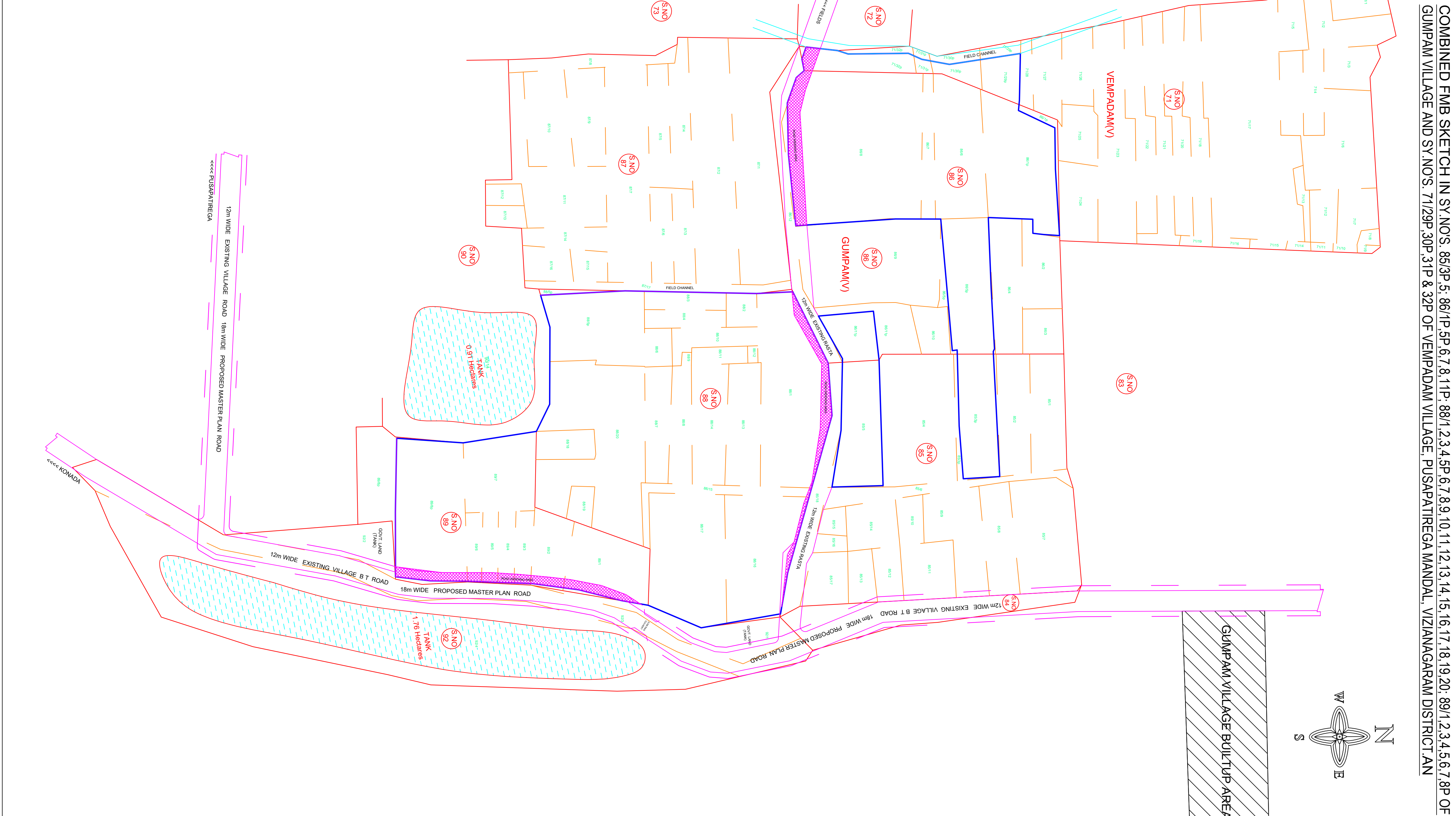




ID	Name	Activity			Performance			Efficiency			Capacity			Reliability		
		Eng	Prog	Test	Eng	Prog	Test	Eng	Prog	Test	Eng	Prog	Test	Eng	Prog	Test
1	Project Alpha	95	92	90	98	95	93	99	97	95	99	98	96	99	98	97
2	Project Beta	90	88	85	92	90	88	95	93	91	96	94	92	97	95	93
3	Project Gamma	88	85	82	90	88	85	93	91	89	94	92	90	95	93	91
4	Project Delta	85	82	80	88	85	83	90	88	86	92	90	88	93	91	89
5	Project Epsilon	82	80	78	85	82	80	88	85	83	90	88	86	91	89	87
6	Project Zeta	80	78	75	83	80	78	85	82	80	88	85	83	89	87	85
7	Project Eta	78	75	73	80	78	75	82	80	78	85	82	80	87	85	83
8	Project Theta	75	73	70	78	75	73	80	78	75	82	80	78	84	82	80
9	Project Iota	73	70	68	75	73	70	78	75	73	80	78	75	81	79	77
10	Project Kappa	70	68	65	73	70	68	75	73	70	78	75	73	79	77	75
11	Project Lambda	68	65	63	70	68	65	73	70	68	75	73	70	77	75	73
12	Project Mu	65	63	60	68	65	63	70	68	65	73	70	68	74	72	70
13	Project Nu	63	60	58	65	63	60	68	65	63	70	68	65	71	69	67
14	Project Xi	60	58	55	63	60	58	65	63	60	68	65	63	69	67	65
15	Project Omicron	58	55	53	60	58	55	63	60	58	65	63	60	66	64	62
16	Project Pi	55	53	50	58	55	53	60	58	55	63	60	58	63	61	59
17	Project Rho	53	50	48	55	53	50	58	55	53	60	58	55	60	58	56
18	Project Sigma	50	48	45	53	50	48	55	53	50	58	55	53	58	56	54
19	Project Tau	48	45	43	50	48	45	53	50	48	55	53	50	55	53	51
20	Project Upsilon	45	43	40	48	45	43	50	48	45	53	50	48	52	50	48
21	Project Phi	43	40	38	45	43	40	48	45	43	50	48	45	50	48	46
22	Project Chi	40	38	35	43	40	38	45	43	40	48	45	43	48	46	44
23	Project Psi	38	35	33	40	38	35	43	40	38	45	43	40	45	43	41
24	Project Omega	35	33	30	38	35	33	40	38	35	43	40	38	42	40	38
25	Project Alpha	33	30	28	35	33	30	38	35	33	40	38	35	40	38	36
26	Project Beta	30	28	25	33	30	28	35	33	30	38	35	33	38	36	34
27	Project Gamma	28	25	23	30	28	25	33	30	28	35	33	30	35	33	31
28	Project Delta	25	23	20	28	25	23	30	28	25	33	30	28	32	30	28
29	Project Epsilon	23	20	18	25	23	20	28	25	23	30	28	25	30	28	26
30	Project Zeta	20	18	15	23	20	18	25	23	20	28	25	23	28	26	24
31	Project Eta	18	15	13	20	18	15	23	20	18	25	23	20	25	23	21
32	Project Theta	15	13	10	18	15	13	20	18	15	23	20	18	22	20	1

[illegible]

AREA STATEMENT		5y. No. of Squatters (GUMWATER)	Proposed 5y. No. of Squatters
85/39P	1407.39	85/39P	1750.68
86/1P	2549.61	86/1P	2549.61
86/50P	2033.50	86/50P	2033.50
86/6P	2387.73	86/6P	2387.73
86/7P	526.11	86/7P	526.11
86/8P	7041.78	86/8P	7041.78
86/11P	5705.85	86/11P	5705.85
88/1	4202.88	88/1	4202.88
88/2	364.23	88/2	364.23
88/3	405.64	88/3	405.64
88/4	526.11	88/4	526.11
86/5P	2347.26	86/5P	2347.26
88/6	404.70	88/6	404.70
88/7	1092.69	88/7	1092.69
88/8	849.87	88/8	849.87
88/9	687.99	88/9	687.99
88/10	364.23	88/10	364.23
88/11	40.47	88/11	40.47
88/12	1416.65	88/12	1416.65
88/13	1467.39	88/13	1467.39
88/14	809.87	88/14	809.87
88/16	3075.12	88/16	3075.12
88/17	3561.36	88/17	3561.36
88/18	647.52	88/18	647.52
88/19	364.23	88/19	364.23
88/20	5159.69	88/20	5159.69
89/1	1861.62	89/1	1861.62
89/2	917.28	89/2	917.28
VEPAID (V)			
89/3P	445.17	89/3P	445.17
89/4	445.17	89/4	445.17
89/5	404.70	89/5	404.70
89/6	1942.56	89/6	1942.56
89/7	2832.90	89/7	2832.90
89/8P	2832.90	89/8P	2832.90
TOTAL	57317.65	TOTAL	57317.65

[illegible]

ANNEXURE – I

INFRASTRUCTURE TO BE PROVIDED AND SPECIFICATION IN THE LAYOUT AREA:

I. The following services should be provided by the layout owner.

A. Municipal Corporation/Municipal Area/Non-Municipal Areas (Gram Panchayats):

1. Bitumen surface roads with Water Bound Macadam road (WBM).
2. Pucca Masonry drain/RCC drain including load drain and drainage system in arrangement with Municipal Corporation/Municipality/Gram Panchayat/near by outlet.
3. Protected Water supply arrangement with Municipal Corporation/Municipality/ Non-Municipality or borewells with internal water supply system by the layout owner.
4. Street electrification arrangement with Municipal Corporation/Municipality or by the layout owner.
5. Rain harvesting structures in open space/parks.
6. The open spaces shall be enclosed with a minimum of 2'-0" height basement wall and over that 2'-0" height grills or Brick masonry.
7. Avenue plantation.

II. Specifications :

Shall conform to the detailed guidelines detailed in Annexure-II.

ANNEXURE - II

Guidelines for taking up Development works Engineering Designs & Construction:

GENERAL REQUIREMENT:

1. General:

This section of Engineering guidelines for layout development have been compiled on outline VUDA's general procedure and practices in respect of the Engineering works for the development of land and providing infrastructure facilities within the jurisdiction of VUDA.

The following guidelines have been prepared in order to facilitate the efficient, processing of Engineering drawings, submissions and construction approvals for release of Final Layout Plan. Applicant should be aware that each requirement to be treated on its merits and that approval is dependent on the overall impact of the development of the area and not solely in compliance with minimum Engineering standards.

It is the responsibility of the applicant to ensure that all works are carried out in a sound efficient workmen like manner and in accordance with sound engineering practice and principle and are completed in accordance with the approved Engineering Drawing and specifications.

Before the applicant commencing the Civil Engineering works, Engineering drawings are to be submitted and approved by VUDA. After obtaining the approval and any consent required in writing from statutory authority and adjoining property owner if applicable the applicant may construct the roads, drains and all other improvement works.

1. EARTH Work:

2.1 Removal of Trees.

The applicant is advised that no trees are to be removed without VUDA permission.

Removal of trees is limited to those directly affected by road and/ or drainage construction or as specified herein. Trees which are considered to be dangerous or may damage any part of the road, proposed road or public place, drainage structure or any public utility installation, or may affect visibility, shall be removed or trimmed.

Trees and / or shrubs to be retained are to be adequately protected at all times and particulars care shall be taken to avoid damage in the roots, trunks and branches.

1.2 Clearing and Grubbing:

For the full area of the site specified or shown on the drawing the prescribed materials, being fences, concrete and / or brick foundations and / or floors, structures of all descriptions, trees, shrubs, scrub, stumps, logs, boulders and roots, except those fences, structures, trees, shrubs and / or items shall be cleared and / or wholly grubbed and shall be disposed of in accordance with the provisions of section 3.3.

1.3 Disposal of material:

All material cleared and / or grubbed in accordance with these guidelines shall become the property of the applicant and shall be removed from site and disposed of in an / appropriate manner.

The burning of materials is prohibited.

1.4 Stripping of Topsoil

The topsoil is to be stripped from the construction area to a depth specified on the approved Engineering drawings, or as directed by VUDA stockpiled and replaced or as directed by VUDA stockpiled and replaced upon the earth works at the completion of the construction and / or spread over those areas of the site indicated on the approved Engineering drawings appropriate erosion and sediment control measures are to be implemented for stockpile sites and those areas where topsoil has been replaced.

1.5 Unsuitable Material / Improper Works :

Following the stripping of topsoil and before any excavation, filling or other works commenced any underlying material which is unsuitable for the placing of filling or as a sub-grade material shall be removed and disposed of, as directed, to an approved site.

If at any time during the progress of the work VUDA Engineering (Quality control cell of VUDA) is of the opinion that any material of work whether fixed or not, is of inferior or improper nature, he may direct, in writing, the removal or amendment of the same by the applicant, notwithstanding that he may previously have expressed satisfaction in regard there to and the removal or amendment of the said material or work shall be done.

1.6 Embankments

Embankments shall be constructed from approved sound material placed in horizontal layers not greater than 150mm in thickness loose measurement and shall be compacted to give a density ratio or at least 95% standard as per the MDST / IRC specification where the cross slope of the natural surface is steeper than one (1) vertical, in four (4) horizontal, the base of the entire embankment shall be stopped and roughened to prevent slipping, and benched to hold the top of the embankment, before an existing to give a bond with new material.

1.7 Catch Drains / Table Drains :

On the top side of cuttings catch drains shall be provided with a cross-sectional area not less than 0.2 Square meters. Side slopes not steeper than adjacent road gutter and a minimum depth of 300mm over a width of at least 300mm. The minimum gradient of catch drains shall be 1:100. The catch drain shall be located a minimum 2.5 mtrs from the edge of the cutting.

Where the grade of the catch drain exceeds 6% scour protection shall be provided. The type of scour protection provided shall be sufficient in completely restrict scour.

Proper outlet drains shall be provided leading to culverts and in earth cuttings pitching of the outlet drain is to be provided to prevent scour.

The applicant may construct an embankment not less than 500mm high, 300mm wide on top with 2:1 slopes in lieu of cutting catch drains.

Table drains, when necessary shall be aligned and graded parallel to the shoulders of the roadway and diverted at intervals not exceeding 150 metres into culverts, side drains for water sources.

Where grade of the table drain exceeds 6% scour protection in the form of concrete lined drain to kerb and gutter shall be provided.

2. Section Road works:

3.1 General:

The road pavement is to be designed in accordance with MDST/IRC specifications.

The road pavement shall be constructed on the sub-grade or sub-base in uniform layers to provide the specified pavement thickness. No individual layers shall be more than 200mm or less than 100mm compacted thickness. Each layer of the pavement shall be finished by slurry in to give smooth surface conforming to the design.

3.2 Sub-base course:

In all cases except in cut in rock or hard gravel strata the sub-base shall be formed with Quarry Rubbish of minimum 230mm thick including consolidation with 8 to 10 tonnes road roller including sectioning to camber and gradient trimming side slopes etc. The sub-base material shall have the properties / specifications as per MDST.

3.3 Base course:

Base course is proposed in two layers each 100mm thick (loose) compacted to 75mm thick each. The base course material shall satisfy the requirements of MDST/IRC.

- a) 1st Layer provide WBM using 65mm size HB OTG metal (IRC) spread 100mm thick loose compacted to 75mm thick using 25% of gravel to blindage including sectioning to camber and gradient and consolidation with 8 to 10 tones capacity Power Roller.
- b) 2nd Layer providing WBM road by spreading 63 to 45mm HBG GR-II Metal (I.R.C./ MDST) to compacted thickness of 75mm using 25% of gravel for blindage including sectioning to camber and gradient and consolidate with 8 to 10 tonnes power roller and wetting the consolidation for a period of fortnight etc.,

3.4 Wearing Course :

a) B.T. Carpet :

Providing B.T. carpet 20mm thick using 0.18 cum of 13X20mm size stone chippings (passing 22.4mm sieve and retained on 11.2mm sieve) and 0.09 cum of 11.2mm size stone chippings (passing 13.20mm sieve and retained on 5.6mm sieve) using total quantity of 14.60 Kgs of 80/100 Grade Bitumen

per 10 Sq.m including sectioning to camber and consolidation of 8 to 10 tonnes power roller.

b) **B.T. Seal Coat:**

Providing B.T. simultaneous Seal coat using 0.06cum of course fine aggregate 6.70mm size passing I.S. 9.50mm sieve and retained on I.S. 2.36mm sieve per 10 Sq.mts and using total quantity of 680 Kgs of 80/100 grade Bitumen per 10 Sq.mts including consolidation with 8 to 10 tonnes Power Roller.

3.5 Kerb and Gutter :

Kerb and gutter is to be provided as per type design enclosed in VCC (1:2:4) mix using 20mm size H.B.G. metal for 100 feet, 80 feet and 60 feet wide roads.

Roads design:

1. 24', 30' & 33' wide roads / paths:

Carriage way 4.00 mts wide with provision for side drains and germs on both sides.

2. 40' wide road:

Carriage way : 7.50 Mts.

Greener / Path way : On either side.

Drainage : Masonry drains with provision of suitable connecting pipe.

3. 60' wide road:

Carriage way : 10 Mts.

Kerb and Gutter : 640mm

Greener / Pathway : On either side.

Drainage : Masonry drains with provision of suitable connecting pipe.

4. 80' /100 wide roads

Carriage way : 4 lane carriage way with two bays of 7.5 Mts each and Central divider of 2.4 mts.

Kerb and Gutter : 640mm

Greenery / Path way : On either side.

Drainage : Masonry drains with provision of suitable connecting pipe.

5. Longitudinal Section:

A longitudinal Section of the center line of the roads shall be supplied at scales of

1:500 Horizontal

1:100 Vertical

The longitudinal section of the centerline of roads shall show supplied chainage reduced level of existing surface and of design level of road design grades, length of vertical curves and where appropriate stopping sight distance.

Longitudinal levels should be taken at maximum 20metre intervals and at all intermediate changes of grade kerb return profiles shall be detailed Longitudinal sections and cross-sections shall be taken along existing intersecting road for sufficient distance (approx. 50 metres) to enable kerb returns, dish-crossing and any necessary drainage to be designed.

6. Cross Sections:

Cross-sections shall be supplied at intervals not exceeding 30 metres for straights and 15 metres at curves at scales of 1:100 natural, cross sections shall show chainage, reduced levels of existing surface and the design level of pavement, kerb and gutter and leaf path.

Cross sections shall show how the new construction ties in with any existing road pavement.

7. Kerb and Gutter:

100', 80' and 60' wide roads to be provided with an approved sealed pavement with kerb and gutter to adequately and safely provided both vehicular and pedestrian access to each allotment; pram ramps are to be provided in all kerb returns.

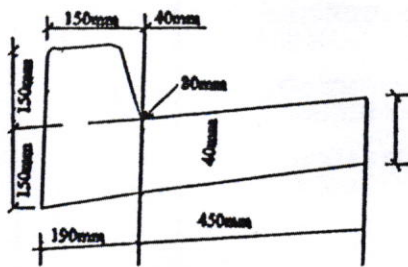
8. Avenue Plantation :

Types of species to be raised for Avenue Plantations.

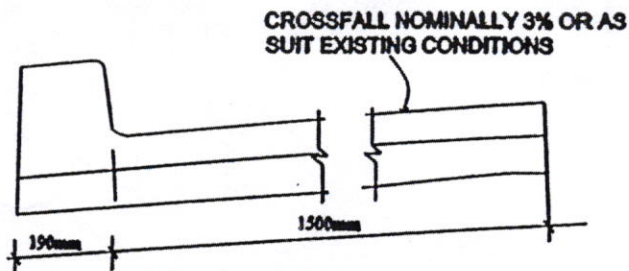
Sl. No	Category of Road	Spacement	Species to be raised
1	30m and above	3x8m on either side	a) S.S. Amam b) P. Foosugina c) Kanuga d) Colonix
2	Above 15m but less than 30m	3x8m	a) Sisso b) Kanuga c) Sapta adia d) Malliggivhia
3	Below 15m	3x8m in a staggered fusion	a) Kanuga b) Neem c) Spatadia d) Miclling tonix

Care should be taken to avoid planting of plants under electric transmissions lines.

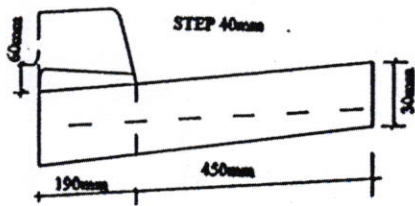
For planting the avenue, 60x60cm cube pits should be dug. Red earth and farmyard manure shall be supplemented if the soil is poor.



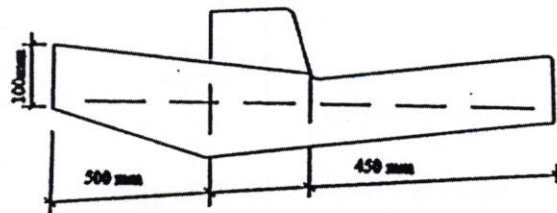
NOMINAL INTEGRAL K&G



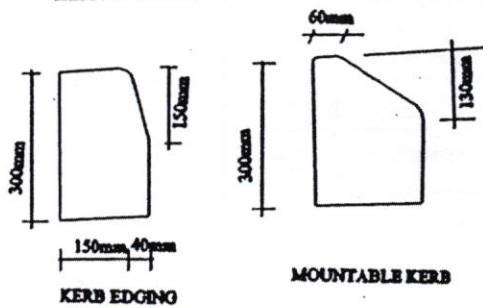
BUS STOP TYPE K&G



KERB VEHICLE ENTRANCE 3M LONG (NORMAL) WITH TWO 100mm WINGS HEAVY DUTY

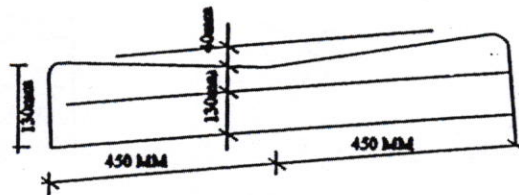


LOW LEVEL FOOTPATH VEHICLE ENTRANCE HEAVY DUTY

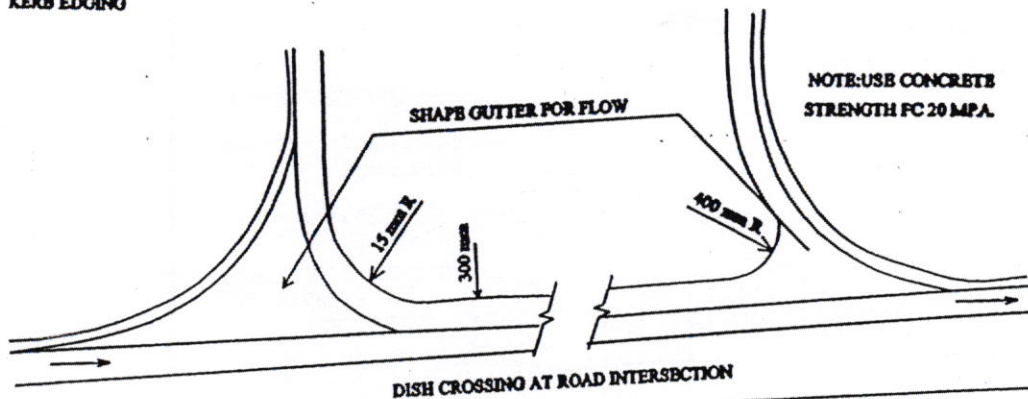


KERB EDGING

MOUNTABLE KERB

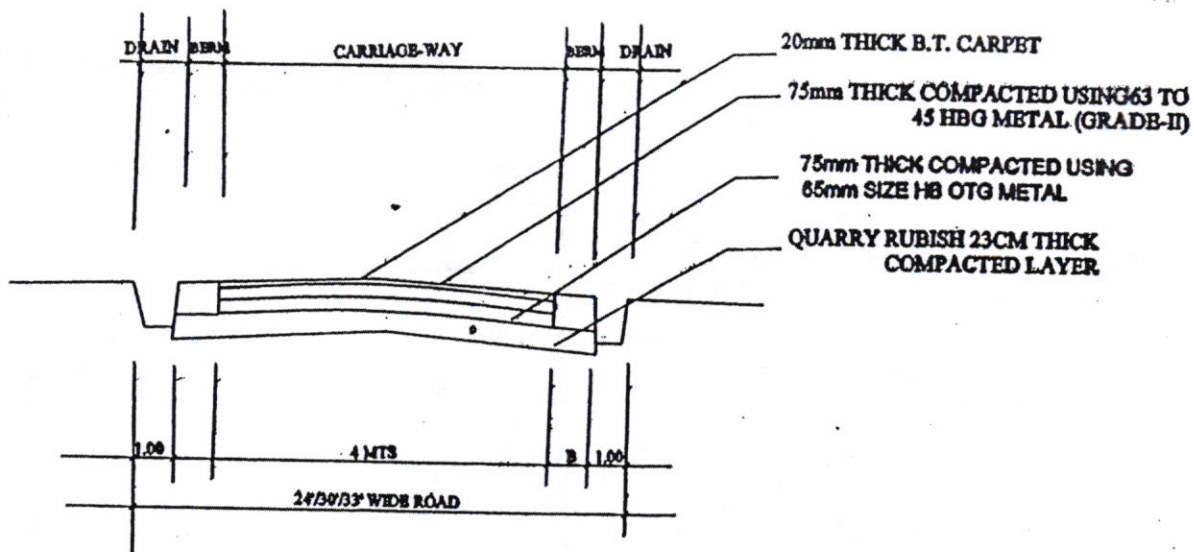


DISH CROSSING



DISH CROSSING AT ROAD INTERSECTION

		KERB RADIUS	CORNER SPLAY
X-ROADS	90°	6 M	6M
T- JUNCTIONS	90°	6 M	4M
ANGLE LOSS THAN 75°		9 M	7.5 M
ANGLE GREATER THAN 90	AS FOR	90°	AS FOR 90°

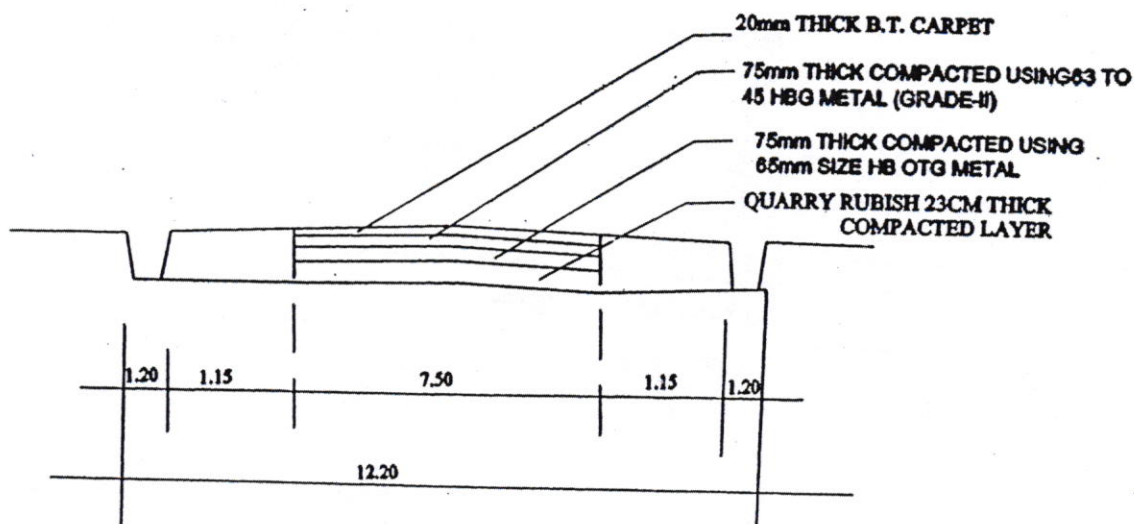


CROSS SECTION OF 24'-0", 30'-0" & 33'-0" WIDE ROAD/PATH

NOT TO SCALE

ALL DIMENSIONS ARE IN METRES

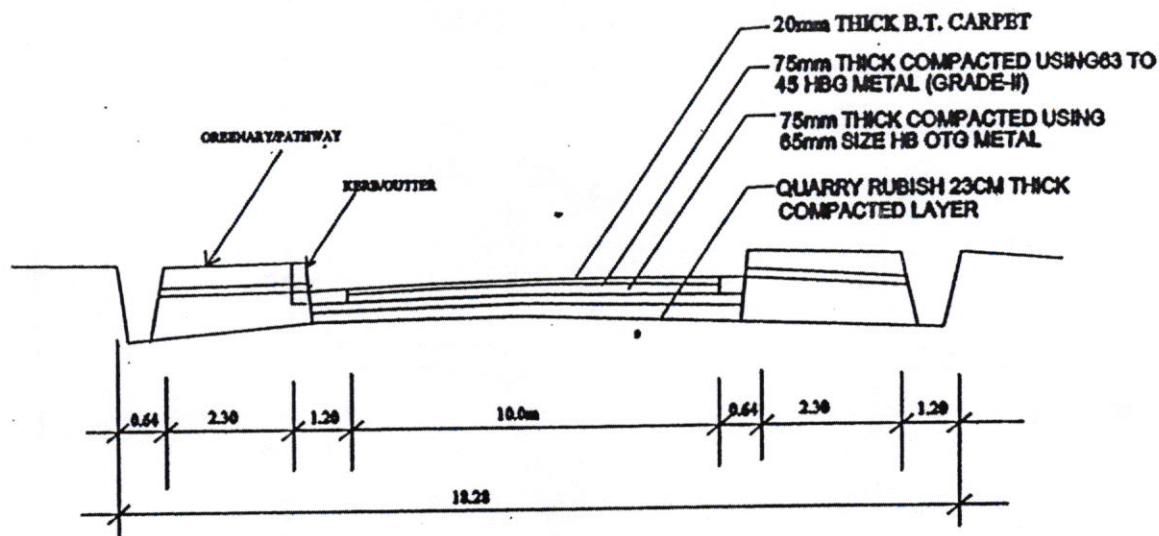
ROAD WIDTH	CARRIAGE-WAY	BARM
24'-0"	4.0 MTS	0.66
30'-0"	4.0 MTS	1.37
33'-0"	4.0 MTS	2.00



CROSS SECTION OF 40'-0" ROAD/PATH

ALL DIMENSIONS ARE IN METRES

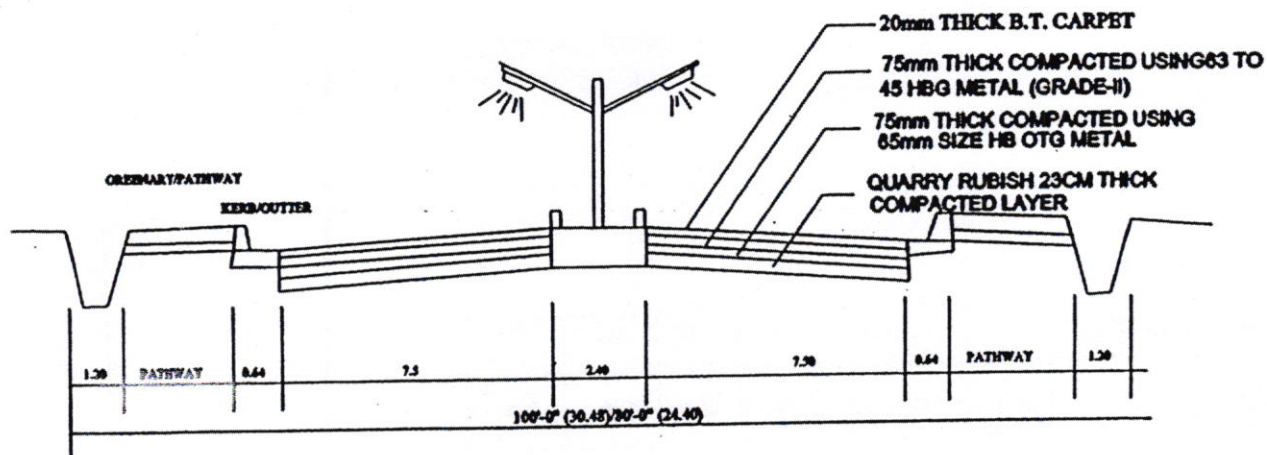
NOT TO SCALE



CROSS SECTION OF 60'-0" ROAD/PATH

ALL DIMENSIONS ARE IN METRES

NOT TO SCALE

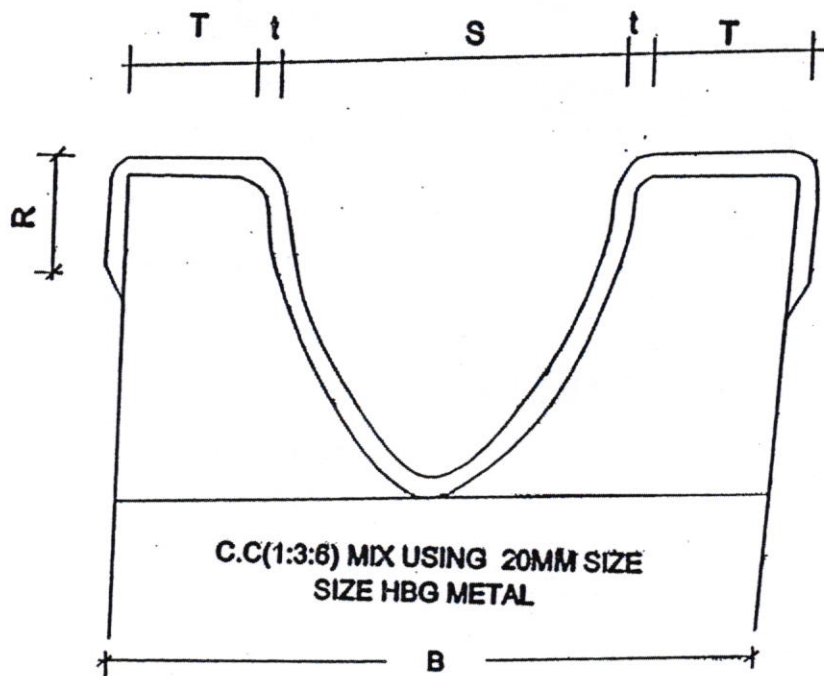


CROSS SECTION OF 100'-0" (30.48)/80'-0" (24.40)

ROAD WIDTH	CARRIAGE-WAY	PATH-WAY
100'-0"	7.50	4.70
80'-0"	7.50	1.66

ALL DIMENSIONS ARE IN METRES

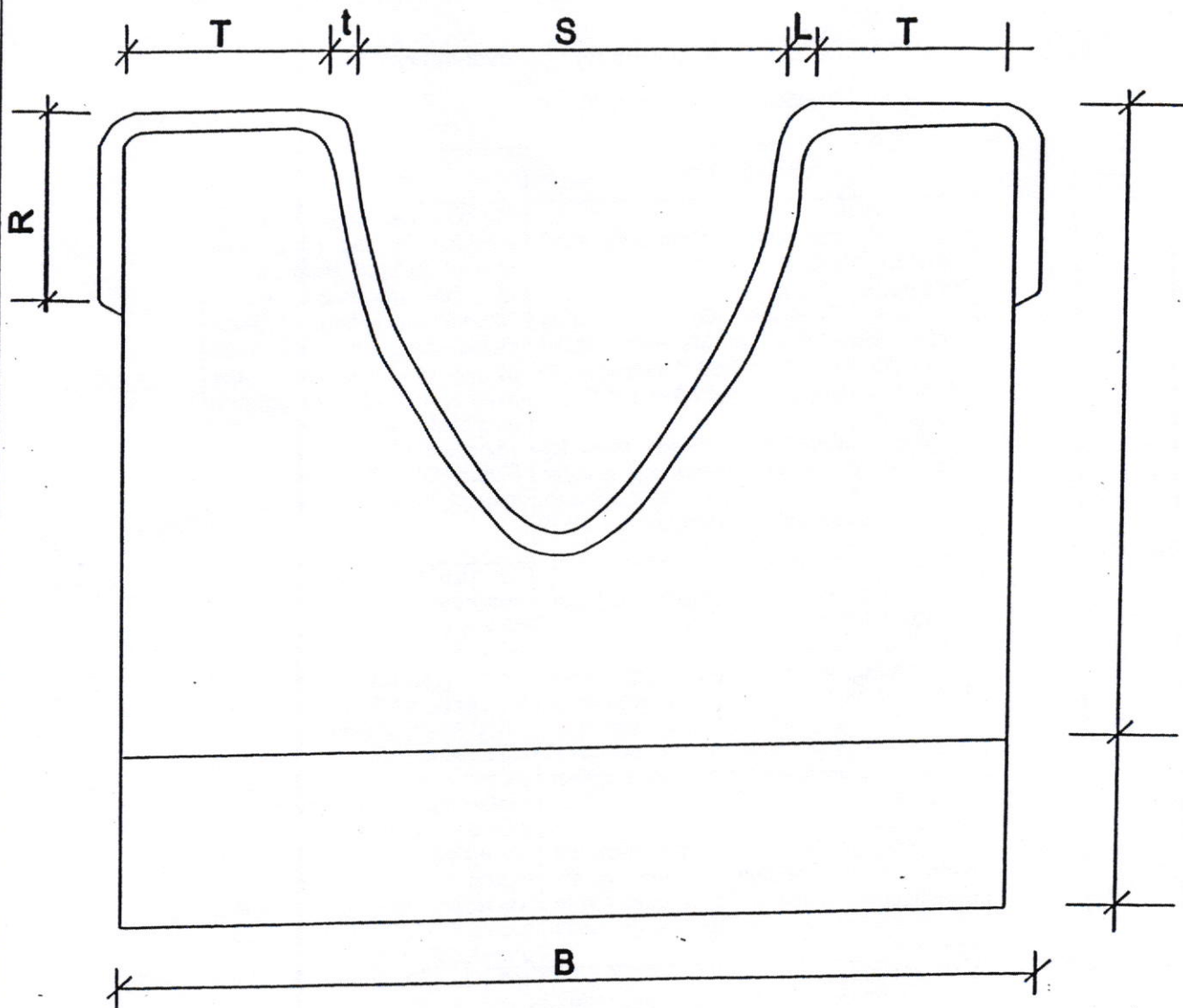
NOT TO SCALE



NOT TO SCALE
ALL DIMENSIONS ARE IN MM

C C DRIAN

ROAD WIDTH	SIZE OF DRAIN	S	T	t	d	H1	H2	B
40'-0"	12"	300	150	12	80	300	150	624



R.R.DRAIN

ROAD WIDTH	SIZE OF DRAIN	S	T	t	d	H1	H2	H3	B
40'-0"	12"	300	300	20	80	300	80	150	940
60'-0"	15"	380	300	20	80	380	80	150	1020
50'-0"	18"	450	300	20	80	450	80	150	1090
100'-0"	24"	600	300	20	80	600	80	150	1200

Providing CC/RR drains in private layouts for approval of layouts
(Revised specifications)

Sl. No.	Size of drain	Type of drain	Specifications	Remarks
1	12"	CC	Bed concrete CC (1:3:6) mix using 20mm size HBG Metal 150mm thick Side walls: CC(1:3:6) mix using 20mm size HBG Metal, 150mm thick for side walls. Road side walls are to be raised if necessary to maintain camber and required crossfall. Plastering Plastering in CM (1:3) 12mm thick for inside wetted perimeter area, top and for outside border 80mm width. The drain is to be constructed as per type design No.II enclosed.	12" size CC drain is to be provided for the cumulative flow of sullage/ storm water for the maximum length 700mm including branch drains where the discharge is commutative. CC drains are to be provided for the steeper gradients and where the embankment is minimum. Extra widths if necessary are to be provided for side walls.
2	12"	RR	Bed concrete CC (1:5:10) mix using 40mm thick size HBG Metal 150mm thick. Side wall and bottom. RR Masonry in CM (1:6) mix using hard variety of rough stone with 300mm thick side walls and 80mm thick for bottom layer. Road side walls are to be raised if necessary to maintain camber and required crossfall. Plastering : Plastering in CM (1:5) 20mm thick for inside wetted perimeter area, top and for outside border 80mm width. The drain is to be constructed as per type design No.III enclosed.	12" size RR drain is to be provided for the cumulative flow of sullage storm water for the maximum length 700mm including branch drains where the discharge is commutative. RR Masonry drains are to be constructed for at higher embankments and at ditches, broken lands, hilly terrain to maintain gradient and to act as retaining wall. Necessary inverts are to be provided wherever necessary. Extra widths if necessary are to be provided for side walls.
	15"	RR	Bed concrete CC (1:5:10) mix using 40mm size HBG Metal 150mm thick, Side wall and bottom layer. RR Masonry in CM (1:6) mix using hard variety of rough stone with 300mm thick for side walls and 80mm thick for bottom layer. Road side walls are to be raised if necessary to maintain camber and required cross fall. Plastering : Plastering in CM (1:5) 20mm thick for inside wetted perimeter area, top and for outside border 80mm width. The drain is to be constructed as per type design No.IV enclosed.	15" size RR drain is to be provided for the cumulative flow of sullage/ storm water for the length beyond 700mts and up to 1150mts (cumulative length of 1150 mts) including branch drains where the discharge is commutative. Necessary inverts are to be provided wherever necessary to act as retaining wall and to maintain gradient. Extra widths if necessary are to be provided for side walls.
	18"	RR	Bed concrete: CC (1:5:10) mix using 40mm size HBG	18" size RR drain is to be provided for the cumulative

			Metal 150mm thick. Side wall and bottom layer. RR Masonry in CM (1:6) mix using hard variety of rough stone with 300mm thick side walls and 80mm thick for bottom layer. Road side walls are to be raised if necessary to maintain camber and required cross fall. Plastering : Plastering in CM (1:5) 20mm thick for inside wetted perimeter area, top and for outside 80mm width. The drain is to be constructed as per type design No.V enclosed.	flow of sullage/ storm water for the length beyond 1170mm and up to 1600m (cumulative length of 1600m) including branch drains where the discharge is commutative. Necessary inverts are to be provided wherever necessary to act as retaining wall and to maintain gradient. Extra widths if necessary are to be provided for side walls.
	24"	RR	Bed concrete CC (1:5:10) mix using 40mm size HBG Metal 150mm thick, side wall and bottom layer. RR Masonry in CM (1:6) mix using hard variety of rough stone with 300mm thick for side walls and 80mm thick for bottom layer. Road side walls are to be raised if necessary to maintain camber and required cross fall. Plastering : Plastering in CM (1:5) 20mm thick for inside wetted perimeter area, top and for outside border 80mm width. The drain is to be constructed as per type design No.VI enclosed.	24" size RR drain is to be provided for the cumulative flow of sullage /storm water for the length beyond 1600m and up to 2800m (cumulative length of 2800 m) including branch drains where the discharge is commutative. Necessary inverts are to be provided wherever necessary to act as retaining wall and to maintain gradient. Extra widths if necessary are to be provided for side walls.

1. The above drain sizes and lengths are given based on to maintain bed slopes to arrive the minimum cleansing velocity of one metre per second.
2. The layout owner has to construct the drains in consultation with the VUDA Engineering Staff.
3. Catch drains and leading drains of higher size i.e, more than 24" size are to be provided as directed where there is possibility of getting discharge from upstream catchments and further in continuation follow higher sizes than the incoming drain.
4. The minimum size of culvert with vent of size 1'-6"x2'-0" for slab culverts.
5. The culvert vent sizes are 0'-6" more than the upstream side drain with minimum heights of 2'-0" with suitable sizes of walls and slab.

Note: The size of the drain varies according to discharge and there are no norms for adopting the size straight way according to the width of the road. However, the following minimum sizes of drain to be followed for different types of roads are suggested subject to increasing width of drain according to increase in quantity of discharge.

ABSTRACT

- a) For 40' wide road : 12" size C.C/R.R.
b) For 60' wide road : 15" size C.C/R.R.
c) For 80' wide road : 18" size C.C/R.R.
d) For 100' road and above roads : 24" Size R.R. Masonry

--o0o--

15M
2/8/18
shw

Sw
2/8/18
JPO

DS
3/8/18
PO


For VICE CHAIRMAN
Urban Development Authority
Visakhapatnam