



MUNICIPAL CORPORATION OF GREATER MUMBAI

**SEWERAGE PROJECT
DEPARTMENT**

**EASE OF DOING
BUSINESS**

Definition

- **Byelaws:** DRAINAGE WORKS (BYE-LAWS) (See sections 231, 234, 239, 240 and 243,259 of Mumbai Municipal Corporation Act 1888.
- **Sewer:** Sewer shall mean a closed drain carrying night soil and other water borne wastes.
Under ground pipe conveying sewage/ waste water.
Flowing maximum 2/3 of its cross sectional area.
Flow is essentially gravitational.
Essentially stoneware pipe, Reinforced Cement Non Pressure pipe(RCNP3/4 class pipe), High density polyethylene pipe (HDPE pipe) etc. (brands approved by M.C.G.M.)

- **Manhole or Inspection Chamber" -**

A built up opening by which a man may enter or leave a drain, a sewer or other closed structure for inspection, cleaning and maintenance of sewer line.

- **Inspection Chamber:-**

I) First inspection chamber (Size 0.90MX0.60 MX0.45M) or 0.90 m X 0.45 M X 0.45 M)

II) Last inspection chamber:- (Size 0.90MX0.60 MX 1.50M) or 0.90 m X 0.45 M X 1.50 M)

- **Manhole:-**

I) First Manhole-0.53 M man entry, 1.20 M deep & 1.20 m bottom dia Conical Manhole.

II) Last Manhole:- 0.53 M man entry, 2.30 M deep & 1.20 m bottom dia Conical Manhole.

III) The center to center distance between two manholes is 100 feet (as per provision in section 231 of MMC Act)

- **Water Requirement:** Requirement as per water Byelaws adopted by H.E.
- **Street Connection:** Sewer pipe connecting from sewer trap to municipal manhole.
- **Septic tank:** A structure complying with I.S. Code 2470 part I & II
- **Slope:** Slope is gradient given to the sewer to achieve required self cleaning velocity.
- **Internal Drainage Layout :** Sewer laid on the shortest route to avoid deeper depth of sewer trap with inspection chamber/ manhole at required distances.
- **Sewage Generation:** Sewage generation worked out on the basis of “Minimum Drainage and Sanitation requirements as per Bye-Laws No 36.1”.

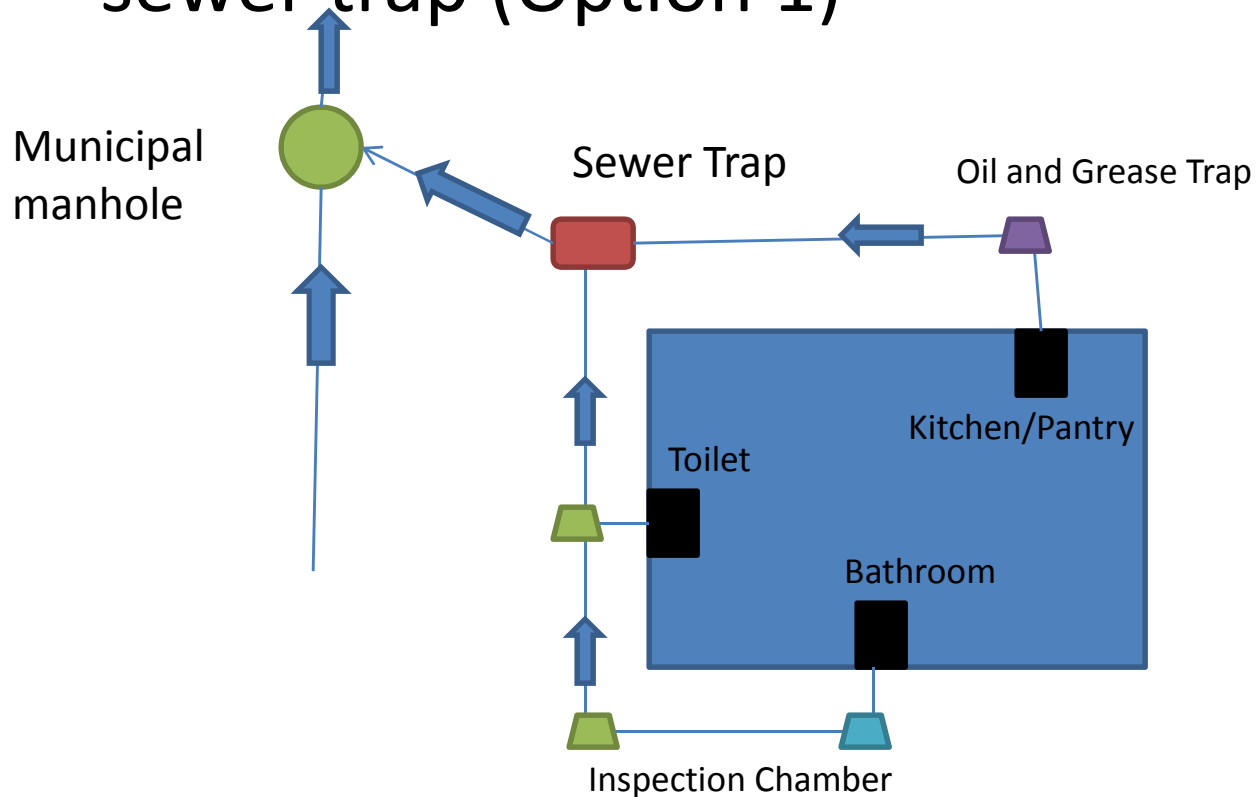
KEY Features

SP offers remarks in respect of following three different cases

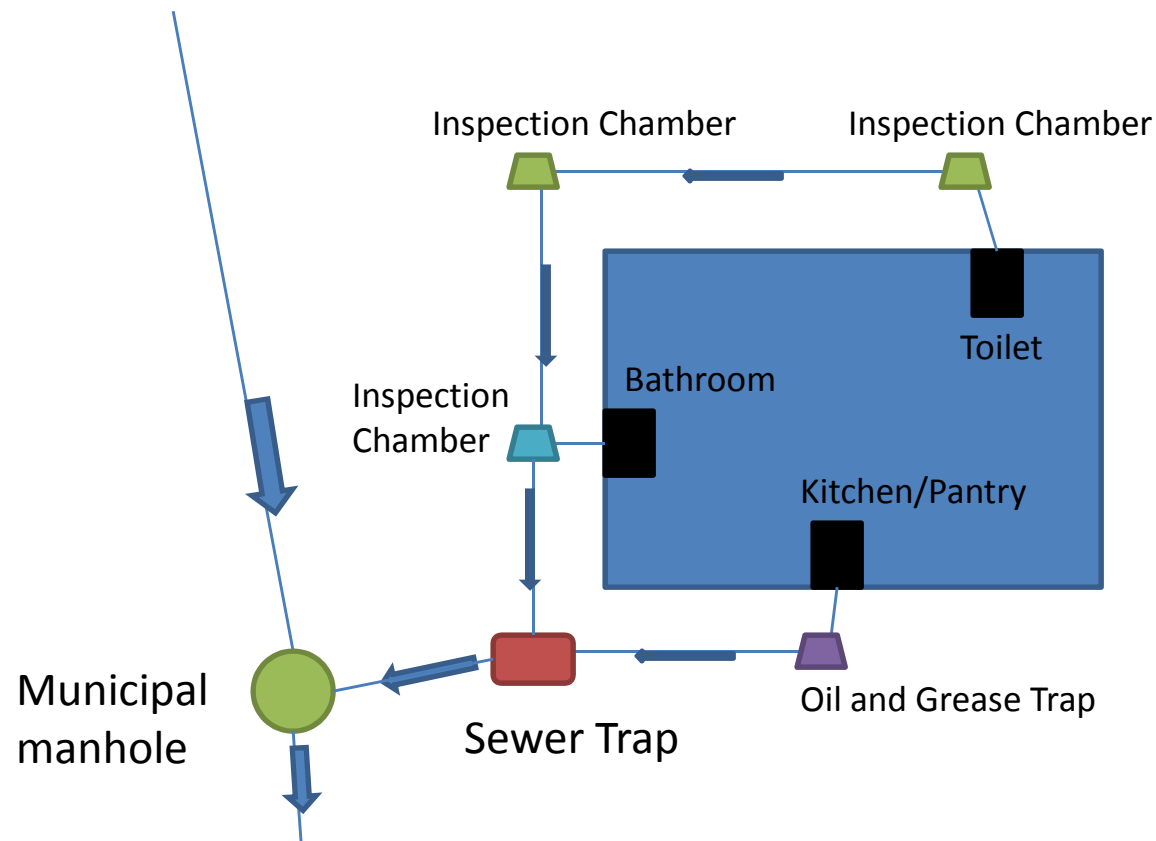
- Remarks for street connection, internal sewer or to lay sewer on D.P. road by MCGM if developer wish to do so.
- Remarks for construction of Septic Tank & Upflow Filter/Soak Pit.
- Remarks for overflow connection from S.T.P. to the nearby sewer line.
- To accept D.C.C. (Drainage Completion Certificate) in all above cases.

TECHNICAL DETAILS REQUIRED FOR INTERNAL LAYOUT

- Select shortest route to avoid deeper depth of sewer trap (Option 1)



- Select shortest route to avoid deeper depth of sewer trap (Option 2)



Flow calculation for Internal Sewer & Street Connection

- Calculation of sewage flow:-

- **Residential Building**

Number of Residential Tenements:- N

No of person per tenements = 5 , Peak Factor = 3

**Flow generated: $(N*5*135*0.85*3)/(4.54*1000000)$
= ____ Million Gallon Per Day (MGD)**

- **Other than Residential Building:-**

Number of Occupants :- M

e.g. for Office building (as per bye-laws 36.3.1)

Gents per W.C. = 25 nos **=25 x 1 =25 ..A**

Ladies per W.C. = 15 nos **=15 x 1 =15..B**

M=A+B=40

**Flow generated:- $(M*45*0.85*3)/(4.54*1000000)$
= ____ Million Gallon Per Day (MGD)**

Design Criteria for Sewer Line

- Selection of sewer pipe

Sr. No.	Dia. Of Pipe in mm	Slope 1 in	Discharge in MGD
1	150	80	0.360
2	230	135	0.83
3	300	200	1.47
4	350	240	2.03
5	400	290	2.45

Sewer connection by Pumping Arrangement

- When the sewer connection is not possible by gravity, in such cases provide sump well and pumping arrangement wherein the sewage flow is allowed in sump well and from there it is lifted up through rising main and connect it to Municipal sewer by gravity through intermediate balancing chamber. The Sump Well shall be designed for 20 minutes retention period and balancing chamber for 2 minutes retention period.

Design Criteria for Septic Tank

- **Size of Septic tank/Upflow filter/Soak pit shall be calculated as per IS-2470 Part I & II**

Calculation of Size:-

Residential Building

Number of Residential Tenements:- N

No of person per tenements = 5

1. **Volume required for Daily Sewage Generation= $(N*5*135*0.85)/1000$ =A**
2. **Volume required for digestion of sludge = $N*5*0.033$ =B**
3. **Volume required for of Digested sludge per year= $N*365*0.00021$ =C**

Capacity of Septic Tank :- $A+B+C=D$ in Cu.M

Dimensions of Septic Tank:

The length in meter = 2 to 4 times of width

Liquid Depth of septic tank =1 mtr (below invert level of sewer trap)

Capacity of Soak Pit = $(M \text{ or } N *5)*0.283$

OR

Capacity of Upflow Filter= $A/3$ to $A/2$

- **Location requirement for Septic Tank:** Shall be accessible for maintenance as well as de-sludging by cesspool vehicles

Other than Residential Building:-

Number of Occupants :- M

e.g. for Office building (as per bye-laws 36.3.1)

$$\text{Gents per W.C.} = 25 \text{ nos} \qquad = 25 \times 1 = 25 \text{ ..I}$$

$$\text{Ladies per W.C.} = 15 \text{ nos} \qquad = 15 \times 1 = 15 \text{ ..II}$$

$$M = I + II$$

$$1. \text{ Volume required for Daily Sewage Generation} = M * 45 * 0.85 / 1000 \qquad = A$$

$$2. \text{ Volume required for digestion of sludge} = M * 0.033 \qquad = B$$

$$3. \text{ Volume of Digested sludge per year} = \underline{M * 365 * 0.00021} \qquad = C$$

Capacity of Septic Tank:- $A+B+C=D$ in Cu.M

Capacity of Soak Pit $= (M \text{ or } N * 5) * 0.283$

OR

Capacity of Upflow Filter = $A/3$ to $A/2$

Checklist for Sewerage Remark

1.Name of work & Location		
a	Name of Work	
b	C.T.S. /C.S. No	
c	Village /Division	
2.Ownership Details		
a	Name of IOD Holder	
3.Details of Consultants		
a	Name of Consultant	
b	Whether Consultant is registered with Sewerage Project Department.	Yes/No
c	If yes, Registration no & Whether certified true copy of upto date revalidated license is submitted.	Yes/No
d	Whether appointment letter of Consultant from IOD Holder is submitted.	Yes/No

4.Scrutiny Fee

a	Gross Area of plot under development to be reflected in Profarma duly certified by Architect/Licensed Surveyor	Area:- _____sq mt
b	Whether Architect/Licensed Surveyor who has certified gross plot area has submitted their license copy.	Yes/No
c	Rate at which Scrutiny fee to be charged prevailing at the time of payment i.e.	Rs_____ per sq mt
d	Scrutiny fees towards proposal submitted for NOC from S P department Amount= 4a(Gross Plot Area) x 4c(Prevailing Rate)	Hence Amount:-
e	Whether certified true copy of receipt towards payment of scrutiny fee has been submitted.	Yes/No

5. Sewer line remarks		
a	Whether there is existing sewer network	Yes/No
b	Rate for Sewer line remarks is to be charged prevailing at the time of payment	Rs. _____ Per remark.
6. Proportionate Prorate Charges		
a	Whether certified true copy of D P remarks/Plan in respect of plot under reference has been submitted under no _____ dtd _____	Yes/No
b	Whether plot under reference is affected by i) existing D P Road ii) proposed D P Road iii) deriving access through right of way abutting D P Road.	Yes, affected by _____ /No
c	If yes what is the affected length in mt (if D P road passes through plot then length of both side of D P Road shall be counted)	Length:- ___ RM Note:- Length shall be marked on certified true copy of D P Plan/IOD Plan (highest of length measured on DP Plan/IOD Plan shall be considered)
d	Rate of proportionate prorata charges per running meter prevailing at the time of payment	Rs 27050/ - per mt valid till revision of USOR
e	Proportionate prorata charges /Amount	Amount in Rs= Length(6c)* Rate(6d)*1.39568*0.25
f	Whether certified true copy of receipt towards payment of proportionate prorata charges has been submitted.	Yes/No

MUNICIPAL CORPORATION OF GREATER MUMBAI

(BLOCK ESTIMATE)

(As Per Circular No.CA/WSSD/1 of 05.04.2002)

Sanctioned under No. DMC / E / 17 dated 01.04.2014

Subject :-

Sr.No.	Description	Length in mtr	Rate (Rs)	Per	Amount (Rs)
1	Providing and Laying 230mm dia.S.W pipe sewer upto 2/3/5 Mt. Depth.	10	27,050.00	RMT	270500.00
				(A) Total -Rs.	270500.00
	Add 4% Physical Contingencies			Rs.	10820.00
				(B) Total -Rs.	281320.00
	Add 10% Cost Contingencies on (B)			Rs.	28132.00
				Total -Rs.	309452.00
	Add 12% Water & Sewerage Charges on (B)			Rs.	33758.40
				(C) Total -Rs.	343210.40
	Add 10% Supervision Charges on (C)			Rs.	34321.04
				(D) Total -Rs.	377531.44
	To derive multiplying factor = (D) / (A)				1.39568
	Cost at 25% on (D)			Rs.	94382.86
				Say Rs.	94,400.00
Prorata Charges In Words :- Rupees Ninety four thousand four Hundred Only					

Amount of prorata = Length in Rmt. X Rate X multiplying factor X 0.25

$$= 10 \quad \times 27050 \quad \times 1.39568 \quad \times 0.25$$

$$= 94382.86 \quad \text{say } 94400.00$$

7.If plot under reference is not affected by existing/proposed D P Road or not deriving access through right of way abutting D P Road then payment of proportionate prorated charges is not applicable

Note:- If certified true copy of receipt towards payment of scrutiny fee & certified true copy of receipt towards payment of proportionate prorated charges (if applicable) is not submitted, the proposal shall not be processed further.

(Remarks to be issued by the consultant empanelled / L.Ps registered with H.E. Dept)

Case no-1

Street connection- A) Construction requirement.

The check lists for issue of street connection remarks

Sr. No.	Observation to be made	
a	Whether there is existing sewer net work	Yes/No
b	Whether remarks from SO department regarding dia & functioning of existing sewer line, dia & functioning of existing street connection if any, depth of connecting manhole, flow direction towards which pumping station, etc have been obtained.	Yes, under no _____ dtd _____
c	Whether sewage flow that may be generated in the proposed development on the plot is calculated, whether size of the street connection is worked out & whether the said worked out size is sufficient to cope with the discharge.	Yes

d	Whether there is existing street connection & whether it is functioning smoothly.	If “Yes” then said street connection can be retained. If “No”, then permission for the New street connection shall be granted.
e	Whether there is no existing street connection &/or is not functioning smoothly.	If “Yes”, then permission for the New street connection shall be granted.

Note:- E E (B.P)/ EE(SRA) shall ensure that approved plans shall reflect the number of tenements in case of Residential Development & no of occupancies in respect of Commercial Development in order to arrive at sewage flow.

The street connection remarks are

There is no objection to retain the existing street connection if it fulfills criteria “a” to “d” above

or

There is no objection to lay street connection of 150mm dia at a slope of 1:80 if it fulfills criteria “a” to “c” & “e” above

Case no-2**Street connection- B) Acceptance of DCC.****The check list for issue of DCC for street connection**

Sr. No.	Observation to be made	
a	Whether remarks for retaining street connection is given.	If "Yes" then DCC for street connection is not to be insisted If "No" then following procedure is to be adopted for new street connection
b	Remarks for laying street connection of 150mm dia at a slope of 1:80 through Ch.E. (SP) are issued.	under no _____ dtd_ _____
c	Whether Ch.E. (SO) executed the work of street connection.	Yes/No
d	Whether Ch.E. (SO) certified the executed work from workmanship, specification point of view.	Yes under no _____ dtd_ _____ /No
e	Whether under taking on Rs 200/- Stamp paper is given by IOD Holder stating therein that they will pay proportionate prorata charges if any towards upsizing/laying sewer line on abutting existing(non D P) Road	Yes/No

Sr. No.	Observation to be made	
f	Whether application letter from the consultant along with Appendix II i.e. Drainage Completion Certificate has been submitted.	Yes/No
g	DCC in respect of new street connection can be accepted if complies with check list criteria "b" to "f" above	

Case no-3

Septic tank- A) Construction requirement.

In absence of sewer network abutting to plot under reference .

1.Check list for allowing construction of Septic tank/Upflow filter/Soak pit

Sr. No.	Observation to be made	
a	Whether there is existing sewer net work.	If "Yes" then remarks for street connection shall be issued If "No" then following procedure to be adopted

Sr. No.	Observation to be made	
b	If "a" above is "NO", calculate the size of septic tank on basis of sewage generated in plot depending on occupancy.	Size of Septic tank/Upflow filter/Soak pit shall be calculated as per IS-2470 Part I & II

Case no-3**Septic tank- B) Acceptance of DCC.****Check lists for acceptance of DCC.****1) For Septic tank/Upflow filter/Soak pit.**

Sr. No.	Observation to be made	
a	Whether application letter from the consultant along with Appendix II i.e. Drainage Completion Certificate has been submitted.	Yes/No
b	Whether size (length, width and liquid depth) of Septic tank is as per the approval or otherwise. (Capacity to be checked with the maximum liquid depth of 1.2mtr).	Yes/No
c	Whether Vent shaft has been erected at Sewer trap and septic tank.	Yes/No
d	i) Whether location of Septic tank constructed as per the location approved by BP office & is accessible for the vehicle for the cleaning of Septic Tank. ii) Whether the constructed septic tank is assessable by Municipal desludging vehicle.	Yes/No Yes/No

Sr. No.	Observation to be made	
e	Whether overflow of Septic tank/Upflow filter/ Soak pit is given to SWD/Nalla.	Yes/No
f	Whether Structural stability certificate from registered Structural Engineer in respect of Septic tank/Upflow filter has been submitted.	Yes/No
g	Whether undertaking regarding regular cleaning of septic from the IOD Holder has been submitted.	Yes/No
h	Whether under taking on Rs 200/- Stamp paper is given by IOD Holder stating therein that they will pay proportionate prorated charges if any towards upsizing/laying sewer line on abutting existing(non D P) Road if the plot is abutting to existing Road	Yes/No
i	Whether undertaking on Rs.200/- stamp paper is given by I.O.D. Holder stating that the he will discard the Septic Tank constructed and connect the sewage flow to the municipal sewer line as and when laid abutting to the plot.	Yes/no
j	If all the requirements as stipulated in Sr no "a" to "i" are complied with then DCC can be accepted.	

Case no-4**Sewerage treatment plant (STP) - A) Construction requirement.****Check list for allowing construction of Sewerage Treatment Plant(STP)**

Sr. No.	Observation to be made	
a	Whether there is existing sewer net work.	Yes/No
b	Whether the construction area is more than 20000 sq mt .	If "Yes" then following procedure is to be adopted. If "No" & if "a" above is "Yes" then street connection permission may be granted
c	Whether as per the NOC of MOEF STP is required to be provided	If "Yes" or "No" only the following procedure is to be adopted.
d	Whether feasibility report of Consultant has been submitted in respect of STP	Yes/No

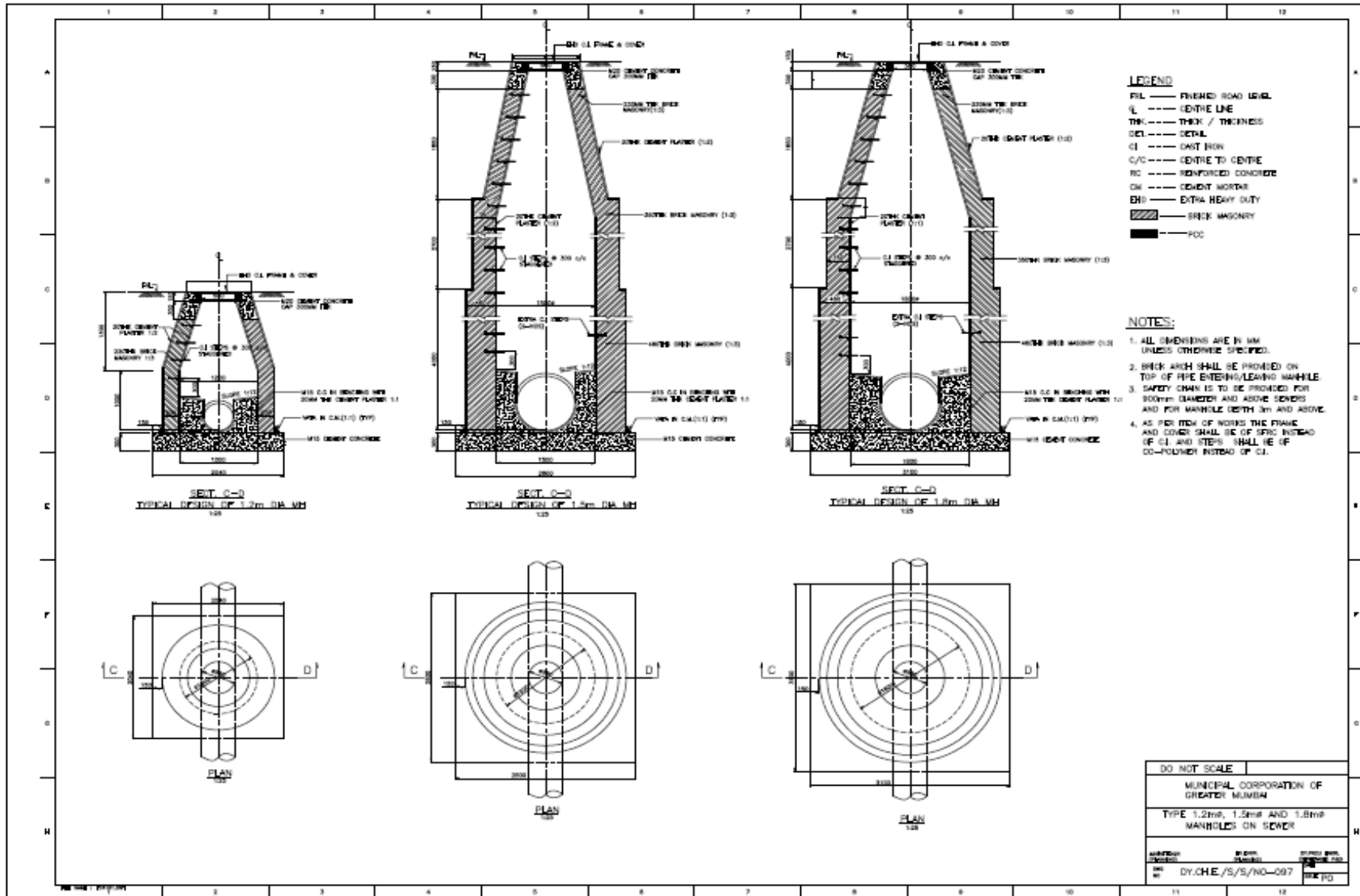
Sr. No.	Observation to be made	
e	Calculate the sewage that may be generated in plot depending on occupancy.	<p style="text-align: center;">Calculation of Capacity:-</p> <p><u>Residential Building</u> No of person per tenements = 5 Capacity of STP= (N*5*135*0.85)/1000 = ____ Cubic Meter Per Day</p> <p><u>Commercial Building:-</u> Number of Occupants :- M e.g. for office</p> <p style="text-align: right;">Gents per W.C. = 25 nos A Ladies per W.C. = 15 nos B M=A+B</p> <p>Capacity of S.T.P.:- (M*45*0.85) /1000 = ____ Cubic Meter Per Day</p>
<p>Note-E.E.(B.P.) /E.E. (SRA) shall ensure that approved plans shall reflect the number of tenements in case of Residential Development & no of occupancies in respect of Commercial Development in order to calculate the capacity of Septic tank/Upflow filter/Soak pit/ Sewerage Treatment Plant(STP).</p>		

Case no-4**Sewerage treatment plant (STP) - B) Acceptance of DCC.****2) For Sewerage Treatment Plant(STP)**

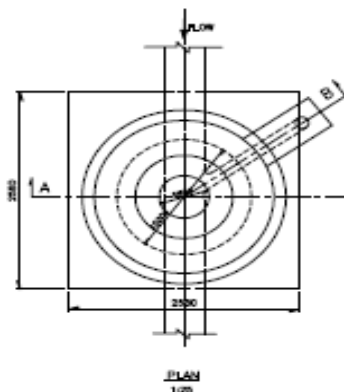
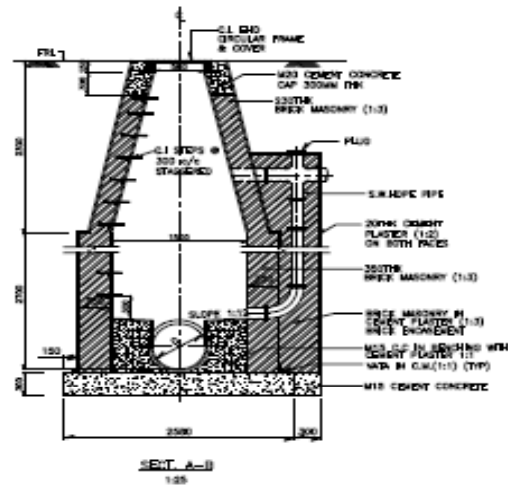
Sr. No.	Observation to be made	
a	Whether application letter from the consultant along with Appendix II i.e. Drainage Completion Certificate has been submitted.	Yes/No
b	Whether Vent shaft has been erected at Sewer trap or.	Yes/No
c	Whether location of STP constructed as per the location approved by BP /SRA office.	Yes/No
d	Whether overflow of STP is given to SWD/Nalla. If there is an existing sewer line then whether overflow is connected to sewer line.	Yes/No
e	Whether Structural stability certificate from registered Structural Engineer in respect of STP has been submitted.	Yes/No

Sr. No.	Observation to be made	
f	Whether part completion certificate/Ready to operation certificate has been issued by Dy.Ch.E. (Env) Civil.	Yes/No
g	Whether under taking on Rs 200/- Stamp paper is given by IOD Holder stating therein that they will pay proportionate prorated charges if any towards upsizing/laying sewer line on abutting existing(non D P) Road if the plot is abutting to existing Road.	Yes/No
h	Whether undertaking regarding maintaining of STP in working condition has been submitted by the IOD/IOA Holder.	Yes/No
i	If all the requirements as stipulated in Sr. no "a" to "h" are complied with then DCC can be accepted.	
<p>Note: All the works shall be carried out as per the Drainage Bye-laws of MCGM.</p>		

1.2 m dia. , 1.5m dia and 1.8m dia. Circular Manhole Details



Vertical Drop Arrangement for Circular Manhole with full encasement



LEGEND

- FRL ----- FINISHED ROAD LEVEL
- CL ----- CENTRE LINE
- THK. ----- THICK / THICKNESS
- DET. ----- DETAIL
- CI ----- CAST IRON
- C/C ----- CENTRE TO CENTRE
- RC ----- REINFORCED CONCRETE
- CM ----- CEMENT MORTAR
- EHD ----- EXTRA HEAVY DUTY
- BRICK MASONRY
- PCC

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. BRICK ARCH SHALL BE PROVIDED ON TOP OF PIPE ENTERING/LEAVING MANHOLE.
3. SAFETY CHAIN IS TO BE PROVIDED FOR DIAMETER AND ABOVE SEWERS 900mm AND FOR MANHOLE DEPTH 3m AND ABOVE.
4. AS PER ITEM OF WORKS THE FRAME AND COVER SHALL BE OF SFRC INSTEAD OF C.I. AND STEPS SHALL BE OF CO-POLYMER INSTEAD OF C.I.

DO NOT SCALE 14/02/13

MUNICIPAL CORPORATION OF GREATER MUMBAI

VERTICAL DROP ARRANGEMENT FOR CIRCULAR MANHOLE WITH FULL ENCASMENT

DWG NO. DY.CH/S/S/99 Po

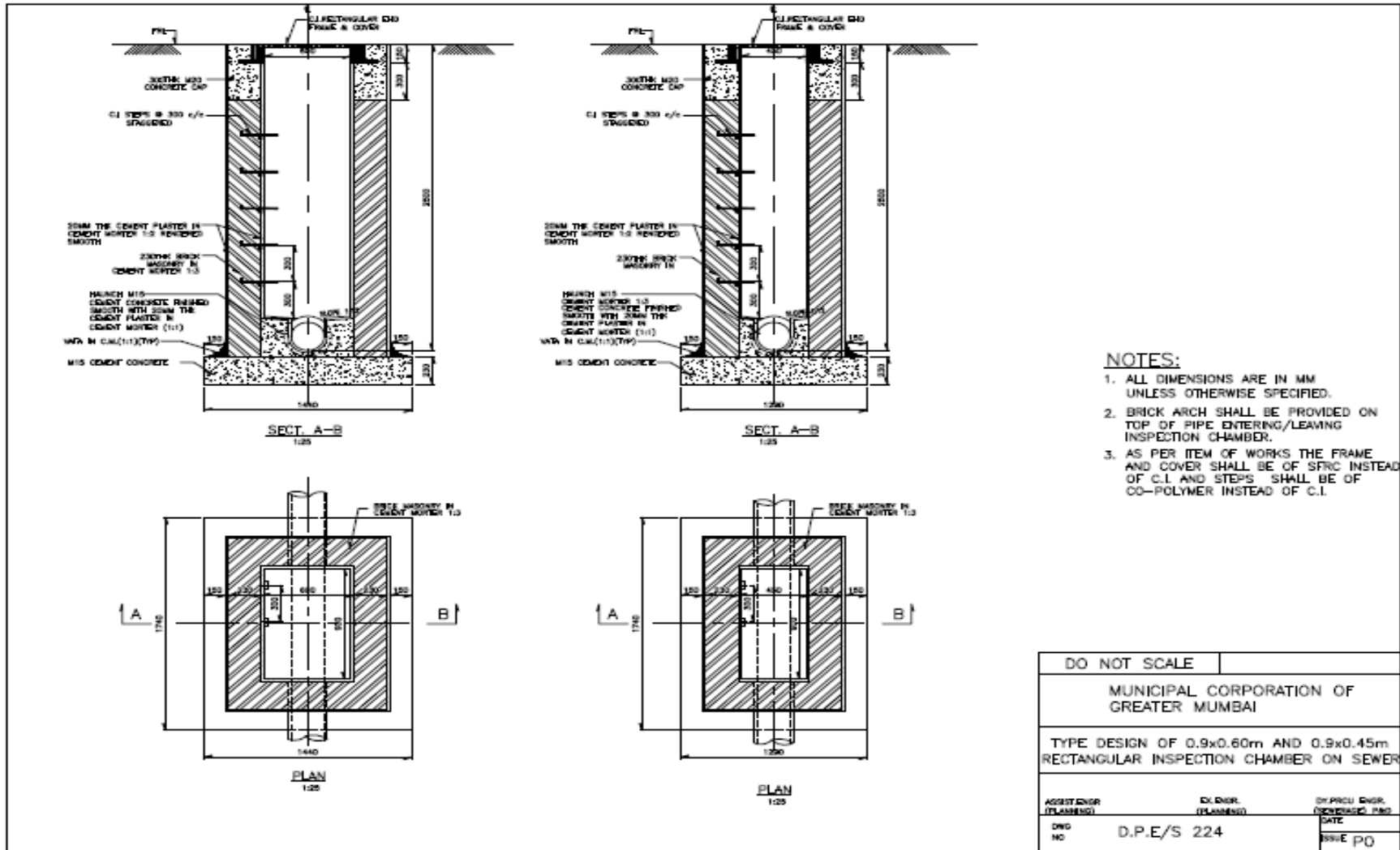
TRACED BY H. DRAFTSMAN CHECKED BY DATE

ASSIST. ENGR. (PLANNING) EX. ENGR. (PLANNING) DY. PRCU. ENGR. (SEWERAGE) P&D

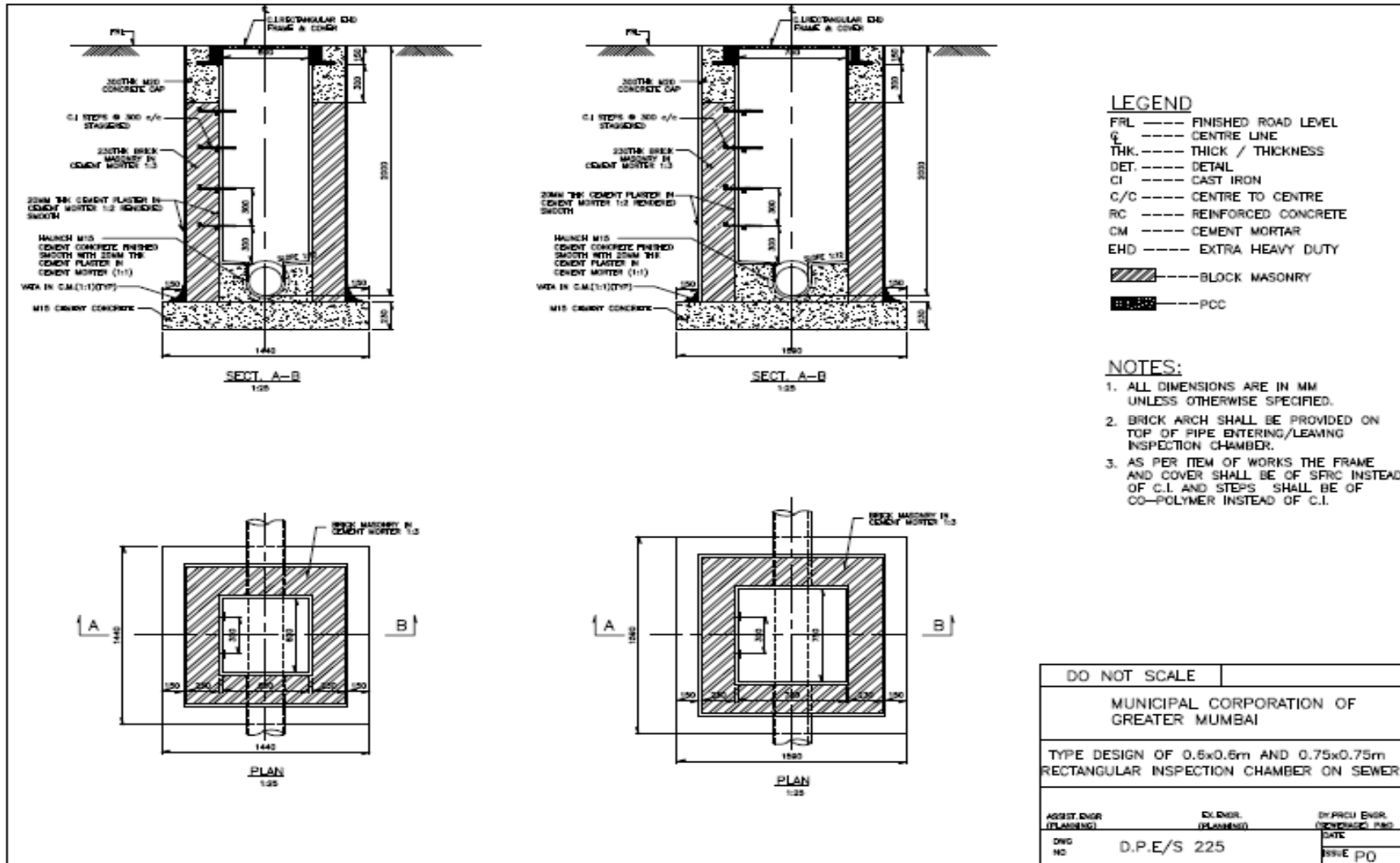
TRADING UNDER THE NAME & STYLE OF

CONTRACTOR WITNESS WITNESS DY. MUNICIPAL COMMISSIONER SPECIAL ENGINEERING

Rectangular Inspection Chamber (0.9 x 0.6) Mtr & (0.9 X 0.45)Mtr



Rectangular Inspection Chamber (0.6 x 0.6) Mtr & (0.45 X 0.45)Mtr



THANK YOU

The text 'THANK YOU' is rendered in a bold, blue, sans-serif font. The letters have a slight 3D effect with a gradient from a darker blue at the top to a lighter blue at the bottom. Below the text is a faint, semi-transparent reflection of the same text, creating a mirror-like effect.