.5	1.95	1.5	13.16
Size of the Septic tank (140 Users) (Calculated based on certain assumption for same has been mentioned in previous slide)	6.02	2.01	1.34	16.16 (One year Cleaning Interval)
Size of the Septic tank (210 Users) (Calculations based on certain assumption for same has been mentioned in previous slide)	6.87	2.29	1.54	24.25 (One year cleaning interval)

Once In Every 8-10 days

Parameters

Outlet |% Reduction Inlet |

рН

Outlet

COD (mg/l)

How toilet is cleaned?

Daily

Undersized

Tank 1 (35% Smaller)

Tank 2 (46% Smaller)

Inlet

TSS (mg/l)

Outlet

%

Reduction

mentioned in previous silde) Indian Standards (2470 (PART 1) -1958), "Code of practices for installation of septic tanks", Design criteria and

Waste

water

Inlet

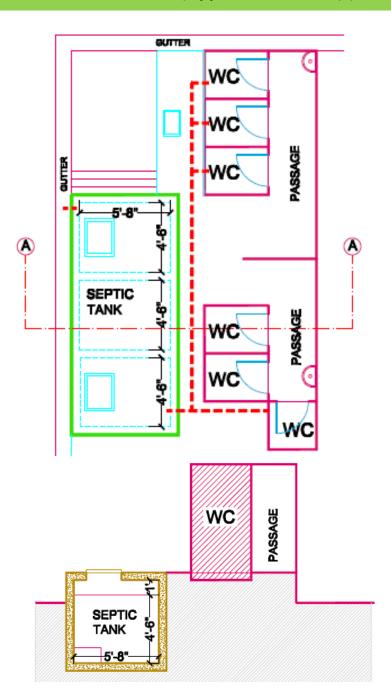
construction (Second revision) CPHEEO manual 2013 (Chapter 9)

Sr No Location, Area

Community toilet

140-210

CASE 2: COMMUNITY TOILET (Opposite Bus Stand) (*PRABHAG* 5)







CASE 2: COMMUNITY TOILET (Opposite Bus Stand) (*PRABHAG* 5)



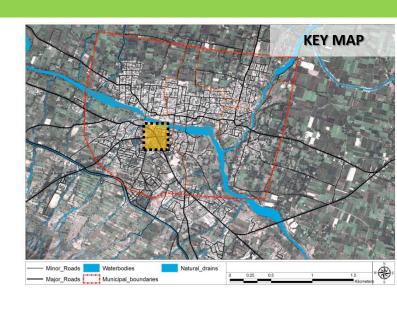














CASE 2: COMMUNITY TOILET (Near Bus Station) (*PRABHAG* 5)

stand

Use 21		lding type nunity toilet	Inp	outs to sep Black wa					How toilet is cleaned? Weekly							
Length (m) Breadth (m) Breadth (m) Height(m) (300 mm free board has been considered) Volume of the septic tank (Cu							k (Cu m)									
	Actual Size of	the tank		4.5	2.0			1.8		16.2						
(C ass	of the Septic ta alculated based umption for sa entioned in pre	d on certain me has been		7.37	2.29			1.34	2	24.25 (One year cleaning interval)				24.25 (One year cleaning interval		g interval)
References: Indian Standards (2470 (PART 1) -1958), "Code of practices for installation of septic tanks", Design criteria and construction (Second revision) CPHEEO manual 2013 (Chapter 9) The capacities are recommended on the assumption that the discharges from only WC will be treated in the septic tank. Smaller)						33%										
									,							
								Parameters								
Sr No	Location, Area	Waste		BOD (mg	/I)		COD (m	ng/I)		pH TS		TSS (mg	TSS (mg/l)			
3. 110	20000011, 7110 0	water	Inlet	Outlet	% Reduction	Inlet	Outlet	% Reduction	Inlet	Outlet	Inlet	Outlet	% Reduction			
1	Near Bus	Black Water		705			1880			7.52		318				

ANALYSIS-

Design Parameters Water Quality Assessment

GENERAL OBSERVATION-SEPTIC TANKS



VENTILATION PIPES:

In some of the cases no ventilation pipes have been provided to the septic tanks. This is leading to significant odour problems in the vicinity

ACCESSIBILITY:

In few cases the septic tanks are not accessible for maintenance and repairs. This is probably due to location of them below the toilet blocks

OUTFALL:

In newly developed areas effluents from the septic tank are let off into soak pits or nearby areas. In the old city areas these effluents are let-off directly into open/ closed gutters.

DESIGN:

All the septic tanks in the cases studied are rectangular in shape with 2 baffles and 3 chambers. Only one case (case no 9) have precast septic tank.

METHOD OF CONSTRUCTION:

Only in a single case, the septic is precast and circular in shape. Rest all the cases have septic tanks constructed onsite

BAFFLES:

In all the cases the septic tanks have been provided with two baffles which separate the tanks into 3 compartments (seen in precast as well)

INPUTS TO SEPTIC TANK:

In all the cases only black water is let-off into the septic tanks. The grey water is directly let-off into nearby drains

MAINTENANCE:

For timely maintenance of the septic tanks adequate number of openings have been provided. The problem is that the openings have been permanently sealed leading to breakage and no re-usability of the lid

MATERIALS:

Almost all the septic tanks in the cases studied have been constructed in brick masonry with cement plastering and RCC lid on top

ANALYSIS- General Observations

Overall Cleaning Practices	For daily cleaning of the toilets/ bathrooms water is used. But chemical detergents such as <i>Harpic</i> , <i>Domex</i> are used for cleaning once in a week
Septic Tank Cleaning	Out of the total cases studied the septic tanks were never cleaned in 14 cases, in 6 cases it was cleaned one time or more than two times.

Following table shows the septic tank cleaning practices in Wai town (Based on samples):

Case no	Year of construction of Septic tank	Age of the Septic tank (Year)	Cleaning Frequency of ST	When septic tank last emptied?
1	2010	4	Nil	Not cleaned yet**
2	2004-05	10	Nil	Not cleaned yet **
3	2001	13	Nil	Not cleaned yet **
4	2002	12	Nil	Not cleaned yet **
5	2012	2	Nil	Not cleaned yet **
6	1988	26	More than 8-10 times	2012
7	2007-08	7	Nil	Not cleaned yet **
8	2004-05	10	Nil	Not cleaned yet **
9	2007-08	7	Nil	Not cleaned yet **
10	2011-12	3	Nil	Not cleaned yet **

^{**}Not cleaned indicates the septic tank has not been cleaned till date

ANALYSIS- General Observations

Case no	Year of construction of Septic tank	Age of the Septic tank (Year)	Cleaning Frequency of ST	When septic tank last emptied?
11	2008	6	Nil	Not cleaned yet**
12	2007	7	Nil	Not cleaned yet**
13	2011-12	3	Once in every year	2013
14	2012	3	Nil	Not cleaned yet**
15	1982	32	One time	2009
16	2001	13	One time	2011
17	2000	14	Nil	Not cleaned yet**
18	2003	11	Once in two year	March 2014
19	1987	27	More than two times	Two years ago-2012
20	2000	4	One time	Two years ago-2012

**Not cleaned indicates the septic tank has not been cleaned till date

Cleaning Frequencies of the Septic Tanks:

Out of the total cases studied the septic tanks can be divided into 3 categories on the basis of their cleaning frequencies:

- a.) Tanks never cleaned or cleaned before 5 years: 13 cases
- b.) One time cleaned: 3
- c.) More than two times or Regularly clean (Once every one or two year): 4

[•]Above conclusions show there is severe need of spreading awareness related to cleaning and proper maintenance of the septic tanks in the users.

^{*} It has also been observed that the general awareness of the people in the cases studied related to the use of toilets and the maintenance of Septic tanks is lacking.

ANALYSIS- Design Parameters of septic tank

Individual plot (G)

Individual plot (G)

Bungalow (G+1)

Individual plot (G)

Individual plot (G)

Apartment (G+2)

Individual plot

Group Housing

(G+2)

(G+1)

5

6

8

9

10

11

	RESIDEN	TIAL PR	OPERTIES		Volu	ume of the Septic t			
Case No	Building type	Users (Actual)	Users considered	Age of Septic tank (Year)	Actual	AS PER CPHEEO manual (2013) (Cleaning interval of three years)	When was the septic tank last emptied??	Observations	PERCENT ** (Smaller/ Bigger)
1	Individual plot (G)	2	5	4	2.03	1.52	Not cleaned**	Oversized	+ 34%
2	Bungalow (G+1)	5	5	10	2.93	1.52	Not cleaned**	Oversized	+ 93%
3	Row House (G+1)	6	5	13	2.93	1.52	Not cleaned**	Oversized	+ 93 %
4	Bungalow (G+1)	16	20	12	3.42	4.76	Not cleaned**	Undersized	- 17 %

3.02

4.5

4.10

3.78

3.02

4.83

2.64

7.23

1.52

15.50

1.52

1.52

1.52

3.06

1.52

15.40

Not cleaned**

In year 2012

Not cleaned**

Not cleaned**

Not cleaned**

Not cleaned**

Not cleaned**

Not cleaned** Undersized

Oversized

Undersized

Oversized

Oversized

Oversized

Oversized

Oversized

Continued.....

+ 99%

- 71%

+ 170%

+ 149%

+ 99%

+ 58%

+ 74%

- 53%

2

26

7

10

7

3

6

7

5

50

5

5

5

10

5

50

4

60

5

5

3

11

4

40

**Not cleaned indicates the septic tank has not been cleaned till date

	RESIDE	NTIAL PI	ROPERTIES		Volu	me of the Septic ta			
Case No	Building type	Users (Actual)	Users considered	Age of Septic tank (Year)	Actual	AS PER CPHEEO manual (2013) (Cleaning interval of three years)	When was the septic tank last emptied??	Observations	PERCENT(%) ** Smaller/ Bigger
13	Apartment (G+2)	30	50	3	5.85	15.40	Not cleaned**	Undersized	- 53%
14	Individual plot (G)	4	5	3	3.24	1.52	Not cleaned**	Oversized	+ 113%
15	Individual plot (G+1)	2	5	32	7.29	1.52	Not cleaned** (More than Two years)	Oversized	+ 380%
16	Apartment (G+2)	80	100	13	5.93	30.61	Not cleaned** (More than three years)	Undersized	- 81%
17	Bungalow (G)	5	5	14	5.98	1.52	Not Cleaned**	Oversized	+ 293%
18	Bungalow (G)	5	5	11	5.83	1.52	Jan 2012	Oversized	+ 284%
19	Bungalow (G+1)	2	5	27	3.15	1.52	In year 2011	Oversized	+ 107%
20	Apartment (G+2)	20	20	4	4.41	5.31	In a year 2010	Undersized	- 17 %

^{**}Not cleaned indicates the septic tank has not been cleaned till date

ANALYSIS- Design Parameters of septic tank

	RESIDENTIAL PROPERTIES								
Sr. No.	Analysis	%	Note						
1	Oversized	70% (14 Nos.)	From the analysis it is observed that the capacity of the septic tank is additional for the users up to 10-15, as it clearly indicated in table that the contractors are following standard design for every households within the city.						
2	Undersized	111% 17 1005 1	For users above 20, capacity of the tanks is not adequate, therefore it has to reconstructed as per standard for better result.						

Case no 4 & case no 20 which have followed the design standards.

Note:

3

20% (4 Nos.)

100% (20 Nos.)

Adequate Sized

TOTAL

^{*}CPHEEO 2013 manual is used for the analyzed the septic tank scenario in the city.

^{**} for the analysis the actual volume of the septic tank is compared to the standard volume.

^{***} IS Code 2470 (Part 1) is also used for the analyzing septic tanks.

ANALYSIS- Comparison of Design Parameters of septic tank

Usually the design of a septic tank must be

Rectangular Tanks: length must be 2 to 4 times the

Circular: Diameter must be 1.35 meter (minimum)

Thickness: for brick work 200 mm thick with 12 mm

thick plaster, for stone masonary minimum

If ST volume exceeds 2000 litres, tank must be divided into two chambers. It must be divided

Each compartment of the tank must have an

Cover to this opening: RCC or of Cast Iron

Must be removable and must be sealing the

using a fixed durable partition. Suitable openings

must be provided to the partitions (100 to 150mm

(Rect. - min 455x610 mm/ Circ. -min. 500 mm dia.)

The walls and floor of the septic tank must be of thickness to provide adequate strength and water

Current Practices Observed

Observation from the case studies

Design of the septic tanks observed has been as

per the standards. Majority of the septic have

All the cases have the septic tanks built in brick

Mostly the septic tanks have 2 baffles and 3

compartments with adequate openings in the

In all the cases, the septic tanks have adequate number of openings. The problem is that the

opening have been sealed, which leads to

breakage in case of maintenance

masonry and are built as per standards

followed the minimum dimensions

Y/N

Υ

Υ

Υ

Ν

* The above table shows a comparison between the design parameters as per the IS Code with the observations made of the cases studied in

partitions

	As per IS Code
Parameter	Criteria

rectangular or circular

thickness must be 370 mm

width

tightness.

opening/dia)

opening properly

opening

Design

Construction

Technique/

Materials

No. of Baffles

Openings

the site visit

ANALYSIS- Design Parameters of septic tank

As per IS Code

closer than 20 mtr to the building

Location should be open to sky, as far as possible

from the exterior wall of a building, should not be

located in swampy areas or flood prone areas

Parameter	Criteria	Y/N	Observation from the case studies
Ventilation	Every tank must have a ventilation pipe (50mm dia) with a suitable cage/ mesh on top Height of pipe: 2m if tank is 20 mtr or more away from building, 2m above building top if tank is	N	In several cases the septic tanks have ventilation pipes, the desired height (minimum 2 m) of the ventilation pipe described as per standard has

Outfall of ST

Effluent should not be let-off into an open channel drain or water body

Large tanks must be cleaned on half yearly/ yearly

Large tanks must be cleaned on half yearly/ yearly basis. For domestic tanks cleaning must be done

Ν

Ν

Ν

less

open/ closed drains. In few cases it is let-off into soak pits

Very few septic tanks are regularly cleaned.

Awareness related to cleaning of septic tanks is

Locations are as per standards and mostly the

Effluents in most of the cases is let-off into

Current Practices Observed

not been followed in many cases.

septic tanks are accessible

once in two years

Y – as per IS Code and N – not as per the standards

Accessibility/

Location

Cleaning

Users

75

INSTITUTIONAL BUILDINGS

Building type

Hospital (G+1)

Case

No

21

NOTE:

sector.

	' ' '						two year	sized	
22	Court Building (G+1)	121	150	52	5.5	9.05	Not Cleaned**	Undersized	- 25%
23	Panchayat Office (G+1)	210	200	27	11.32	12.32	Not Cleaned**	Adequately sized	+ 9%
24	Post Office (G)	75	100	34	3.75	6.46	Not Cleaned**	Undersized	- 31%
25	Police Station, Tehshil Office, Collector off. (G)	135	150	32	4.12	9.05	Not Cleaned**	Undersized	- 46%
26	Vishwakosh Karyalaya (G+2)	45	50	52	3.2	3.05	Not Cleaned**	Adequately sized	+ 23%
27	School (G)	264	300	24	2.41	18.48	Not	Undersized	- 85%

• Cleaning frequency of septic tank is almost nil, the municipality & intuitional administrative department is not given any attention to this

Not cleaned indicates-As per information gathered from current employees the septic tanks have not been cleaned

Age of

Septic

tank

(year)

28

Actual

5.54

Users

100

In case of institutional buildings majority of the existing septic tanks are undersized.

(Actual) considered

Volume of the Septic tank (cum)

When was

the septic

tank last

emptied??

Once in a

Cleaned**

PERCENT(%)

Bigger

+ 1%

Observations ** Smaller/

Adequately

Calculations based on

experience of experts/

consultants

(Cleaning interval of

one year)

6.46

since(10-15 years) they are working- and information prior to that could not be collected.

• The sewage generation is taken 20 PLCD for the institutional buildings. And for the design IS Code 2470 has been followed.

^{**}Not cleaned indicates the septic tank has not been cleaned till date

ANALYSIS- Design Parameters of septic tank

Community toilet				Volume of the Septic tank (cum)				
Case No	Building type	Users (Actual)	Users considered	Actual	Calculations based on experience of experts/ consultants (Cleaning interval of one year)	Cleaning Frequency	Observations	PERCENT(%) **Smaller/ Bigger
1	Near police station (Tank 1)	140 210	200	10.53	60.98	Once in every 8-10 days	Undersized	- 35%
2	Near police station (Tank 2)	140-210	200	13.16	60.98	Once in every 8-10 days	Undersized	-46%
3	Opposite Bus stand	210	200	16.2	60.98	Once in every 8-10	Undersized	- 33%

Note:

days

[•]In both cases the size of septic tank is not sufficient, the local body have to clean this tank once in a every month because the tank is fill in very short period of time. After that suspended solids come along with outlet and creates unhygienic condition.

[•]For analyzing of septic tank 35 users per seat has been considered and detention period is 24 hours. IS code 2470 is also used.

ANALYSIS- Water Quality Assessment

Notes:

- *The septic tank reduces BOD up to 50%. (Source-CPHHEO manual 2013, Chapter 9, Section 9.1.2.2)
- **Conventional Septic tank removal efficiency if properly designed and with proper septage removal frequency can effectively remove about 40-50% BOD and 50-70% TSS. (Source-CPHHEO manual 2013, Chapter 9, Section 9.1.2.3)
- ***For comparing the BOD results of samples, few samples were collected from Inspection chambers to analyze Inlet BOD. It varied in the range of 100 to 600. It was considered as influent BOD value against which effluent values were compared. It is considered only for cases in residential areas. This has been explained in the next slide.

Sample Collection Technique















QUALITY ASSESSMENT

42

93

52.3

61%

RESIDENTIAL

PROPERTIES

13

14

15

109

Case study No.	Inlet BOD (mg/l)	Outlet BOD (mg/l)	% (Reduction of BOD)	Cleaning Frequency of ST	When septic tank last emptied?	Note
1		84		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
2		31.8		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
3			Sample i	not collected due to i	naccessibility	
4	Sample not collected due to inaccessibility					
5		14.1		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
6	101.3	78	23%	More than 8-10 times	2012	Defunct, Septic tank is not clean frequently
7	Sample not collected due to inaccessibility					
8	1	135		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
9		228		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
10	1	153		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
11		108		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
12	138	112.5	18%	Nil	Not cleaned yet	Defunct, Septic tank has not been cleaned past 5-6 years
13	109	42	61%	Once in a every	2013	Functioning well

year

Nil

One Time

Functioning well

Septic tank inlet pipe is concealed

Septic tank inlet pipe is concealed

2013

Not Cleaned yet

20009

	ENTIAL PERTIES	QUALITY AS	SESSMENT			
Case study No.	Inlet BOD (mg/l)	Outlet BOD (mg/l)	% (Reduction of BOD)	Cleaning frequency of ST	When septic tank last emptied?	Note
16	142	115	19%	One time	2011	Defunct, Septic tank has not been cleaned past 5-10 years
17	1	195		Nil	Not cleaned yet	Septic tank inlet pipe is concealed
18		102		Once in two year	March 2012	Septic tank inlet pipe is concealed
19	-	185		More than two times	Two years ago- 2012	Septic tank inlet pipe is concealed
20		24		One time	Two years ago- 2012	Septic tank inlet pipe is concealed

For comparing the BOD results of samples, few samples were collected from Inspection chambers to analyze Inlet BOD. It varied in the range of 100 to 600. It was considered as influent BOD value against which effluent values were compared. It is considered only for cases in residential areas.

- •As per the CPHEEO standards, a septic tank generally reduces the BOD levels around 25 50%. In the cases studied, in case no. 13, the reduction of BOD has been as per the standards. This shows that this septic tank is working efficiently.
- In other cases the BOD reduction level is very less indicates that the septic tanks are not working efficiently and are not cleaned regularly.

(Marathi)

INSTITUTIONAL BUILDINGS		QUALITY ASSESSMENT				
Institutional	Inlet BOD (mg/l)	Outlet BOD (mg/l)	% (Reduction of BOD)	Cleaning frequency of ST	When septic tank last emptied?	Note
Hospital	1	177		Once in every year	More than 10 times	Septic tank inlet pipe is concealed
Court Building		Sample not collected due to inaccessibility				
<i>Panchayat</i> Samiti	186	114	38%	Nil	Not cleaned yet	Functioning well
Post Office	Sample not collected due to inaccessibility					
Police station	420	330	21.42%	Nil	Not cleaned yet	Defunct, not cleaned past 10-12 years
Vishwakosh	Sample not collected due to inaccessibility					
School (Marathi)	354	307.5	13.13 %	Nil	Not cleaned yet	Defunct, not cleaned past 5 years

- As a suit a CRUEFO at an dender a sout's toul assume the ROD levels around 2F FOO/
- As per the CPHEEO standards, a septic tank generally reduces the BOD levels around 25 50%.
 In the cases studied, in case of Hospital, the reduction of BOD has been as per the standards. This shows that this septic tank is working efficiently.
- In other cases the BOD reduction level is very less (BOD reduction below 25%)—indicates that the septic tanks are not working efficiently and are not cleaned regularly.

COMMUNITY TOILET		QUALITY ASSE	SSMENT	
Name	Inlet BOD (mg/l)	Outlet BOD (mg/l)	% (Reduction of BOD)	Note
Opposite Police station	502	412.5	1/8/	Defunct, Design of septic tank is not as per standards
Opposite Bus stand	805.3	705	12.42	Defunct, Design of septic tank is not as per standards

- As per the CPHEEO standards, a septic tank generally reduces the BOD levels around 25 50%.
- In both cases, septic tanks are not following standards because the design of the septic tank is not proper. The municipality have made efforts to clean septic tank every month but it will increase the maintained cost.

Septic Tank Improvements

SUGGESTIONS- RELATED TO USE OF SEPTIC TANK

Cleaning Practices

	buckets of water to maintain
Septic Tank Cleaning	For creating awareness related to the cleanliness of septic tanks people should be made aware of the desired practices through IEC material, septic tank cleaning manuals.
Construction Material of	Locally available materials are being used for construction of septic tanks. No

buckets of water to maintain

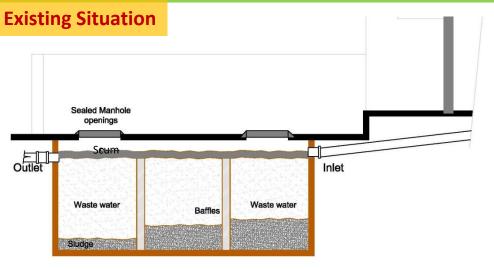
As per standard, after every usage the toilet must be flushed using 2 to 3

Septic Tank changes in this practice is required. Design of septic tanks should be as per standards. Also, the local contractors should be trained to acquaint them with the best **Design of the Septic Tank**

practices in constructing septic tanks. Removable lids must be used instead of sealing the openings with fixed tiles. Even though the cost of the tiles (Rs. 200 approx.) is half than the concrete lid **Accessibility** (Rs. 600), breaking the tile every time cleaning the septic tank proves

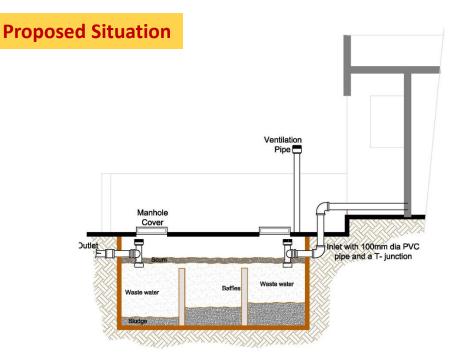
expensive.

As per standards, both black and grey water can be let-off into the septic tank **Input to the Septic Tank**



Sr No	Component	Current Scenario
1	T Junction (Inlet & Outlet)	Absent
2	Access manhole cover	Absent
3	Ventilation Pipe	Absent (In Some cases)

Schematic Sketch

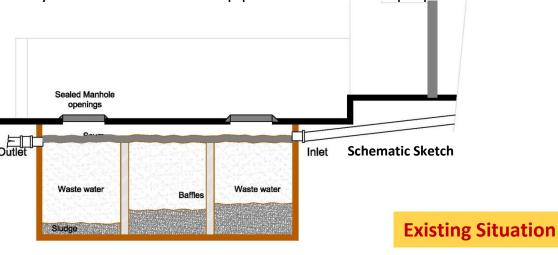


Sr No	Component	Current Scenario
1	T Junction (at Inlet & Outlet)	Proposed
2	Access manhole cover	Proposed
3	Ventilation Pipe	Proposed (In Some cases)

Schematic Sketch

1.) Inlet/ Outlet Pipe: As per best practices for construction of a septic tank, it is advisable to use a T- junction pipe joint at both the inlet and outlet of the septic tank. Usually 100 mm diameter PVC pipes are used for the purpose.

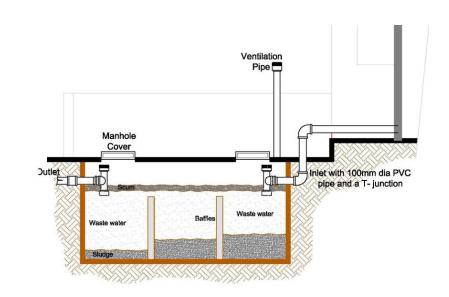




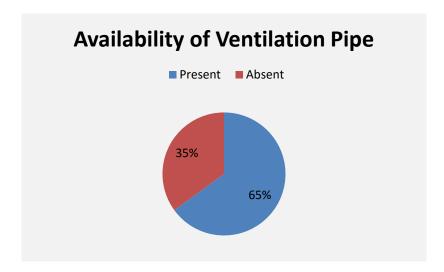
Proposed Situation

For efficient working of the septic tanks the methods adopted for constructing a Septic tank must be as shown in the adjacent diagram.

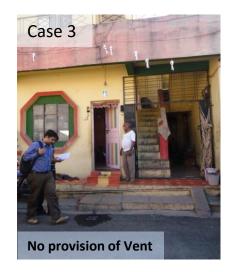
* The use of T-junction pipes in the inlet and outlet help avoid the choking/ blocking of the sludge flow through the pipes due to the gathered scum.



2.) Ventilation Pipes: In the cases studied, in several cases the ventilation pipes required for the septic tanks is absent. In a few cases ventilation pipes have been provided above the inspection chambers only.





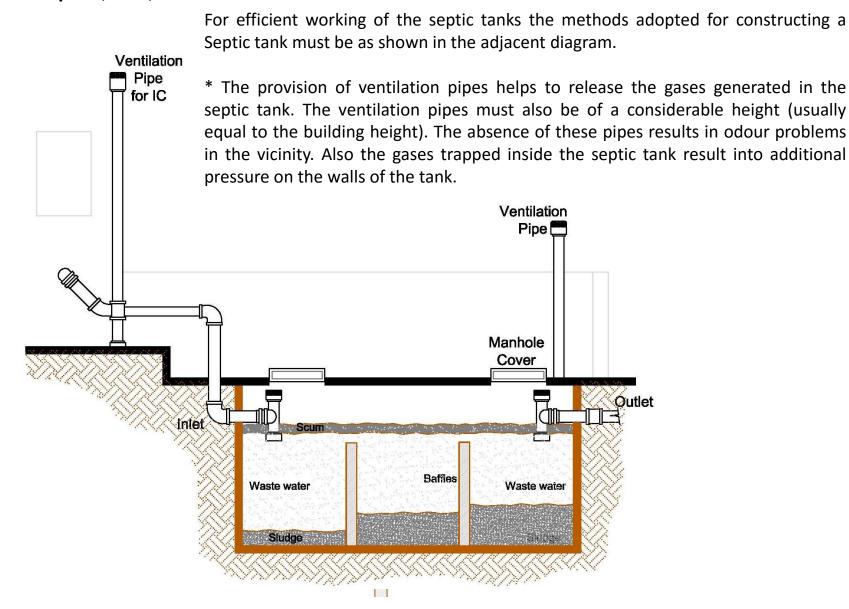








2.) Ventilation Pipes: (contd)



3.) Openings of the Septic Tanks:

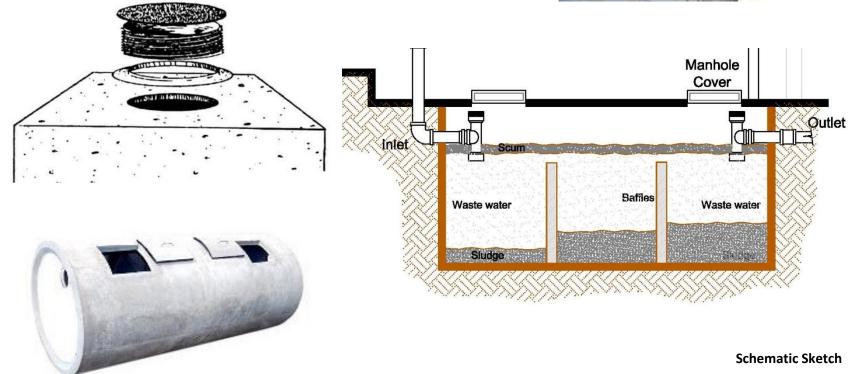
Adequate number of openings for a septic tank is very necessary for the maintenance and cleaning purpose.

In few cases the septic tanks had no accessibility due to the location of septic tanks below the toilet block.

Ideally a septic tank must have atleast two manholes of adequate size and must be covered properly with a concrete lid. This opening help for keeping the maintenance of the septic tanks and the lids prevent odour problems as well as any mishaps/ accidents.



Case no 7: Nhavi Ali No provision of lid/ openings



4.) Solutions for oversized Septic Tanks:



Case no 3: Damle Ali

- No provision of lid/ openings
- Volume of septic tank: Oversized
- Inlet: Only Black water

In a few cases studied, it was observed that the septic tanks are oversized as compared to the actual required sizes as per the standards.

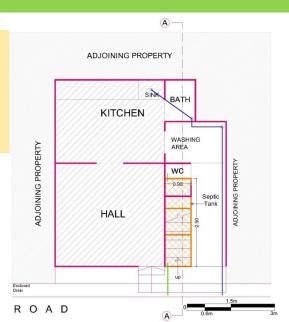
To make proper use of the volume of the septic tanks the grey water generated in the households can also be let off into the septic tanks.

Only precaution that need to be taken is to minimize the use of chemicals and acids to clean the bathrooms and for washing purpose. These chemicals hamper the biological process in the septic tanks.

Existing Scenario:

Only Black water let-off into Septic Tank. Grey water is directly let-off into nearby drains

LEGEND Grey water Black water



Proposed Scenario:

Black and Grey water let-off into Septic Tank.



Improvements in Septic Tanks are suggested as a case study, for case no. 16. And cost required for respective improvements is estimated here.

(Costs are taken from Schedule of Rates (SoR), Satara, however for certain items/ works for which costs are not included in SoR, they are taken from local masons/ contractors)

	Items required for the improvements of septic tank						
Sr No	Installation of ventilation pipe	Criteria (IS CODE:2470)	Amount (INR)	Reference			
1	PVC pipe	100 mm dia (Not less than 50 mm dia)	89	IS CODE 2470 (Part 1): Generally the ventilating pipe may extend to a height of about 2 m when the septic tank is at least 20 m away from the nearest building and to a height of 2 m above the top of the building when it is located closer than 20 metres. The ventilating pipe may also be connected to the normal soil ventilating system of the building where so desired. SOR 2012-13 (Pune Region): Section H- Miscellaneous works Local Market rate-130/m			
2	Cage of mosquito proof mesh	Mosquito proof mesh	35-50	Local Market Rate			
3	Access opening & cover	 For Rectangular- Not less than 455x600 mm For circular- Not less than (circular opening) 500 mm dia 	600-750 (Rectangul ar R.C.C)	IS CODE 2470 (Part 1): Section 3.4.9-Access opening & cover , Page no. 12 Local Market Rate			

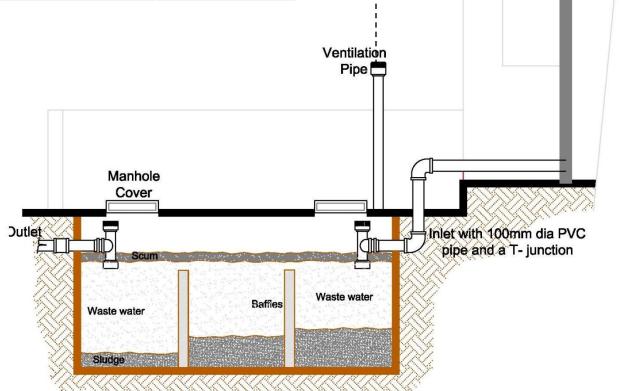
(contd..)

4						
	Items required for the improvements of septic tank					
Sr No	Installation of ventilation pipe	Criteria (IS CODE:2470)	Amount (INR)	Reference		
4	T junction	100 mm dia	120	Local market rate (2014)		
5	L junction	100 mm dia	100	Local market rate (2014)		

1. INSTALLATION OF VENTILATION PIPE

Installation of ventilation pipe	Criteria (IS CODE:2470)	Amount (INR)
PVC pipe	100 mm dia (Not less than 50 mm dia)	89
Cage of mosquito proof mesh	Mosquito proof mesh	35-50
Requirement of PVC pipe= heig from the building he	712	
Total (INR) (P	750	



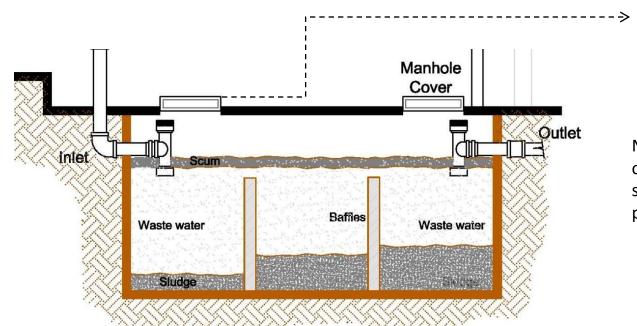


Proposed Ventilation Pipe

2. ACCESS AND OPENING COVER

Installation of cover	Criteria (IS CODE:2470)	Amount (INR)
Access opening & cover (1 Nos.)	 For Rectangular- Not less than 455x600 mm For circular- Not less than (circular opening) 500 mm dia 	650 (R.C.C) Local Market rate



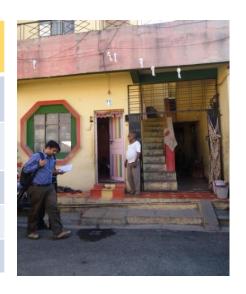


Proposed openable Cover

Note: in this case due to constraint of space (WC constructed over the septic tank) only one access can be provided wit openable lid.

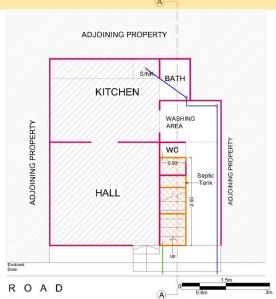
3. CONNECT GREY WATER PIPE TO SEPTIC TANK (SOLUTION OF FOR OVERSIZED SEPTIC TANKS)

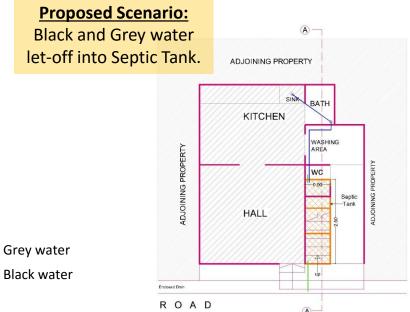
Installation of PVC pipe to combine (Grey water)	Criteria (IS CODE:2470)	Amount (INR)
Inlet pipe (PVC Pipe-required 1.5 meter)	100 mm dia	133.5
T Joint (2 nos.)	100 mm dia	240
L joint (3 nos.)	100 mm dia	300
Total (INR)		673.5



Existing Scenario:

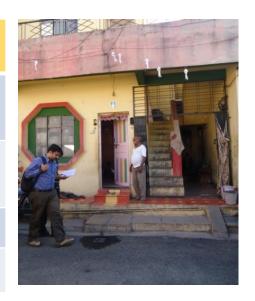
Only Black water let-off into Septic Tank. Grey water is directly let-off into nearby drains

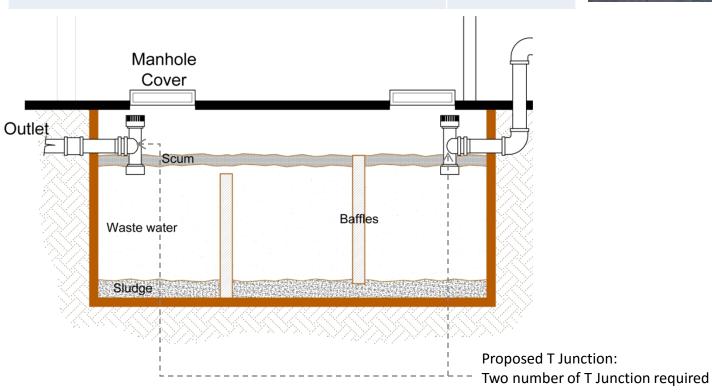




4. CONSTRUCTION OF T JUNCTION AND NECESSARY PIPE CONNECTIONS

Installation of ventilation pipe	Criteria (IS CODE:2470)	Amount (INR)
PVC pipe (1 m)	100 mm dia (Not less than 50 mm dia)	178
2 T Joint	100 mm dia	240
Total (INR)		418





COSTING DETAILS FOR CASE NO. 3

Sr .no.	Improvements	Cost (INR)
1	Installation of ventilation pipe	750
2	Access & Opening cover	650
3	Connect Grey Water pipe to septic tank	673.5
4	Construction of T junction	418
	TOTAL COST	2491.5

Note: only material costs are considered

Considering the local costs of the labor (having discussed with the local contractors) for implementing the above works on site, the labor costs shall be Rs. 2000



Case no 3: Damle Ali

- No provision of lid/ openings
- Volume of septic tank: Oversized
- Inlet: Only Black water

In this case, there is no ventilation pipe for the septic tank and the openings do not have a removable cover. Also the inlet, outlet of the septic tank do not have a T-junction PVC pipe and the grey water is not let-off in the septic tank. To implement all the above works, the costing has been given as given here.