

GOVERNMENT OF MAHARASHTRA

PUBLIC WORKS DEPARTMENT

FORM - P

VOLUME - IV

(Specification and Drawings)

FOR THE WORK OF
FOUR LANING OF CHINCHOTI-KAMAN
ANJURPHATA TO MANKOLI ROAD
M.S.H. NO. 4 KM. 0/000 - 26/425
TALUKA BHIWNADI DIST. THANE

(2)

GOVERNMENT OF MAHARASHTRA

Name of work :- Four Laning of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwnadi
Dist. Thane

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SECTION- I

TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS

Name of work :- Four Laning of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwandi
Dist. Thane

REFER SCHEDULE "L" OF VOLUME-I

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SCHEDULE-I

Item No.	Item of work	Reference to Standard (P.W.D.) Specification in Red Book Volume I 1981 Edition / Specification for Road and Bridge works, Ministry of Road Transport and Highways 2001 Edition.		Additional Specification if any.
		Specification Number	Page Number	
1.	2.	3.	4.	5.
1.	ITEM NO.(1):- Excavation for roadways in soft strata such as earth soil of all sorts sand, gravel or soft. murum hard murum, hard murum and boulders including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts and leads and spreading for embankment or stacking, disposing as directed etc. complete.	Rd-2 Rd-3 Rd-4	P-180 P-183 P-184	This shall include all kinds of rock or shale indurated clay soil, silt sand and gravel soft average and hard murum and any other materials which can best be removed with a shovel after loosening with a pickaxe or bar. It shall also include isolated boulders upto 0.10 cubic metre each which do not need blasting and could be removed with a pick bar and shovel. The excavated materials shall be utilized in the respective items of the work as required as per specifications of the item concerned and as directed by the engineer - in - charge.
2.	ITEM NO.(2):- Watering and compacting of embankment formed of materials obtained from the road cutting, with all leads and lifts leads and lifts to 95% of standard proctor density after laying them in layers of 20 to 30 cm with vibratory roller roller etc. complete.	MORT & H 101 to 126 305 201	3 to 37 . 67 to 83 41 to 43	Material for embankment shall be used after testing for quality and approval from Engineer in charge.

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3.	ITEM NO (3):- Providing earth work in embankment with approved materials obtained from departmental land or other sources specified by Engineer in-charge, with all leads including all lifts, laying in layers of 20 to 30cm thickness, breaking clods, dressing to the required lines, curves, grade & section, watering and compaction to 100% of standard proctor density with static roller etc. complete.	MORT & H 101 to 126 305 201	3 to 37 .67 to 83 41 to 43	Material for embankment shall be used after testing for quality and approval from Engineer in charge.
4.	ITEM NO (4):- Supplying 60 mm trap stone metal at the road side for metal including conveying & stacking with all leads and lifts etc. complete	Rd-19(a)	P-199	The materials shall be got tested from the approved laboratory before use at the cost of the contractor. He must preserve the forest conservation act 1980 he is fully, wholly and solely, responsible for violation of forest conservation Act 1980. If the Government quarries are not available, it will be responsibility of the Entrepreneur to obtain the materials from the private quarry at his own cost for which the contractor should obtain the permission of the owner and the competent authority at his own and no claim for extra lead charges will be entertained.

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5.	ITEM NO.(5):- Supplying 40 mm trap stone metal at the road side for metal including conveying & stacking with all leads and lifts etc. complete.	Rd-22	P-201	- do -
6.	ITEM NO.(6):- Supplying hard murrum at the road side, including conveying and stacking with all leads and lifts etc. complete.	MORT & H 101 to 126 407 900 Rd-23	3 to 37 128 to 130 337 to 343 202	The materials shall be got tested from the approved laboratory before use at the cost of the concessionaire. The finished surface of hard murrum side shoulder shall be at 5% slope.
7.	ITEM NO.(7):- Supplying soft murrum at the road side including conveying and stacking with all leads and lifts etc. complete lead	Rd-24	P-203	- do -
8.	ITEM NO.(8):- Supplying stone dust of trap stone aggregate at the road side, including conveying and stacking with all leads and lifts for use in bituminous road surface etc complete.	Rd-41	P-215	- do -
9.	ITEM NO.(9):- Spreading oversize 40mm and 60mm metal including sectioning and with all leads and lifts etc. complete.	Pd-29 Rd-34	P-205 P-208	--
10.	ITEM NO.(10):- Spreading hard murrum, soft murrum & stone dust over the rubble soling, oversize and size metal layer / Blundage on W.B.M. surface and with all leads and lifts etc. complete	Rd 28,31,36, 37	P-205, 206, 211	Prior to spreading of materials, permission for spreading should be obtained from the Engineer - in - Charge.
11.	ITEM NO.(11):- Compacting oversize metal (200mm loose) layer by vibratory roller including necessary, labour, materials and artificial watering etc. complete.	Rd-32	P-206	---

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12.	ITEM NO.(12):- Compacting the size metal (100 mm loose) layer with vibratory roller, including necessary labour, materials and artificial watering etc. complete.	Rd-35	P-209	
13.	ITEM NO.(13):- Providing and laying granular sub base (GSB) of compacted thickness of 150mm in two layers, each layer not exceeding 75mm compacted thickness with specified graded gravel in sub base course, including conveying all material, with all leads and lifts labour, machinery to the site of work, spreading specified graded gravel in uniform layers on prepared surface, watering and compacting with vibratory roller etc. complete.	MORT & H 101 to 126 401 900	3 to 37 101to105 337to343	The materials shall be got tested from the approved laboratory before use at the cost of the concessionaire. The grading of material shall be as per table 400-2 with CBR value shall not be less than 20% with grading III.
14.	ITEM NO.(14):- Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specifications including premixing the material with water to OMC in mechanical mix Plant, carriage of mixed material by tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density including lighting, guarding, barricating and maintenance of diversion and all material with all leads and lifts etc. complete.	MORT & H 406		The materials shall be got tested from the approved laboratory before use at the cost of the concessionaire.

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15.	ITEM NO.(15):- Providing and applying primer coat with bitumen emulsion on prepared surface of granular base and spraying primer at the rate of 0.60 per Kilogram per sq.mt. using mechanical means including clearing of road surface, and supplying materials with all leads and lifts etc. complete.	MORT & H 101 to 126 501 503 900	3 to 37 139to154 157to160 337to343	i) Emulsion of Indian Standard grade shall be used. ii) For controlling traffic, construction & maintenance of diversion, is to be done at the cost of concessionaire no extra claim for payment shall be entertained for this. iii) The work shall be carried out in day time only in ordinary whether.
16	ITEM NO.(16):- Providing and laying bituminous tack coat, @ 50 Kilogram per sq.mt. over R.T. surface mechanical sprayer including supplying all materials, with all leads and lifts preparing the existing surface, heating bitumen and applying tack coat evenly on the surface etc. complete. (using 60/70 grade)	MORT & H 101 to 126 501 503 900	3 to 37 139to154 157to160 337to343	i) Bitumen of Indian Standard grade shall be used. ii) For controlling traffic, construction & maintenance of diversion, is to be done at the cost of concessionaire, no extra claim for payment shall be entertained for this. iii) The work shall be carried out in day time only in ordinary whether.



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17.	ITEM NO.(17):- Providing and laying hot mix hot laid bituminous macadam 75 mm average thickness with 3.3% Bitumen contain bitumen by weight of total mix for leveling course to remove irregularities / Base course including diversion of traffic supply of all materials, with all leads and lifts heating bitumen and chips in drum mix plant, cleaning the road surface, laying bituminous macadam by paver finisher including compacting with vibratory roller transportation and cost of all materials, bitumen from refinery etc. complete. (excluding tack coat)	MORT & H 101 to 126. 501 504 900	3 to 37 139 to 154 160 to 164 337 to 343	i) Bitumen of Indian Standard grade of 60/70 penetration shall be used. ii) For controlling traffic, construction & maintenance of diversion, is to be done at the cost of concessionaire, no extra payment shall be entertained for this iii) The minimum bitumen content shall be 3.3 % as per table 500.4 for grading I page 162 of MORT & H specifications. If bitumen content is more than 3.3 %, no extra cost will be paid. v) Proper camber super-elevation shall be provided as directed by Engineer - in - Charge. vi) Hydrometre analysis test shall be taken for testing of fines in the aggregates to ensure that extensive natural fines are not present in mix. vii) Density shall be checked by taking core of BM by core cutter machine and not by sand replacement method.
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18.	ITEM NO.(18):- Providing and laying hot mix hot laid Dense Bituminous Macadam 50/75mm compacted thickness with 4.50 % bitumen content by weight of total mix on prepared surface with specified graded crusher aggregates for the base/binding course including loading of aggregates with F.E. Loader, heating of stone aggregates and bitumen and mixing, in modern drum mix type of hot mix plant transporting the hot mix to work site laying the mixed material with sensor paver finisher to the required grade, level and camber, rolling by power roller and vibratory roller to achieve the desired density. (Grade of Bitumen should be 30/40) with supplying of all materials with all loads and lifts etc. complete.	MORT & H-507	Before execution of work the concessionaire shall get approval to job mix from Engineer-in-charge.
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19.	ITEM NO.(19):- Providing and laying bituminous concrete 40 mm compacted thickness on prepared surface with specified graded stone aggregates for wearing course including loading of aggregates with F.E. Loader premixed with bituminous binder @ 5 per cent of weight of mix and filler @ 2 per cent of weight of aggregate in modern drum type hot mix plant, transporting the mixed material to work site, laying the mix material with sensor paver finisher to the required level, grades and rolling with vibratory & power roller to achieve the desired density. (Grade of Bitumen should be 30/40) with supplying all materials with all leads and lifts etc. complete.	MORT & H-509	---	Before execution of work the concessionaire shall get approval to job mix from Engineer-in-charge
20.	ITEM NO.(20):- Providing rubble filling of trap/granite/quartzite gneiss stones of approved quality in foundation including hand packing filling gravel of sand in the voids and supplying of all materials with all leads and lifts etc. complete.	MORT & H-2204 RD-57	571 151	
21.	ITEM NO.(21):- Providing and laying in situ cement concrete of M-15 proportion with trap metal in foundations including necessary compacting and curing and supplying all materials with all leads and lifts etc., complete. (including form work)(This item is for foundation of HP drains)	MORT & H-1500 1701 to 1718 2100	443to449 461to478 565to568	Before execution of work the concessionaire shall get approval to mix design from Engineer-in-Charge.
22.	ITEM NO.(22):- Providing and laying weep holes of 100 mm diameter AC/PVC pipes as per drawing for abutment returns, return walls etc. Complete.	MORT & H-2706	637	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge.

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23.	ITEM NO.(23):- Providing and laying in situ (Using concrete mixer) reinforced cement concrete M-20 of trap metal for R.C.C. work in solid slab/ T-beam & slab / Box girder and balanced cantilever, including centering, formwork, scaffolding, ramming, vibrating finishing in cement plaster and curing and supplying all materials with all leads and lifts etc. complete (excluding reinforcement) (This item is for slabs of slab drains, minor bridges).	MORT & H-1500 1701 to 1718	443to449 461to477	Before execution of work the concessionaire shall get approval to mix design from Engineer-in-Charge.
24.	ITEM NO.(24):- Providing and cutting bending, hooking, laying in position and tying Mild steel / HYSD / TMT bars for reinforcement as per detailed drawings for R.C.C. work.	MORT & H 1600	453to457	The work shall be carried out as directed by Engineer-In-Charge.
25.	ITEM NO.(25):- Dismantling carefully the existing structure of stone masonry in cement or lime mortar, including sorting out serviceable materials and stacking the dismantled material with all leads and lifts neatly as directed etc. complete.			The work shall be carried out as per detailed wording of Item and Instruction of Engineer-in-Charge
26.	ITEM NO.(26):- Providing and laying in situ cement concrete of 1:3:6 proportion with trap metal in foundations including necessary compacting and curing and supplying all materials with all leads and lifts etc., complete. (including formwork) (This item is for Builtup gutter).	CD-8	P-163	

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27.	ITEM NO.(27):- Providing and laying cement concrete pipe of IS 438-1988 N.P.4 class in proper line level & slope including providing fixing collars in cement mortar 1:2 and supplying all materials with all leads and lifts etc. complete (including form work) A) 1200 mm dia. B) 900 mm dia. C) 750 mm dia. D) 600 mm dia. E) 300 mm dia. F) 150 mm dia.	MORT & H- 2901 to 2911 CD-7	663 to 666 162	
28.	ITEM NO.(28):- Providing, laying, spreading and compacting stone aggregates of specified sizes to water bound macadam specification, including spreading in uniform thickness, hand packing rolling with 3 wheeled steel and vibratory roller 8 10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening, binding materials to fill up the interstices of coarse aggregates, watering and compacting to the required density making necessary earthen bund to protect edges, lighting, guarding, barricading and maintenance of diversion and supplying all materials with all leads and lifts etc. complete. a) By manual means i) Grading-I	MORT & H 101 to 126 404 900	3 to 37 112 to 120 337 to 343	The materials shall be got tested from the approved laboratory before use at the cost of the concessionaire.

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29.	ITEM NO.(29):- Providing and laying precast polished chequered colour cement tiles of size 26 x 32 and 20 mm thick as per drawing or as directed on bed of 1:4 cement mortar including neat cement float, filling joints with cement slurry mixed with approved shade of pigment to match the colour of tiles, curing, polishing and cleaning and supplying all materials with all leads and lifts etc. complete.	Bd-M-33 B	P-392	---
30.	ITEM NO.(30):- Dismantling of Flexible Pavements and disposal of dismantled materials with all leads all leads and lifts stacking serviceable and unserviceable materials separately by Mechanical Means	MORT & H 202	---	---
31.	ITEM NO.(31):- Providing and laying in situ Dry lean cement concrete sub base (M-10) grade of trap metal of specified gradation using minimum cement content of 15 Kg/cum. OPC 43 grade cement mixing as per approved design mix, using batching plant of appropriate capacity, transporting and laying with self propelled paver with electronic sensor device and compacting with vibratory roller of minimum 80-100 KN static weight to give desired compacted density providing construction joints, and curing with liquid curing compound and sprinkling water and covering with moist hessian or ponding of water for 7 days including all materials, with all leads and lifts labour, machinery including bailing out water manually, and formwork etc. complete.	MORT&H-601.	---	Before execution of work the concessionaire shall get approval to mix design from Engineer-in-Charge

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32.	ITEM NO.(32): Providing and laying Pavement Quality Concrete of M-40 grade (cast in situ) of trap metal including providing 125 micron thick impermeable plastic sheet membrane over the surface to be covered, coarse and fine aggregates of specified gradation using minimum cement content of 350 kg/cum., approved admixtures, mixing as per the design mix to the specified workability, providing necessary side forms, rails and guide wires, transporting the mix with transit mixers and laying and spreading with self propelled slip form paving train of required capacity and compacting with plate vibrator and minimum ten needle vibrators, curing with approved resin based aluminised reflective curing compound and covering with moist hessian or ponding and sprinkling of water for a minimum period of 14 days, fixing dowels, tie-bars, cutting joints joint-filters, sealants and all types of joints and finishing to the desired surface texture including all material, labour, machinery with all leads and lifts etc complete.	MoRT&H-602.	--	Before execution of work the concessionaire shall get approval to mix design from Engineer in-Charge.
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33.	ITEM NO.(33):- Providing and fixing precast heavy duty inter locked concrete paving block of 80mm thickness having a strength of 300 kg/Sq.mt. of approved quality and shape on a bed of grit / sand of 65mm thick with C.M. 1:4 striking joints, including neat cement float filling joints with coloured cement slurry all labour all material with all leads and lifts and cleaning etc. complete	I.S.15658 : 2006 BS-6717	---	The work shall be carried out as per detailed wording of Item and instruction of Engineer-in-charge.
34.	ITEM NO.(34):- Dewatering including diversion of streams, providing earthen bunds coffer dam etc. as may be necessary for foundation and other parts of the work and bailing out and pumping out water, during and after excavation as required (The item include dewatering for excavation upto foundation level, filling foundation and sub structure masonry above water level) By using 5 to 9 Horse power pump.	MORT & H 304.3.3 BR-4	64to65 104to05	Record of dewatering shall be maintained in log book as directed by Engineer - in - Charge.
35.	ITEM NO.(35):- Providing and laying in situ M-20 cement concrete of trap metal for R.C.C. caps over piers and abutments including necessary scaffolding, centering, formwork, compacting by vibrating, finishing and curing and all materials with all leads and lifts etc. complete (excluding reinforcement)	MORT & H- 1500 1701 to 1718 2205	443to449 461to478 572	The necessary concrete mix design for grade M-20 shall be carried out such that characteristic strength shall be as per acceptance criteria as per IS456. The minimum cement content shall be as per IRC-21 for severe exposure.
36.	ITEM NO.(36):- Providing expansion joints bituminous pad 25 mm thick	MORT & H- 2601to2602	617 to 619	The work shall be carried out as per detailed wording of Item and instructions of Engineer - in - charge.

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37.	ITEM NO.(37):- Providing Tar paper (as per IS std.) bearing as per details given.	MORT & H-2001to2002	535	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge.
38.	ITEM NO.(38):- Providing and laying in situ M-15 cement concrete of trap / granite / gneiss metal for R.C.C work including centering, formwork, scaffolding, ramming, vibrating, finishing and curing and all materials with all leads and lifts etc. complete. (excluding reinforcement) (This item is for Slabs on Built up gutter)	MORT & H-1500 1701 to 1718 2908	443to449 461to477 666	Before execution of work the concessionaire shall get approval to mix design from Engineer-in-Charge.
39.	ITEM NO.(39):- Providing and laying in situ M-20 cement concrete of trap / granite / quartzite / gneiss metal for R.C.C. work of for kerb and ballast walls, for box return etc. including scaffolding, centering, formwork, compaction, finishing and curing and supplying all materials with all leads and lifts etc. complete (excluding reinforcement)	MORT & H-1500 1701 to 1718	443to449 461to477	
40.	ITEM NO.(40):- Providing galvanised iron 100 mm diameter/UPVC (SWR) grade 110 mm outer diameter pipe for water spouts as per drawing etc. complete.	BR-55	P-150	

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41.	ITEM NO.(41):- Providing R.C.C. parapet with (15x 60cm) M-25 cement concrete of trap/ granite / quartzite / gneiss metal, cast in situ precast panels as per the detailed drawing including reinforcement, scaffolding, centering, formwork, compating, finishing and supplying all materials with all leads and lifts and curing etc. complete.	MORT & H- 1500 1701 to 1718 2908	443to449 461to477 666	
42.	ITEM NO.(42):- Providing and laying 90 cm thick flexible stone mat as per standard drawing consisting of 45 cm thick trap rubble soling, 22.50 cm thick over size metal layer of 100 to 150 mm metal, 11.30 cm thick layer of 80 to 100 mm over size metal and 11.20 cm thick layer of 40 mm size metal with blindage of hard murum for rubble soling and over size and soft murum for size metal layer including supplying all materials with all leads and lifts at work site, spreading and compaction etc. complete.	MORT & H- 2507 2508	612 613	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge.
43.	ITEM NO.(43):- Dismantling R.C.C. concrete work including breaking concrete by chiselling, wedging etc. including cutting the reinforcement, stacking the servicable materials and the debris separately with all leads and lifts or spreading the debris as directed by Engineer-in-Charge with all leads and lifts etc complete.			The work shall be carried out as per detailed wording of Item and instruction of Engineer-in-Charge.

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44.	ITEM NO.(44):- Shifting of water supply line from road side embankment including reinstalling the road embankment as before in approximate length of 600 meter.	---	---	The work shall be carried out as per detailed wording of Item and Instruction of Engineer-in-Charge.
45.	ITEM NO.(45):- Providing selected hard murrum filling including laying in layers of 15 to 20 cm watering and compacting and supplying all materials with all leads and lifts etc. complete.	CD-14	P-167	---
46.	ITEM NO.(46):- Providing R.C.C.(M-15) ordinary kilometre stone of standard design as per IRC:8-1980, including painting, printing, numbering for SH Standard and fixing in C.C. 15 block of size 65 x 55 x 60 centimeter etc. complete.	MORT & H-804 RD-69	326 243to244	The work shall be carried out as per detailed wording of Item and instructions of Engineer - in - charge.
47.	ITEM NO.(47):- Providing R.C.C.(M-15) 5th kilometre stone of standard design as per IRC:8-1980, fixing in c.c.M15, block of size 80 x 55 x 60 cms including painting, printing and numbering etc. complete.	MORT & H-804 RD-69	326 243to244	The work shall be carried out as per detailed wording of Item and instructions of Engineer - in - charge.
48.	ITEM NO.(48):- Providing R.C.C.(M-15) 200 metre stone of standard design as per IRC:8-1980, fixing in c.c.M15, block of size 80 x 55 x 40 cms including painting, printing, and numbering etc. complete.	MORT & H-806 RD-69	327 243to244	The work shall be carried out as per detailed wording of Item and instructions of Engineer - in - charge.

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49.	ITEM NO.(49):- Providing and fixing informatory sign boards in square and rectangular shape of any size made out of 16 Gauge (1.6mm) thick Mild Steel sheet painted with one coat of zinc chromate sloveing primer and two coats of green stove enamel paint on front side and grey stove enamel on back side and border message/symbols etc. with cutout of white retro reflective sheeting, of engineering grade, including M.S. angle frame of size 35 x 35 x 3 MM and two M.S. angle iron post of size 65 x 65 x 6MM, 3.65 metre long properly crossed brace with angle iron of size 50 x 50 x 5MM duly painted with alternate black and white bands of 25cm width including G.I. fixtures, fixing the board in 1:4:8 concrete block of size 60 x 60 x 75 cm including transportation etc. complete. with 7 years guarantee.	MORT & H-801to802 IRC-67 (2001)	311to316	The work shall be canied out as per detailed wording of Item and instruction of Engineer - in - charge.
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50.	ITEM NO.(50):- Providing Cautionary sign boards 90cm.equilateral triangle with apex point upward prepared on fibre reinforced plate 3.0 millimetre thick bonded with white retroreflective sheeting on Engineering grade having pressure sensitive/heat activated adhesive retroreflective white back ground and red border and back side gray, retroreflective symbols, letters, numerals, arrows, one M. S. angle post of 65 x 65 x 6 millimetre size and 3.65 metre long, inflated bottom and drilled on top, and painting posts with white & black border of 25 centimetres, fitting board to post with 2 numbers of strong G. I. bolts and nuts including transportation & fixing in p.c.c. 1:4:8 etc. complete.	MORT & H- 801to802 IRC-67 (2001)	311to316	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge. Necessary bond for seven years guarantee shall be furnished by agency.
51.	ITEM NO.(51):- Providing and laying of hot applied White thermoplastic compound 2.5mm thick, traffic lane edge/centre lines strips 10cm. wide, including reflectorising glass beads @250 gms.per sqm area, thickness of 2.5mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes etc. complete with 3 years guarantee.	MORT & H- 803	---	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge. Necessary bond for seven years guarantee shall be furnished by agency.
52.	ITEM NO.(52):- Providing and painting new Zebra painting of pedestrian crossing on the carriageway with approved road marking paint in two coats etc. complete.(over 10cm.wide path)	MORT & H- 803	---	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge.

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53.	ITEM NO.(53):- Providing and erecting Gantries on both of road as per detailed drawing and specification etc. complete.	---	---	The work shall be carried out as per detailed wording of Item and instruction of Engineer-in-charge.
54.	ITEM NO.(54):- Providing and fixing M-15 R.C.C. Guard stone of 20 x 20 x 75 cms including fixing in ground and white washing etc. Complete.	MORT & H- 806 RD-70	327 244	---
55.	ITEM NO.(55):- Providing R.C.C.(M-15) Boundary stone of standard design as per IRC-25-1967, fixing in c.c.M15, block of size 50 x 50 x 75 cms including finishing and lettering including painting etc. complete.	---	---	The work shall be carried out as per detailed wording of Item and instruction of Engineer-in-charge.
56.	ITEM NO.(56):- Supplying and installation of delineator (road way indicators, hazard markers, object markers) 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 and the drawing.	MORT & H- 805	---	---

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57.	ITEM NO.(57):- Providing and fixing informatory sign boards in square and rectangular shape of any size made out of 16 Gauge (1.6mm) thick Mild Steel sheet painted with one coat of zinc chromate stoveing primer and two coats of green stove enamel paint on front side and grey stove enamel on back side and border message/symbols etc. with cutout of white retro reflective sheeting of engineering grade, including M.S. angle frame of size 35 x 35 x 3 MM and two M.S. angle iron post of size 65 x 65 x 6MM, 3.65 metre long properly crossed brace with angle iron of size 50 x 50 x 5MM duly painted with alternate black and white bands of 25cm width including G.I fixtures, fixing the board in 1:4:8 concrete block of size 60 x 60 x 75 cm including transportation etc. complete.	MORT & H-801to802 IRC-67 (2001)	311to316	The work shall be carried out as per detailed wording of Item and instruction of Engineer - in - charge. Necessary bond for seven years guarantee shall be furnished by agency.
58.	ITEM NO.(58):- Providing and applying three coat of flat oil paint of approved colour, shade and quality to plastered surface including scaffolding if necessary, cleaning the surface (excluding primer coat) etc. complete.	Bd-O-6	P-406	
59.	ITEM NO.(59):- Construction of cement concrete kerb with top and bottom width 115 and 165 respectively, 250 mm high in M-20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, etc. complete.	MORT & H-408		

Concessionaire

Engineer-in-Charge

60.	ITEM NO.(60):- Providing and fixing single height one sided metal crash barrier of galvanizing cold formed section as per detailed drawing including galvanizing, erection, conveying fixing M-20 concrete Block of size 60 Centimetre x 60 Centimetre including cost of materials labours etc, complete.			The work shall be carried out as per detailed wording of item and instruction of Engineer-in-charge. The materials shall be got tested from the approved laboratory before use at the cost of the contractor.
-----	---	--	--	---

Note : a) Recent or modified Amendments to specifications if any shall be considered.

b) If any code / Standard is not mentioned / wrongly mentioned, then refer to the latest list/Correct list of code / standards.

c) Any other item not covered above and required for the project shall be executed as per instruction of Engineer-in-charge and based on technical specification (Schedule L in Volume No.I)

Concessionaire

Engineer-in Charge

SECTION- II

ADDITIONAL CONDITIONS

Concessionaire

B¹
Engineer-in-Charge

ADDITIONAL CONDITIONS

Name of work :- Four Lining of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwnadi
Dist. Thane

1) The Government of Maharashtra reserves the right of permitting the utility agencies to lay the telephone cables / electric cables / Water supply pipe lines or any other utilities along / across the road. The Entrepreneur will permit the agencies to lay such utilities for which the permission of the Engineer-In-Charge shall be obtained before laying of such utilities. The agencies, which would be laying the utilities, will be asked to inform the Government and Entrepreneur for the work being done by them. The Charges towards, restoration of the ground, road as prescribed by the Government will be paid by the agencies directly to the Entrepreneur prior to actual start of the work of laying of utilities and the entrepreneur will restore the ground or road as directed by the Engineer In-Charge.

2) Laboratory Cum Site Office for Engineer and Other Supervisory Staff :

The Concessionaire has to construct One laboratory cum site office.

3) Traffic Control and Incident Management :

The project would have elaborate system for road signs and markings, for traffic control and management during construction and operation period. The Entrepreneur shall make arrangement for providing highway patrolling, substance service and crane services linked with emergency call boxes for the convenience and safety of the users.

Concessionaire

93
Engineer-in-Charge

28

SECTION- III

DRAWINGS OF VARIOUS WORKS
COMPONENT

Concessionaire

13
Engineer-in-Charge

DRAWINGS OF VARIOUS WORKS COMPONENT

Name of work :- Four Lining of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwnadi
Dist. Thane

**The Detailed Drawings of H.P. Drains,
Slab Drains, Minor Bridges & Major
Bridges are provided separately in
Annexure- I of Volume-IV**

Concessionaire

Engineer-in-Charge

SECTION- IV
DRAWINGS OF JUNCTION
IMPROVEMENT

Concessionaire

B¹
Engineer-in-Charge

DRAWINGS OF JUNCTION IMPROVEMENT

Name of work :- Four Lining of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwnadi
Dist. Thane

**The Detailed Drawing of Junction
Improvement is Provided separately in
Annexure- I of Volume-IV**

Concessionaire

Engineer-in-Charge

SECTION- V

DRAWINGS OF FIELD LABORATORY
CUM SITE OFFICE

Concessionaire

Engineer-in-Charge

GOVERNMENT OF MAHARASHTRA

DRAWINGS OF FIELD LABORATORY CUM SITE
OFFICE

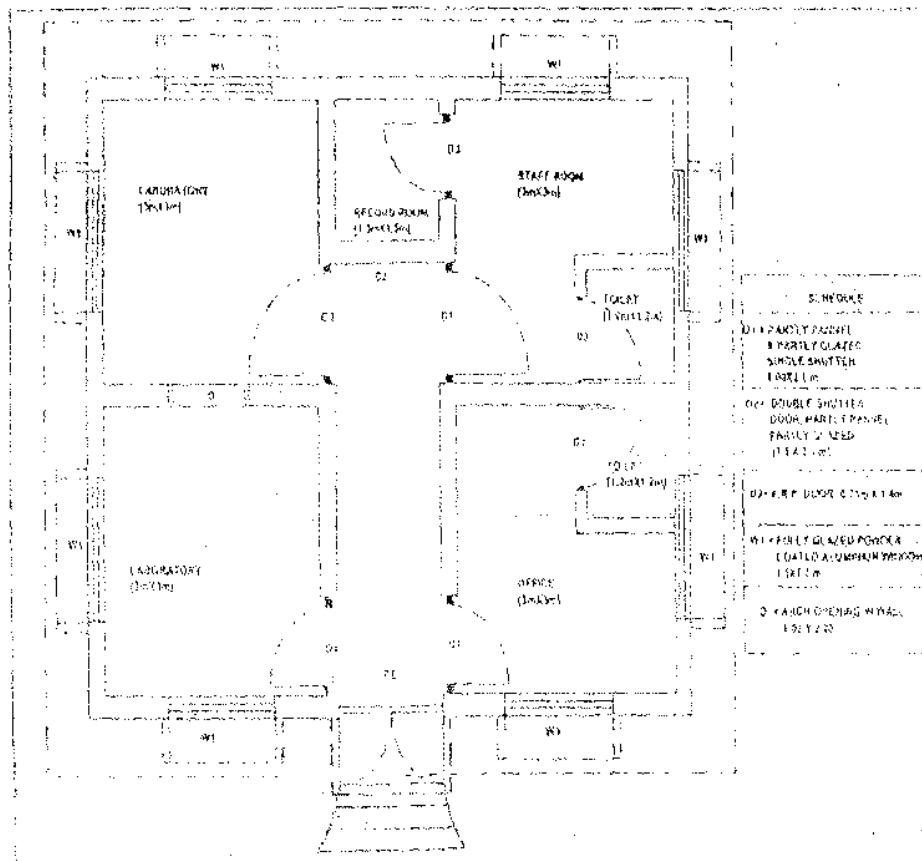
Name of work :- Four Laning of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwnadi
Dist. Thane

Attached Separately.

Concessionaire

Engineer in Charge

GOVERNMENT OF MAHARASHTRA

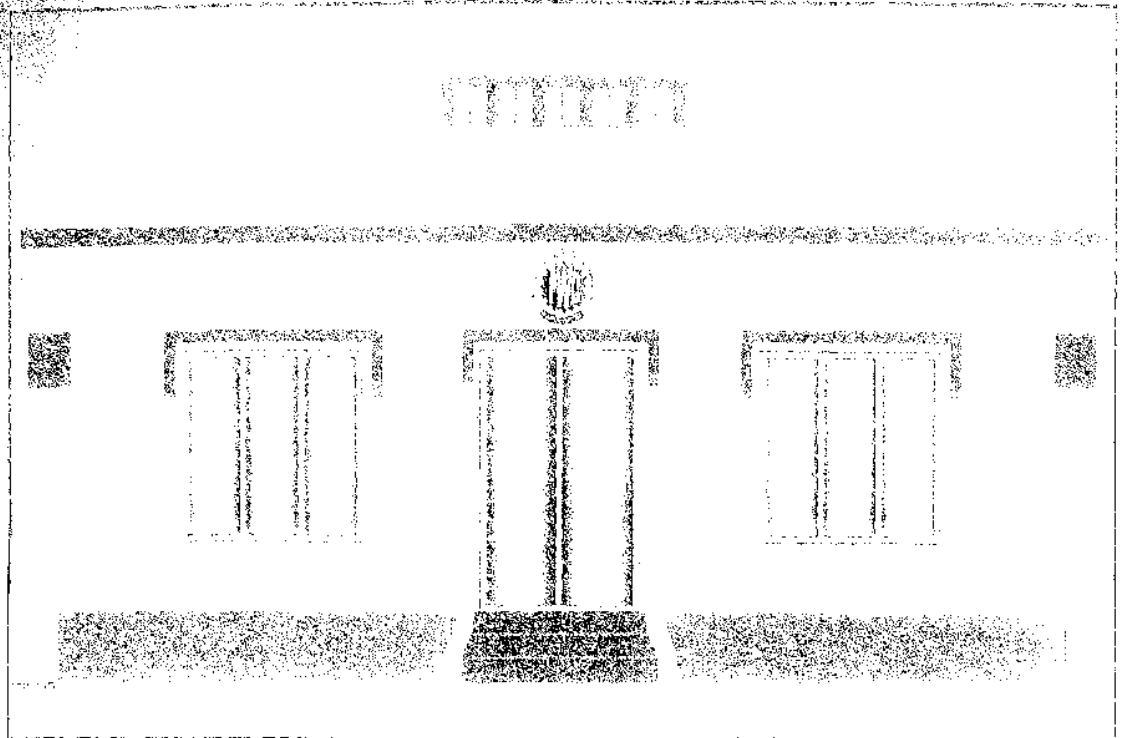


Plan For Laboratory Cum Site Office

Concessionaire

Engineer-in-Charge

35



Elevation For Laboratory Cum Site Office



5/10

SECTION- VI

DRAWINGS OF TOLL PLAZA

(As per Booklet on Model Toll Plaza issued by GOM - PWD,
vide No. PSP-2005/CR 51/Rd-9 Dated 11/08/2005)

Concessionaire

Engineer-in-Charge

(3A)

DRAWINGS OF TOLL PLAZA

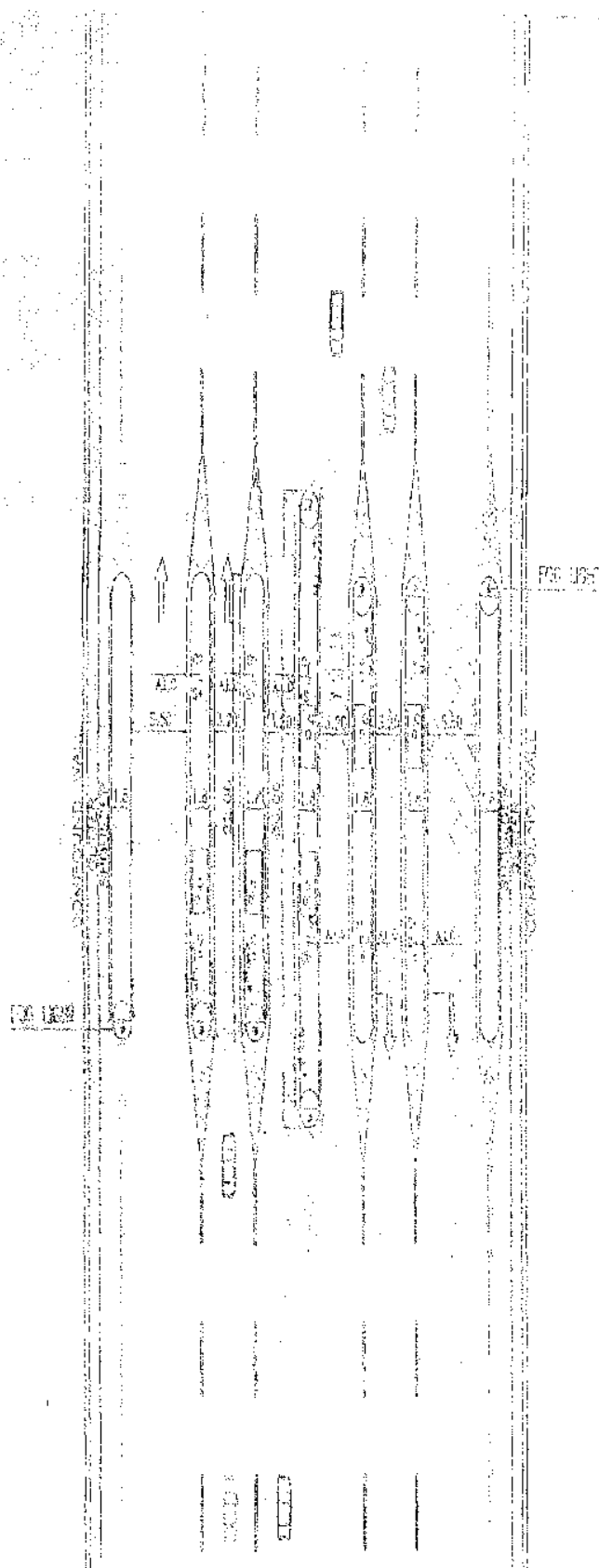
Name of work :- Four Laning of Chinchoti-Kaman Anjurphata to Mankoli
Road M.S.H. No. 4 Km. 0/000 - 26/425 Taluka Bhiwandi
Dist. Thane.

Attached Separately.

Concessionaire

Engineer-in-Charge

8



LEGEND:

- ALL - APPROXIMATE LANE CLOSURE
- WLD - WIDTH LANE CLOSURE
- C - CLOSURE
- C - 700' WIDE CLOSURE ZONE

NOTES:

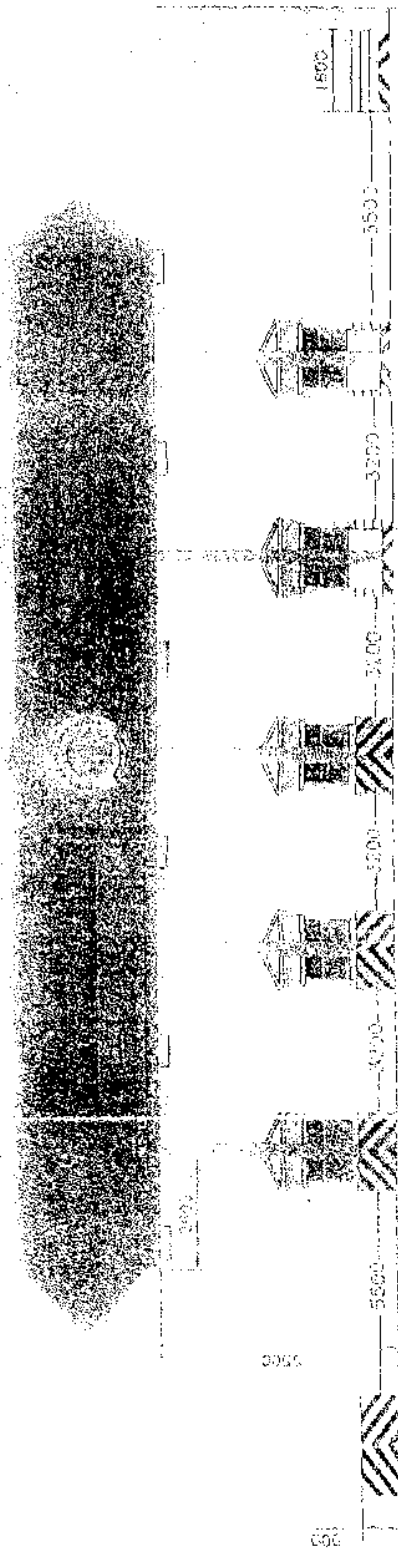
1. ALL DIMENSIONS ARE IN FEET

PROPOSED TYPE PLAN FOR
6-LANE TOLL PLAZA FOR
4-LANE MAIN ROAD

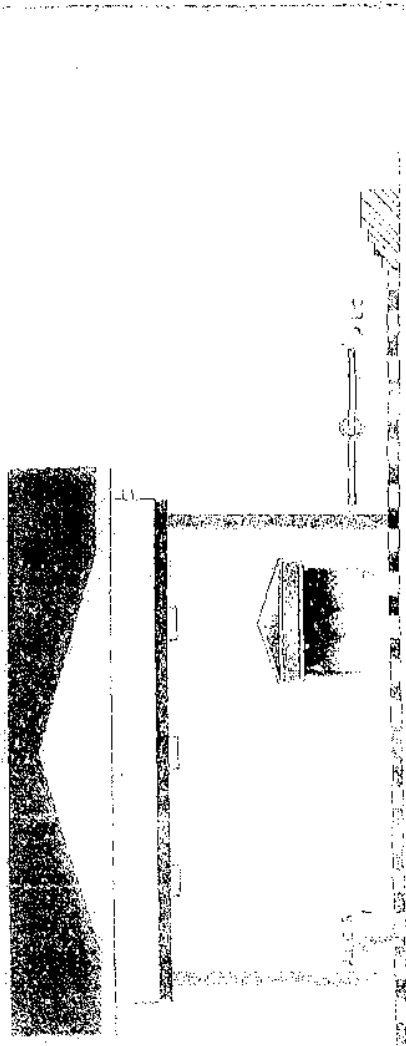
DRAWING NO. 1057

13

39



FRONT ELEVATION

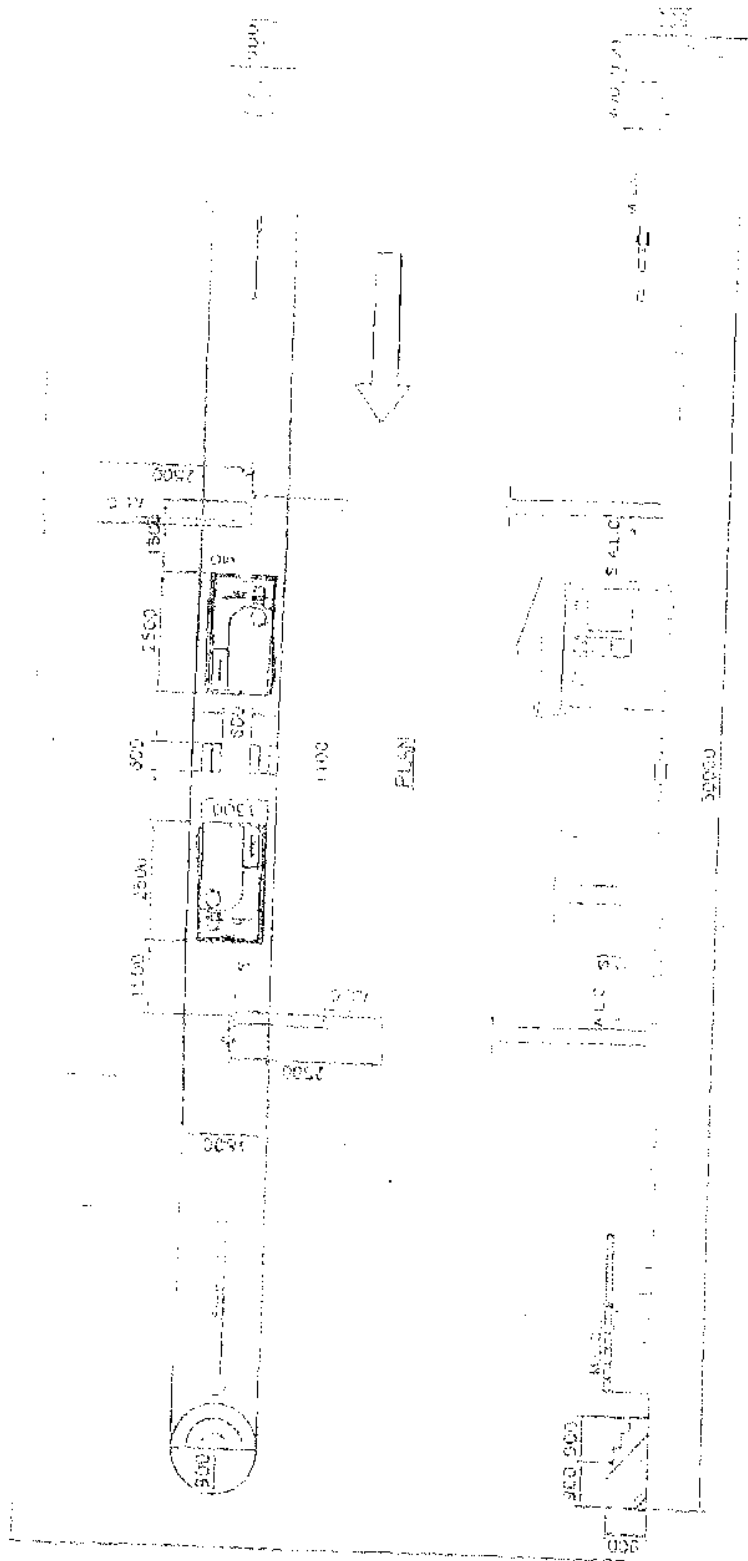


SIDE ELEVATION

LEGEND:
A.L.C. = AUTOMATIC LANE CLOSER
M.L.C. = MANUAL LANE CLOSER
S = SIGNAL
GRADE OF CONCRETE FOR TOLL ISLAND = M30.
ALL DIMENSIONS ARE IN MM

BRIDGE NO. 1

60



GENERAL TOLL (SLAND SECTION)

UNCLASSIFIED

A.L.C. = AUTOMATIC AND LOGGING

$$M_{\text{eff}} = M_{\text{eff}}^{\text{eff}} + M_{\text{eff}}^{\text{eff}}$$

2000

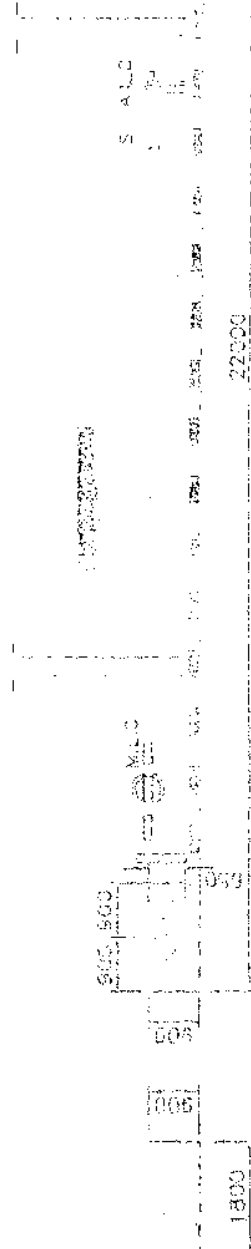
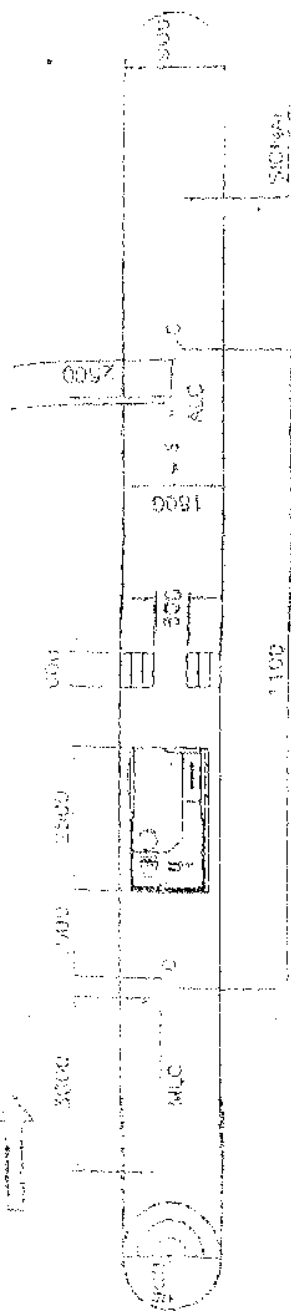
GRADE OF CONCRETE FOR TALL BUILDINGS

100

NOV - 21 1966

DRAWING NO. - 9

2



WINTERGATE TOLL SLAB SECTION

CONCLUSION

SECRET

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

M.L.C. = NATURAL LIFE CLOSING

724215
H
(2)

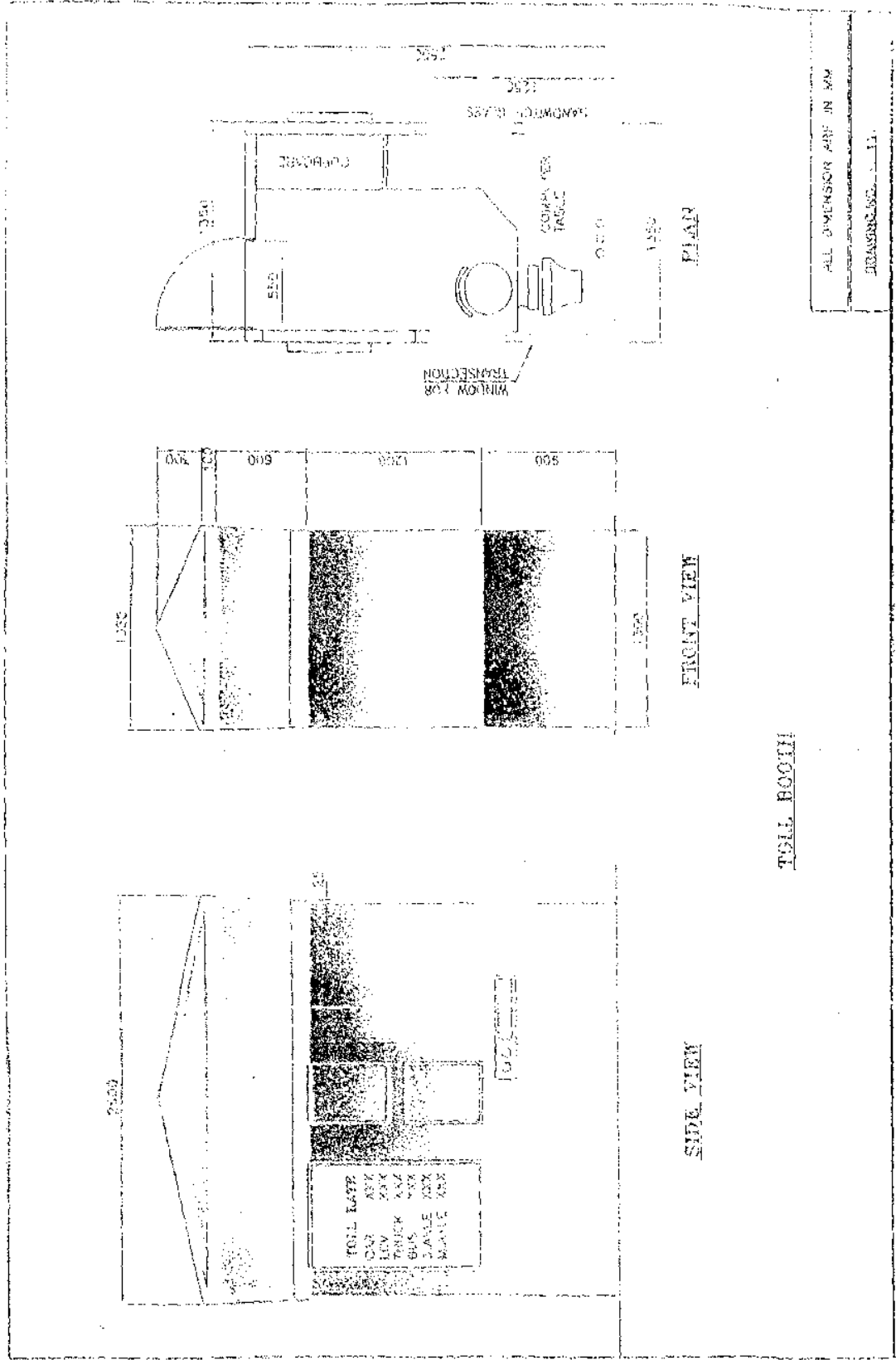
C = TOLL PLAZA CARPOOL? VOLUNTEER

GRADE OF CONCRETE FOR FOOT WALLS

NOT - ALL DISCOVERIES ARE IN HAND

CONFIDENTIAL - NO

42



ALL DIMENSION ARE IN MM
DRAWING NO. 11

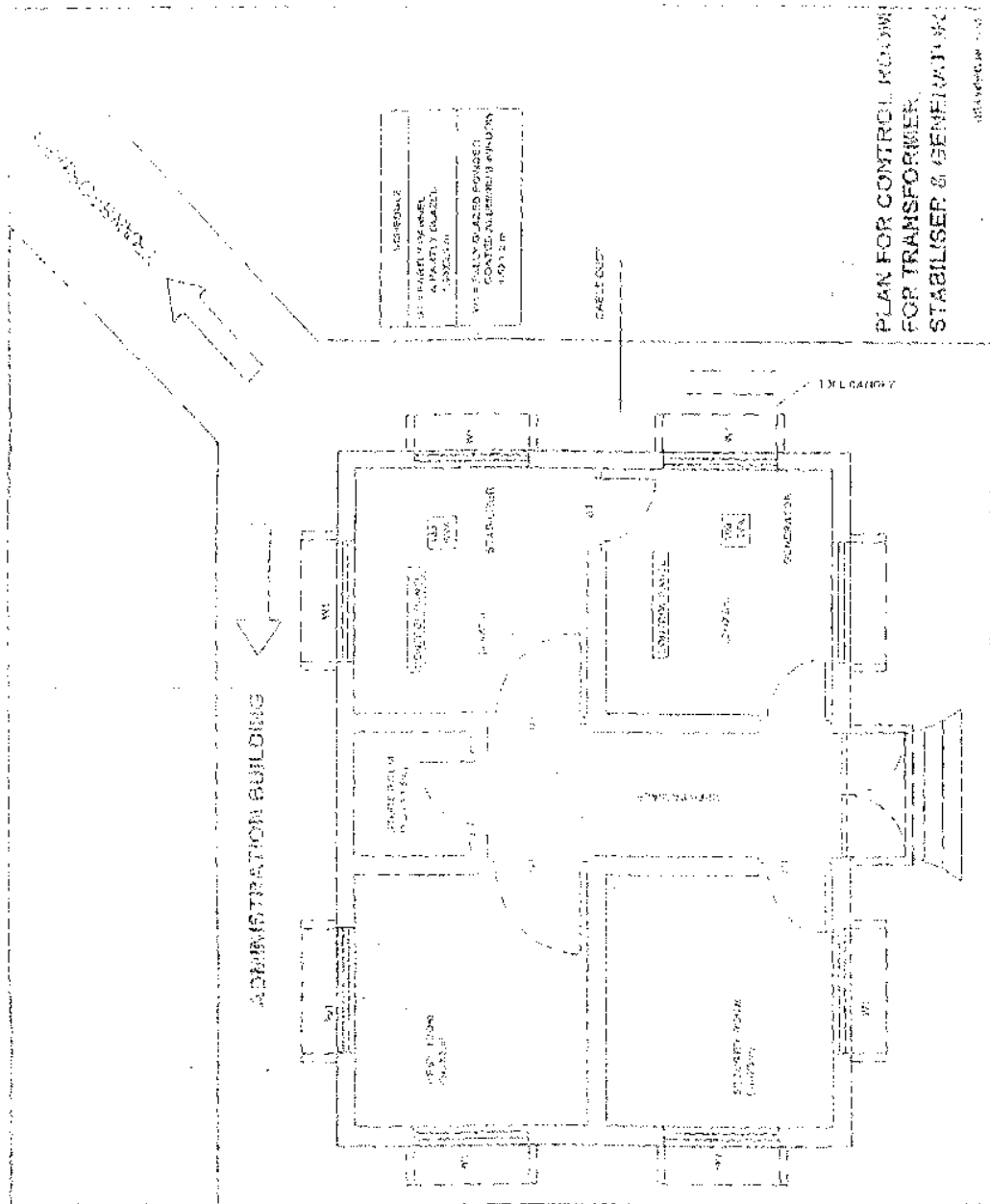
TOLL BOOTH

FRONT VIEW

SIDE VIEW

PLAN

TOLL RATE
CV
ABV
LOV
TRUCK
BUS
TRAILER
TRUCK

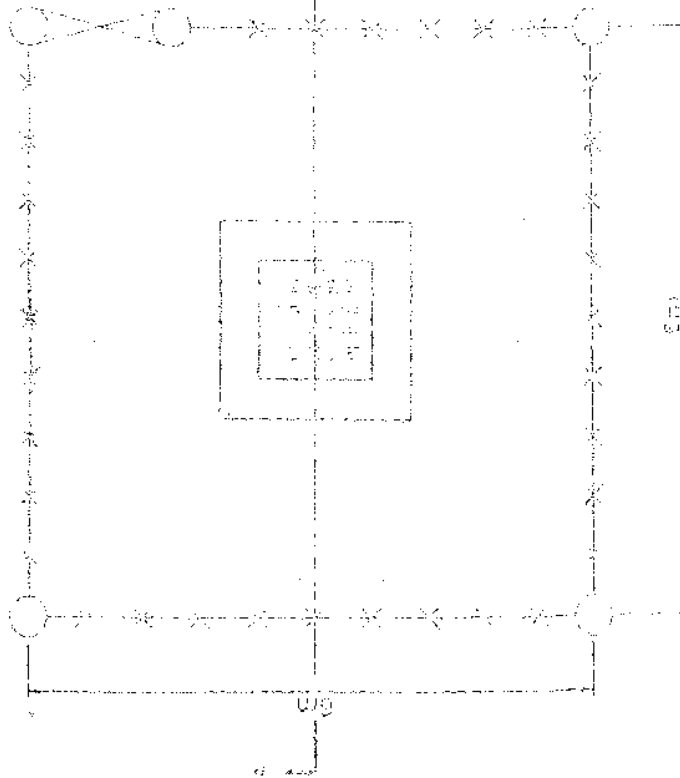


B2

25

CHAIN-LINK FENCE LINE

DATE



PEDESTAL FOR TRANSFORMER

CONCRETE MISC.

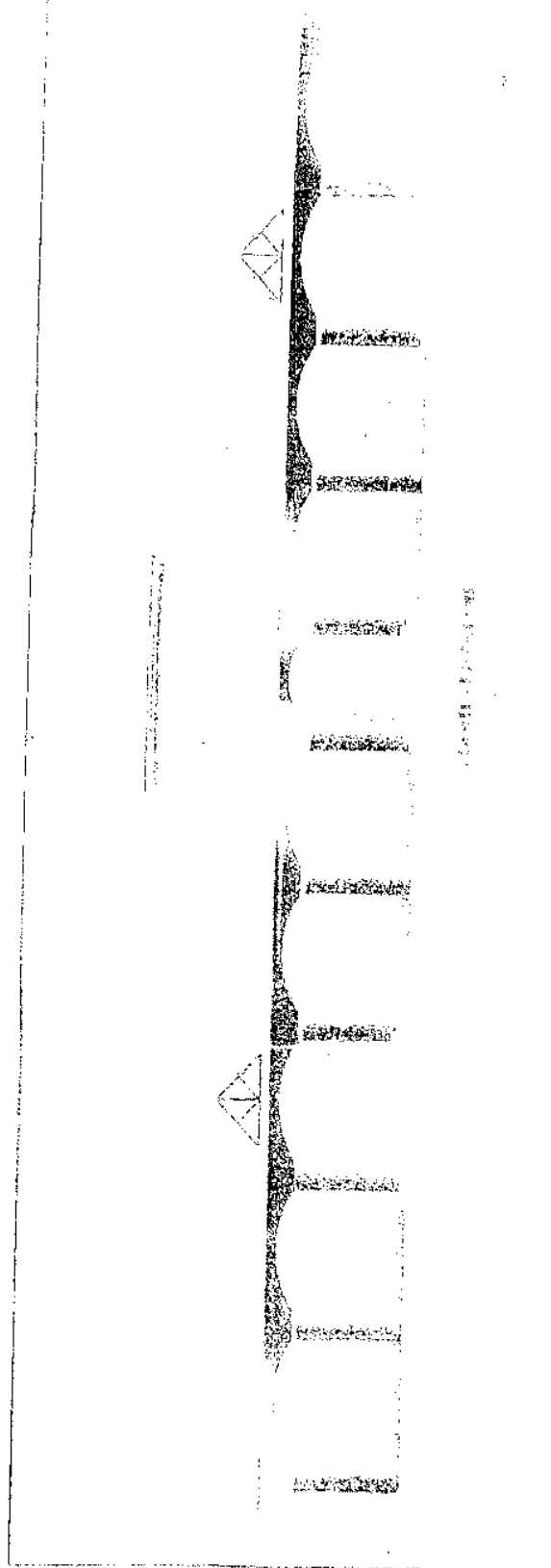
PLAN

SECTION 100

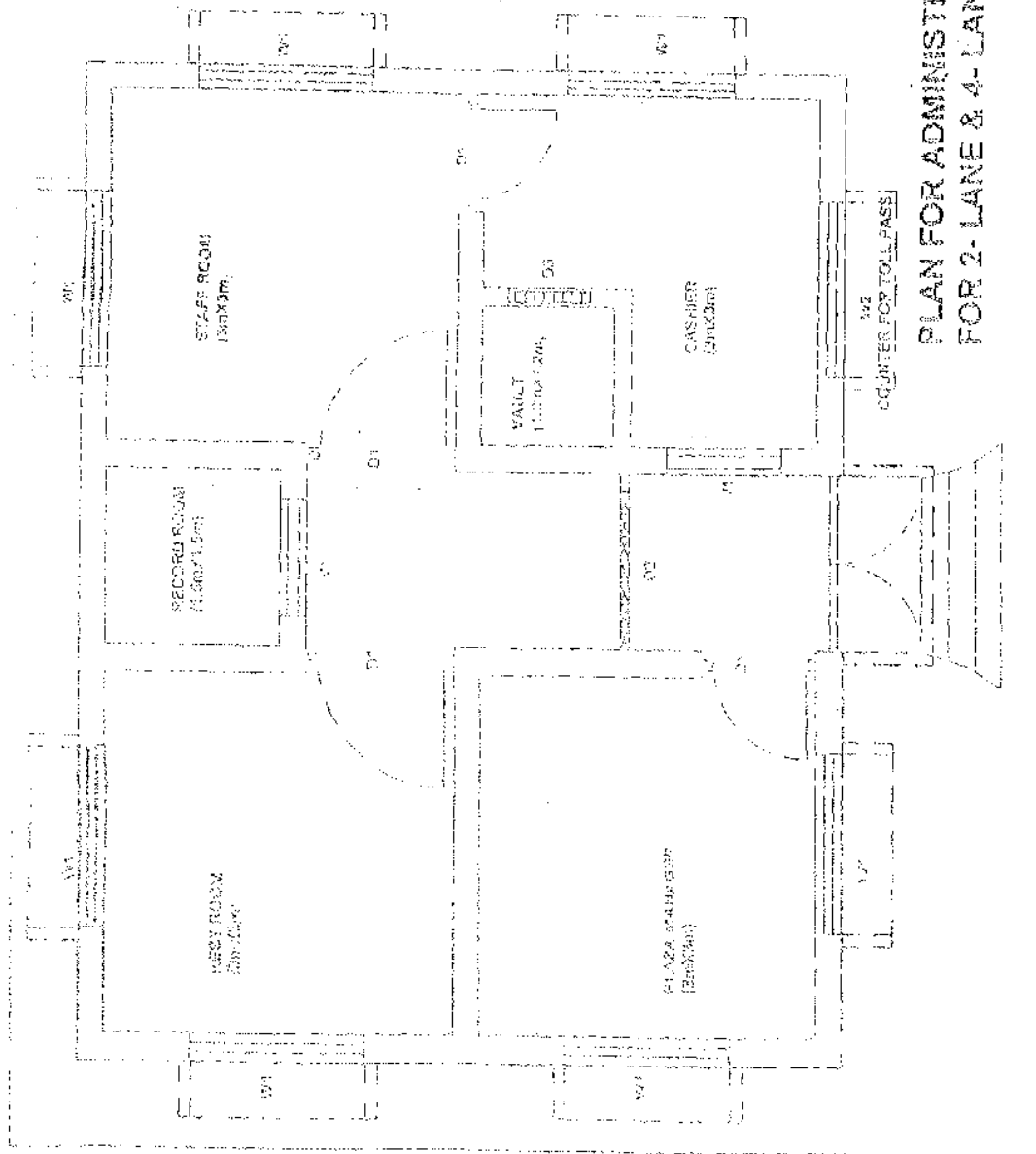
SWITCHYARD FOR OUTDOOR TRANSFORMER

100

Yds



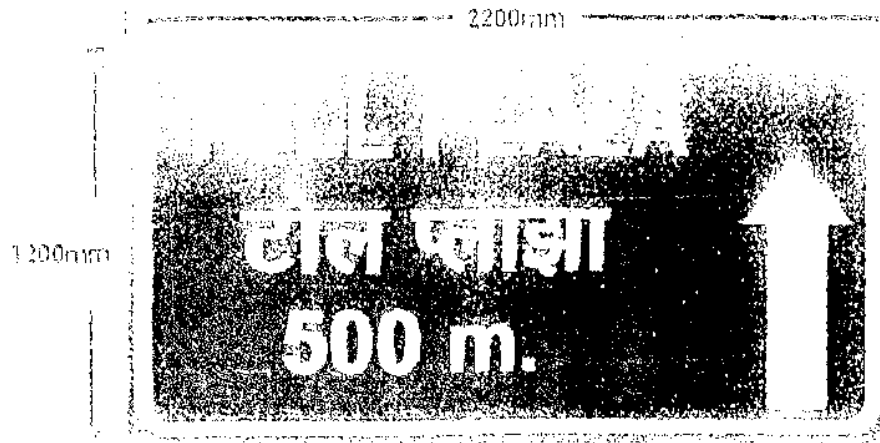
B₁



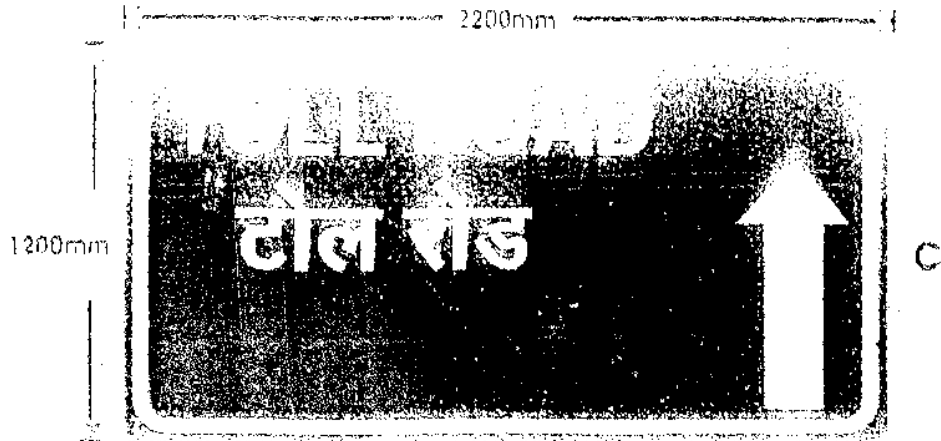
01	STAFF ROOM	13x23m
02	REST ROOM	5m x 7.5m
03	RECORD ROOM	11.5x11.5m
04	PLAZA	12.5x15.5m
05	VAULT	11.5x12.5m
06	CASHIER	5m x 10m
07	REST ROOM	5m x 7.5m
08	COUNTER FOR TOLL PASS	1.5x2
09	STAFF ROOM	13x23m
10	REST ROOM	5m x 7.5m
11	RECORD ROOM	11.5x11.5m
12	PLAZA	12.5x15.5m

PLAN FOR ADMINISTRATIVE BUILDING
FOR 2-LANE & 4-LANE TOLL PLAZA

12



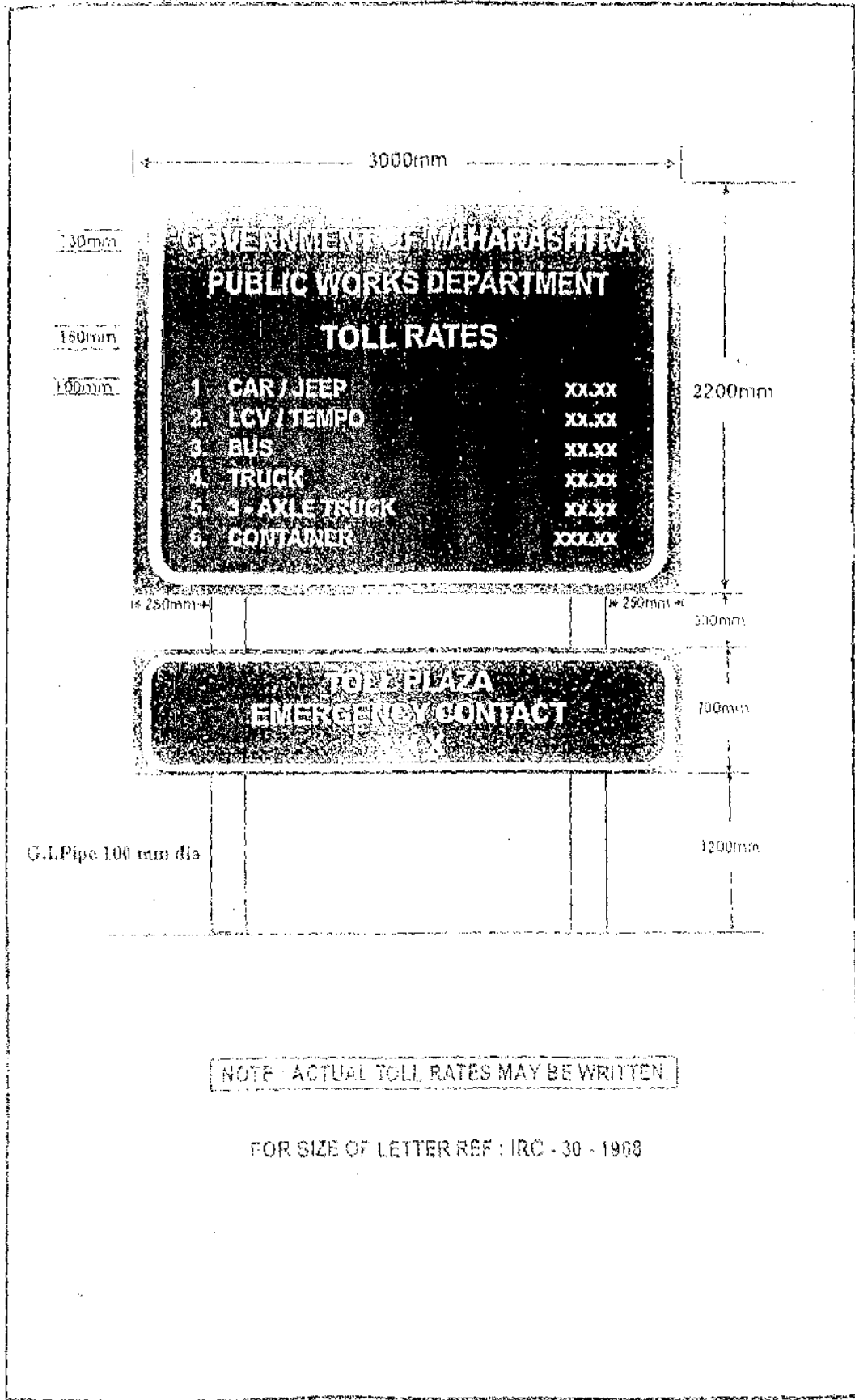
RULES FOR THE DESIGN OF INFORMATORY
SIGNS, LETTER SIZES SHALL BE IN
ACCORDANCE WITH IRC-67-2001 ANNEXURE-4
IRC - 30 -1968 & Govt. Circular No. 0499/D652(86)Rd-1
Date 23/2/2000



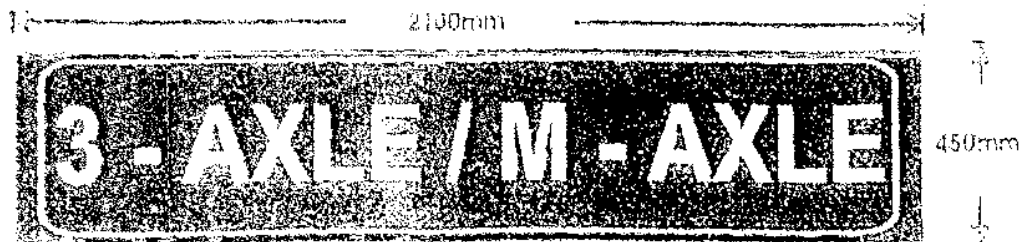
BOARD (D) @ EVERY 5 KMS. ON TOLL ROUTE

RULES FOR THE DESIGN OF INFORMATORY
SIGNS, LETTER SIZES SHALL BE IN
ACCORDANCE WITH IRC-67-2001 ANNEXURE-4
IRC - 30 -1968 & Govt. Circular No. 0499/D652(86)Rd-1
Date 23/2/2000

132



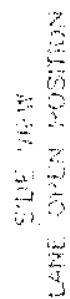
BOARDS CONTROL CANOPY



LETTER HEIGHT - 205mm
LETTER THICKNESS - 31mm
LETTER WIDTH - IRC - 30 - 1968

E36

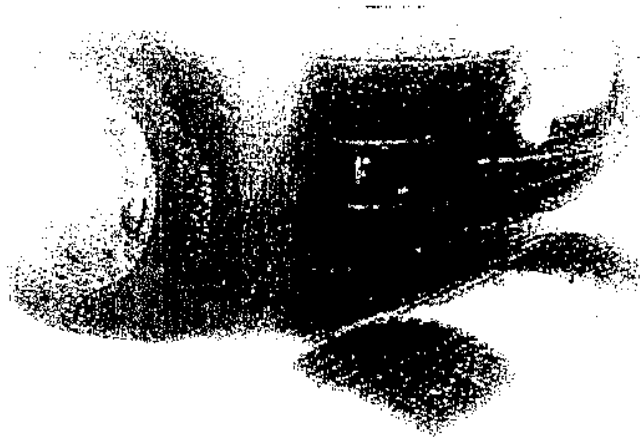
52



NOTE - ALL INFORMATION IS UNCLASSIFIED

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SPEED BUMPS

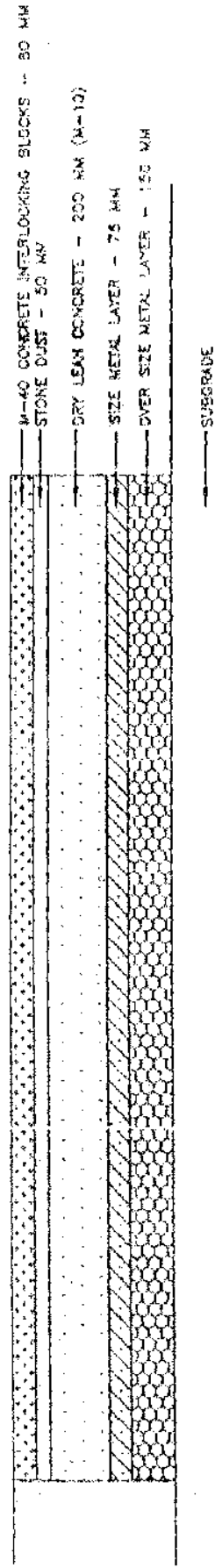


Description:

- The speed bumps are made of rubber.
- It has high resistance to severe impacts and brutal weather conditions.
- It is easy to install due to its modular design which provides interlocking arrangement due to which it is perfectly installed and fixed to road surface. It has round and smooth edge at both the ends.
- Reflectors and glass beads are provided on both the sides of the speed bumps for night vision.
- These are available in Yellow and Black combination for greater visibility.
- The Reflector and Glass beads provide better night visibility.
- These are available in Yellow and Black combination for greater visibility.
- Speed bumps are provided with grooves for draining out rain water.
- It can be instantly installed by epoxy or by spikes for anchoring.

13/10

CROSS SECTION OF INTERLOCKING PAVER BLOCKS



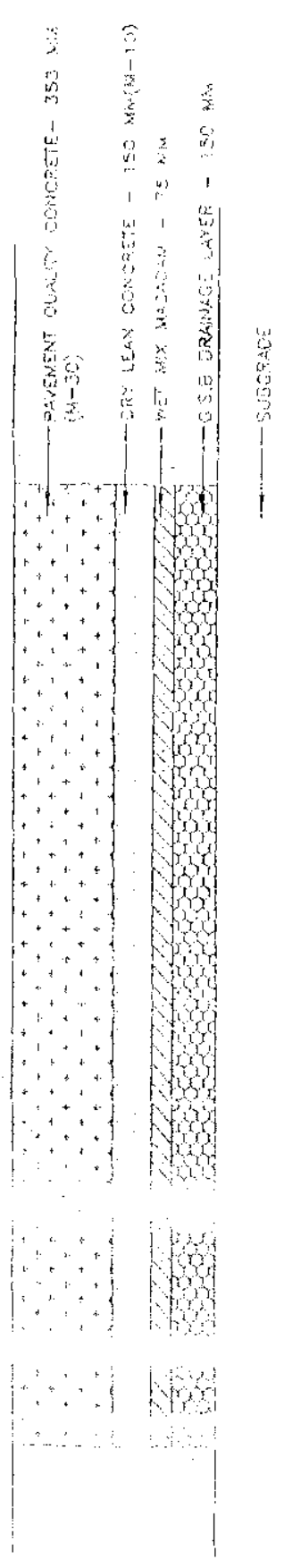
12

5

52

56

CROSS SECTION OF CONCRETE ROAD



(59)

ADMINISTRATIVE BUILDING

It may be constructed as load bearing structure or may be constructed as R.C.C. frame structure

Provisions in Administrative Building.

• Reception	To receive Road facility users, Dignitaries, Officers & other visitors
• Waiting area	Area to wait for road users
• Administration Manager room	Independent office room for Administration Manager
• Toll manager room	Independent office room for Toll Manager
• Pantry + dining room	For preparation of food and eating place
• Security Guard room	Independent room for Security Guard
• Cash Count room	Room to collect and count cash received from Toll Booth. Separate table for each Toll Booth
• Cash Supervisor (Cashier) room	Independent office room for Cash Supervisor
• Safety vault room	Very large amount is received in every shift as such the cash is required to be kept in Toll Plaza Administrative Building till it is sent to the bank
• Administrative Staff Room	Room for administrative staff working in Toll Plaza
• Store room	Room to store stationary, equipments and
• Record room	Room to store all important documents and

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• Control room	All controls of Toll Plaza are exercised from this room. This room is provided in such a way that the whole view of the Toll Plaza is possible from this room and all activities of Toll Plaza operation can be controlled through this room.
• Electronic Work Shop	Work Shop Room to carry out all repair works of electronic Toll equipments, Computers etc
• Cash Van Room	The cash collected at Toll Plaza is transported to Bank through Cash Van. The Cash Van is taken inside Admin. Building when cash is taken out of vault for depositing it in Bank
• Dormitory/Rest Place for Ladies & Gents	Toll booth operators are provided with facility of dormitory, separate for Gents Toll operators as well as for Ladies Toll operators. These dormitories are provided with changing room & toilet. It is also provided with lockers so that Toll operators can put their personal belonging in the locker
• Central UPS room	Room to keep batteries of Emergency Power supply and other related accessories for power back up in case of power backup.
• Central Server room	Room to keep Main Server of computer networking system.
• Conference room	Room for meetings/presentations.
• Parking area	Spec. for parking of vehicles of Office staff, Ambulance, Cash van, Towing vehicle
• Toilet for staff	Separate for Gents and Ladies
• Public Telephone	Public Telephone with STD, ISD facility

• Public toilet	Separate for Gents and Ladies
• Drinking water	Potable water
• Over head Water tank	10,000 liters capacity is provided for Use of water in Administrative Building.
• Fire Extinguisher, Sand Buckets & Provision of Underground water tank of 20000 liters minimum capacity	To Extinguish the fire if any, which may occur at Toll Plaza Administrative Building.

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ROAD FURNITURE

1) Cateyes:	- These are provided at Spacing 3 m/c in toll plaza area to demarcate the border of the toll plaza area. - These are also provided on lane marking. Solar battery operated cateyes can also be provided where ever necessary, more particularly along & before speed Bump.
2) Speed Bumps: -	These are made up of rubber material with reflectors and glass beads. These are provided at the entry of Toll Plaza lanes.
3) Rumbling Road Marking Strips: -	This is provided in Toll Plaza area in each corridor before starting of Interlocking block area or concrete pavement area. This is provided in straight approach to alert the vehicle driver to slow down the speed of vehicle as the Vehicle approaches the Toll Plaza. Width of the reflective paint marking is 30 cm & gap width is 90 cm.
4) Flickering Lamps / Fog Light: -	At the entry of Toll plaza. These are provided on the top of the bull nose facing traffic to call the attention of the road user.
5) Underground Cable Ducts	Independent ducts for laying - Electric supply cables (Power & Signal) - Computer networking & Toll equipment cables. - Optical Fiber Cable
6) Removable	Removable Barricading or Removable Concrete Barrier. Concrete Crash Barrier. These are provided to separate out Traffic Corridors or Lanes. When the toll in any particular corridor is more then, Toll Plaza Manager can open additional lanes for clearing the traffic effectively at Toll Plaza with the help of removable Barricading.

7) Delineators

- These are provided to demarcate the road way and at Toll Plaza to demarcate Toll Plaza Area. These are provided at 15 m/c spacing.

FACILITIES

Public Toilet at Toll Plaza

Public toilet at end of straight Exit length of toll plaza area for both corridors.

- Hygienically Clean
- Separate for Ladies & Gents
- With the provision of facility of small table for changing the nappies of child.
- Dressing table with mirror, paper napkins, liquid soap
- The toilets are provided with the Gents & Ladies sweeper for 24 hours.
- Security personnel for security of facility user & security of vehicles in parking area.

Other facilities: -

- Separate Hygienic Drinking water facility near public toilet
- Public Telephone at Toll Plaza.
- Limited Parking only near public toilet for each corridors
- Provision for collection of use & throw material, used water bottles, tins, cold drink bottles, left over food packets etc. from the road users vehicles.

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TRAFFIC ROAD SIGNS

IRC: 67 - 2001

MATTER	REFERENCE	LOCATION
TOLL PLAZA 200 M.	Drawing @ Page No. 11	200m on either side of starting of Toll Plaza area
TOLL PLAZA 500 M.	Drawing @ Page No. 11	500m on either side of starting of Toll Plaza area
TOLL ROAD	Drawing @ Page No. 12	At entry point of Toll road for both corridors
EMERGENCY CONTACT	Drawing @ Page No. 12	At every 5000m, on either side in Toll Route
TOLL RATES	Drawing @ Page No. 13	50m on either side of starting of Toll Plaza area
TOLL PLAZA 1000 M.	Drawing @ Page No. 14	1000m on either side of starting of Toll Plaza area
NO PARKING	Fig 13.20 P.No.47 IRC: 67-2001	50m on either side of Toll Plaza area
NO STOPPING	Fig 13.21 P.No.47 IRC: 67-2001	75m on either side of Toll Plaza area
HORN PROHIBITED	Fig 13.19 P.No.47 IRC: 67-2001	At Starting of Toll Plaza area on either side
STOP	Fig 13.1 Page No. 39 IRC: 67-2001	On the column of Toll Plaza facing traffic
SPEED LIMIT 30 Km	Fig 13.22 P.No.47 IRC: 67-2001	At 100m on either side of starting of Toll Plaza area

TOLL EQUIPMENTS

1) Automatic Lane Closer	Barrier of Automatic lane closer instrument is in horizontal position when vehicle enters the Toll lane & barrier takes vertical position when road user pays Toll
2) Manual Lane Closer	This is used when lane is required to be closed for longer period to carry out repair work in the lane. This is operated manually by moving swinging arm which spans across the lane.
3) Toll Island Signal	It turns Red when vehicle enters the Toll lane & it turns Green when road user pays Toll amount. It works in co-ordination with Automatic Lane Closer
4) Fog Light/ Flickering light	For calling the attention of road user & to make him aware that his vehicle is approaching Toll Plaza. Fog lights are provided in rainy & winter season.
5) Automatic Vehicle Counter & Classifier	Instrument for vehicle classification & counting. It classifies the type of Vehicle & also counts the vehicle on each lane of Toll Plaza.
6) Toll Lane Camera	The Toll Plaza Manager & control room operator can see activities in each lane on C.C.T.V. Camera.
7) Toll Booth Camera	The Toll Plaza Manager & control room operator can see activities inside the Toll booth.

B

8) Oversize /over loaded Vehicle detector Sensor	This sensor is provided to detect oversize/ overloaded vehicle. Oversize / overloaded vehicle is stopped before entering the Toll lane before it causes the damage to the Toll Booth.
9) Toll Booth Computer	To record data of tickets issued, Shift No., Toll Booth No., Date, Time, Number of Vehicle, Type of Vehicle & amount received from the road user.
10) Siren	To be operated by Toll booth operator in case of Emergency to call the attention of Road User, Control room & Toll Supervision.

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UNDERGROUND CABLE DUCT

Description:

This Cable duct is provided from Toll Plaza Canopy to Toll Plaza Control Room(Administrative Building) and also from Administrative Building to Transformer, Generator & stabiliser room. The Mild Steel/Galvanised Iron Cable trays are provided as shown in Drawing. One side trays are used to carry computer and Toll equipment related cables and other side trays are used to carry power cables only, to avoid disturbance to computer/toll equipment due to induction.

The top of cable duct is covered by removable slabs (covers).

Bh

DELINEATORS

Description:

These are normally provided to demarcate Roadways and it's boundary on high embankment and in cutting. These are also provided near Toll Plaza to demarcate Straight and Merging length. These are available in different sizes ranging from 600 mm to 1400 mm and made up of plastic, M.S. pipes and reinforced plastics. It is provided with reflective tape on the top. It is also many times provided with metal guard to protect reflective tape portion.

INTERLOCKING PAVER BLOCK TO APPROACH ROAD TO TOLL PLAZA

Description:

The interlocking block pavement is provided in the straight approach road of toll plaza. The interlocking blocks are provided on both sides for a length 50m from the center of toll plaza. The interlocking blocks pavement is easy to maintain and can be repaired easily in case of damage to road surface. These interlocking blocks if kept in spare can be used for repairing the damaged portion of road. These interlocking blocks are kept in spare, as they can be used for repairing the damaged portion of road. The traffic can be allowed immediately on the repaired portion of the road as no curing is required for the damaged portion.

Details of Cross

- Oversize Metal Layer (60 mm) = 150 mm Compacted
- Size Metal Layer (40 mm) = 75 mm Compacted
- Dry Lean Concrete (M10) = 200 mm (Compacted)
- 100 Stone dust = 50 mm (Compacted)
- Interlocking Blocks (M40) = 90 mm

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CONCRETE ROAD FOR APPROACH TO TOLL PLAZA

	The Concrete Road (P.Q.C.) is another option available in place of interlocking block pavement.
Details of Crust	• G.S.B. in accordance with MORT clause no. 401=150 mm (Optional) • Wet Mix Macadam in accordance with MORT clause no. 406=75 mm (Compacted) • Dry Lean Concrete in accordance with MORT clause no. 801=150 mm (Compacted) • Pavement Quality Concrete(M40) in accordance with MORT clause no. 602 & 704 =350 mm (Compacted)

BROAD OUT LINE OF SPECIFICATION FOR ADMINISTRATIVE BUILDING OF 6 LANE & 8 LANE TOLL PLAZA

1	Construction of Building	Main Structure	R.C.C. Frame Structure Grade of Concrete M-30
2	Walls	External Internal	230 mm Thick Brick Wall 150 mm Thick Brick Wall
3	Plaster	External Internal	Sand faced Cement Plaster 20 mm Thick Cement Plaster with Neeru finish
4	Floorings	Entrance Central UPS Plaza Manager Admin. Manager Toilet Bath W.C. Staircase Steps & Risers Remaining Portion	Marbonite Flooring Ceramic Tiles Kota Stone Flooring Kota Stone Flooring
5	Badm Work	W.C. Bath	Ceramic Tiles
6	Doors	Main Doors Toilet Doors	Anodized Partly Glazed & Partly paneled Aluminum Door F.R.P. Doors
7	Windows		Aluminum Frame Fully glazed Windows
8	Kitchen Ckta	Pantry	Granite
9	Fixture & Fastening		Powder Coated Brass Fixture & Fastening
10	Painting	Internal	Oil Bond Distemper
11	Water Proofing	Terrace Slab	Conventional Water Proofing

BROAD OUT LINE SPECIFICATION FOR TOLL CANOPY

1	Main Canopy Structure	Steel Structure
2	False Ceiling of Canopy	Aluminum Powder Coated
3	Encasing of Column	Powder Coated Mild Steel Sheet of 16 Gauge
4	Roofing of Toll Canopy	G.I. Precoated Sheet
		25 to 30 mm thick

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ELECTRICAL REQUIREMENTS

No		Fans	Tubes	Computer	A/C	Qty.
1	Entrance Foyer	2	4	1 No.		
2	Administrator Area	5	8			
3	Plaza Manager	3	4	1 No.		
4	Administration Manager	2	2			
5	Reception Area	2	2			
6	Waiting Area	2	2			
7	Conference Room	2	4			
8	Corridor	0	3			
9	Cash Update	8	8			
10	Cash Super	1	2	1 No.		
11	Vault	1	1			
12	Security Guard	1	1			
13	Cash Van	0	1			
14	Ladies & Gents room	2	2			
15	Lobby	1	2			
16	Staircase	0	1			
17	Control Room (A/C)	4	6	6 No.	2 No. (1.5 M.T.)	
18	Control UPS	1	1			
19	UPS Room	1	1		1 No. (1.5 M.T.)	
20	Toilets	6	6	8 No.		
21	Electric Room	1	1		1 No. (1.5 M.T.)	
22	Pantry	1	1			
23	Dining	3	5			
24	Store	1	1			
25	Toilet	14	14			
26	Control Room For Transformer	1	1			
27	Stabiliser	2	4			
28	Generator	2	4			
29	Security	2	2			
30	Rest Room	2	2			
31	High Mast 7.2 Kw					2
32	LCD 150 W in Toilets					18
33	Canopy					6 No.
34	Signal lamps 40 W					24
35	Fog lamps 40 W					6
36	Street lighting 250w each in Toilets Plaza Area					20
	(not provided.)					

ABSTRACT

No.	Electrical Equipments	KW	Qty	Total
1	A/C 1.5 MT	1.500	5	7.50 KW
2	Computer	0.300	16	4.80 KW
3	Printer	0.300	16	4.80 KW
4	Fans	0.060	74	4.44 KW
5	Tube	0.052	98	5.10 KW
6	High Mast	7.200	2	14.40 KW
7	ICD	0.150	18	2.70 KW
8	Automatic Lane Closer	0.750	6	4.50 KW
9	Signal Lamp	0.100	24	2.40 KW
10	Fog Lamp	0.100	6	0.60 KW
	Total			4.80 KW

CAPACITY OF ELECTRICAL EQUIPMENTS

Total Power requirement	51.24 KW
Transformer Capacity	75 KVA
Generator Capacity	53 KVA
Stabilizer Capacity	63 KVA
UPS Capacity (with half an hour backup)	40 KVA

136

SECTION- VII

DRAWINGS OF CROSS SECTION OF
ROAD

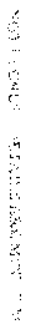
Concessionaire

Engineer-in-Charge

73

123

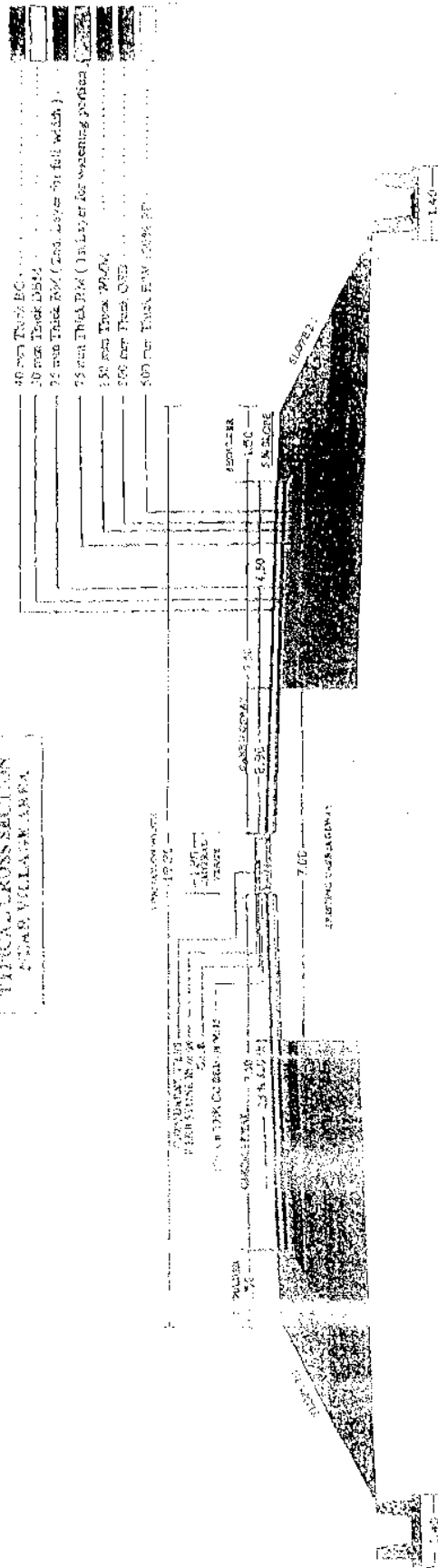
STANDARD CROSS SECTION
IS REQUIRED



2

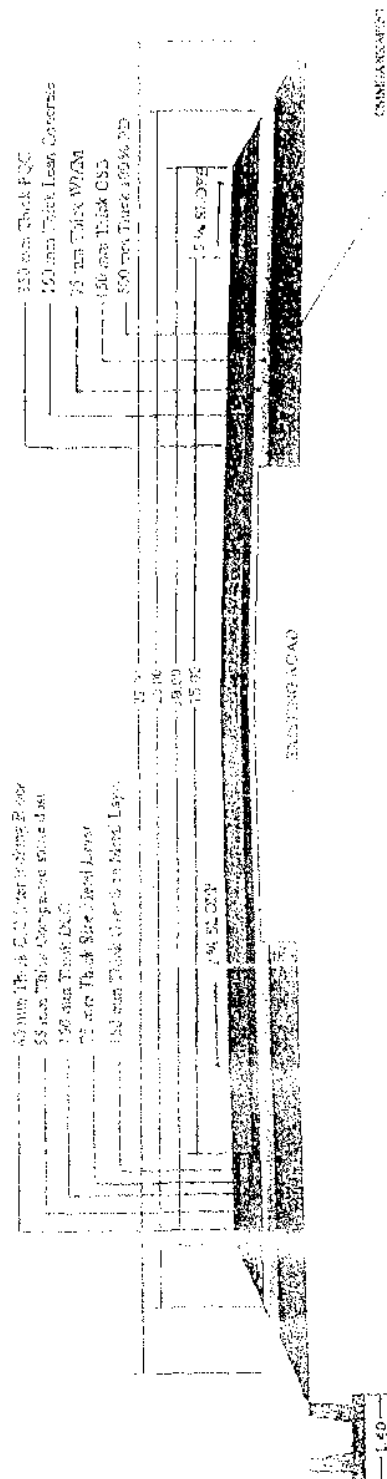
MD

1887 MAY 13 6 PM
NO. 1058000 70411



2002-2003 25. 379,676 (S) 622, 276,618

10

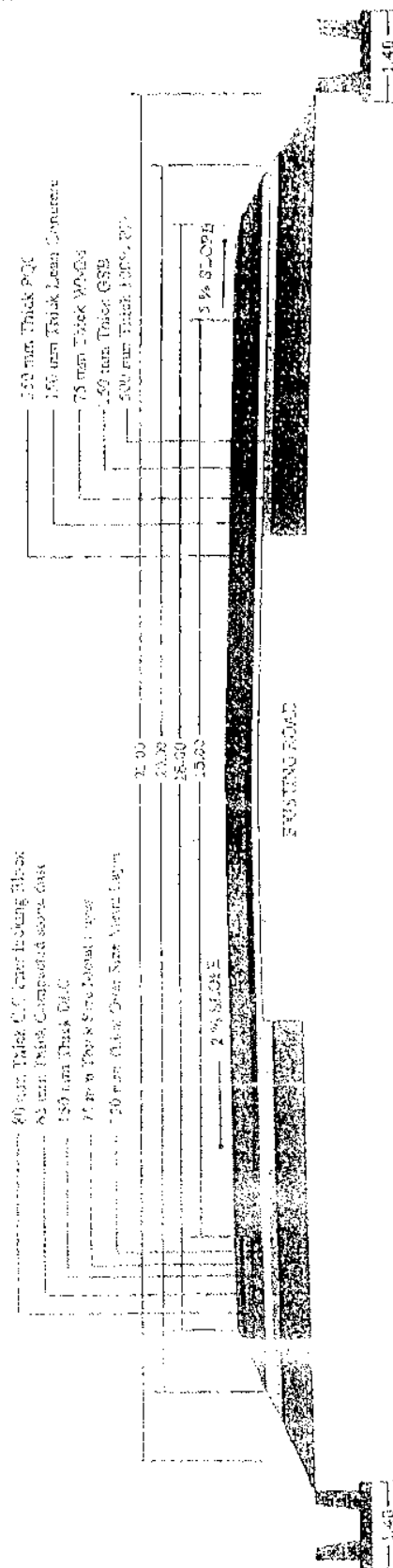
TYPICAL CROSS SECTION
WITH ONE SIDE GUTTER

WOTC-27577-11840316000-14

6-10-1984 - 2500 - 2500

(19)

27



4

SECTION- VIII

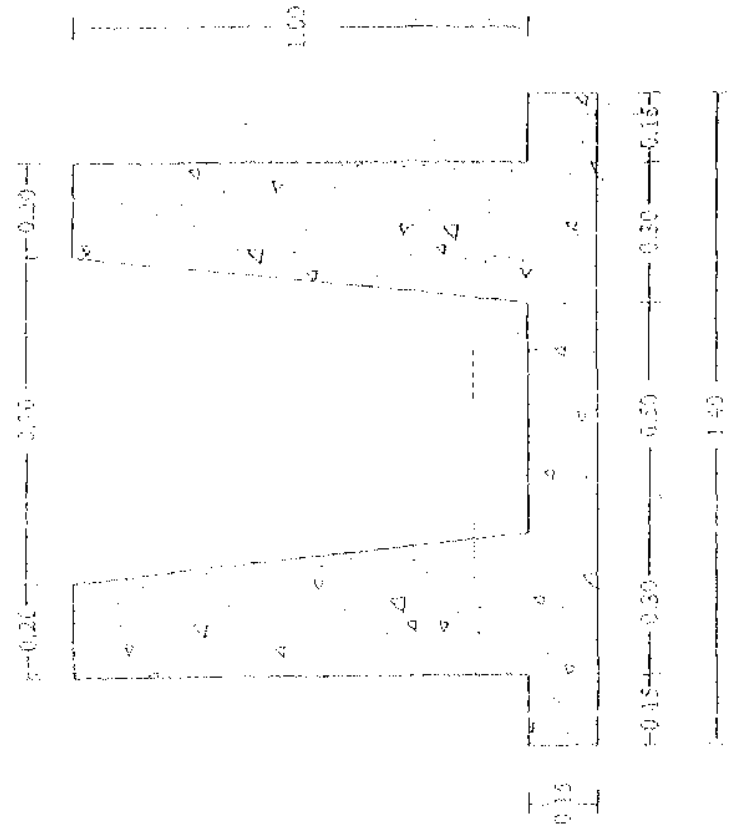
CROSS SECTION OF BUILT-UP
GUTTER

Concessionaire

Engineer-in-Charge

NAME OF WORK FOUR LANE OF CHINCHOTI - KAMAN - ANUR PHATA - MANKOLI ROAD M.S.H.4SECTION
 S. N. 22/600 TO 26/425 TALUKA - BHILWANDA, DIST - THANE.

CROSS SECTION OF BUILTUP GUTTER



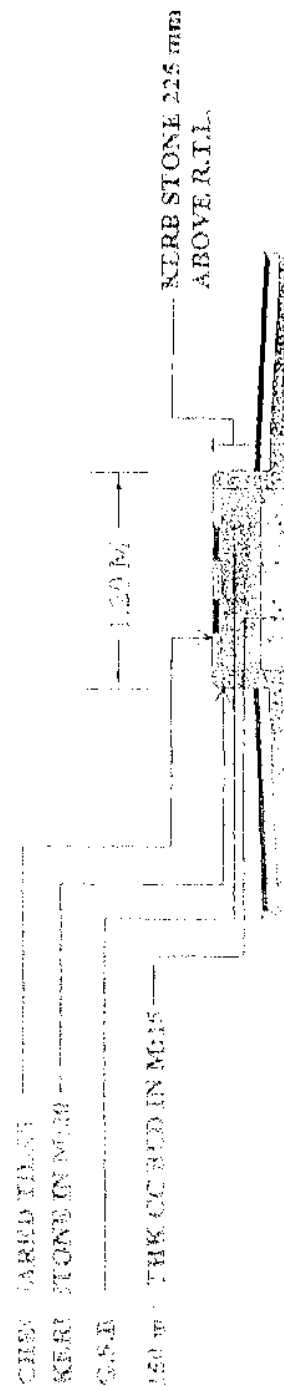
SECTION- IX

DRAWING OF MEDIAN VERGE

Concessionaire

Engineer in Charge

DETAILS OF CENTRAL VERGE



GOVERNMENT OF MAHARASHTRA

SECTION- X

DRAWING OF CRASH BARRIER

Concessionaire

Engineer in Charge

GOVERNMENT OF MAHARASHTRA

SECTION- XI

DRAWING OF GANTRY

Concessionaire

Engineer in Charge

SECTION- XI

DRAWING OF GANTRY ATTACHED
SEPERATEL IN APPENDIX- I OF
VOLUME-IV.

Concessionaire

Engineer-in-Charge

83

17.5

5.25 5.25

4.50

12.50

VIEW AT



13