GOVERNMENT OF ANDHRAPRADESH

Office of the Commissioner, Panchayat Raj & Rural Development
#12-47,PVS Icon,4th Floor,Pathuru X Road,Beside Reliance Digital,
Tadepalli, Amaravathi-522501.

Circular.No.608/EGS/PE(C)/ 2018, Dated: 15 .10.2019.

Sir,

Sub:- MGNREGS–AP – RWS&S Department - Providing Open Side Drains with cover slab for Gram Panchayats on first priority – Technical Guidelines issued – Reg.

Ref:-
1. CMP.NO.217/Secy-CM/2019 Dt:06.08.2019 of the Secretary to CM, GoAP.
2. Minutes of review meeting Dt: 04-10-2019 of Hon'ble Minister, PR & RD, Mines and Geology, GoAP.
3. DO.Lr.No.SAC-15/3/2018–COO II–SAC Dt:04-10-2019 of Principal Secretary, PR & RD,GoAP.
4. T/o Message No.608/EGS/PE(C)/2019, Dt:11.10.2019 of Commissioner (PR & RD).

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1) Vide reference 1st cited, the Secretary to Hon'ble CM, GoAP has informed that the Hon'ble Chief Minister desires that NREGS Funds shall be utilized for the purpose of Construction of side drains as priority-I for improving sanitation facilities and transforming the villages towards Swatch Bharat initiatives.
2) In the D.O letter 3rd cited, the Principal Secretary, PR & RD, GoAP has also written to all the Collectors how much amount will be allotted to each Rural Constituency under SBM grant.
3) Previously instructions were issued
   i) To provide Underground drainage system for villages having population above 5000. For this, house hold grey water discharge is only considered for finalization of drain size.
   ii) To provide side drain with cover slab for the villages having population 2000-5000. For this, house hold grey water and rain water from house area are taken into consideration for finalization of drainage section.
   iii) For the village having population less than 2000, Soak pits are proposed

4) Now it is decided to take up CC open drainage system with cover slabs irrespective of population of the GP with the following parameters.

a) For Internal Roads:
   I) Providing drains on both sides of the road where site is available
   II) Providing drain on one side of the road where site is available on one side only due to laying of CC road
   III) Providing individual soak pits within the house area where site is not available due to laying of CC road for the entire width of the road.
   IV) A platform also can be constructed for washing clothes, utensils and it should be connected to the soak pit or drain.

Design criteria :

A) Household drainage (Kitchen, bathroom Grey water) assuming 80% drain off.

B) Rainfall discharge from road surface and house area

b) For Main Roads

I) Providing drains on both sides of the road, duly presuming that site is available on both sides of the road.

Design criteria :

- Same as internal roads.

5) **Financial Pattern**

As per instructions issued vide ref 2nd and 4th cited, it is decided to execute the works through RWS & S Department with a financial sharing pattern of 70 : 30 (MGNREGS : Convergence fund).

Initially it is proposed to take up the works in one Gram Panchayat in each Rural Assembly Constituency on saturation basis. If allocated amount available is more, number of Grama Panchayats can be taken up on saturation basis duly adopting suitable cost effective technology for treatment with reuse.

In order to work out designs certain technical guidelines are formulated and communicated for guidance as follows.

Guidelines :

1. A comprehensive village map along with levels, duly fixing the out fall drain shall be prepared before starting any work. The existing side drains with levels shall also be indicated. The layout plan shall be approved by the Gram Panchayat and it shall be displayed in the GP Office.
2. It will facilitate that as and when the funds are available, the drainage system will be provided according to the GP approved layout plan.
3. For existing CC road portions, the drainage system shall be taken up on one side / both sides of the road depending on the house locations with suitable removable flank chambers and availability of site.
4. Liquid waste from the bath rooms, kitchen, and storm water shall only be allowed in the drains.
5. Liquid Waste from W.Cs. should not be allowed strictly into the drains or soak pits.
6. The drains should be designed both to carry household grey water and storm water. (Other than WC Liquid waste) as stated above.
7. Proper slopes should be maintained to see that liquid waste does not stop at any point and goes to the tail-end. A slope of 1 in 200 is suggested as far as possible to develop non silting velocity.
8. Removable cover slab is to be provided at every 30 meters distance and at every change of alignment, gradient or size of a drain.
9. At the tail-end point, this liquid waste should be taken into regular Drainage scheme and let-out after proper cost effective treatment keeping in view of the minimum O&M and efforts should be made for reuse for Agriculture purpose or plantation purpose etc.,.
10. Population distribution: 5 members may be taken per house.

11. Peak factor should be taken as 3 (three).
12. Discharge should be calculated taking 80% of water supply of 100LPCD.
13. Self cleaning velocity can be taken as 1.0m/sec. At start, less Velocity may also be allowed based on the ground strata to reduce deeper trench cutting.
14. Invert levels of end points should be common for all lines at junctions.
15. Disposal points should invariably be identified before going for design.
16. Proper measures should be taken for disposal of the liquid waste.
17. In case the disposal point is lower than the surrounding ground level the disposal may be planed either by digging lower ponds or with pumping, to avoid submergence.
18. Typical design calculations for population up to 2000 are herewith attached.
19. The crosses sections shall be either Semi Circular or Trapezoidal. In no case a cross section of Rectangular or Square shall be allowed.
20. For higher populations the cross sections of the drains shall be suitably modified and adopted.
21. The execution should start from the downstream to upstream to avoid stagnation of drainage water.
22. Simultaneously, house connections are to be provided to the drains.
23. Where Under Ground Drain or open side drains are partly done, the balance area must be completed to cover entire village with the present open drainage system and let off after proper treatment.
24. For isolated houses separate drain should be provided with suitable community soak pit.
25. Detailed project report should be prepared by the Superintending Engineer, RWS & S with holistic saturation mode, duly meeting the expenditure from 2% Admin charges.

Encl: Typical Designs

Yours sincerely,

R. Ranade Rao
15/10/2019

Technical Advisor, PR &RD

To,

All the District Collectors in the State.
The Engineer-in-Chief(RWS & S), Gollapudi, Vijayawada.
The Chief Engineer (RWS & S), Gollapudi, Vijayawada.
All the Superintending Engineers (RWS & S), in the State.
All the Executive Engineers (RWS & S), in the State.
Copy to submitted to Principal Secretary, PR &RD,RWS&S for favour of information.
Copy to the Commissioner, PR & RD for information.
Copy to the Managing Director, Swatch Andhra Corporation for information.

Gopal Krishna Dwivedi, I.A.S.,
Principal Secretary to Government

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Government of Andhra Pradesh
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D.O.Lr.No: SAC-15/3/2018-COO II-SAC, Dt:04.10.2019.

Dear Bhaskara garu,

Sub: SAC-Implementation of Liquid Waste Management under SBM (G) with the Convergence of MGNREGS Department – Requested – Reg.

Ref: Note No. 1034/M(PR & RD, Mines & Geology/2019, Dt: 04/10/2019 from the Hon'ble Minister, PR & RD, Mines & Geology.

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Kind attention is invited to the subject and reference cited.

It is has been decided by the Government of Andhra Pradesh to utilize Swachh Bharat Mission Gramin Funds for Liquid Waste Management works like covered side drains in all the Mandals in the Districts with convergence funds of SBM(G) – 30% and MGNREGS – 70%. Details of Constituency wise Financial Eligibilities indicated in the list enclosed for your convenience.

I, therefore request all the District Collectors to issue necessary instructions to the concerned SE RWS & S to prepare an action plan for implementation of Liquid Waste Management works as per the budget indicated in the annexure in Districts under SBM (G) with the convergence of MGNREGS Department.

Regards,

Yours Sincerely,

(Gopal Krishna Dwivedi)

Encl: As above.

To
Sri P.Bhaskara, IAS
District Collector & Megistrate,
Prakasam.

FINANCIAL ELIGIBILITY TO TAKE UP RWS WORKS UNDER LWM

S.No	District Name	Assembly Name	Financial Eligibilty	SBM(G) - 30%	MGNREGS - 70%
1	Prakasam	Addanki	11.50	3.50	8.00
2		Chirala	11.50	3.50	8.00
3		Darsi	11.50	3.50	8.00
4		Giddalur	11.50	3.50	8.00
5		Kandukur	11.50	3.50	8.00
6		Kanigiri	11.50	3.50	8.00
7		Kondapi (SC)	11.50	3.50	8.00
8		Markapuram	11.50	3.50	8.00
9		Ongole	11.50	3.50	8.00
10		Parchur	11.50	3.50	8.00
11		Santhanuthalapadu (SC)	11.50	3.50	8.00
12		Yerragondapalem (SC)	11.50	3.50	8.00
		SUB TOTAL:	**138.00**	**42.00**	**96.00**

Design of Open Drainage System for the Villages having Population Upto 2000

Assumptions:

I

1	No of persons in one house	5
2	House discharge	80% of 100lts
3	usage is assumed as	12Hrs
4	Size of Plot	10m x 15m 150sqm
5	Road width of the internal streets	7.50m
6	Main Road width	15.0m
7	Parking,schools etc area is considered	20% additional

II Rainfall discharge

i. Percolation losses in Internal Houses — 30% of rainfall discharge

ii. Rainfall on Roads — 40% considered for open Drains

III Semi Circular pipes for internal streets & Trapezoidal section for main roads ,

IV (I)12 Houses on one side of internal road and (II)8 houses on one side of internal road Internal roads are considered on either side of the Main Road. This may vary from village to village.

V

Internal roads on one side having 12 houses are taken as 50% and internal roads on one side having 8 houses are taken as 50% on either side of main road

Dicharge calculations:

I **12 Houses on one side of internal road:**

a)	House Discharge = 12 x5 x100 x 0.8	4800	lit/day
	Discharge from the houses on either side of road i.e., from 24 houses	9600	lit/day
	Assuming 12Hrs usage = 9600/(12*60)	13.333333	lpm
	Take Peak factor as 3		
	Peak discharge = 3 x 13.333	40	lpm
	=40 /(1000 * 60)	0.0006667	cum/sec
i	**If the drain is considered on one side, The Discharge from houses**	**0.0006667**	cum/sec .....A
ii	**If the drain is considered on two sides , The Discharge from houses into one drain = 0.000667/2**	**0.0003333**	cum/sec .....B

b) Rainfall from houses

Area from which rainfall considered = 24 * 150sqm	3600	sqm
Area in Hectares' = 3600 / 10000	0.36	hectares
30% is treated as percolation losses, then area of flow (70*0.36/100)	0.252	hectares

d) Rainfall discharge from Houses Area: (24 Houses)

Discharge Q = RAP/36;
Where R = Intensity of Maximum Rainfall in cm/hr (take the maximum rainfall details from the concerned department for that particular locality/ district);
Assume R = 63mm/hr =6.3cm/hr
A = Drainage area in hectares;
P = Impervious factor (say) 0.80 for ordinary soils as most of the area is covered withhouses and concrete pavements
Q = (6.3 x 0.252 x 0.8) / 36 — 0.03528 cum/sec C

e) Total discharge from Houses = house discharge + rainfall discharge ie., A + C (0.000667+0.03528) — 0.03595 cum/sec .....D

f Total Dischrage for drains if provided on one side of internal road = D — 0.03595 cum/sec .....F

g Total Dischrage for drains if provided on two sides of internal road = (D) / 2 = Q (0.03595/2) — 0.0180 cum/sec

IF Drain is considered on two sides

i) Area of the drain= Q/V = 0.018 / 1.0 — 0.0180 sqm
Assume V= velocity of flow as 1.00m/sec

j) If semi circular pipe is taken in to consideration as Drain section

$(\prod r^2) / 2 = 0.018$ — 0.0180

$r^2 = 0.018 * 2 / \prod$ — 0.01144

r = 0.107 m

say r= **150** mm

Diameter of semicircular pipe= 300 mm

IF Drain is considered on one side

Area of the drain= Q/V =0.036/1.0 — 0.036 sqm
Assume V= velocity of flow as1.00m/sec

If semi circular pipe is taken in to consideration as Drain section

$(\prod r^2) / 2 = 0.036$ — 0.036

$r^2 = 0.036 * 2 / \prod$ — 0.0229

r = 0.1512 m

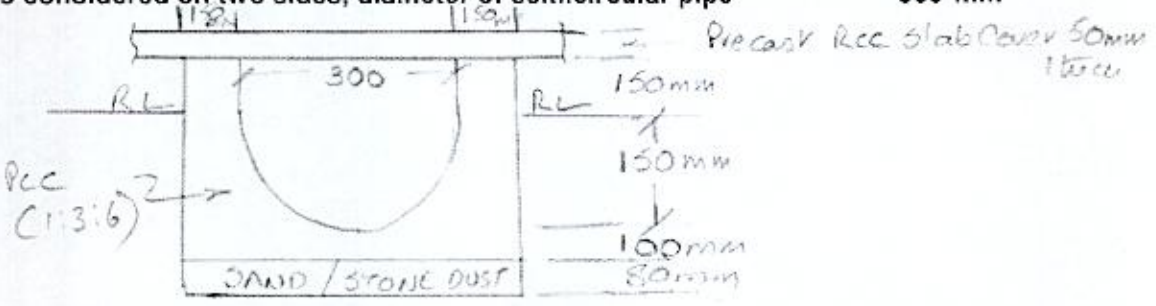
say r= **150** mm

Diameter of semicircular pipe= 300 mm

Summary:

120m (400') length of street with 12 houses on either side of road

i. **If drain is considered on one side, diameter of semicircular pipe** — **300 mm**
ii. **If drain is considered on two sides, diameter of semicircular pipe** — **300 mm**



II **8 Houses on one side of internal road:**

Road Length = 80M
Street width = 7.50M
House Area - 10M X 15M = 150sqm

a) House Discharge = 8 x5 x100 x 0.8 — 3200 lit/day
Discharge from houses on either side of road ie., from 16 houses — 6400 lit/day
Assuming 12Hrs usage= 6400/(12*60) — 8.889 lpm
Take Peak factor as 3
Peak discharge = 3 x 8.889 — 26.666667 lpm
= 26.667 /(1000 * 60) — 0.0004444 cum/sec

i **If the drain is considered on one side, The Discharge from houses** — **0.0004444** cum/sec .....A 1

ii **If the drain is considered on two sides , The Discharge from houses in each drain (0.000444/2)** — **0.0002222** cum/sec .....B 1

b) Rainfall from houses
Area from which rainfall considered = 16 * 150sqm — 2400 sqm
Area in Hectares = 2400 / 10000 — 0.24 hectares
30% is treated as percolation losses, then area of flow (70*0.24/100) — 0.168 hectares

d) **Rainfall discharge from Houses Area :**

Discharge Q = RAP/36;
Where R = Intensity of Maximum Rainfall in cm/hr (take the maximum rainfall details from the concerned department for that particular locality/ district);
Assume R = 63mm/hr =6.3cm/hr;
A = Drainage area in hectares;
P = Impervious factor (say) 0.80 for ordinary soils
Q = (6.3 x 0.168 x 0.8) / 36 — 0.02352 cum/sec .....C 1

e) Total discharge from Houses = house discharge + rainfall discharge ie., A 1 + C 1 (0.000444+0.01764) — 0.02396 cum/sec .....D 1

g) Total Dischrage for drains if provided on one side of internal road = D 1 (0.02396) — 0.02396 cum/sec F1

h Total Dischrage for drains if provided on two sides of internal road = (D1) / 2 = Q (0.02396/2) — 0.0120 cum/sec

IF Drain is considered on two sides

i) Area of the drain= Q/V = 0.011982 / 1.0 — 0.0120 sqm
Assume V= velocity of flow as1.0m/sec

j) If semi circular pipe is taken in to consideration as Drain section
$(\prod r^2) / 2 = 0.012$ — 0.0120
$r^2 = 0.012 * 2 / \prod$ — 0.0076251
r = — 0.0873 m
say r= — **100** mm
Diameter of semicircular pipe= — 200 mm

IF Drain is considered on one side

Area of the drain= Q/V =0.02396 /1.0 — 0.0240 sqm
Assume V= velocity of flow as 0.50m/sec

If semi circular pipe is taken in to consideration as Drain section

$(\prod r^2) / 2 = 0.024$ 0.0240

$r^2 = 0.024 * 2 / \prod$ 0.0152501

r = 0.1235 m

say r= **150** mm

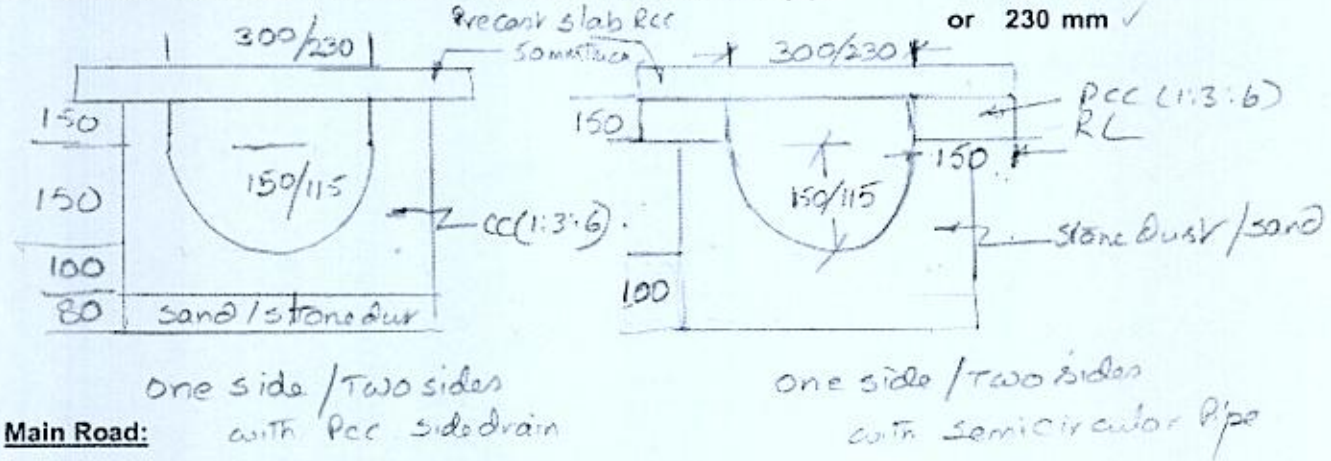
Diameter of semicircular pipe= **300** mm

Summary:

80m (262') length of street with 8 houses on either side of road

i if drain is considered on one side, diameter of semicircular pipe **300 mm** ✓

ii if drain is considered on two sides, diameter of semicircular pipe **200 mm** or **230 mm** ✓



III **Main Road:**

A To Cover 1000 Population , Internal roads on one side having 12 houses on one side are taken as 50% and internal roads having 8 houses on one side are taken as 50% (on either side of main road)

50% streets of 12 houses - 2 rows — 60 Persons for 12Houses

50% streets of 8 houses - 3 rows — 40 Persons for 8Houses

20% Parking Areas

i. Discharge from 12 houses streets = 2 x F (2*0.03595) 0.0719

ii. Discharge from 8 houses streets = 3 x F 1 (3*0.02396) 0.0719

0.1438

Area of the drain= Q/V = 0.1438 /1.0 0.1438 sqm

Assume V= velocity of flow as 1.00m/sec

Drain is provided on both sides of the Road

If Trapezoidal section is taken in to consideration as Drain section

Area 0.1438 sqm

Assume bottom width as 200mm and depth as 0.45m

Top Width 0.439 m

say **450** mm

B To Cover 2000 Population , Internal roads on one side having 12 houses on one side are taken as 50% and internal roads having 8 houses on one side are taken as 50% (on either side of main road)

20% extra for parking etc.,

Total Discharge through drains

Total Discharge = Q =2x0.1438 0.287573 cum/sec

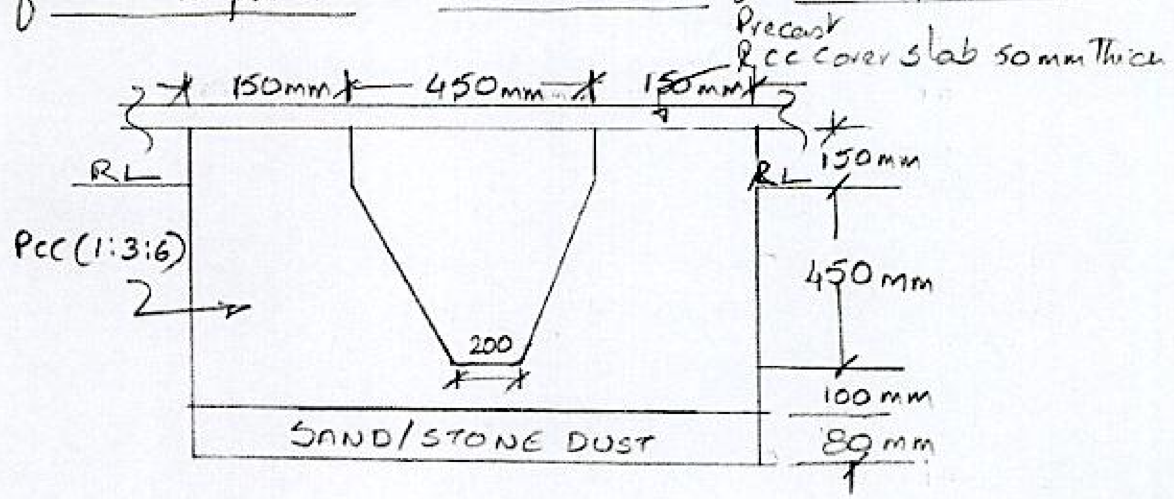
Area of the drain= Q/V = 0.287573/ 1.0	0.2876 sqm
Assume V= velocity of flow as 0.50m/sec	

Drain is provided on both sides of the Road

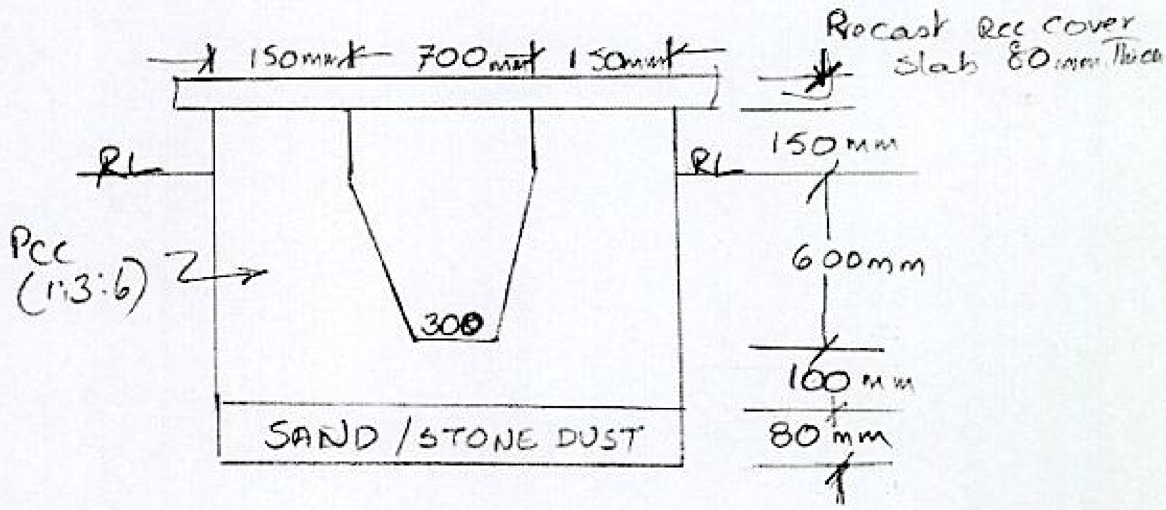
If Trapezoidal section is taken in to consideration as Drain section

Area	0.2876 sqm
Assume bottom width as 300mm and depth as 0.45m	
Top Width	0.978 m
	1000 mm
Assume bottom width as 300mm and depth as 0.6m	
Top Width	0.659 m
say	**700.00** mm

(A) If drain is provided on both sides for 1000 population



(B) If drain is provided on both sides for 2000 population



15/10/2015
Tech - Advisor