TOWNSHIP OF SCUGOG

DESIGN CRITERIA AND STANDARD DETAIL DRAWINGS 2003

Adopted by Council: May 12, 2003

TOWNSHIP OF SCUGOG

DESIGN CRITERIA

AND

STANDARD DETAIL DRAWINGS

FOR

SUBDIVISION DEVELOPMENT

AND

SITE PLANS

2003

Adopted by By-Law No.38-03

THE CORPORATION OF THE TOWNSHIP OF SCUGOG

BY-LAW NUMBER 38-03

BEING A BY-LAW TO ADOPT DESIGN CRITERIA AND STANDARD DETAIL DRAWINGS (2003) FOR GENERAL SERVICES IN THE TOWNSHIP OF SCUGOG.

WHEREAS Council adopted Design Criteria and Subdivision Standards by By-Law Number 83-90;

AND WHEREAS the lapsing of time warranted a major revision;

AND WHEREAS the revision produced substantial changes;

AND WHEREAS the Council deems it advisable to adopt revised standards for general services within the Township of Scugog;

NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE TOWNSHIP OF SCUGOG Enacts As Follows:

1. That the Design Criteria and Standard Detail Drawings (2003) for the Township of Scugog attached hereto as Schedule "A" and forming part of this By-Law, be adopted.

2. That By-Law Numbers 83-90, 31-92, 26-93, 15-99, 27-99 and 7-00 are hereby repealed..

3. This By-Law shall come into full force and effect on the date of passing.

Read a First, Second and Third time and finally passed this 12th day of May, 2003.

MAYOR, Doug Moffatt

CLERK, Kim Coates

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SECTION A - GENERAL INFORMATION

A 1.00 GENERAL

A 1.01 FAMILIARIZATION

Prior to the commencement of the Engineering design, the Consultant shall obtain copies of the Township of Scugog "Design Criteria" and "Standard Detail Drawings" to familiarize himself with the requirements of subdivision design in the Township of Scugog.

A 1.02 REGIONAL MUNICIPALITY OF DURHAM

The Regional Municipality of Durham is responsible for all sanitary sewers and watermains that are to be installed on all road allowances and registered blocks and easements within the Region of Durham.

The Regional Municipality of Durham is responsible for all Regional Roads.

The Consulting Engineer shall contact the Region of Durham Engineering Department to obtain copies of the Regional Design Standards for sanitary sewers and watermains.

A 1.03 ENGINEERING REQUIREMENTS FOR DRAFT PLAN APPROVAL

A Preliminary Engineering Report must be submitted by the Developer's Consulting Engineer to the Township Engineer in accordance with the Official Plan. This report must be presented in a readable, comprehensive and professional manner. The Report must be signed and sealed by a Professional Engineer.

This Preliminary Report shall contain the following and be submitted in duplicate:

a. <u>The Draft Plan</u>

The Draft Plan must be in a form acceptable to the Planning Departments of the Regional Municipality of Durham and the Township of Scugog.

b. <u>Contour Plan</u>

This plan must be at a scale of no larger than 1:1000 giving contour lines at sufficient intervals to permit assessment of existing surface drainage patterns. Contour intervals shall not be greater than 1.5 metres. This plan is to extend to the limits of the drainage area to be served by proposed sanitary and storm sewer systems, including lands beyond the boundaries of the subdivision. For large external drainage areas, separate Contour Plans at a larger scale may be provided. All elevations are to refer to Geodetic Datum.

c. <u>General Plan of Services</u>

This will be a plan based on the Draft Plan and must schematically show the proposed storm sewer systems and their connection to existing systems. Direction of flow must be indicated on all sewers. This plan is to be accompanied by preliminary engineering calculations indicating the quantity of storm water flow at the connection to existing systems and/or at proposed outfalls. Consideration must be given to the whole catchment area to ultimately be developed. Blocks and easements for storm drainage systems shall also be shown.

SECTION A - GENERAL INFORMATION

A 1.03 *ENGINEERING REQUIREMENTS FOR DRAFT PLAN APPROVAL* - (cont'd)

c. General Plan of Services - (cont'd)

Preliminary road profiles and area grading requirements must also be identified in the Preliminary Report. Blocks of land for community mail centres must be identified on the Draft Plan and the General Plan of Services.

d. Drainage Plan

When a natural drainage channel passes through and is affected by the construction of the subdivision, drawings must be submitted to indicate the location and typical cross-sections of the existing channel and of any proposed changes. In general, creek diversions will not be permitted, unless these are in the nature of improvements to the existing watercourse. An erosion-sediment control plan will be required. A preliminary stormwater management plan and report will be required by the Township of Scugog in accordance with Section C 4.05 of this document. The Consulting Engineer must submit an outline of the erosion-sediment control plan in accordance with Section C 5.04.

Any proposed modifications to an existing channel and/or flood-plain will require Conservation Authority review and approval. The Consulting Engineer must meet with Conservation Authority staff and confirm their requirements, prior to proceeding with the preliminary Engineering Report.

e. Soils Report

A soils investigation and report from an independent Soils Consultant will be required by the Township Engineer.

f. Hydrogeologic Report

The proponents of a draft plan application shall provide a detailed Soils and Hydrogeological Report prepared by a qualified Hydrogeologist, relating to the soil types and their ability to physically accommodate private sewage disposal systems, the availability of potable groundwater supplies from the proposed water-supply sources, the anticipated quantitative and qualitative impacts within the development and with neighbouring water sources, and proposed mitigative measures. Preliminary on-site testing must be reviewed with the Township Engineer and must be sufficient to support the proposed residential density. Test wells shall be drilled and pump testing performed to carry out the hydrogeological investigation. The proposed monitoring program, prior to, during and after construction shall be submitted by the hydrogeologist to the Township and the Durham Region Department of Health Services for review.

g. Landscape Analysis

The proponents of a draft plan application shall provide a detailed Landscape Analysis of the site and adjacent properties which indicates major tree species, measures to be taken to protect environmentally sensitive areas and/or natural physical features of the site, proposed new plantings and existing topography at 1.5 metre intervals.

SECTION A - GENERAL INFORMATION

A 1.03 ENGINEERING REQUIREMENTS FOR DRAFT PLAN APPROVAL - (cont'd)

h. Environment Assessment Act

In June 1993 private sector developers were made subject to the Environmental Assessment Act for projects covered by the Municipal Class Environmental Assessment (Class EA) process. The details of this are contained in Ontario Regulation 345/93.

It is the responsibility of the Developer to determine, in consultation with the Township and the Region, if they are the proponent of the project. If the Developer is the proponent of the project, the Developer is responsible for reviewing the criteria set out in Ontario Regulation 345/93 to determine if the proposed project is subject to any EA requirements. It is strongly suggested that the proponent review ALL schedules to determine the Class EA requirements of a project. Additional information can be acquired from the Environmental Assessment Branch, Transportation and Municipal Projects Unit at (416) 440-3450.

The Developer's Consulting Engineer shall clearly identify in the Preliminary Engineering Report how all appropriate Class EA requirements (either Schedule "C" process or "approved development under the *Planning Act* cannot be granted until the proponent has Draft Plan demonstrated full compliance with the Class EA requirements. Draft Plan approval may be granted on the condition that the Class EA requirements will be fulfilled.

i. Traffic Management

The Developer's Consulting Engineer shall demonstrate prior to Draft Plan Approval to the satisfaction of the Township that the recommendations of the Township of Scugog's Traffic Management of Development - A Review Process Report, dated January 2003, have been complied with. Refer to Appendix "B" for a copy of the Traffic Management of Development Draft Plan Checklist.

A1.04 FUNCTIONAL REPORT

A functional report and plan is required prior to commencement of the final design. Prior to the commencement of the functional report, the Developer's Consulting Engineer shall meet with the Township Engineer and Director of Public Works to discuss the Township's requirements and with the Region's Engineering Department to discuss the Region's requirements. It is suggested that when possible this be a joint meeting. The functional report shall provide all details, calculations, costs, alternatives and recommendations necessary to evaluate the proposed development.

The functional report and plan shall include, but will not necessarily be limited to the following considerations:-

a. major roadway alignments, cross-sections and intersections,
b. roadway structures,
c. watercourse improvement and channelizations,
d. railway crossings
e. parkland development
f. major trunk sewers,
g. storm drainage systems,
h. sanitary drainage systems,
i. water distribution systems,
j. lot grading design,

SECTION A - GENERAL INFORMATION

A1.04 FUNCTIONAL REPORT - (cont'd)

k. pumping station locations,
l. noise attenuation measures.

In cases where the subdivision development under consideration forms part of a larger area set aside for future development, the functional report shall confirm that the servicing design does not limit the future development. In addition, the functional report is required when a subdivision is being phased and the engineering design is being undertaken for each phase separately.

Where Design Criteria as herein identified cannot be met for a specific development proposal, the Consulting Engineer shall employ special design considerations related to road and lotting patterns, storm drainage and outlets, grading, erosion and siltation controls, and protection of Environmentally Sensitive areas. All special design considerations will be subject to the Township Engineer's approval.

The functional report shall be signed and sealed by a Professional Engineer.

A1.05 CONSULTING ENGINEER

"Consulting Engineer" means a competent professional engineer or firm of engineers employed by the Developer and skilled and experienced in municipal work and land development projects and registered with the Association of Professional Engineers of the Province of Ontario, possessing a current certificate of authorization to practice professional engineering as required by the Professional Engineers Act.

A 2.00 SUBMISSIONS

Engineering drawings shall be submitted simultaneously to the Region of Durham and to the Township of Scugog. The Consulting Engineer is advised to review the Region of Durham's Design Criteria to determine the requirements for submissions of engineering drawings to the Region's Engineering Department.

Prior to the Township Engineer commencing with he review and approval of engineering reports and plans, the Developer shall enter into a Financial Agreement with the Township of Scugog to the satisfaction of the Township Solicitor.

A2.01 FIRST SUBMISSION TO THE TOWNSHIP OF SCUGOG

The initial submission of engineering drawings to the Township of Scugog shall contain the following information:

a. certified information checklist (Form A1 - Appendix A),
b. one copy of the approved Draft Plan,
c. two copies of the proposed plan for registration showing all lot and block numbering and dimensioning,
d. Declaration from the Consulting Engineer indicating that he has been retained to design and supervise the construction of the work in the subdivision according to the terms of the Subdivision Agreement,
e. three copies of the General Plan of Services,
f. three copies of the Lot Grading Plan,
g. three copies of the Area Rough Grading Plan,
h. three copies of the Storm Drainage Plan,

SECTION A - GENERAL INFORMATION

A2.01 FIRST SUBMISSION TO THE TOWNSHIP OF SCUGOG - (cont'd)

i. three copies of the storm sewer design sheets, and computer printouts, and detail calculations for pipe strength and bedding,
j. three copies of all plan and profile drawings,
k. three copies of the Park Grading Plan,
l. three copies of all detail drawings other than the Township of Scugog Standard Detail Drawings,
m. three copies of all drawings pertinent to the design,
n. three copies of all other calculations necessary to check the design,
o. three copies of a soils report for confirmation of the pavement design, prepared by a qualified Soils Consulting Engineer,
p. illumination calculations,
q. noise attenuation report,
r. four copies of all "R" plans showing proposed easements,
s. two sets of streetscape or tree planting plans for boulevards (to the Township Engineer and Director of Parks & Recreation),
t. supplementary hydrogeologists reports as required by the Township,
u. Three copies of the Traffic Management Plan. The Developer's Consulting Engineer shall demonstrate to the satisfaction of the Township that the Engineering recommendations of the Township of Scugog's Traffic Management of Development - A Review Process Report, dated January 2003 have been complied with. Refer to Appendix C for a copy of the Traffic Management of Development Engineering Review Checklist.

The Applicant must include a completed "Information Checklist" with every submission to the Township of Scugog. The Information Checklist shall by prepared on the standard Form A1 contained in this section of the document. Every submission to the Township of Scugog must be certified complete by the Applicant's Consulting Engineer. Incomplete submissions will not be considered by the Township of Scugog. The above information will be reviewed by the Township of Scugog and one set of drawings and calculations will be returned to the Consulting Engineer with the required revisions noted.

A2.02 SUBSEQUENT SUBMISSIONS

Subsequent submissions of items (d) through (s) inclusive shall be made until the engineering drawings and design is acceptable to the Township of Scugog Engineer. The design of the underground electrical distribution system shall be completed by the applicable Hydro authority. This design shall be submitted to the Township Engineer and shall be approved prior to the final approval of the engineering drawings. The design of the Bell telephone system, Cable TV system and gas mains shall follow the same format as the applicable Hydro authority requirements.

A2.03 MINISTRY OF THE ENVIRONMENT APPLICATIONS

After the engineering design and drawings are in a state acceptable to the Township of Scugog, three copies of the Ministry of the Environment application forms for storm sewers and one complete set of engineering drawings shall be submitted to the Township Engineer. All copies of these applications shall be signed by the Township Engineer and Clerk of the Township of Scugog and shall be returned to the Consulting Engineer. The Consulting Engineer shall make application to the Region for the approval of the Ministry of the Environment, under the Ontario Water Resources Act. The Developer must submit completed MOE forms, declaring compliance with the Environmental Assessment Act.

SECTION A - GENERAL INFORMATION

A2.04 OTHER APPROVALS

The Consulting Engineer shall be required to make all submissions and representations necessary to obtain approval from all other authorities affected (Ministry of Natural Resources, Ministry of Transportation Ontario, Conservation Authorities, Canada Post Corporation, Medical Officer of Health, Transport Canada, etc.). The Township of Scugog shall be kept informed of the progress of these submissions by copies of all correspondence.

A2.05 ORIGINAL TRACINGS

After all approvals have been received from all parties affected, original tracings shall be submitted to the Township Engineer. These tracings shall be signed and dated by the Township Engineer and returned to the Consulting Engineer. Changes or revisions to the drawings, after the signature of the Township Engineer has been affixed, must be formally submitted to the Township Engineer for approval.

If after one year from the date of the signing of the engineering drawings by the Township Engineer, the Developer fails to enter into a Subdivision Agreement with the Township of Scugog, the Township Engineer reserves the right to revoke and/or all approvals related to the engineering drawings.

A2.06 PREPARATION OF SUBDIVISION AGREEMENT

The draft of the Subdivision Agreement will be prepared by the Township Engineer and forwarded to the Township Clerk. The final Subdivision Agreement will be prepared under the direction of the Township Clerk who shall obtain Council's approval for the execution of the Agreement.

The engineering drawings must be signed by the Township Engineer prior to the preparation of the draft Subdivision Agreement Schedules.

The Township Clerk must be in a position to clear ALL Conditions of Draft Plan Approval (especially those conditions of the Ministries of Natural Resources and Environment) prior to the preparation of the draft Subdivision Agreement Schedules.

Note: Prior to the commencement of preparation of the Subdivision Agreement, the Developer's Consulting Engineer shall provide the Township Engineer with the following:-

a. Ministry of Environment Certificates of Approval for Township services to be constructed for the proposed subdivision.

b. The name of the person and/or company and Mortgagees with whom the Subdivision Agreement will be executed. The Developer's address and telephone number shall be provided.

c. The name, address and telephone number of the Developer's lawyer.

d. A breakdown of the number of units proposed within the subdivision:-

SECTION A - GENERAL INFORMATION

A2.06 *PREPARATION OF SUBDIVISION AGREEMENT* - (cont'd)

ie. Single family units
Semi detached units
Townhouse units
Apartment units - Bachelor Dwelling Unit
One Bedroom Dwelling Unit
Two Bedroom Dwelling Unit
Three or more Bedroom Dwelling Unit

e. Four (4) copies of the Reference Plan for the subdivision.

f. Four (4) copies of the LEGAL DESCRIPTION of the subdivision, based on the reference plan.

g. Eight (8) copies of the proposed final plan for registration (M-Plan) complete with the street names, lot numbers, surveyor's certificate, owner's certificate and all other pertinent information required by the registry office.

h. Eight (8) copies of the reference (40R-) plans for any easements to be granted to the Township.

i. Eight (8) copies of the approved engineering drawings.

j. Eight (8) copies of the "M" and "R" plans reduced to legal size.

k. An OLS Certificate in tabular form identifying all lot numbers and corresponding frontages, depths and areas, in compliance with the appropriate zoning by-law.

l. A detailed cost estimate of Township Services to be constructed for the subdivision. The cost estimate shall be signed and sealed by a Professional Engineer.

The estimated cost of Services shall be detailed to show individual items of construction. The total estimated cost of Services shall include the following:-

i. detailed cost of services;
ii. the actual estimated cost of the Hydro underground distribution system and street lighting;
iii. any other miscellaneous expenditures required by the Subdivision Agreement as the Developer's obligations; such as park equipment, park landscaping, development of open space, etc.
iv. allowances for contingencies and engineering in accordance with the following:-

m. All Subdivision Agreements between the Township of Scugog and Developers of Subdivisions shall be deemed to include the provisions of Sections K and L of this Document. (Ref. Township of Scugog By-Law Nos. 83-90 and 31-92).

Estimated cost of Services - Items (i, ii & iii)		Contingencies	Engineering
1.	First $500,000.00.00	15%	15%
2.	Next $500,000.00.00	10%	10%
3.	Residual amount over $1,000,000.00	8%	8%

SECTION A - GENERAL INFORMATION

A2.06 PREPARATION OF SUBDIVISION AGREEMENT - (cont'd)

This estimate will be used as a basis for calculation of the security to be posted for the development.

The Developer shall provide the Township of Scugog with written confirmation from the following utility authorities that satisfactory arrangements have been made for the installation of underground services in the proposed subdivision:-

- applicable Hydro Authority
- Bell Canada
- Consumer's Gas
- Appropriate Cable Vision Company
- Any other Authority where required

In addition to the above, Location Approvals shall also be submitted by the appropriate utility authorities.

n. Proposed timetable for construction of services.

o. Proposed landscaping plan where necessary or required.

p. Proposed staging Plans.

A2.07 REQUIREMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION

Prior to commencement of construction, the Developer's Consulting Engineer shall submit the following information to the Township Engineer for approval (allow at least 2 weeks for approval).

a. Three (3) sets of all construction specifications.

b. The proposed contractor and subcontractors.

c. The Contractor's list of suppliers.

d. One (1) copy of the signed Contract Documents complete with unit prices.

e. All other information specified in the Subdivision Agreement as a requirement prior to commencement of construction or other information required by the Township Engineer.

f. Conservation Authority Permits for erosion and sediment control measures proposed.

g. Ministry of Natural Resources work permits, if applicable.

A2.08 PREPARATION OF PRE-SERVICING AGREEMENT (IF APPLICABLE)

The draft of the Pre-Servicing Agreement will be prepared by the Township Engineer and forwarded to the Township Clerk. The final Pre-Servicing Agreement will be prepared under the direction of the Township Clerk who shall obtain Council's approval for execution of the Agreement.

The Pre-Servicing Agreement will not be executed until such time that the Township of Scugog is satisfied that the Developer has complied with the Region of Durham requirements for pre-servicing, effective August 1, 2001.

SECTION A - GENERAL INFORMATION

A2.06 *PREPARATION OF PRE-SERVICING AGREEMENT* - (cont'd)

Security required in conjunction with Pre-Servicing Agreement's shall be calculated as follows:

1. Security for Internal Services shall be the greater of:

   1.1 20% of the cost of the Internal Services; or

   1.2 the estimated cost of restoring and maintaining the Lands disturbed during the construction of Services until such time that a healthy growth of vegetation is achieved over the Lands.

2. Security for site specific requirements, as determined by the Township Engineer, which could include measures such as the implementation of a well monitoring program prior to and during construction including security for the replacement of impacted private wells, implementation of environmental monitoring programs, construction and maintenance of measures necessary to mitigate the impact of construction on surrounding lands, etc. shall be calculated based on 100% of the value of the site specific requirements.

3. Security for External Services shall be calculated based on 100% of the value of the external services. Note: Construction of External Services shall be subject to the issuance and conditions of a Road Occupancy Permit.

Security for Township administration costs in the event of default by the Developer shall be calculated at 15% of the sum of the security determined in Items 1, 2 and 3 above.

A3.00 *ENGINEERING DRAWING REQUIREMENTS*

A3.01 All engineering drawings shall be prepared in metric and in a neat and legible fashion. The design information presented on these drawings shall be completed in ink to meet with Regional requirements for microfilming.

A3.02 All engineering drawings shall be prepared on 3 mil drafting film (mylar) with a matte surface on the working side.

A3.03 The standard Township of Scugog title block as shown in the detail drawings shall be used on all engineering drawings. A title sheet is required for the engineering drawings.

A3.04 All General Plans, Lot Grading Plans, Area Rough Grading Plans, Plan and Profile Drawings and Detail Drawings shall be prepared on standard A1 sheets. Storm Sewer Drainage Area Plans may be completed on larger sized drawings in order that the entire drainage system being designed may be presented on one sheet.

A3.05 The lot numbering and block identification on all engineering drawings shall be the same as shown on the Registered Plan for the area.

A3.06 All elevations shown on the engineering drawings are to be of geodetic origin. Aerial photo interpretation methods for securing existing contours and elevations will not be accepted by the Township for base plan information on engineering drawings.

A3.07 All plan and profile drawings are to be prepared so that each street can be filed separately. The street names shall be identified on the Plan portion of the drawings.

SECTION A - GENERAL INFORMATION

A3.00 ENGINEERING DRAWING REQUIREMENTS - (cont'd)

A3.08 When streets are of a length that requires more than one drawing, match lines are to be used with no overlapping of information.

A3.09 The reference drawing numbers for all intersecting streets and match lines shall be shown on all plan and profile drawings.

A3.10 A north arrow shall be referenced on all drawings.

A3.11 All engineering drawings shall be stamped by a Professional Engineer. The Engineer's stamp must be signed and dated, prior to the issuance of drawings for tendering and signed by the Township Engineer.

A4.00 GENERAL PLAN OF SERVICES

A4.01 A "General Plan of Services" drawing shall be prepared for all developments at a maximum scale of 1:1,000.

A4.02 When more than one "General Plan of Services" drawing is required for any development then the division of drawings shall reflect the limits of the Registered Plans as closely as possible. Where more than one plan is prepared, a supplementary "General Plan of Services" at a smaller scale shall be prepared to show the entire plan of subdivision on one drawing.

A4.03 The reference Geodetic Benchmark and the Site Benchmarks to be used for construction shall be identified on the General Plan of Services.

A4.04 A Key Plan at a scale of 1:10,000 shall be shown on all "General Plan of Services" drawings and the area covered by the drawing shall be clearly identified.

A4.05 A drawing index shall be shown on all "General Plan of Services" to identify the Plan and Profile Drawing number for each street or easement shown.

A4.06 All road allowances, lots, blocks, easements and reserves are to be shown and are to be identified in the same manner as shown on the Registered Plan.

A4.07 All existing services, utilities and abutting properties are to be shown in dotted lines.

A4.08 All services to be constructed are to be shown on the "General Plan of Services" in solid lines.

A4.09 All storm and sanitary sewers are to be shown. It is not necessary to show the length, grade and the sewer material on the "General Plan of Services" however, the sizing, direction of flow and type of the sewer must be shown.

A4.10 All manholes will be shown and are to be numbered in accordance with the design drawings.

A4.11 All catchbasins are to be shown.

A4.12 All watermains, valves and hydrants are to be shown. Watermains to be identified only by size and usage.

A4.13 All curbs and sidewalks are to be shown.

A4.14 All fencing is to be indicated by height and type.

SECTION A - GENERAL INFORMATION

A4.00 GENERAL PLAN OF SERVICES - (cont'd)

A4.15 Dimensioning of utilities and roadways is not required on the "General Plan of Services".

A4.16 All sites for parks, schools, churches, commercial and industrial development must be shown.

A4.17 If a subdivision encroaches on an existing floodplain, the approved fill line restrictions must be shown, as specified by the local conservation authority.

A4.18 Proposed locations of Community Mail Boxes and the associated number of units shall be shown on the "General Plan of Services".

A4.19 Buffer Strips

Buffer strips shall be provided between commercial/industrial and residential developments. Buffer strips shall include a solid wood fence with a minimum height of 1.8m to a maximum height of 2.4m, in a location approved by the Township. Coniferous tree plantings shall be provided at 4m intervals with a minimum caliper of 45mm along any portion of the fence that is visible from a public street. Refer to Section G4.00 for preferred species. Where the buffer strip is located at least 30m from any residential swimming pool, one in three may be a deciduous tree. Preferred species include red oak, little leaf linden, deborah maple, schwedler maple, green ash and white ash.

A5.00 PLAN AND PROFILE DRAWINGS

A5.01 All plan and profile drawings shall be prepared at a scale of 1:500 horizontally and 1:50 vertically. A complete legend shall be provided on all Plan and Profile Drawings.

A5.02 Plan and Profile drawings are required for all roadways, blocks and easements where services are proposed within the development, for all outfalls beyond the development to the permanent outlet, for all boundary roadways abutting the development and for other areas where utilities are being installed below grade.

A5.03 All existing or future services, utilities and abutting properties are to be shown in dotted or dashed lines.

A5.04 All services to be constructed are to be shown in solid lines.

A5.05 The profile portion of the drawing shall be a vertical projection of the plan portion whenever possible.

A5.06 All road allowances, lots, blocks, easements and reserves are to be shown and are to be identified in the same manner as the Registered Plan. Lot and block frontages are to be shown.

A5.07 All curb and gutter and sidewalks shall be shown and dimensioned on the plan portion of the drawing.

A5.08 All storm sewers shall be shown and dimensioned on the plan and shall also be plotted on the profile of the drawings. The sewers shall be described only by size, direction of flow and type in the plan portion, but shall have a complete description on the profile portion of the drawing including length, grade, material, class of pipe, usage and bedding requirements. The size of the pipe shall be plotted to full scale on the profile. The resulting hydraulic grade line for the 1:100 storm event shall also be plotted on the profile portion of the drawing.

SECTION A - GENERAL INFORMATION

A5.00 *PLAN AND PROFILE DRAWINGS* - (cont'd)

A5.09 All manholes shall be shown on the plan and on the profile portion of the drawing. The manholes shall be identified by chainage, number on the plan and on the profile and shall also be referred to the applicable Township of Scugog Standard Detail Drawing or to a special detail on the profile portion of the drawing. All invert elevations shall be shown on the profile with each having reference to the north arrow.

A5.10 All catchbasins and catchbasin connections shall be shown. Catchbasins are to be numbered for easy reference.

A5.11 All storm sewer manholes which have safety platforms are to be noted.

A5.12 All drop connections are to be noted and referred to the Township of Scugog Standard Detail Drawing.

A5.13 All rim and invert elevations for rear lot catchbasins are to be shown.

A5.14 Manhole benching details are to be shown at a scale of 1:25 whenever the Township of Scugog Standard Detail Drawings are not applicable.

A5.15 All watermains, hydrants, valves, etc. shall be shown, described and dimensioned on the plan portion of the drawing. In addition, the watermain shall be plotted to true scale size on the profile portion of the drawing and shall be described.

A5.16 The location of all storm, water and sanitary service connections shall be shown on both the plan and profile portion of the drawing using different symbols for each service. These services need only be dimensioned when the location differs from the standard location as shown on the Township of Scugog Standard Detail Drawings. The connections to all blocks in the development shall be fully described and dimensioned (size, length, grade, invert elevations, materials, class of pipe, bedding etc.).

A5.17 The centreline of construction with the 20 metre stations noted by a small cross shall be shown on the plan portion of the drawing.

A5.18 The original ground at centerline and the proposed centreline road grade shall be plotted on the profile. The proposed centreline road grade shall be fully described (length, grade, P.I. elevations, vertical curve data, high point chainages, low point chainages, etc.).

A5.19 Details of the gutter grades around all 90 degree crescents, intersections and cul-de-sacs shall be provided on the plan portion of the drawing as a separate detail at a scale of 1:100.

A5.20 Special notes necessary to detail construction procedures or requirements are to be shown.

A5.21 Chainage for the centreline of construction are to be shown on the profile portion of the drawing. The P.I., B.H.C., E.H.C., B.V.C. and E.V.C. chainages are to be noted.

A5.22 The proposed pavement structure design shall be noted on the plan portion of the drawing.

A5.23 The basement elevation of all existing dwellings on streets where sewers are to be constructed shall be noted on the profile. The resulting hydraulic grade line for the 1:100 storm event shall also be plotted.

SECTION A - GENERAL INFORMATION

A5.00 *PLAN AND PROFILE DRAWINGS* - (cont'd)

A5.24 All existing services, utilities and features are to be shown on the plan portion of the drawing. Those services and utilities below grade that are critical to the new construction shall also be shown in the profile. Test holes may be required to determine actual elevation of these services and utilities.

A5.25 The curb radii at all intersections shall be shown on the Plan portion of the Drawing.

A5.26 Profiles of roadways shall be produced sufficiently beyond the limits of the proposed roads, to confirm the feasibility of possible future extensions.

A5.27 The location of all luminaire poles shall be clearly shown on the Plan portion of the drawings.

A5.28 The proposed location and type of all street name and traffic control signs shall be shown on the Plan portion of the drawings.

A5.29 Proposed locations and types of all trees to be shown on the Plan portion of the Drawing.

A6.00 *OTHER DRAWINGS*

A6.01 *LOT GRADING PLANS AND AREA ROUGH GRADING PLANS*

All lot grading plans and area rough grading plans shall be prepared in accordance with the criteria given in Section E of this document.

A6.02 *STORM DRAINAGE PLANS*

All drainage plans for storm sewer design shall be prepared in accordance with the criteria given in Section C of this document.

SECTION A - GENERAL INFORMATION

A6.00 *OTHER DRAWINGS* - (cont'd)

A6.03 *DETAIL DRAWINGS*

The Township of Scugog Standard Detail Drawings shall be utilized whenever applicable. The latest revision of the Ontario Provincial Standard Drawings may be utilized when approved by the Township Engineer. These drawings shall be reproduced as part of the engineering drawings for the development and must be referred to by number on the affected plan and profile drawings. The Consulting Engineer shall be responsible to check the suitability of the details provided on these standard drawings for the application proposed. Individual details shall be provided by the Consulting Engineer for all special features not covered by the Township of Scugog Standard Drawings. These special details shall be drawn on standard sized sheets and shall be included as part of the engineering drawings. The minimum scale to be used for any special manhole or sewer detail shall be 1:25.

A7.00 *CERTIFICATE OF COMPLETION AND FINAL ACCEPTANCE*

The term "Certificate of Completion" shall be used to describe the date when the services are complete and acceptable to the Township of Scugog subject to the maintenance requirements pursuant to the Subdivision Agreement. "Final Acceptance" shall be the terminology used to describe the date when the Developer's maintenance requirements have been fulfilled and the Services are acceptable to the Township of Scugog. "Final Acceptance" of the subdivision shall be the date on which the Council of the Township of Scugog agrees by By-Law that all the conditions of the Subdivision Agreement have been fulfilled and *all* maintenance requirements have been completed.

The "Certificate of Completion" and "Final Acceptance" must be requested in writing by the Developer. The dates for "Certificate of Completion" and "Final Acceptance" of the Services in the development shall be established by the Township of Scugog.

When the Services are completed and cleaned to the satisfaction of the Consulting Engineer, he shall advise the Township Engineer in writing that the work is completed and shall request an inspection by the Township of Scugog. The Township of Scugog shall carry out their inspections and shall advise the Consulting Engineer of any items of work requiring further rectifications. When all deficiencies have been corrected to the satisfaction of the Township Engineer, a report shall be forwarded to the Council (Certificate of Completion) recommending a date for the commencement of the maintenance period.

Near the end of the maintenance period the Services shall be reinspected by the Consulting Engineer and all deficiencies found shall be corrected. When the Consulting Engineer is satisfied that the work is complete and acceptable, he shall so advise the Township and shall request a final inspection by the Township Engineer. When all work is completed to the satisfaction of the Township Engineer, a report shall be forwarded to the Council recommending "Final Acceptance" of the works.

SECTION A - GENERAL INFORMATION

A8.00 "AS-CONSTRUCTED" DRAWINGS

A8.01 GENERAL

The "As-Constructed" drawings constitute the original engineering drawings which have been amended to incorporate the construction changes and variances in order to provide accurate information on the works as installed in the development.

A8.02 "AS-CONSTRUCTED" FIELD SURVEY

The "As-Constructed" revisions shall be based upon a final survey of all the subdivision services and the Consulting Engineer's construction records. The final survey of the subdivision services shall include a field check of the following items:-

a. Location and invert elevations of all sewer manholes.

b. Distances between all sewer manholes.

c. Location of all roadway catchbasins.

d. Location, rim and invert elevations for all rear yard and lot catchbasins.

e. Location of all sidewalks and curbs.

f. Location and ties to all valve boxes and valve chambers.

g. Location of all hydrants.

h. Location and ties to all special watermain appurtenances.

i. Road centreline elevations.

j. Site Benchmarks.

k. Location of all service connections to all lots and blocks and location of connection from nearest downstream manhole (ie. 0+023).

l. Sewer pipe sizes.

m. Location of all fencing constructed as part of the subdivision services.

n. "As-Constructed" Tree Planting.

A8.03 DRAWING REVISIONS

The original tracings shall be revised to incorporate all changes and variances found during the field survey and to provide the ties and additional information to readily locate all underground services. One set of prints of the approved engineering drawings shall be submitted, which show the approved figures with the changed figures in coloured pencil.

All sewer and road grades are to be recalculated to two decimal places.

All street line invert elevations of storm and sanitary house connections to each block shall be noted on the drawing.

SECTION A - GENERAL INFORMATION

A8.03 DRAWING REVISIONS - (cont'd)

All pencil notations on the drawings shall be removed and shall be replaced in ink.

All screening shall be removed.

All street names, lot numbering and block identification shall be checked against the Registered Plan and corrected if required.

The Contractor, the date of commencement of construction and the date of completion shall be noted on the "General Plan of Services" drawings only.

The "As-Constructed" revision note shall be placed on all drawings in the revision block. The title sheet of the Engineering Drawings shall be clearly marked with; "As-Constructed", using dry transfer lettering (48 pt. Grotesque 216).

The Contract Number (Regional or Municipal only) shall be added to the drawings, if applicable.

A8.04 TOLERANCES

A maximum vertical plotting tolerance of 0.2 metres on the 1:50 vertical profile portion of the drawings and a maximum horizontal plotting tolerance of 1 metre on the 1:500 scale drawing shall be considered acceptable without replotting.

All sewer lengths are to be shown to the nearest 0.15 metres.

The information shown on the "As-Constructed" drawings may be checked by the Township of Scugog at any time up to two years after final acceptance of the subdivision and if discrepancies are found between the information shown on the drawings and the field conditions, then the drawings will be returned to the Consultant for rechecking and further revision.

The consultant shall be required to explain in writing, any major difference between the design and the "As-Constructed" data and to provide verification that alteration does not adversely affect the design of the subdivision services.

A8.05 SUBMISSIONS

Upon completion of all construction work and the "As-Constructed" revisions, the original tracings shall be submitted to the Region of Durham for microfilming and then to the Township of Scugog for their permanent records.

The submission of the "As-Constructed" drawings to the Township of Scugog must be completed before "Final Acceptance" of the subdivision will be given.

In addition, the Developer shall provide to the Township of Scugog a digital copy of the "As-Constructed" drawings on CD media in a tagged image file (TIF) format.

The Consulting Engineer shall provide a written declaration to the Township of Scugog stating that all Subdivision works have been constructed in accordance with the terms of the Subdivision Agreement, approved Engineering Drawings and the Township's Design Criteria, prior to "Final Acceptance".

SECTION A - GENERAL INFORMATION

A9.00 PRIVATE SERVICING OF RESIDENTIAL LOTS

A9.01 GENERAL

Where a development is privately serviced, all wells shall be constructed in conformance with the Ontario Water Resources Act, R.S.O., 1980, and Ontario Regulation 612/84 and all private waste-disposal systems shall be designed and constructed in accordance with Part 8 - Sewage Systems of the Ontario Building Code and with the requirements of the Region of Durham Health Department.

A9.02 WATER SUPPLY SYSTEMS

a. Each water supply well must be drilled to the depth of the aquifer proposed for development in the supporting hydrogeologic report, prior to the completion of the first stage of road construction and the sale of the lots.

b. The well shall comprise new steel casing, having an inside diameter at least 125mm and a wall thickness at least 4.7mm, and a commercial, wirewound, stainless steel screen at least 0.3 metres in length if completed in the overburden. The annular space shall be grouted from a depth of 3 metres to surface in accordance with the Ontario Well Regulation.

c. Each well shall be capable of delivering at least 9 litres/minute of essentially sand-free water for a continuous six-hour period or two four-hour periods during any given 24-hour period, as determined by a controlled-discharge pumping test.

d. The distribution system shall be capable of delivering at least 825 litres within one hour during the peak-demand morning and evening periods from combined storage and direct well withdrawals.

e. The system shall be equipped with suitable water treatment equipment to provide water supplies meeting the Ontario Ministry of the Environment Drinking Water Objectives for nitrate, iron, manganese, methane, hydrogen sulphide and the Ontario Ministry of Health standards for bacteriological quality.

f. Prior to the sale of the lots, a Letter Report shall be prepared by the hydrogeologist certifying the well yield, the domestic-supply adequacy, the ground water treatment system storage requirements, and the well construction conformance with the current Ontario Regulation, for distribution to the Developer, the Township and the Durham Region Department of Health Services and subsequently to the lot purchaser.

A9.03 WASTE DISPOSAL SYSTEMS

Each system shall be designed and constructed in accordance with the standards specified in Part 8 - Sewage Systems of the Ontario Building Code and the requirements of the Region of Durham Health Department.

The Township of Scugog's role with respect to the approval and construction of private sewage disposal systems has been transferred to the Region of Durham Health Department.

SECTION A - GENERAL INFORMATION

A9.00 PRIVATE SERVICING OF RESIDENTIAL LOTS - (cont'd)

A9.04 CERTIFICATION

The Developer shall retain a qualified Consultant approved by the Township Engineer who specializes in the design of Private Well and Sewage Systems. This Consultant will be responsible to both the Developer's Consulting Engineer and the Developer to complete the design, supervise and provide on-site inspection for the installation of private systems on the lots and certify that the private systems have been installed in accordance with all approved drawings and to the satisfaction of the Township, the Region of Durham Health Department and the Ministry of the Environment.

A10.00 OCCUPANCY CERTIFICATE

The Township of Scugog shall issue an occupancy certificate for each lot, prior to the Chief Building Official's issuance of an occupancy permit. The intention of the occupancy certificate is to:

a. certify the completion or state of completion of the works required to adequately service the building lot;

b. provide a mechanism to ensure that the minimum standards pertaining to lot grading and drainage, sodding and/or seeding of the lot, finishing of the driveway, etc., are complied with to the satisfaction of the Township; and

c. document the date the Developer has completed the construction of the lot services and works.

The occupancy certificate is issued as a means of documenting the completion of the following works that are required by the Chief Building Official prior to the issuance of the occupancy permit:

1. a means of egress providing access to an open public thoroughfare is constructed to the satisfaction of the Township;

2. required fire fighting access routes have been provided and are accessible;

3. that the main storm sewer is constructed and operational so as to facilitate the construction and operation of the building drains;

4. required electrical supply to the lot is provided and operational;

5. water supply system for the lot is complete and operational; and

6. sewage disposal system for the lot is complete and operational.

SECTION B - ROADWAYS

B 1.00 CLASSIFICATIONS

B 1.01 STREET CLASSIFICATION

All roadways in new developments shall be classified according to the traffic volume expected and to the intended use of the roadway. For predominantly residential areas three classifications shall be noted as follows: Local, Minor Collector or Major Collector. For industrial areas the streets shall be classified Local or Collector dependent upon length of street, traffic volume expected and expected amount of truck traffic. Arterial roadways shall be classified as divided or undivided. The proposed classification of all streets in the development shall be confirmed with the Township of Scugog prior to the commencement of the design.

The following table is presented as a guide to the determination of the street classification.

CRITERIA	LOCAL	COLLECTOR	ARTERIAL
Source Provided	Land Access	Land Access Traffic Movement Transit Routes	Traffic Movement Transit Routes
Length of Trip	Short	Medium	Long
Flow	Interrupted	Interrupted	Through
Interconnections	Local Collector	Local Collector Arterial	Collector Arterial Freeway
Estimated A.A.D.T.	0-1,000	1,000-3,000	over 3,000

SECTION B - ROADWAYS

B 2.00 GEOMETRIC DESIGN ELEMENTS

B 2.01 RESIDENTIAL STREETS

GEOMETRIC DETAIL	6.7 m[1] ESTATE RESIDENTIAL	8.0 m ESTATE RESIDENTIAL	LOCAL	MINOR COLLECTOR	MAJOR COLLECTOR
Minimum Right-of-way Width (metres)	23[2]	20	20	20	26.5
Design Speed (km. per hour)	50	50	50	50	60
Minimum Safe Stopping Sight Distance (metres)	65	65	65	65	85
Minimum Visibility Curves in Sag (K values)	8	8	8	12	18
Minimum Visibility Curves on Crests (K values)	8	8	8	10	15
Minimum Horizontal Radius (Radius in Metres)	80	80	80	110	160
Pavement Width (E/P to E/P in metres)	6.7	8.0	8.0	9.5	11.0
Pavement Crossfall (per cent)	2.0	2.0	2.0	2.0	2.0
Minimum Grade (percent)	2.0	0.5	0.5	0.5	0.5
Maximum Grade (percent)	4.0	5	5	5	5
Maximum Grade for Through Roads at Intersections (percent)	3.5	3.5	3.5	3.0	3.0
Maximum Grade for Stop Roads at Intersections (percent)	2.0	2.0	2.0	1.5	1.5
Intersection Angle (degrees)	70-90	70-90	70-90	80-90	85-90
Minimum tangent length of Intersections (metres) taken from limit of daylighting triangles	30	30	30	50	60
Minimum tangent length between reverse curves (metres)	30	30	30	50	60

SECTION B - ROADWAYS

B2.00 GEOMETRIC DESIGN ELEMENTS - (cont'd)

B2.01 RESIDENTIAL STREETS - (cont'd)

(1)The 6.7 metre Estate Residential Road Section with open ditches shall only be used where an extension of an existing open ditch section is required to service plans of subdivisions or severances.

(2)Additional Right-of-way will be required where warranted by Grading Requirements.

SECTION B - ROADWAYS

B2.00 GEOMETRIC DESIGN ELEMENTS - (cont'd)

B2.02 INDUSTRIAL STREETS

GEOMETRIC DETAIL	URBAN LOCAL	RURAL LOCAL	URBAN COLLECTOR
Minimum Right-of-way Width (metres)	23.0	26.5	26.5
Design Speed (km. per hour)	50	50	60
Minimum Safe Stopping Sight Distance (metres)	65	65	85
Minimum Visibility Curves in Sags (K values)	8	8	18
Minimum Visibility Curves on Crests (K values)	8	8	15
Minimum Horizontal Radius (Radius in Metres)	80	80	160
Pavement Width (E/P to E/P in metres)	9.5	7.0	11.0
Pavement Crossfall (percent)	2.0	2.0	2.0
Minimum Grade (percent)	0.5	2.0	0.5
Maximum Grade (percent)	5	3.5	5
Maximum Grade for Through Roads at Intersections (percent)	3.5	3.5	3.0
Maximum Grade for Stop Roads at Intersections (percent)	2.0	2.0	1.5
Intersection angle (degrees)	70-90	70-90	80-90
Minimum tangent length at Intersections (metres) taken from limit of daylighting triangles	30	30	60
Minimum tangent length between reverse curves (metres)	30	30	60

SECTION B - ROADWAYS

B.200 GEOMETRIC DESIGN ELEMENTS - (cont'd)

B 2.03 ARTERIAL STREETS (Non-Regional)

GEOMETRIC DETAIL	UNDIVIDED	DIVIDED
Minimum Right-of-way Width	30	37
Design Speed (km. per hour)	60	80
Minimum Safe Stopping Sight Distance (metres)	85	135
Minimum Visibility Curves in Sags (K values)	18	30
Minimum Visibility Curves in Crests (K values)	15	35
Minimum Horizontal Radius (Radius in Metres)	300	350
Pavement Width (E/P to E/P in metres)	14	2 @ 8
Median Width (metres)	n/a	5.5
Pavement Crossfall (percent)	2	2
Minimum Grade (percent)	0.5	0.5
Maximum Grade (percent)	5	5
Maximum Grade for Through Roads at Intersections (percent)	2.0	2.0
Maximum Grade for Stop Roads at Intersections (percent)	1.0	1.0
Intersection Angle (degrees)	85-90	85-90
Minimum tangent length at Intersections (metres) taken from limit of daylighting triangles	75	75
Minimum tangent length between reverse curves (metres)	130	130

SECTION B - ROADWAYS

B 3.00 DESIGN ELEMENTS

B 3.01 HORIZONTAL CURVES

Horizontal alignment is to conform to the requirements as outlined in Section B 2.01. In general, "right angle bends" will not be permitted on local streets except in the case of "Courts" or "Crescents" serving no more than 50 residential lots. Where permitted, these bends (Standard Drawing No. SS-224) must not have a deflection angle greater than 110 degrees.

B 3.02 VERTICAL CURVES

All points of grade change in excess of 1% shall be designed with vertical curves as outlined in the current Ministry of Transportation of Ontario publications. The minimum visibility curves to be used are outlined in the geometric details for each roadway classification. The minimum tangent length of any road grade shall be 9 metres.

B 3.03 BACKFALL AT INTERSECTING STREETS

At all street intersections the normal crossfall of the major street shall not be interrupted by the crown line of the minor street. A 1 to 2 per cent backfall shall be provided on the minor street at all street intersections. This backfall shall continue to the end of the curb return radii to facilitate proper drainage of the intersection. Overland flow routing of storm drainage through the intersection must be maintained.

B 3.04 CURB RETURN RADII AT INTERSECTIONS

The curb return radii at street intersections shall conform to the following dimensions:

PAVEMENT WIDTH STREET A	PAVEMENT WIDTH STREET B	CURB RETURN RADII
6.7 m	6.7 m	10.0 m
7.0 m	7.0 m	10.0 m
8.0 m	8.0 m	10.0 m
8.0 m	9.5 m	10.0 m
8.0 m	11.0 m	12.0 m
8.0 m	14.0 m	12.0 m
9.5 m	9.5 m	12.0 m
9.5 m	11.0 m	12.0 m
9.5 m	14.0 m	15.0 m
11.0 m	11.0 m	12.0 m
11.0 m	14.0 m	15.0 m
14.0 m	14.0 m	15.0 m

B 3.05 DAYLIGHTING REQUIREMENTS AT INTERSECTIONS

Daylighting at all intersection quadrants shall be included in the road allowances to provide for uniform boulevard widths. Such daylighting shall be included on the proposed plan for Registration (M-Plan) and on all engineering drawings. For local roads intersecting local roads, the minimum daylighting requirement shall be a radius of 5.0 metres. For all other intersections, the size of the daylighting or visibility triangle is a function of the number and width of lanes, the various design speeds on the intersecting roads and the right-of-way widths on both roads. The Consulting Engineer shall submit detailed calculations for sizing of daylighting triangles at these intersections in accordance with Design Criteria prepared by the Ministry of Transportation Ontario, Chapter E (at grade intersections).

SECTION B - ROADWAYS

B 3.06 CULS-DE-SAC AND BULBS

Permanent culs-de-sac shall be constructed in accordance with the details provided in the standard drawings. Minimum gutter grades of 1% shall be maintained along the flow line of all gutters around the culs-de-sac. The design road grade on the cul-de-sac shall be such that the drainage is directed away from the end of the cul-de-sac and towards the beginning of the bulb area where catchbasins are to be located. Hammer heads for open ditch road sections at dead ends shall be constructed in accordance with the details provided in the Standard Drawings. All culs-de-sacs, hammer heads, bulbs and intersections shall be detailed at a scale larger than the road plan. The details shall show gutter, crown and other grades sufficient to determine that the road will properly drain and shall be used as a basis for layout. In general, park entrances shall be provided from a cul-de-sac.

B 3.07 TEMPORARY TURNING CIRCLES

Temporary turning circles will be considered whenever a road is to be continued in the future in a phased Plan of Subdivision and the distance from the temporary dead end to the centreline of the nearest intersecting street is greater than 90 metres. Details for the requirements of temporary turning circles are provided in the Township of Scugog Standard Detail Drawings.

B 3.08 LOCATION OF UTILITIES

The location of utilities within the road allowance shall be as detailed on the Township of Scugog Standard Drawings. Utility drawings shall be submitted to the Township Engineer for approval of utility locations.

All utility wiring is to be housed underground or direct buried, for Residential Subdivisions. For Industrial type subdivisions, the primary electrical distribution system is to be placed overhead and all secondary wiring is to be housed underground, subject to the applicable Hydro authority approval. Hydro transformers are to be housed in suitable enclosures and mounted on transformer pads installed at the final surface of ground. Hydro transformer pads must be placed in locations detailed on the Township of Scugog Standard Drawings. Bell telephone and Cable TV junction boxes are to be mounted at the surface in approved standard enclosures, provided by the appropriate Authority. Hydro tranformer pads and Bell Telephone and Cable TV junction boxes are in general to be located adjacent to common lot lines.

B 3.09 COMMUNITY MAIL BOX REQUIREMENTS

In general, community mail centres and/or site individual super mail boxes shall be placed in locations approved by the Township of Scugog. Community mail centres shall be constructed in mini-parks, centrally and suitably located in the plan of subdivision on consultation with Canada Post Corporation. The design of the community mail centre must incorporate such criteria as pedestrian safety, traffic flow and aesthetics. The Township of Scugog may require the Developer to furnish the following amenities within the community mail centre:

- park benches
- fencing
- garbage containers
- landscaping

SECTION B - ROADWAYS

B 3.09 COMMUNITY MAIL BOX REQUIREMENTS (cont'd)

- pedestrian lighting
- concrete pad or interlocking stone finished surface
- architectural controlled kiosks
- architectural controlled canopies over groups of super mail boxes
- adjacent car bays parallel to the travelled portion of the roadway

All details associated with community mail centres shall be identified on the Engineering Drawings and will be subject to the approval of the Township Engineer. The Developer shall be responsible for constructing community mail centres within residential subdivisions, prior to the issuance of the first Building Permit.

In areas where site individual super mail boxes are proposed within a residential subdivision, the locations will be subject to the approval of the Township Engineer. In general, individual super mail boxes shall be located near the rear lot line of flankage lots on concrete pads. The location of super mail boxes shall in no way restrict site lines at intersecting roads. When establishing the spacing of street lighting within a residential subdivision, consideration must be given for the placement of a street light adjacent to the location of super mail boxes. Parallel car bays shall also be located adjacent to super mail boxes to ensure a continuous traffic flow. The length of bays will be governed in general by the number of super mail boxes. Architectural controlled canopies shall also be constructed at the Developer's expense over each group of super mail boxes.

All amenities associated with site individual super mail boxes shall be constructed at the Developer's expense. All associated details must be shown on the Engineering Drawings and will be subject to the approval of the Township Engineer. The approval of Canada Post Corporation with respect to location of community mail centres and/or site individual super mail boxes will be required prior to the approval of the Engineering Drawings by the Township Engineer.

B3.10 GUIDERAILS

The Developer shall be responsible for the review of the guiderail warrants identified in the Roadside Safety Manual, prepared by the Ministry of Transportation Ontario, dated 1993. Where applicable, the Developer shall be responsible for the design and construction of guiderails in accordance with the Ontario Provincial Standard Specifications. All details associated with guiderails shall be identified on the Engineering Drawings and will be subject to the approval of the Township Engineer.

B 4.00 PAVEMENT DESIGN

The minimum pavement design for all streets in new subdivisions shall be as detailed on the Township of Scugog Standard Drawings. The Developer shall engage the services of a qualified geotechnical consultant to sample and test subgrade materials to confirm that the Township's minimum pavement design is appropriate. Soil sampling shall be carried out in the presence of the Geotechnical Consultant at intervals not exceeding 60 metres along the centreline of the subdivision road. The composition and design thickness of the pavement section shall be determined from:

SECTION B - ROADWAYS

B4.00 PAVEMENT DESIGN - (cont'd)

(1) Mechanical Sieve Analysis of the Subgrade Soil,
(2) Frost Susceptibility,
(3) Drainage, and
(4) Traffic Volumes

Copies of all test results and proposed road designs shall be submitted with the Engineering Drawings. In no case will a pavement design less than the minimum Township of Scugog Standard as shown on the standard drawing for the particular road classification be considered acceptable.

Testing and approval of all granular materials at the designated pits prior to placement and subsequent in-situ verification tests shall be performed by the Township's Geotechnical Consultants. A minimum of 48 hours prior notice must be provided to the Township Engineer when requesting services of the Township's Geotechnical Consultants.

Prior to the placement of asphalt pavement, the Consulting Engineer must submit to the Township Engineer for approval, the asphalt pavement mix designs. The pavement design must be sufficient to provide for ultimate wheel loads over the road, prior to placement of surface course asphalt.

B 5.00 CONSTRUCTION REQUIREMENTS

B 5.01 CLEARING AND GRUBBING AND AREA ROUGH GRADING

The road allowance shall be cleared of all trees and shrubs which are not included in final landscaping, and of all other obstructions for such widths as are required for the proper installation of roads, services, and other works. Rough grading shall be done to bring the travelled portion of the road to the necessary grade and in conformity with the cross-section shown on the drawings. Rough grading of all lots and easements must be performed prior to the road construction. The sub-grade for all roads shall be properly shaped and compacted to 95% Standard Proctor Density, prior to any application of granular base course materials. In all cases, topsoil shall be stripped for the complete width of the road allowance and stockpiled at locations approved by the Township Engineer. Topsoil shall not be sold and removed from the site.

For any excess fill removed to a disposal site classified as "swamp, ravine, floodplain or lake", the Developer must receive prior written permission from the local Conservation Authority.

B 5.02 ROAD SUB-DRAINS

In general, 100 mm dia. perforated, filter cloth wrapped plastic corrugated subdrains will be required to run continuous along both sides of all roads with curb and gutter. It will be the responsibility of the Developer to justify deviation from this standard by submitting a "Soil Drainage Report" from a recognized independent Geotechnical Consultant. Sub-drains may be omitted if it can be shown that the sub-grade is sufficiently permeable to ensure adequate drainage of the road base.

SECTION B - ROADWAYS

B 5.03 SNOW CLEARING

Snow clearing operations prior to "Final Acceptance" may be carried out by the Township if so requested in writing by the Developer and the associated costs may be charged back to the Developer. If the road base and surface is not prepared to the satisfaction of the Township Director of Public Works or Township Engineer, snow clearing operations will not be performed by the Township of Scugog. If snow clearing operations are carried out by Township forces, the Township will not be held liable for any resulting damage to roadworks.

B 5.04 STAGING OF CONSTRUCTION

The construction of all roads in new subdivisions shall be staged in order that the completion of the roadway coincides with the completion of the development of the surrounding lands. The initial stage of construction shall provide roadways of adequate quality for building construction, traffic movement and land access. The second stage of construction shall complete the roadway to the final design cross section.

The second stage of roadway construction shall not commence in any area until all of the following conditions are met:

(1) a minimum period of one year has expired from the completion of Stage 1 construction;

(2) 85% of the dwellings with frontage or flankage on the street are completed to the fine grading and topsoil stage and have received unconditional occupancy certificates;

(3) all undeveloped lots are graded in accordance with the approved lot grading plan;

(4) all service connections for multiple family, commercial, institutional or other blocks are installed; and

(5) the approval of the Township Engineer and Council is obtained in writing.

B5.04.01 *Estate Residential Roadways With Open Ditches*

For estate residential roadways with open ditches the initial stage of road construction shall consist of the grading, to the full cross sectional width as shown on the standard detail drawings, the complete granular base, the base course of asphalt, utilities, streetlighting, fine grading, topsoiling and sodding of all boulevards and ditches.

The second stage of road construction shall comprise the surface course of ashphalt, the driveway culverts and entrances for all undeveloped lots, the adjustment of all utilities to grade, placement of trees, and all other work necessary to complete the roadway to the final design cross section.

B 5.04.02 *Local Residential, Minor Collector Roadways and Estate Residential Roadways with Curb and Gutter*

The initial stage of construction shall consist of the grading to the full cross sectional width as shown on the standard detail drawing, the complete granular base, the base course of asphalt, utilities and streetlighting.

SECTION B - ROADWAYS

The second stage of road construction shall comprise the installation of the curb and gutter, the sidewalk, the grading topsoiling and sodding of all boulevards, the grading, gravelling and paving of all driveway approaches, the completion of the base course and surface courses of asphalt, the final adjustment to grade of all utilities, placement of trees and all other work necessary to complete the roadway to the final design cross section.

B5.04.03 Major Collector, Local and Industrial Collector and Arterial Roadways

For these roadways, the initial stage of construction shall comprise all work necessary to complete the roadway to the final design cross section as shown on the standard detail drawing with the exception of the surface asphalt, and the driveway approach paving. The curb and gutter and sidewalk are to be completed as part of the stage 1 construction for these roadway classifications. The second stage of construction shall include the surface course asphalt, the driveway approach paving, the final adjustment to grade of all utilities, placement of trees and all other work necessary to complete the roadway to the final design cross section.

B 5.05 OTHER REQUIREMENTS

Whenever it is necessary to cut through an existing Township road, the Developer's Contractor will be responsible for properly compacting the backfill material and restoring the surface pavement to its original conditions immediately upon completion of backfilling operations. Before making detours, permission is required from the Township Public Works Department. Where the road is not part of the Township Road system, approval from the appropriate road authority will also be necessary. In all cases the Fire, Police Departments, School Bus Companies and Ambulance Service must be notified by the Developer or his Contractor.

The Developer shall install temporary concrete Jersey barriers in accordance with OPSD 911.140 to the satisfactin of the Township to delineate phasing limits.

All work will be done in accordance with ordinances and By-laws of the Township of Scugog.

B 6.00 CONCRETE CURB AND GUTTER

Concrete curb and gutter conforming to the Township of Scugog Standard Detail Drawings shall be used on all new subdivision roadways. Mountable concrete curb and gutter in accordance with SS-226 should be used in urban residential areas and concrete barrier curb and gutter in accordance with SS-225 should be used in commercial and industrial areas. Two stage curb construction in accordance with the Standard Detail Drawing will be considered as an acceptable alternate to monolithic curb and gutter, when approved by the Township.

SECTION B - ROADWAYS

B 6.00 CONCRETE CURB AND GUTTER

Driveway depressions shall be formed in the curb according to the details and locations as shown on the standard detail drawings. If the driveway depression should be improperly located, then that section of depressed curb which is improperly located shall be broken out and shall be replaced with a normal curb and gutter section. The concrete capping of a depressed curb shall not be permitted. The new driveway depression at this location can be formed by cutting the back of the curb with a curb cutting machine providing the existing section is free from cracks and other defects and that the entrance is to a single-family residence. For multiple-family, commercial, industrial, apartment and other entrances the existing curb and gutter shall be completely removed and replaced with a steel reinforced depressed curb section in accordance with the detail on the standard drawing.

B 7.00 SIDEWALKS

The location requirements for sidewalks in new subdivisions shall be confirmed with the Township Engineer prior to commencing the detailed design. In general, sidewalks are required on both sides of all arterial and collector roadways and at least one side of all local streets. For local roadways, the locations of schools, parks, churches, commercial establishments etc., the length of street, traffic volume expected and the number of dwelling units serviced will be used as criteria in determining whether sidewalks are required on one or two sides of the street. Notwithstanding the requirements set forth above, the Township may require cash-in-lieu thereof towards the construction of sidewalks in the area if an exception to these requirements are granted.

The sidewalk shall conform in details and dimensions to the current Township of Scugog Standard Detail Drawings and shall be installed at locations as shown on the typical road cross sections. The width of sidewalks for streets is 1.50 metres.

The sidewalks shall be increased in thickness at all driveway locations as shown on the standard drawings. In cases where the sidewalk has been constructed prior to the establishment of an entrance to other than a single-family residence then the existing sidewalk shall be removed and shall be replaced with a thickened sidewalk section with wire mesh reinforcing in accordance with the standard drawing.

At street intersections the curb and the sidewalk shall be depressed to meet the roadway elevation as shown on the standard drawings.

When a sidewalk is constructed adjacent to a curb and gutter a keyway shall be provided along the back of the curb to support the sidewalk, all in accordance with the details shown on the Township of Scugog Standard Detail Drawing.

B 8.00 DRIVEWAY APPROACHES WITH CURB AND GUTTER

The Developer is responsible for the grading, gravelling and the paving of all driveways from the curb to the sidewalk or from the curb to the street limit if no sidewalk exists.

SECTION B - ROADWAYS

B 8.01 MINIMUM DRIVEWAY DESIGN

The minimum consolidated depth requirements for the granular base and asphalt in driveways shall be as follows:

(a) SINGLE-FAMILY RESIDENTIAL

(1) asphalt - 50 mm. of HL3 asphalt- granular base - 155 mm. of Granular "A" or 100 mm. of 20 mm crushed limestone.
(2) alternative - deep strength - 75 mm. HL8 base course - 50 mm. HL3 - surface course

(G.B.E. = 255 mm.)

(b) COMMERCIAL, LIGHT INDUSTRIAL AND APARTMENTS

- asphalt - 50 mm. HL8 basecourse
  - 40 mm. HL3 surface course
- granular base - 225 mm. Granular "B" plus 150 mm. of Granular "A" or 230 mm. of 20 mm crushed limestone

(G.B.E. = 480 mm.)

(c) HEAVY INDUSTRIAL DRIVEWAYS

- asphalt - 75 mm. HL8 basecourse
  - 40 mm. HL3 surface course
- granular base - 300 mm. Granular "B" plus 150 mm. of Granular "A" or 300 mm. of 20 mm crushed limestone.

(G.B.E. = 580 mm.)

Equivalent depths of deep strength asphalt will be permitted as a substitute for the pavement specified in (b) and (c).

Alternate types of driveways (ie. paving stones, concrete pads, etc.) will be subject to approval by the Township Engineer.

B 8.02 DRIVEWAY AND PARKING LOT GRADES

The maximum permissible design grade for any driveway on private lands shall be 6.0%. The maximum "As-Constructed" grade for any driveway on private lands shall be 7.0%. These maximum grades are not recommended and should be employed only in exceptional cases where physical conditions prohibit the use of lesser grades. The minimum driveway grade shall be 1.0%. The use of negative grade driveways is actively discouraged. Negative sloping driveways will only be considered in estate residential developments under special circumstances. Where negative sloping driveways are used, a positive slope of at least 2.5 percent must be maintained from the garage over a minimum distance of 10.0 metres.

The maximum permissible parking lot grade shall be 3% and the maximum permissible driveway entrance grade shall be 5% for commercial develoments.

SECTION B - ROADWAYS

B 8.03 DRIVEWAY DEPRESSIONS

The width and location of the depressions in the curb and gutter for single-family residential driveways shall be as detailed on the Township of Scugog Standard Detail Drawing with particular attention being placed on the location of the garage and the direction of traffic flow. Driveway cuts shall be located at the minimum distance of 1.0 metres from any side lot line.

The width and location of the driveway depressions for apartment, commercial, and industrial driveways shall be detailed on the engineering drawings. These driveways shall be designed to accommodate the anticipated vehicular traffic without causing undue interference with the traffic flow on the street. The maximum width of any driveway depression for commercial, apartment or industrial driveways shall be 12 metres. All apartment, commercial and industrial driveways shall be provided with barrier curbs constructed to blend into the roadway curb and gutter.

B 9.00 DRIVEWAY APPROACHES WITH OPEN DITCHES

The Developer is responsible for the grading and gravelling of all driveways from the edge of pavement of the roadway with open ditches to the street line.

The minimum consolidated depth requirements for the granular base in Residential driveways shall be as follows:

- 250 mm Granular "A" or
- 200 mm of 20 mm Crushed Limestone

The minimum consolidated depth requirements for the Granular Base in Commercial, Industrial and Apartment Driveways shall be as follows:

- 375 mm Granular "A" or
- 325 mm of 20 mm Crushed Limestone

The minimum length of each C.S.P. driveway culvert shall be 11.0 metres and the minumum diameter shall be 450 mm. Extruded Polystrene insulation (styrofoam H140 or approved equivalent) shall be provided on top of each culvert along the length that the culvert is covered with backfill material. The maintenance and repair of such culverts shall remain the responsibility of the Developer until such time as the Works have been accepted by the Town.

The construction of driveway headwalls at each end of the driveway culvert will not be permitted.

A 3.0 metre wide platform area shall be constructed in the ditches fronting each fire hydrant. The minimum culvert length shall be 6.5 metres and the minimum diameter shall be 450 mm.

SECTION B - ROADWAYS

B10.00 BOULEVARDS

All boulevard areas are to be graded according to the details shown on the Township of Scugog Standard Detail Drawings and to the satisfaction of the Township Engineer. In order to minimize construction problems for the utility companies, the grade of the boulevard shall be constant from the back of the curb to the street limit. Terracing or embankments within the road allowance on new subdivision streets shall not be permitted. The final grade of sod placed within the boulevard areas shall match and not exceed the finished grade of top of concrete sidewalk and curb.

All debris and construction materials shall be removed from the boulevard area upon completion of the basecourse asphalt construction and the boulevards shall be maintained in a clean state until the roadway section is completed.

Clean weed-free topsoil shall be placed on all boulevard areas that are to be sodded. The minimum depth of topsoil required shall be 100 mm.

No. 1 nursery sod shall be used for all boulevard areas that are to be sodded.

B11.00 CORNER LOTS

A 3.0m reserve shall be provided along the flankage of each corner lot.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 1.00 EASEMENT REQUIREMENTS

C 1.01 GENERAL

Where underground services are placed outside road allowances and blocks of land under the ownership of the Township of Scugog, permanent easements are required.

Easements must be located on one side of the common lot line between adjacent lots. Pipes shall be centred on the easement. The easements will not be permitted to straddle common lot lines. Building extensions or roof overhangs will not be permitted to encroach over the limits of the Township's easements.

Where two pipes are to be located on one easement, the minimum width of easement shall be the width of easement required for the larger of the two pipes plus 1/2 the width of easement for the smaller pipe, rounded to the next 1.0m increment. Additional easement width may be required to ensure adequate separation between the two pipes and a minimum separation of 3.0 metres between the easement limit and the nearest pipe.

C 1.02 STORM SEWER MAINS

The minimum width of easements for storm sewers shall be in accordance with the following:

Size of Pipe	Depth of Invert	Minimum Width of Easement
Up to 675 mm	3.5 m maximum	6.0 m
750 mm to 1500 mm	3.5 m maximum	8.0 m
1650 mm and up	4.0 m maximum	4.0 m plus 3 times OD. of Pipe, rounded to next 1.0 m increment.

C 1.03 STORM CONNECTIONS FOR REAR YARD CATCHBASINS

The minimum width of permanent easements for leads to rear yard catchbasins shall be 6.0 metres for pipe sizes ranging from 250 mm to 675 mm in diameter. For pipe sizes greater than 675 mm, criteria under Section C 1.02 shall apply. The lead shall be centred on the easement.

C 1.04 EASEMENTS FOR DRAINAGE SWALES

Where rear and side yard swales provide drainage from more than one lot or 0.5 hectares, whichever is greater, a minimum easement width of 6.0 metres shall be provided over the total length of swale.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT -

C 2.00 BLOCKS OF LAND REQUIREMENTS

Stormwater management facilities, water quality control facilities, overland flow routes for the major storms and open channels shall be contained in blocks of land, con- veyed to the Township of Scugog. Natural Watercourses and their associated floodplains shall also be contained in blocks of land under ownership of the Township or Local Conservation Authority and zoned as Hazard Lands. Precise limits of the Hazard Lands and corresponding blocks will be subject to the approval of the Local Conservation Authority and the Township of Scugog.

The minimum width of blocks of land for open channels shall be the width of top of open channel plus 7.5 metres for maintenance requirements.

Valley lands (crest of slope to crest of slope) shall be contained within blocks of land to be conveyed to the Township of Scugog or Local Conservation Authority, as a condition of development (subject to provisions of Section C 4.01).

C 3.00 DRAINAGE POLICIES

C 3.01 DRAINAGE OBJECTIVES

To assist in the attainment of proper drainage, the Township has set the following objectives for drainage management within its boundaries:

- prevent loss of life and minimize property damage and health hazards;
- minimize inconvenience from surface ponding and flooding;
- minimize adverse impact on the local groundwater systems and baseflows in receiving watercourses;
- minimize downstream flooding and erosion;
- minimize pollution discharges to watercourses;
- minimize soil losses and sediments to sewer systems and waterbodies from construction activity;
- minimize impairment of aquatic life and habitat; and
- promote orderly development in a cost-effective manner.

SECTION C - STORM DRAINAGE AND STORMWATER MANAGEMENT

C 4.00 ATTAINMENT OF DRAINAGE OBJECTIVES

C 4.01 PLANNING

The Township of Scugog has a policy that the valleys of existing watercourses should be maintained and preserved in their natural state insofar as this is feasible. Where an area is to be developed, the Township will require, as a condition of development, that:

- Valleys or watercourses shall be dedicated to the Township in blocks of land.

- A conservation buffer strip 10.0 m wide from the stable top of valley bank be respected. The Township may ask that this strip be dedicated to the Municipality and that it not be considered part of the park dedication requirements set out in the Planning Act. Where the buffer strip remains in private ownership, the Township will ask that it be protected by zoning and/or agreement.

- *Hazard lands and stormwater management facilities are not acceptable as part of the park land dedication requirements.*

The Township discourages watercourse diversions, alterations, pipings and channelization except where these are needed for flood and/or erosion control. Permits for such work shall be obtained under existing legislation from the Township of Scugog, the appropriate conservation authority and the Ministry of Natural Resources.

Conservation Authorities endeavour to restrict the construction of all buildings and structures from within prescribed limits as described in accordance with their 'Fill, Construction and Alteration to Waterways' regulations.

C 4.02 MAJOR AND MINOR SYSTEMS

In general, the Township of Scugog supports the concept of urban drainage having two separate and distinct components - the minor drainage system and the major drainage system. The minor drainage system comprises swales, street gutters, catchbasins and storm sewers. The major drainage system comprises the natural streams and valleys and the man-made channels and ponds.

C 4.03 RUN-OFF QUANTITY CONTROL

Since development almost invariably increases run-off from any storm due to the increase in impervious surfaces, it will usually be necessary to compensate by exercising control on the quantity of urban run-off. The only exception will be when it can be proven that the increased run-off will not do any harm. Some of the methods of quantity control are temporary storage of water on parking lots, discharging rainwater leaders onto the ground and grassed areas, and downstream stormwater retention or detention ponds. The Township of Scugog takes a flexible approach to encourage ingenuity and the development of superior communities. At the same time, the Township endorses the "Blue-Green Concept" whereby the open spaces provided by Hazard Lands, major systems, valleys and parks are integrated into a continuous green belt for the beneficial use of both the public and water transport.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 4.04 RUN-OFF QUALITY CONTROL

The Township requires developers, contractors and builders to plan and execute their operations so as to minimize sediment and debris pick-up and transport to water bodies. The degree of control and methods used must meet regulations and guidelines of the M.O.E., M.N.R., M.T.O. and the conservation authorities.

C 4.05 MASTER DRAINAGE PLANS

The Township requires a Master Drainage Plan for all proposed urban developments at the Secondary Plan stage of land use planning. The primary purpose of the Master Drainage Plan is to define the effects of urban development and to determine the solution that is compatible with the objectives for the watershed, meets the constraints and does so at the highest benefit:cost ratio. In some cases, a Master Drainage Plan may not have been prepared along with a Secondary Plan. The Township will then require the proponent of a Draft Plan of Subdivision to prepare a Preliminary Stormwater Management Plan using the following methodology:

Inventory Site and Watershed

- topography, soils, land use (present and proposed), vegetative cover
- details on channels, watercourse crossings, culverts, bridges, etc.

Preliminary Hydrology and Hydraulics

- select most appropriate models
- select design storms
- simulate pre- and post-development hydrographs
- define floodlines

Define Constraints

- flooding; history of past floods and storms, flood damage centres, present and future floodlines (with no stormwater management) on watersheds greater than 135 ha.
- erosion; mapping of erosion and valley bank instability on site and downstream, assessment of sensitivity to flow changes, assessment of remedial measures.
- environmental; water quality assessment, environmentally sensitive areas, groundwater recharge or discharge areas
- institutional; policies and objectives of M.O.E., M.N.R., conservation authority, regional and local municipalities
- economic; the aim is to achieve the development at least present value cost or at highest benefit:cost ratio while doing no significant harm to anyone or anything else

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 4.05 MASTER DRAINAGE PLANS (cont'd)

Formulate Alternative Solutions

- if the hydrologic and hydraulic changes can be handled by the existing system, there is no need to formulate alternative solutions

- if there are problems or binding constraints, the solutions may include any appropriate set of structural or non-structural measures

- structural measures include pipe and ditch configurations, dams and weirs, various types of storages, diversion channels, channelizations, diking, dry and wet floodproofing

- non-structural measures include change of land use, prohibition of floodplain occupancy, use of two zone concept of floodplain management, setbacks from valley banks, recreational or low density designation on key parts of groundwater recharge or discharge areas

- hydrologic and hydraulic analyses to locate and size storage facilities, channels, pipes and overland flows

Evaluate Alternatives

- a blend of technical, aesthetic and economic feasibility

- quantify, in present value dollar terms, all benefits and costs that can be quantified

- describe qualitatively all other benefits and costs

- combine into a benefit cost matrix for comparison of alternatives

Report Presentation

- concise and clear, to aid decision makers and reviewing agencies

- flood plain maps, computer listings and output, supportive figures

For additional information on the requirements of Master Drainage Plans, the Consulting Engineer should procure the Provincial Document entitled, 'Urban Drainage Design Guidelines'.

The Township of Scugog may elect to undertake Master Drainage Plans at the Secondary Plan Stage or prior to Draft Plan Applications for a group of developments within a defined urban area. All associated costs will be levied against the developable lands.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 5.00 MAJOR SYSTEM

C 5.01 HAZARD LANDS AND FLOODLINES

The Conservation Authorities of Ontario administer fill, construction and alteration to Waterways Regulations made under the Conservation Authorities Act, R.S.O., 1980. These regulations restrict the following:

- the placement of fill in a regulated area;
- the building or renovation of structures within a floodplain; and
- the alteration of a watercourse.

Conservation Authority staff can advise if the property is regulated and what types of projects require approval.

The Township of Scugog requires that Hazard Lands be clearly defined on all watersheds and that no development other than necessary access or services be located therein. The Township also requires that the floodplains that would result from the 1:100 year and Regional Storms be defined for pre-development and post-development conditions. This applies not only to the area to be developed, but also to the watercourses affected downstream and upstream of the development. In general, Conservation Authorities require that there be no adverse impacts either downstream or upstream of the development.

Where a natural watercourse or a man-made channel is used as a component of the major drainage system, irrespective of the drainage area, the Township of Scugog requires that all land that would be inundated by the greater of the Regional Storm over 1:100 year storm floods be classified as Hazard Lands. In urban areas, where deemed appropriate by the Township, no part of any lot for development may intrude upon such Hazard Land. In cases where lots extend into Hazard Lands, it will normally be required that the minimum standards for area, depth and width required under the appropriate development zoning are maintained on the table land portion of the lot, and the Hazard Lands portion of the lot will be zoned in a Hazard Land category. In rural areas, Hazard Lands may be left in private ownership, but a by-law will impose a restriction on alteration of any land or building thereon within the Hazard Land limits, consistent with conservation authority regulations.

C 5.02 ACCEPTABLE LEVELS OF FLOOD RISK

The Township of Scugog requires that no new building should be damaged by the floodwater levels generated by the Regional Storm or the 1:100 year storm, whichever is the more stringent. This applies not only to the major drainage system, but also to the minor drainage system. This therefore requires proper care in the design of streets, gutters and catchbasins, grading of lots and road allowances, setting the elevations of openings into buildings and weeping tile connections.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 5.03 METHODS AND DEGREE OF QUANTITY CONTROL

In general, urbanization of land leads to increased run-off, primarily due to the increased use of impervious surfaces and faster transport of the water in storm sewers and on streets. Some of this increase can be obviated by discharging rainwater leaders onto grassed areas, by temporarily storing water on parking lots and by using grassed swales rather than pipes. It is also possible to use a restricted pipe outlet and store water underground in tanks or superpipes. Other control methods that have been used successfully include:

- diverting all overland flow into detention ponds located in passive parks and highway interchanges, with discharge limited to some predetermined rate;

- constructing detention storage facilities on the major system watercourse with discharge rates being controlled.

The Township of Scugog endorses use of any or all of these methods of controlling the rate of run-off from a proposed new development or for re-development within an existing urbanized area. The Consulting Engineer is required to analyze the constraints and opportunities and to develop a drainage system that maximizes the benefits to costs.

If a detention (dry) pond is to be located on a watercourse, this should, if at all practicable, be incorporated into a road crossing of the watercourse valley. Care must be taken to define the environmental concerns at the site and to design the facility to minimize adverse effects. If a detention pond is to be located off-stream (eg. in a passive park) care must be taken to ensure the safety of the residents and the safe passage of all flows without causing undue erosion and maintenance.

A wet pond design is preferred by the Township of Scugog. Wet ponds should be designed as follows:

- the permanent pool should have a minimum depth of 1.5m and a maximum depth of 3.0m;
- the extended detention storage depth shouild be limited to 1 to 1.5m;
- the forebay should be lined with a pre-cast concrete surface and the sideslopes should not be steeper that 5:1;
- a pipe connecting the main cell and the forebay should be provided in the forebay berm;
- the forebay berm should be lined with a pre-cast concrete surface and the top elevation should be set at the permanent pool water level;
- the side slopes below the permanent pool should not be steeper than 5:1;
- the side slopes above the permanent pool should not be steeper than 4:1;
- a transition zone (safety ledge) should have a minimum depth of 1.0m and the slope shouldn't be steeper than 6:1;
- a minimum 4.0m wide maintenance access road should be provided for maintenance purposes;
- a safety buffer of 5.0m with a maximum crossfall grade of 5.0% should be provided around the entire perimeter of the pond;

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C5.03 METHODS AND DEGREE OF QUALITY CONTROL - (cont'd)

- in the event a trail system linking the pond to the surrounding lands is required, a standard 5.0m wide plateau (3.0m wide asphalt trail + 1.0m flat shoulders both sides) may be considered acceptable by the Township of Scugog;
- a maximum draw down depth of 0.5m should be provided;
- the outlet draw down pipe should be flush with the bottom of the pond invert. A maximum 0.5m deep lined sump with slopes not steeper than 5:1 should be provided at this location;
- the side slopes of the pond should be sodded from 0.6m below the permanent pool up to the top of the extended storage detention. A landscaping plan for the proposed stormwater management facility should be prepared for the review and approval of the Township Engineer and the Township of Scugog;
- the invert elevation of the inlet pipe should be located at the permanent pool level; and
- in addition to the quality storage volumes, the pond volumes shall take into consideration the erosion storage volumes in isolation of the quantity storage volumes.

The Township of Scugog prohibits the construction of detention ponds over intensive use recreational playing fields (ie. ball diamonds, soccer pitches, etc.).

Stormwater management facilities shall be seeded/sodded to a depth of 10cm immediately after construction of the pond with the exception of a designated working area for the removal of sediment in the stormwater management facility. Landscaping to be completed within one (1) year of the date of registration of the subdivision. The timing of the development of the stormwater management facility may be altered by the Township of Scugog as necessary, depending on such site specific matters as split ownership, location of the stormwater management facility related to other phases being registered, house occupancy levels in the subdivision, timing of registration in respect to growing season or other considerations.

Under no circumstances should the contours of the land in such detention ponds be altered after construction without notifying the Township of Scugog and the appropriate conservation authority and without obtaining their agreement that such modification will have no detrimental effect on stormwater management.

As a guideline to be used until Master Drainage Plans are prepared for each watershed, the degree of control on the quantity of run-off from a proposed development shall be:

The post-development peak flow shall not be greater than the corresponding pre-development peak flow for the 1:5 year, 1:10 year, 1:25 year and 1:100 year storms. Other regulatory agencies may require other storm flows to be analyzed (ie. 2 year and/or Regional flows).

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 5.04 METHODS OF QUALITY CONTROL

The Township of Scugog requires the Consulting Engineer to submit an outline of his proposed erosion-sediment control plan along with the draft plan of subdivision submission. This may contain any or all of the following measures:

- sediment traps or temporary retention ponds;
- seeding of topsoil stock piles;
- isolated stripping of development lands;
- vegetation screens.

The Township of Scugog requires the Consulting Engineer to submit details of his erosion-sediment control plan along with the detailed engineering design drawings.

C 5.05 OUTLET STRUCTURES FROM PONDS

Where a detention or retention pond is proposed for quantity control on a major system watercourse, the outlet structures must be designed as much for ease of operation as for hydraulic efficiency. All operational outlet structures shall be of the free-flow ungated type; under no circumstances will gate or valve or stoplog structures be acceptable except that a valve will be permitted in the emergency drain for a retention pond. The inlets and outlets must be protected to prevent child and major debris access. The area at the downstream end must be protected against erosion by channel lining and/or an energy dissipator.

While such ponds will normally be designed not to be overtopped, the dam creating the pond must be designed to pass safely the flows resulting from the Regional Storm.

For Hickenbottom structures, the outlet structure/chamber should be contained in an OPSS maintenance hole and embedded into the banks of the pond. For reverse sloped pipes, the invert elevation should be below the permanent pool at 0.6m above the pond bottom.

C5.06 FOUNTAINS/AERATORS

A fountain/aerator device shall be provided by the Developer, at no cost to the Township of Scugog, in the wetland component of each stormwater management facility.

The fountain/aerator should meet the objectives of industry standards. More specifically, normal aeration requires the displacement of 325,900 gallons (one acre foot) of water every 24 to 48 hours, adding a minimum of 3.2 lbs. of oxygen per horsepower hour. For normal water conditions, a minimum 1 ½ horsepower aerator per surface acre is recommended. For excessive algae growth, a minimum 2 horsepower aerator per surface acre is required.

A report and pertinent details of the fountain/aerator device shall be provided by the Devloper to the satisfactin of the Township of Scugog. Such details should include, but are not limited to:

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C5.06 FOUNTAINS/AERATORS - (cont'd)

- minimum capacity of fountain/aerator;
- horsepower of unit;
- pond volume;
- a maintenance and operation brief;
- proposed electrical supply and main breaker panel;
- location of fountain/aerator and inlet pipes; and
- manufacturer's contact information.

The Township of Scugog will provide the contact information of an approved manufacturer if requested.

C 5.07 CULVERT AND BRIDGE HYDRAULIC CAPACITY

	Design Flood Frequency	
Road Classification	Culverts (Up to 6 m Span)	Bridges, (Over 6 m Span)
Arterial	1:50 years	1:100 years to Regional
Collector	1:25 years	1:50 years
Urban Local	1:25 years	1:50 years
Temp. Detour	1:5 years	1:5 years

Given the Township of Scugog's endorsement of the Blue-Green Concept and the need to protect weepers from undesirable back-water effects, it is considered that only arterials and collectors should, if feasible, be permitted to cross the major system watercourses. It is also recommended that designers consider the need to design culverts and bridges on such arterials and collectors for at least the 1:100 year storm flow, if not for the Regional Storm flow. If smaller culverts or bridges are provided, the backwater effects for the 1:100 year and Regional Storm flows must be determined. Concrete box culverts shall be designed and placed for all watercourse crossings subject to the approval of the Township Engineer. Conservation Authority approval under their Regulations may be required for watercourse/ valley crossings.

C 5.08 WATERCOURSE EROSION AND BANK INSTABILITY

Where erosion or bank instability is already evident in an area to be developed or re-developed, the Township of Scugog requires that the situation be stabilized by appropriate remedial measures. Where an upstream development will cause significantly increased downstream erosion, the Township also requires the Developer to obviate further damage by appropriate remedial measures. In those cases where access to do the work cannot be given by the Township, a cash contribution may be requested from the Developer. Where more than one Developer is involved, the respective shares will be based on the areas of impervious surfaces as calculated for the imperviousness ratio.

When designing remedial erosion or bank instability works, preservation of the natural valley aesthetics must be secondary only to achieving a sound technical solution. A normal low water channel has a capacity of about the 1:2 year flood. Protection to this level will be adequate provided care is taken to prevent undermining by higher floods and provided that the channel bank is not coincident with a higher valley bank. In this latter case, it may be necessary to protect the bank to a level as high as the 1:100 year flood or even the flood resulting from the Regional Storm.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C5.08 WATERCOURSE EROSION AND BANK INSTABILITY - (cont'd)

Conservation Authorities endeavour to restrict the construction of all buildings and structures from within prescribed limits as described in accordance with their 'Fill, Construction and Alteration to Waterways', regulations.

C 6.00 MINOR SYSTEM

C 6.01 WATERSHED AREA

The watershed area shall be determined from contour plans and shall include all areas that naturally drain into the system and any fringe areas not accommodated in adjacent storm drainage systems, as well as other areas which may become tributary by reason of regrading. This information shall be confirmed with the Township Engineer prior to the start of the design of the internal servicing of the site.

C 6.02 STORM DRAINAGE PLANS

EXTERNAL AREAS

A plan shall be prepared to a scale of 1:1,000 or 1:2,000 dependent upon the size of the watershed area, to show the nature of the drainage of the lands surrounding the development site and to show all external drainage areas that are contributory to the drainage system for the development. The external drainage areas shall be divided into smaller tributary areas and the area and the location to which the tributary area is considered in the design shall be clearly shown. The Plan shall clearly show all existing contours used to justify the limits of the external drainage areas.

In lieu of precise information on development on the whole or any part of a watershed area, the latest zoning by-law and official plans issued by the Township shall be used to determine the correct values of the run-off parameters to be used for all external areas in the design and to determine the specific areas to which these values apply.

This external drainage area plan shall be prepared and shall be submitted to the Township Engineer at the functional report stage and prior to the commencement of the detailed storm sewer design.

INTERNAL DRAINAGE PLAN

All internal storm drainage plans shall be prepared to a scale of 1:1,000 and shall include all streets, lots, blocks, easements and other lands within the development. The proposed storm sewer system shall be shown on this plan with all manholes numbered consecutively from the outlet. These manholes shall be the tributary points in the design and the area contributing to each manhole shall be clearly outlined on this plan. The area, in hectares, of each contributing area (to the nearest hundredth) and the run-off parameter used shall be shown in a circle located within the contributing area. In cases where areas of different run-off parameters may be tributary to the same manhole, the areas and the parameters shall be separately indicated on the plan.

In determining the tributary area to each manhole, the proposed grading of the lots must be considered to maintain consistency in the design.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

INTERNAL DRAINAGE PLAN - (cont'd)

In the case of large areas under single ownership or blocks requiring future site plan agreements, the design shall be prepared on the basis of the whole area being contributory to one manhole in the abutting storm sewer unless more than one private storm connection is necessary to serve the property in which case the appropriate area tributary to each connection shall be clearly shown and taken into account in the storm sewer design.

The length, size and grade of each section of storm sewer shall also be shown on the storm drainage plan.

C 6.03 RAINWATER LEADERS

Rainwater leaders on all single family and semi-detached residential units and townhouses shall be discharged onto grassed or garden areas and away from wells or tile-bed areas.

The rainwater leaders from all commercial, industrial, institutional and high density residential buildings should be discharged onto grassed or garden areas, if possible and if acceptable to the Township. Alternatively rainwater leaders may be directed to on-site detention facilities to achieve an equivalent controlled discharge rate of 42 litres per second per hectare of roof area.

Precast concrete splash pads shall be placed at each rainwater leader downspout, all in accordance with the Standard Detail Drawing.

C 6.04 HYDRAULIC DESIGN LEVELS

The system of street gutters, catchbasins and storm sewers shall be designed for the 1:5 year storm with the following exception:

- Consideration will be given to using a 1:10 year storm for high value commercial development and for downtown business areas. In such cases, the Township of Scugog may require some internal control in the form of temporary ponding on parking areas furthest away from the building or underground storage. The Township may require the Developer to provide a manhole located at the street line to control discharges into the storm sewer system.

Where parking lot detention is used in industrial, commercial, institutional and high density residential developments, the controlled discharge rate from parking lots shall not be greater than 250 litres per second per hectare of asphalt and shall not be less than 195 litres per second per hectare of asphalt.

It is vital that the interception capacity of the system of catchbasins be completely compatible with the design capacity of the storm sewers. While the storm sewers will be designed for free-flow conditions for the storm noted above, the actual flows captured by the catchbasins during the 1:100 year design storm shall be determined. The hydraulic grade lines produced by the captured 1:100 year design storm flows shall be determined and plotted on the detailed design drawings. The spacing of catchbasins may be varied and approved orifice inserts fitted into the catchbasins to control the amount of water entering the storm sewers during less frequent storms.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 6.05 CONNECTION OF FOUNDATION WEEPERS

It is the Township of Scugog's policy to connect foundation weepers by gravity to the storm sewer system provided that the elevation of the basement floor is at least 0.60 m above the elevation of the storm sewer obvert at the building envelope. (In some cases, this may require shallow basements). No basement may be constructed below the 1:100 year storm hydraulic gradeline at the site. For buildings located close to the point where the storm sewer discharges into the major system, there is the additional requirement that the basement floor elevation must be 0.60m above the regulatory flood elevation at the point of discharge.

C 6.06 STREETS AND GUTTERS

The depths of flooding permitted on streets while acting as part of the minor drainage system, generally designed for the 1:5 year storm, are as follows:

(a) There shall be no curb overtopping.

(b) On local roads, the flow may spread to the crown.

(c) On collector roads, the flow spread must leave one lane free of water.

(d) On arterial roads, the flow spread must leave one lane in each direction free of water.

The depths of flooding permitted on streets and at intersections during the 1:100 year storm are as follows:

(a) No building shall be inundated at the ground line, unless the building has been floodproofed.
(b) For all classes of roads, the product of depth of water (m) at the gutter times the velocity of flow (m/s) shall not exceed 0.65 m^2/s.
(c) For arterial roads, the depth of water at the crown shall not exceed 0.15 m.

Flow across road intersections shall not be permitted for minor storms (generally 1:5 year). To meet the criteria for major storm run-off, low points in roads cannot be permitted unless adequate provision is made for the safe overland flow at the low points.

C 7.00 HYDROLOGIC CRITERIA

C 7.01 GENERAL

A stormwater management (SWM) study should be conducted in two main stages, namely, preliminary planning and detailed design.

Stage 1

Preliminary planning on a watershed or community basis to define clearly potential drainage constraints, to examine and assess different SWM alternatives and to recommend for approval a SWM scheme which is economically and environmentally justifiable (now called Master Drainage Plan).

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C7.00 HYDROLOGIC CRITERIA - (cont'd)

Stage 2

Detailed design of the proposed and approved SWM scheme, i.e. sizing, grading, location, operation and cost estimates of various stormwater drainage facilities of the major and minor systems, the schedule of their implementation and hydraulic grade lines (now called Stormwater Management Plan).

The system should be designed to meet the requirements of the Township of Scugog, the conservation authorities and the Ministries of the Environment (M.O.E.) and Natural Resources (M.N.R.).

C 7.02 MODELS

Different hydrologic computations or models of various levels of sophistication have been used to estimate stormwater run-off volume and peak flow. The selection of an appropriate model should be based on appreciation of its underlying assumptions and limitations with respect to the problems under consideration. Three categories of commonly used hydrologic models, namely Rational Method, Unit Hydrograph and physical process simulation models, may be considered for the SWM study. Their underlying assumptions and limitations must be clearly stated.

For additional information relative to hydrologic modelling, the Consulting Engineer should procure the Provincial Document entitled, 'Urban Drainage Design Guidelines'.

C 7.02.01 Rational Method

The Rational Method, while simple and popular, has its major limitations in the crude representation of physical run-off parameters and its inability to simulate the actual run-off distribution in time. However, it can be used for the preliminary sizing of the minor sewer system in the final design stage (Stage 2), providing the total drainage area is not greater than 25 ha.

The Rational Method does not take into account the actual storm pattern and thus fails to reflect the run-off distribution in both time and space. This shortcoming makes the Rational Method unsuitable for the design of detention storage, pumping and interceptor facilities.

In recent years, computer programs have been developed for the Rational Method, which dynamically simulate the run-off distribution in both time and space. Such computer programs may be used for the final design of storm sewers and storm water management facilities, subject to the approval of the Township Engineer.

C 7.02.02 Unit Hydrograph Models

Unit Hydrograph Models are of the "black box" type and their validity is strongly dependent on proper calibration of the various parameters. Frequently used models in this category are HYMO, TR20, and HEC1.

The OTTHYMO model gives results compatible with actual measurements and with SWMM and is therefore recommended for all Master Drainage Plan level studies.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C7.02 MODELS - (cont'd)

C 7.02.03 Physical Process Simulation Models

These models reproduce overland flow and routing in street gutters by simplified assumptions. The most frequently used ones are ILLUDAS and SWMM, which were originally designed as urban SWM tools and thus should be used in the detailed flow analysis for the design of new urban sewers or the evaluation of the existing system (Stage 2). In general, for small to medium size urban development, the use of SWMM is more desirable, since it adopts more rigorous hydraulic computations for both overland and pipe flows and also has a comprehensive water quality modelling capability. The OTTSWMM model incorporates the capability of analyzing dual drainage flows (pipe and street) simultaneously. It can be used to calculate the flow captured by the catchbasins during infrequent storms, route this flow through the pipe system and determine hydraulic grade lines. Other physical process simulation models may be employed in the detailed design of the SWM scheme (Stage 2), subject to the approval of the Township Engineer.

C 7.02.04 Validation

Whenever possible, a model should be properly calibrated under local conditions before its actual application. It is advisable to validate the results from the preliminary analysis by using different models, e.g. the post-development peak flows estimated through HYMO should be checked against those obtained through SWMM. Comparison by two models is recommended wherever possible; however, OTTHYMO and OTTSWMM do not require validation.

C 7.03 BASIC DATA

C 7.03.01 Meteorology

All models derive flows from storms of a given frequency. The frequency of the flow is, in general, not identical to the frequency of the storm. The Rational Method uses rainfall intensity-duration-frequency curves. All other models use design storms or, in special cases, real storm distributions.

Standard Drawing No. SS-600 gives the rainfall intensity-duration-frequency (IDF) curves that should be used for all frequencies from 1:2 years to 1:100 years.

Based on these IDF curves, two sets of design storms have been developed for use in studies. These are the SCS Type II and Chicago Distribution Design Storms.

In general, the SCS design storms should be used for determining the hydrographs for rural watersheds and for checking detention storages required for quantity control. The Chicago design storms should be used for determining hydrographs in urban areas and also for checking detention storages. It is prudent to run both sets of design storms to make sure that the more stringent is used for each individual element of the drainage system (pipe flow, street flow, stream or river flow, detention storage).

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C7.03 BASIC DATA - (cont'd)

Current regulations require that the floodlines on streams be determined for the greater of the Regional Storm or a 1:100 year design storm. It is imperative that all on-stream detention and retention ponds be designed to handle the Regional Storm flows without suffering unacceptable damage and without causing unacceptable flooding.

Since the intensity-duration-frequency curves were originally derived from discrete rainfall data with a minimum time duration of 5 minutes, it can be assumed that 10 minutes represents the minimum reasonable time step for discretization purposes. The time step for discretization of the design storm can vary according to the size of the watershed, but must not exceed the estimated time of concentration. The maximum rainfall intensity should be compatible with that of real storms on record.

In the detailed design of storage structures, it is recommended that operation be checked for Spring flood due to combined snow-melt and rain. Wet ponds should be checked for evaporative losses in very dry years. Temperature data should be collected when snowmelt and evaporation are to be estimated. Operation of storage facilities should also be checked in order to verify that a sequence of storms may not be more critical than a design storm.

C 7.03.02 Physical Data

Watershed/community/subdivision should be discretized into subcatchments according to land-use and topographic characteristics from detailed soil and topographic maps along with a well defined development plan. The finer the discretization is, the more precisely one can derive the physiographic parameters such as slope, hydraulic length, and imperviousness, etc. A minimum area of 25 ha. should provide reasonably accurate estimates. In the preliminary planning stage, coarser discretization is acceptable.

Field measurements are required for all major watercourses and items such as channel section, length, slope, the storage-elevation relationship of any ponds, and dimensions of existing culverts.

C 7.03.03 Hydrologic Considerations

In the OTTHYMO model, the soil complex numbers govern the availability of excess rainfall to become run-off. They should be determined according to the soil type/land-use and antecedent moisture conditions.

Time of concentration is required in both HYMO and ILLUDAS as well as Rational Method. Although there is a built-in empirical formula in the HYMO model, it is advisable to compare the estimate with those obtained from other proven empirical formulas or hydraulic approximations.

Initial and final infiltration rates are required in both ILLUDAS and SWMM. Without field measurements of infiltration, model default values may have to be adopted unless otherwise justified. This also applies to other hydrologic parameters such as depression and detention storage, etc.

If the Rational Method is to be used for the preliminary sizing of sewers, the run-off coefficients should be properly determined as a function of imperviousness and rainfall frequency.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 7.04 COMPUTATIONAL REQUIREMENTS

C 7.04.01 Stage 1 - Preliminary Planning

Define clearly potential drainage constraints affecting the development, such as flood control and erosion control criteria, inadequate capacity of downstream system and other constraints imposed by natural environment or government regulations.

Examine different SWM alternatives such as on-line or off-line detention storage, roof disconnection, etc., by appropriate hydrologic computations. Unit Hydrograph Methods or less sophisticated physical process simulation models may be used for the preliminary planning hydrologic and stormwater management analysis. Segmentation of the watershed should be based on land use and drainage patterns. A minimum of ten sub-watersheds is desirable. A coarser segmentation or lumping should be justified by comparison with more detailed discretizations.

Assess each alternative on the basis of economics, i.e. benefit/cost analysis, environmental impacts, i.e. water quality and aesthetic aspects, and compatibility with the general development plan, etc. No-control and over-control options should also be included for comparison.

C 7.04.02 Stage 2 - Detailed Design

Based on the preliminary findings from the planning study, a well-conceived SWM scheme which defines the drainage pattern for the watershed shall be designed, tested and presented in detail. Preliminary sizing of sewers can be carried out using the rational method in accordance with the design guidelines.

The hydraulic grade lines in the storm sewer system must be determined for the 1:5 year storm and for the actual captured flows from the 1:100 year storm.

Storage design, whether on-line or off-line, above ground or under-ground, also requires analysis of such factors as critical sequence of storm events competing for limited storage, snowmelt run-off with large volume and longer duration, and simultaneous operation of a series of storage units resulting in adverse downstream effect due to uncoordinated timing of peaks. The outflow control from the storage facilities should be properly designed to optimize storage utilization.

C 7.04.03 Water Quality Computations

In environmentally sensitive watersheds, the effect of pollution of run-off can be assessed by comparing pre-development and post-development pollutant loadings by means of the STORM model. The model must be applied for an average year and parameters such as suspended solids, biochemical oxygen demand and phosphorus and nitrogen will be compared in terms of annual loading and the "worst event". This event is usually given by a combination of a large number of dry days and a storm of average intensity. If the change in total pollutant loading upstream from the critical creek section is significant, the effect of changes in dissolved oxygen has to be further indicated. Methods to reduce the pollutant loading including temporary detention, and changes in density must be investigated and the results approved by MOE.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C7.04 COMPUTATIONAL REQUIREMENTS - (cont'd)

In addition, evaporation losses and sediment loading are important for wet ponds, in order to evaluate maintenance problems, the need for additional water supply, etc.

The Developer's Consultant shall contact the Ministry of Environment to ascertain their specific requirements for water quality measures, relative to each development.

C 7.04.04 Presentation of Hydrologic Studies

Hydrologic studies should describe the model parameters and criteria for their selection as well as input and output data. The Consulting Engineer has the responsibility for the computations, and the Township shall check the main assumptions and the input data. All information required for this verification should be submitted with the hydrologic computations. To facilitate review, the following documentation should be submitted.

(a) Plan showing the model subcatchments that enclose the drainage modification project.

(b) Summary tables that provide the following data on the portion of the drainage project:

(i) total drainage area;
(ii) pre- and post-development impervious area and run-off coefficients;
(iii) pre- and post-development area devoted to each ground cover element (rooftop, street, grass, etc.);
(iv) total drainage area devoted to each hydrologic soil group;
(v) storage volumes associated with pre- and post-development run-off control measures.

(c) Site plan maps showing:

(i) boundaries of drainage modification project;
(ii) pre- and post-development topography;
(iii) points along the drainage modification project boundaries that receive run-off from offsite drainage areas;
(iv) pre- and post-development structures, paved areas, and vegetative cover;
(v) pre- and post-development drainage network (sewers, culverts, inlets, manholes, swales, open channels, etc.) and drainage divides for land area tributary to each sewer or culvert inlet, as well as the following information:

- length, cross-sectional dimensions, gradient, and roughness factor of each conduit;
- invert and ground elevations for all junctions and connecting conduits;
- for on site drainage area, the total area of each ground cover element tributary to a storm sewer or culvert inlet;
- for off site areas tributary to a storm sewer or culvert inlet, total acreage by land use classification.

(vi) pre- and post-development run-off control measures.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C7.04 COMPUTATIONAL REQUIREMENTS - (cont'd)

(d) The hydraulic grade lines produced by the actual captured flows from the 1:100 year storm shall be plotted on the detailed design drawings.

C 8.00 STORM SEWER DESIGN

C 8.01 RUN-OFF OR IMPERVIOUSNESS COEFFICIENTS

Run-off coefficients to be used in storm sewer design with the Rational Method shall be as follows:

Parks over 4 hectares	0.20
Parks 4 hectares and under	0.25
Single-family Residential (Urban)	0.45
Single-family Residential (Estate Residential)	0.40
Semi-detached Residential	0.60
Townhouses, Maisonettes, Row Houses, etc.	0.75
Apartments	0.75
Schools and Churches	0.75
Industrial	0.75
Commercial	0.90
Heavily Developed Areas	0.90
Paved Areas	0.95

A 10 minute inlet entry time at the head of the system must be utilized unless large external drainage areas exist.

C 8.02 PIPE CAPACITIES

Manning's formula shall be used in determining the capacity of all storm sewers. The capacity of the sewer shall be determined on the basis of the pipe flowing full.

The value of the roughness coefficient 'n' used in the Manning's formula shall be as follows:

(a) Concrete Pipe all sizes	0.013
(b) Concrete box culverts	0.013
(c) Smoothwall Polyethylene Pipe	0.013
(d) Corrugated Polyethylene Pipe	0.020 to 0.028 (as a function of pipe diameter)

C 8.03 FLOW VELOCITIES

Minimum acceptable velocity = 0.75 m./sec.
Maximum acceptable velocity = 4.5 m./sec.

C 8.04 MINIMUM SIZES

The minimum size for a storm sewer main shall be 300 mm. for concrete pipe.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 8.05 MINIMUM GRADES

Regardless of flow velocities obtained, the minimum design grades for pipe storm sewers shall be as follows:

Sewer Size	Concrete Pipe
up to 375 mm.	0.40%
450 mm. to 525 mm.	0.30%
600 mm. to 1,200 mm.	0.20%
1,200 mm. and over	0.15%

C 8.06 MINIMUM COVER

The depth of a deep storm sewer shall be sufficient to provide a suitable outlet for the building foundation weeping tiles. The minimum cover to the top outside pipe barrel of a deep storm sewer shall be 2.5 to 3.0 metres depending on the storm service connection requirements. The minimum cover to the top outside pipe barrel of a shallow storm sewer system shall in no case be less than 1.3 metres from the centreline of the roadway. Where shallow storm sewer systems are placed for estate residential developments, all pipe shall be polyethylene as manufactured by "Big O", or approved equivalent.

C 8.07 LOCATION

The storm sewers shall be located as shown on the standard Township of Scugog road cross section drawings. This standard location shall be generally 1.5 metres south or west of the centreline of the road allowance. In the case of crescents, looped and curvilinear streets, this standard location may be varied to the extent that the storm sewer remains on the same side of the centreline of the street (i.e., left or right) to avoid crossing the sanitary sewer trenches at the changes in direction of the street.

C 8.08 CURVED SEWERS

Radial pipe shall be allowed for all storm sewers 1000 mm. in diameter and larger providing that a manhole is located at the beginning or at the end of the radial section. The minimum centreline radius allowable shall be 15 x the pipe diameter.

C 8.09 LIMITS

All sewers shall be terminated at the subdivision limits when external drainage areas are considered in the design with suitable provision in the design of the terminal manholes to allow for the future extension of the sewer.

When external areas are not included in the sewer design, the sewer shall extend at least half way across the frontage and/or flankage of any lot or block in the subdivision.

C 8.10 SEWER ALIGNMENT

All storm sewers shall be laid in a straight line between manholes unless radial pipe has been designed.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 8.11 PIPE CROSSINGS

A minimum clearance of 0.20 metres shall be provided between the outside of all pipe barrels at all points of crossing. In cases where the storm sewer crosses a recent utility trench at an elevation higher than the elevation of the utility, a support system shall be designed to prevent settlements of the storm sewer, or alternatively the original trench will be re-excavated to the top of the utility and shall be backfilled with compacted crushed stone or concrete to adequately support the storm sewer. When the storm sewer passes under an existing utility, adequate support shall be provided for the utility during and after construction to prevent damage to that utility.

C 8.12 CHANGES IN PIPE SIZE

No decrease of pipe size from a larger upstream to a smaller size downstream will be allowed regardless of the increase in grade.

C 9.00 SEWER PIPE

C 9.01 MATERIALS

The type and classification of all storm sewer pipe and the sewer bedding type shall be clearly indicated on all profile drawings for each sewer length.

Concrete pipe shall conform to the requirements of C.S.A. Specification A257-M1982 for the particular classes as shown below:

a) Non-Reinforced Concrete Pipe,
CSA Standard A257.1-M1982, Class 1, 2 and 3.

b) Reinforced Concrete Pipe,
CSA Standard A257.2-M1982, Strength Classification 50-D, 65-D, 100-D and 140-D.

Polyvinyl Chloride (PVC) Pipe Products shall conform to the requirements of CSA B 182.2, B 182.3, B 182.4, ASTM D 3034, F 679, F 794 and UNI-B-5, B-6 and B-9. The pipe must be manufactured with factory assembled spigot gasket and integral bell joints.

Fabrication of PVC pipe products shall conform to the requirements of CSA Standard B 182.2, B 182.3 and B 182.4.

PVC pipe for storm sewers shall be white in colour.

Polyethylene Pipe products shall conform to the requirements of ASTM D-1248, AASHTO M252-811, AASHTO M294-831, ASTM, D-2321, D-2412, F405, F667-82, CGSB 41-6P-29M and CGSB 41-6P-25. Material specification for polyethelene pipe shall also conform to OPSS 1840.

In urban areas, all storm sewer mains shall be constructed of PVC, PE or reinforced concrete pipe. Storm sewer leads from catchbasins shall be constructed with non-reinforced concrete pipe, PE or PVC pipe. Where shallow storm sewers with catchbasin manholes are placed, all pipe components shall be polyethelene or PVC.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 9.02 PIPE BEDDING

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Details of the types of bedding are illustrated in the Township of Scugog Standard Drawings.

In general, the Type "2" bedding (20 mm. crusher run limestone) shall be used for storm sewers in new developments, and the class of pipe will be selected to suit this bedding detail. Alternate granular materials for pipe bedding may be specified, subject to the approval of the Township Engineer. The width of trench at the top of the pipe must be carefully controlled to ensure that the maximum trench width is not exceeded unless additional bedding or higher strength pipe is used.

C 9.03 VIDEO RECORD

All newly constructed storm sewers shall be T.V. inspected in accordance with OPSS-409 upon satisfactory completion of all other testing, prior to the Township's issuance of "Certificate of Completion".

A permanent record in video taped form shall be supplied, illustrating a continuous record of the sewer installations, service connections, manholes, etc. A report identifying any unusual or sub-standard conditions shall also be submitted.

All video cassettes, reports and data provided from inspections are to become the property of the Township of Scugog. At the discretion of the Township Engineer, additional video inspections and records may be required prior to "Final Acceptance".

C9.04 DEFLECTION TEST

A deflection test shall be performed on all sewers constructed using PE or PVC pipe material.

A suitably designed device described below shall be pulled manually through the pipe 30 days after completion and again prior to the final assumption of the development. The device shall be cylindrical in shape and constructed according to the following dimensions:

Diameter = Pipe I.D. x (100 - 0.15 DR) % - 1 mm
(DR is dimension ration)

Nominal Pipe Size (mm)	Length (mm)
150	100
200	150
250	200
300	250
350	300
375	300
400	300
450	350
500	400
525	450
600	500
675	575
750	675
900	750
1050	900
1200	1050

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 10.00 MANHOLES

C 10.01 LOCATION

Manholes shall be located at each change in alignment, grade or pipe material, at all pipe junctions, at the beginning or end of all radius pipe sections and at intervals along the pipe to permit entry for maintenance to the sewer.

C 10.02 MAXIMUM SPACING

The maximum spacing between manholes shall be as follows:

Pipe Size	Maximum Manhole Spacing
300 mm.	95 metres
375 mm. to 750 mm.	100 metres
825 mm. to 1,200 mm.	125 metres
1,200 mm. and over	150 metres

C 10.03 MANHOLE TYPES

Manholes may be constructed of precast or semi-precast concrete. The Township of Scugog standard manhole details shall be used for manhole design where applicable. Although these standard drawings provide details for manholes up to certain maximum depths and sizes, the Consulting Engineer shall analyze, individually, each application of the standards related to soil conditions, loading and other pertinent factors to determine structural suitability. In all cases where the standard drawings are not applicable, the manholes shall be individually designed and detailed.

A reference shall be made on all profile drawings to the type and size of all storm manholes. In the case of the standard 1,200 mm. precast manhole, the size of the manhole may be omitted and reference need only be made to the standard drawing number.

Precast manholes shall conform to ASTM specifications C-478 M latest revision.

C 10.04 MANHOLE DESIGN

(a) All manhole chamber openings shall be located on the side of the manhole parallel to the flow for straight run manholes, or on the upstream side of the manhole at all junctions.

(b) The direction of flow in any manhole shall not be permitted at acute interior angles.

(c) Safety gratings shall be provided in all manholes when the depth of the manhole exceeds 5 m. The maximum spacing between safety gratings shall not exceed 5 m.

(d) The obverts on the upstream side of manholes shall not be lower than the obvert of the outlet pipe.

(e) The maximum change in direction of flow in manholes, for sewer sizes 900 mm. diameter and over, shall be 45°.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 10.04 MANHOLE DESIGN

(f) Where the difference in elevation between the obvert of the inlet and outlet pipes exceed 0.9 m., a drop structure shall be placed on the inlet pipe.

(g) All storm sewer manholes shall be benched to the obvert of the outlet pipe on a vertical projection from the spring line of the sewer. Pre-benched manholes will not be permitted.

(h) The minimum width of benching in all manholes shall be 230 mm.

(i) Manholes in boulevards shall be located, wherever possible, a minimum of 1.5 m. distant from the face of curb or other service.

(j) Minimum size of any manhole stack shall be 685 mm. square.

C 10.05 GRADES FOR MANHOLE FRAMES AND COVERS

All manholes, located within the travelled portion of a roadway, shall have the rim elevation set flush with the surface of the basecourse asphalt. The concreting and setting of the frame and cover shall be completed in accordance with the details provided in the standard drawing. A maximum of 300mm of modular rings shall be permitted on manholes in new subdivisions. No concrete shall extend over the edge of the manhole.

Prior to the placement of the final lift of asphalt, manhole frames shall be set to final grade.

C10.06 HEAD LOSSES

Suitable drops shall be provided across all manholes to compensate for the loss in energy due to the change in flow velocity and for the difference in the depth of flow in the sewers.

In order to reduce the amount of drop required, the designer shall, wherever possible, restrict the change in velocity between the inlet and outlet pipes to 0.6 metres/sec.

Hydraulic calculations shall be submitted for all junction and transition manholes on sewers where the outlet is 1,050 mm. or greater. In addition, hydraulic calculations may be required for manholes where the outlet pipe is less than 1,050 mm dia. if, in the opinion of the Township Engineer, there is insufficient invert drop provided across any manhole.

Regardless of the invert drop across a manhole as required by calculations, the obvert of the outlet pipe shall not be higher than the obvert of the inlet pipe at any manhole location.

The minimum drops across manholes shall be as follows:

Change of Direction	Minimum Drop (mm)
0	20
1° to 45°	50
46° to 90°	80

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 11.01 LOCATION AND SPACING

Catchbasins shall be selected, located and spaced in accordance with the conditions of design. The design of the catchbasin location and type shall take into consideration the lot areas, the lot grades, pavement widths, road grades and intersection locations.

All catchbasins and their leads shall be of the single, double or backyard type as set out in the standard drawings. The hydraulic capture capacity of the catchbasins is given in the Township of Scugog Standard Detail Drawings. To ensure that the capture or inlet capacity matches that of the storm sewer, the spacing of catchbasins on streets may be varied.

If detailed analysis of the major-minor system and SWMM analysis of the pipe system indicate the need for inlet controls, additional constrictions should be implemented. Since reduction in the size of the standard catchbasin covers is not desirable, an orifice plate or hooded inlet can be located in the catchbasin.

Catchbasins shall be generally located upstream of sidewalk crossings at intersections and upstream of all pedestrian crossings. Catchbasins shall not be located in driveway curb depressions.

Double catchbasins shall be normally required when the catchbasin intercepts flow from more than one direction. Single catchbasins may be used in the case where the total length of drainage to the catchbasin, from both directions, is less than 95 m, subject to the analysis of the major-minor system.

Rear lot catchbasins and connections shall be located as outlined in the lot grading criteria. In general, the catchbasin and the catch-basin connections shall be located entirely on one lot.

C 11.02 CATCHBASIN TYPES

Catchbasins must be of the precast type as shown on the Standard Drawings.

Typical details for the single, double and rear lot type catchbasins are shown in the standard drawings.

Special catchbasins and inlet structures shall be fully designed and detailed by the Consulting Engineer.

C 11.03 CATCHBASIN CONNECTIONS

For single catchbasins, the minimum size of connection shall be 250 mm. and the minimum grade shall be 1.0%.

For double catchbasins, the minimum size of connection shall be 300 mm. and the minimum grade shall be 1.0%.

For rear lot catchbasins, the minimum size of the connection shall be 250 mm. and the minimum grade shall be 1.0%.

In general, catchbasins located in close proximity to a manhole shall have their leads connected to the manhole. Long catch basin connections (in excess of 20 m.) shall be connected to a manhole or, alternatively, the lead can be connected to the sewer and a 1,200 mm. manhole catchbasin used in lieu of the normal 600 mm. square catchbasin.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 11.04 GRATINGS

The pyramidal type frame and cover shall be specified for rear lot and ditch inlet catchbasins as detailed in the Township of Scugog Standard Drawings. The frame and cover for catchbasins located in roadway or walkway areas shall be in accordance with OPSD 400.11.

C 11.05 CATCHBASINS AT INTERSECTIONS

All catchbasins at street intersections shall be located on the tangent section of the curb at a minimum of 0.6 metres distant from the beginning or the end of the radial portion of the curb.

C 11.06 GRADES FOR CATCHBASIN FRAMES AND COVERS

All catchbasins located within the travelled portion of a roadway, shall have the frame elevation set flush with the surface of the base course asphalt. The adjusting and setting of the frame and cover shall be completed in accordance with the details provided in the standard drawing, upon placement of surface course asphalt.

Temporary asphalt curbing shall be placed behind all catchbasins within the travelled portion of the roadway at the stage of base course asphalt. Asphalt curbing shall be placed in accordance with OPSD 601.01 - Type "D", between the two adjacent joints as shown on the Standard Drawing.

Prior to placing surface course asphalt, temporary asphalt curbs shall be removed and replaced by concrete curb in accordance with Standard Drawing No. SS-225.

C 12.00 INLETS, OUTFALLS AND SPECIAL STRUCTURES

C 12.01 GENERAL

Inlet and outlet structures shall be fully designed on the engineering drawings. The details provided shall include the existing topography, proposed grading and the work necessary to protect against erosion.

C 12.02 INLETS

For other than minor swales, where catchbasins with pyramidal tops are used, inlet structures shall be fully designed by the Consulting Engineer. Inlet grates shall generally consist of inclined parallel bars or rods set in a plane at approximately 18° with the top away from the direction of flow. Gabions, rip-rap or concrete shall be provided at all inlets to protect against erosion and to channel the flow to the inlet structure.

Hydraulic design calculations for inlet structures must be performed in accordance with guidelines established by the Ministry of Transportation, Ontario, Drainage Manual.

The design of any culvert on a new or reconstructed watercourse where an inlet grating is required must provide a measure of safety and minimize the risk of entanglement or entrapment of a person.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 12.03 OUTLETS

The Township of Scugog standard headwall shall be used for all storm sewers up to 1,800 mm. For sewers over 1,800 mm. in diameter, the headwalls shall be individually designed. All headwalls shall be equipped with a grating over the outlet end of the pipe and a railing across the top of the headwall for the protection of the public.

All outlets shall blend in the direction of flow of the watercourse with the directional change being taken up in the sewer rather than the channel.

Storm sewer outfalls shall not be connected to existing or proposed road crossing culverts. Storm sewer outfalls must be terminated at separate headwall structures, adjacent to the outlet side of road crossing culverts.

Gabions, rip-rap, concrete or other erosion protection shall be provided at all outlets to prevent erosion of the watercourse and to the area adjacent to the headwall. The extent of the erosion protection shall be indicated on the engineering drawings and shall be dependent upon the velocity of the flow in the storm sewer outlet, the soil conditions, the flow in the existing watercourse and site conditions.

C 12.04 OPEN CHANNELS

The proposed criteria for an open channel design shall be submitted to the Township Engineer for his approval, by the Consulting Engineer, prior to the actual design being undertaken. The Consulting Engineer shall also be responsible for obtaining the approval of the design from the Ministry of Natural Resources, the Ministry of the Environment and the local Conservation Authority, if the open channel concept is favourably considered.

The minimum side slopes of channels shall be three in the horizontal plane to one in the vertical plane. The designer shall provide for dry weather flow in the design of open channels. The maximum velocity for sod lined channels shall be 1.25 m/s and for concrete lined channels shall be 2.5 m/s, for the 100 year or Regional Storm flow.

Open channels shall only be considered at the discretion of the Township Engineer when the design flow exceeds 14.0 C.M.S.

Dry weather flow inverts of open channels are to be designed with concrete, subject to the Township Engineer's approval.

C 13.00 GABION BASKETS AND FILTER FABRIC

C 13.01 GABION BASKETS

Gabion baskets should meet the requirements of OPSS 512.

The engineering drawings shall include special detailed drawings of all gabion basket structures used for the construction of retaining walls, erosion control structures, siltation traps, inlets, outfalls and other special structures.

C 13.02 FILTER FABRIC

Filter fabric should be placed in accordance with OPSS 512.07.02 and should meet the requirements of Class II, OPSS 1860.07.02.

SECTION C - STORM DRAINAGE AND STORM WATER MANAGEMENT

C 14.00 CONSTRUCTION

Construction of all storm sewers and appurtenances shall be in accordance with the specifications and Standard Detail Drawings of the Township of Scugog at the time of approval of the design drawings by the Township Engineer.

SECTION D - STORM DRAIN CONNECTIONS

D 1.00 SINGLE-FAMILY AND SEMI-DETACHED LOTS

D 1.01 GENERAL

The installation of a sewer service connection to serve more than one building (ie. double service) will not be permitted. Semi-detached units will require separate sewer laterals for each side.

D 1.02 CONNECTION SIZE AND GRADE

The minimum size for storm drain connections shall be 150 mm installed at a minimum grade of 2% from the storm sewer to the building envelope.

D 1.03 DEPTH OF CONNECTION

The storm drain connection shall be installed to a sufficient depth to provide for the drainage of the weeping tile around the foundation of the house in accordance with the standard detail drawings.

Concrete or PVC risers shall be used on all drain connections when the depth to invert of the storm sewer exceeds 4.5 m. The riser shall be constructed as shown on the Township of Scugog Standard Drawings.

D 1.04 CONNECTION TO THE STORM SEWER

The connection of the storm drain to the storm sewer shall be made by means of a manufactured tee on the storm sewer line for storm sewer sizes up to and including 450 mm. and by means of a saddle for storm sewer sizes in excess of 450 mm. As an alternate ,"Kor-N-Tee" connectors may be used for 150 mm. and 200 mm. diameter storm drain connections.

D 1.05 STORM DRAIN MATERIALS

Storm drain connections shall be constructed of non-reinforced concrete pipe or polyvinyl chloride (SDR 28) pipe. PVC pipe to be white in colour.

D 1.06 LOCATION

Storm drain connections shall be installed to the location as shown on the Township of Scugog Standard Drawings.

After construction, the end of the connection shall be marked by a suitable length of 50 mm. x 100 mm. lumber extending from the obvert of the connection to a point 0.9 m. above grade. The top of this marker shall be painted green.

Storm drain connections shall be installed to 1.5 metres beyond the streetline and shall be fitted with a manufactured watertight plug.

SECTION D - STORM DRAIN CONNECTIONS

D 2.00 LANDS DEVELOPED UNDER SITE PLAN CONTROL

D 2.01 GENERAL

All blocks of land within the plan of subdivision, shall have a storm drain installed from the storm sewer to 1.5 metres beyond the street limit.

D 2.02 CONNECTION SIZE

The storm drain connection to all multi-family and other blocks shall be sized individually according to the intended use of the lands and in accordance with the requirements of Section C.

D 2.03 DEPTH OF CONNECTION

The depth of the storm drain connection shall be governed by the grading of lands and the extent of the area to be served. The depth of the connection shall be sufficient to provide for drainage of all lands within the block, but in no case shall the depth to the top of the pipe be less than 1.5 metres.

D 2.04 CONNECTION TO MAIN SEWER

The connection of the storm drain to the storm sewer may be made at a manhole or directly to the storm sewer if the size of the connection is less than half of the size of the storm sewer. If the connection size is greater than 250 mm the connection must be made to a manhole on the storm sewer. If the connection is made directly to the storm sewer pipe, then a manhole must be installed on the private lands within 1.5 m. of the street limit.

D 2.05 STORM DRAIN MATERIALS

Concrete pipe shall be used for a storm drain connection to all blocks in the class as required by design. Class of pipe to conform to OPSS Section 1820.07.01.

D 2.06 LOCATION AND TIMING OF CONSTRUCTION

Since the ultimate development of the block may be unknown at the time of the construction of the underground services, it may be desirable to delay the installation of the storm drain connections to the blocks in the plan of subdivision until further information is available.

If the block is developed prior to the placement of the surface course asphalt, then the service connection can be installed to the location required to suit the development. If no development proposals are received for the block at the time of the placement of the surface course asphalt, then the storm drain connections shall be installed to the locations shown on the approved engineering drawings prior to the placing of the surface course asphalt.

In either case, all trenches crossing the travelled portion of the roadway shall be backfilled with granular material thoroughly compacted and the road base shall be restored.

SECTION D - STORM DRAIN CONNECTIONS

D 3.00 BEDDING FOR STORM DRAIN CONNECTIONS

All storm drain connections shall be installed in bedding material as shown on the Township of Scugog Standard Drawings.

D 4.00 CONSTRUCTION

All storm drain connections shall be constructed in accordance with the standards and specifications of the Township of Scugog, current at the time of approval of the engineering drawings by the Township Engineer.

SECTION E - LOT GRADING

E 1.00 GENERAL

The grading of all lots and blocks in new development must be carefully monitored by the Consulting Engineer in order to provide sites that are suitable for the erection of buildings and to provide satisfactory drainage from all lands within the development. In this regard, the design of the grading for all developments will be of primary concern to the municipality and the following criteria shall be used in the preparation of all lot grading plans for new developments in the Township of Scugog.

E 2.00 LOT GRADING PLAN

E 2.01 *Drawing Size*: (594 x 841 mm.) AI

E 2.02 *Scale*: 1:500 for single-family or semi-detached areas and 1:200 for multi-family areas.

E 2.03 All lots and blocks within the subdivision are to be shown and are to be numbered in accordance with the plan proposed for registration.

E 2.04 Existing contours are to be shown at maximum 0.5 m. intervals within the subdivision limits and 15 metres beyond the subdivision limits.

E 2.05 Proposed centreline road elevations are to be shown at 20 m. stations along all roads within and abutting the subdivision. Elevations are to be shown for the 20 m. stations in accordance with the chainage on the profile drawings. In addition, centreline road elevations shall be shown opposite all lot corners.

E 2.06 Proposed elevations are to be shown for all lot corners and intermediate points of grade change. On large blocks, a proposed elevation is to be shown at 15 m. intervals along the frontage of the block and at reasonable intervals along the sides and rear of the block to clearly illustrate the grading of the block in relation to the surrounding lands and house types.

E 2.07 The specified lot grade shall be shown at a location 7.62 m. from the street line. For "split" type drainage patterns, the specified rear of house grade shall be shown. The specified minimum basement floor elevation for each lot shall also be shown.

E 2.08 The direction of the surface water run-off from the rear of all the lots shall be indicated by means of an arrow pointing in the direction of the run-off.

E 2.09 All swales, other than the normal side yard swales, are to be shown along with the invert elevation of the swale at regular intervals (ie. centreline of each lot for rear yard swales).

E 2.10 All rear yard catchbasins shall be shown along with the rim elevation of the catchbasin and the invert elevation of the outlet pipe.

E 2.11 All terracing required shall be shown with the intermediate grades specified.

E 2.12 All lot surfaces shall be constructed to a maximum lot grade of 12% (calculated from the difference in lot elevations between the rear wall of the house and property line - embankments included).

SECTION E - LOT GRADING

E 2.13 Existing elevations are to be shown on adjacent lands approximately 15 metres, or greater if required, from the subdivision limit to enable assessment of the grading between the subdivision and the adjacent areas. The interval of those elevations shall be dependent upon the degree of development of the adjoining lands with the developed areas requiring the most information. The Lot Grading Plan must provide for drainage problems on adjacent property which can only be solved by permitting drainage through the subdivision.

E 2.14 The lot grading plan shall make note of the Township of Scugog Standard Drawings that are applicable to the grading of the development. The Township reserves the right to refuse any house type which is incompatible with the lot grading design specified for a lot.

E 2.15 The lot grading plan shall note all existing slopes that are to be left in an undisturbed state. Temporary fencing shall be required along the top of these slopes to prevent disturbance to the existing vegetation.

E 2.16 A 0.6 metre strip shall be left undisturbed along the boundary of the subdivision next to adjacent properties unless grading is required to eliminate drainage problems on adjacent properties. Such grading must be stipulated on the approved Lot Grading Plan. Temporary fencing shall be placed around the entire site, within the 0.6 metre undisturbed strip.

E 2.17 Lot drainage is to be self-contained within the subdivision limits, where possible.

E 2.18 The lot grading plan shall show proposed locations for building envelopes and envelopes for private sewage disposal systems.

E 2.19 The lot grading plan shall show all proposed easements and blocks for registration.

E 2.20 The lot grading plan shall show all proposed retaining wall structures with respect to heights, types and locations.

E 3.00 LOT GRADING DESIGN

E 3.01 The specified lot grade shall be calculated in accordance with the Lot Grading Detail Sections included in the Township of Scugog Standard Drawings.

E 3.02 The front yards of all lots shall be graded to drain towards the street.

E 3.03 All boulevard areas shall be graded with a constant slope from the curb to the street limit (minimum slope to be 2%, maximum slope to be 5%) and all water boxes, manhole covers, valve boxes, etc. shall be set flush with the finished sod surface.

E 3.04 Driveways shall not be used as outlets for any swales.

E 3.05 All rear yard drainage shall be directed away from the houses in defined swales which outlet at the curb, sidewalk or a catchbasin. Overland flow routes must be provided for all rear yard catchbasins.

E 3.06 The drainage from all the lands within the subdivision limit is to be provided for internally with drainage over abutting lands being permitted only in exceptional cases at the discretion of the Township Engineer.

SECTION E - LOT GRADING

E 3.07 The grading along the limit of the subdivision shall be carefully controlled to avoid disturbance to the adjoining areas. In general, lot drainage should be directed away from top of banks or valley slopes.

E 3.08 The lot grading design shall provide for drainage problems on adjacent property that can be best resolved by permitting drainage through the subdivision.

E 3.09 All lot surfaces shall be constructed to a minimum grade of 2.0%.

E 3.10 All lot surfaces shall be constructed to a maximum lot grade of 12% (calculated from the difference in lot elevations between the rear wall of the house and property line - embankments included).

E 3.11 Maximum slope between all terraces and embankments shall be 3:1 when the vertical difference does not exceed 1 metre and 4:1 when the vertical differences exceeds 1 metre. Between successive terraces, an intermediate level area of at least 1.50 metres in width must be provided.

E 3.12 The lot grading design shall provide for the temporary drainage of all blocks of land within the subdivision that are intended for future development under site plan agreements.

E 3.13 The maximum flow allowable to any side yard swale shall be that from 1 lot, or 0.5 hectares, whichever is less.

E 3.14 The maximum area contributing to a rear yard swale that may be discharged directly onto a road allowance shall be that of 1 rear yard or 0.50 hectares, whichever is less.

E 3.15 The maximum length of a rear yard swale between outlets shall be 60 metres. Where rear yard swales provide drainage for more than 1 lot, the swale must be located within a 6.0 metre minimum easement over the total length. Rear yard swales within easements shall have a minimum slope of 2.0%.

E 3.16 Swales providing internal drainage from each lot shall have a minimum slope of 2.0%.

E 3.17 Minimum depth of any swale to be 250 mm.

E 3.18 Maximum depth for a rear yard swale to be 750 mm.

E 3.19 Maximum depth for a side yard swale to be 450 mm.

E 3.20 Maximum side slope on any swale shall be 3:1.

E 3.21 All drainage swales shall be located on one side of the common lot line between adjacent lots and not along the lot line.

E 3.22 Rear yard catchbasins and outlet pipes shall be located such that the outlet and the catchbasin are located entirely on the same lot. In general, rear yard catchbasins shall be located 2.0 metres from the lot line.

E 3.23 Driveway grades on private property shall be designed and constructed in accordance with Section B 8.02. Driveway locations shall not extend beyond lot line projections within the right-of-way.

SECTION E - LOT GRADING

E 3.24 Where sump pumps are installed in residential developments, discharge pipelines shall not be placed within the Township's ditchlines of the road allowances. Direct discharging to the Township's ditchlines is prohibited. Sump pump discharge pipelines shall outlet in accordance with the details provided in the standard drawings.

E 3.25 Wherever possible, the use of retaining walls is discouraged in new developments. Where retaining walls are required as a result of no other viable alternatives, no retaining wall shall exceed 1.0m in height where it is located within a front or exterior side yard or adjacent to public lands or roadways. Retaining walls must be constructed of textured concrete utilizing earth tone colours or natural limestone or granite blocks, subject to the Township's approval. No retaining wall shall be constructed using wood. A retaining wall may be stepped such that no face of the wall exceeds 1.0m in height provided that there is a 1.0m planting strip between any section of a retaining wall and these lands are used exclusively for landscaping materials that will visually buffer the wall. Prior to construction of retaining walls, the Owner shall prepare and submit six (6) sets of shop drawings, stamped by a professional engineer, to the Township of Scugog for review.

E 4.00 CERTIFICATION

E 4.01 Prior to application for a building permit, individual lot grading plans for each lot shall be prepared and submitted to the Developer's Consulting Engineer for approval. These lot grading plans shall include the following:

1. Lot description including Registered Plan Number.
2. Dimensioned property limits and house location.
3. House type; normal, side split, back split, etc.
4. Finished first floor elevation.
5. Finished garage floor elevation.
6. Finished and original grades over septic tile beds.
7. Finished basement floor elevation (all locations).
8. Elevation of underside and top of footings.
9. Top of foundation wall (all locations).
10. Existing and proposed lot grades for each of the corners of the lot and intermediate points of grade change.
11. Existing trees to be maintained.
12. Driveway locations, widths and proposed grades.
13. Finished road grades adjacent to the lot.
14. Location of house entrances.
15. Location of rainwater downspouts.
16. Location of walkways.
17. Arrows indicating the direction of all surface drainage and swales.
18. Location and elevation of swales.
19. Location of patios, decks and/or porches.
20. Location of terraces and tree wells.
21. Location and dimensions of all easements.
22. All yard catchbasins with rim elevations.
23. Curb cut locations and dimensions.
24. Hydrants, luminaire poles, bell and cable TV pedestals, hydro transformers and point of supply for Hydro service.
25. Location and type of any private sewage disposal system and reserve areas and private wells.
26. Durham Region Department of Health Services Certificate of Approval placed on individual plans for private sewage disposal systems.

SECTION E - LOT GRADING

27. Location of all road features along frontage and flankage of lots (curb lines, catchbasins, sidewalks, etc.).
28. Lot grading certificate by Developer's Engineer in accordance with the Subdivision Agreement requirements.
29. Site Benchmark as shown on approved Engineering Drawings.
30. Proposed street number as assigned and approved by the Township of Scugog.
31. Proposed retaining wall details with respect to heights, types and locations.

After approval and certification by the Developer's Consulting Engineer, the lot grading plans shall be forwarded to the Township Engineer.

E 4.02 Prior to the release of any lot from the conditions of the Subdivision Agreement, the Developer's Consulting Engineer shall provide written certification to the Township of Scugog that the grading and drainage of the lot is in accordance with the approved lot grading and drainage plans.

Prior to Proceeding with framing of structures over Registered lots, builders must provide the Township Building Department and Developer's Consulting Engineer with an O.L.S. certificate identifying "As-Built" underside and top of foundation elevations (all locations) and actual setback distances as specified under the appropriate Zoning By-law.

If the grading differs from the approved lot grading plan, the Consulting Engineer shall provide details of the variance from the approved plans and shall include his recommendations for rectification of the area if required.

'As-Built' Lot Grading Plans for each lot shall be submitted to the Township Engineer by the Developer's Consulting Engineer, prior to issuance of a 'Final Occupancy Certificate'. 'As-Built' Lot Grading Plans shall include all requirements identified under Section E 4.01.

A street number shall be posted for each dwelling in accordance with the provisions of By-law No. 82-90, as amended, prior to occupancy.

E 5.00 AREA ROUGH GRADING PLAN

E 5.01 GENERAL

Where earth cuts and fills in excess of 400mm is required within the lots and blocks of the new development, area rough grading must be performed prior to road construction.

E 5.02 DRAWING REQUIREMENTS

Drawing Size: (594 x 841 mm.) AI

Scale: 1:1,000 for single-family (Rural)
1:500 for single-family (Urban)
1:200 for multi-family areas.

All lots and blocks within the subdivision are to be shown and are to be numbered in accordance with the plan proposed for registration.

Existing contours are to be shown at maximum 0.5 m. intervals.

SECTION E - LOT GRADING

E 5.02 DRAWING REQUIREMENTS - (cont'd)

The area rough grading plan must identify all areas where the depth of fill sections and cut sections are in excess of 400 mm. Self adhesive films shall be permitted on the plan to identify these areas.

E 5.03 CONSTRUCTION REQUIREMENTS

As rough grading proceeds, the Developer must immediately enforce an erosion control program by applying a seed and mulch mixture to the area of concern, to the satisfaction of the Township Engineer.

The Developer and his Engineer shall control the placement of imported fill material on registered lots where private sewage disposal systems are required. Imported fill material placed on Registered lots must meet or exceed the original ground's capability to support a private sewage disposal system as required by the Durham Region Department of Health Services.

Where the proposed grading plan identifies fill over registered lots, "engineered fill" shall be placed and supervised by the Consulting Engineer.

SECTION F - SIGNS

F 1.00 PLAN

The proposed location and type of all street name and traffic control signs shall be shown on Plan and Profile Drawings.

F 2.00 STREET NAME SIGNS

F 2.01 LOCATION

Street name signs shall be placed at each intersection and shall identify each street at the intersection. The location of the street name signs are shown in the Township of Scugog Standard Drawing.

F 2.02 TYPE

The street name signs shall display the same Message on each side of the sign. Sign Messages shall be white lettering on a blue background; both lettering and background to be fabricated from Scotchlite reflective sheeting, High Intensity Grade as manufactured by 3M Canada Limited and have a durability rating of 10 years. Lettering shall be fabricated from 2270 Silver Sheeting; PRA Series C. Lettering for names of streets shall be upper case, 100 mm in height. Lettering for; street, boulevard, crescent, trail, avenue, land, etc., shall be upper case, 50 mm in height. The street name sign blades shall be extruded aluminum manufactured from 50S T6C aluminum alloy. The blades shall have a width of 2.3 mm. and a length of 610 to 915 mm. Correct spacing must be adhered to in order that the message will appear aesthetically correct. Street name signs shall be fitted on top of a 75 mm Diameter galvanized steel post, 10 gauge minimum, 3.65 metres in length. Street name signs are to be combined with stop signs on a single post in accordance with the Standard Detail Drawing.

F 2.03 ERECTION

Street name signs must be erected by the Developer at the completion of the base course asphalt road construction and prior to issuance of building permits. Signs must be maintained by the Developer until "Final Acceptance" by the Township of Scugog.

F 3.00 TRAFFIC CONTROL AND ADVISORY SIGNS

F 3.01 LOCATION

Traffic control and advisory signs shall be located as shown on the Township of Scugog Standard Drawings. In cases where the positioning of the signs is not covered by the standard drawings, the location must be in conformance with the Manual of Uniform Traffic Control Devices for Ontario or the Highway Traffic Act Regulations for Ontario.

All signs shall be mounted approximately at right angles to the direction of and facing the traffic that they are intended to serve. On curved alignments the angle of placement should be determined by the course of the approaching traffic rather than by the roadway edge at the point where the sign is located. Signs for different purposes should not be placed closer together than 30 m.

SECTION F - SIGNS

F 3.02 TYPE

All traffic control and advisory signs shall conform to the current revised standards of the Manual of Uniform Traffic Control Devices for Ontario.

Dead end street barricades shall be constructed in accordance with Township of Scugog Standard Drawing SS-240.

F 3.03 ERECTION

Regulatory signs shall be mounted on hot dipped galvanized steel cold rolled "U" channel (80,000 P.S.I.) posts 3.65 m. in length. Channel posts shall have a minimum thickness of 5 mm and a minimum width of 62 mm. The posts shall be pre-punched with a minimum of 24 holes at 50 mm centres compatible with standard bolt hole arrangements for regulatory signs.

Stop signs shall be placed on a 75 mm diameter galvanized steel post, 10 guage minimum, 3.65 metres in length as shown on the Standard Detail Drawing. Signs shall be individually erected on separate posts, with the exception of street name signs which shall be combined with stop signs.

Traffic control signs must be erected by the Developer at the completion of the base course asphalt road construction and prior to issuance of Building Permits. Signs must be maintained by the Developer until "Final Acceptance" by the Township of Scugog.

Upon completion of base course asphalt, the Developer shall place signage at each point of ingress/egress to the subdivision stating the following:

THIS ROAD
UNASSUMED
BY THE
TOWNSHIP OF
SCUGOG
USE AT
OWN RISK

Each sign shall be 450 mm. wide by 600 mm. high with black letters on yellow reflective background, mounted on "U" channel posts, 3.65 metres in height.

F4.00 STORMWATER MANAGEMENT POND SIGNS

F4.01 LOCATION

Stormwater management pond signage shall be installed by the Developer of the stormwater management facility at the locations specified by the Township of Scugog.

F4.02 TYPE

The signs will be manufactured by the Township and the costs billed to the Developer.

F4.03 ERECTION

Stormwater management pond signs shall be mounted on two (2) steel posts and must be erected by the Developer prior to the issuance of occupancy certificates.

SECTION G - STREET TREE PLANTING

G 1.00 RESPONSIBILITY

The Developer is responsible to plant trees along all road allowances in and abutting the development in accordance with the specifications established pursuant to the Subdivision Agreement. Tree locations on Regional Roads must be confirmed with the Regional Municipality of Durham.

G 2.00 LOCATIONS

Trees shall be planted within the road allowance in locations identified on the Township's typical road sections to the satisfaction of the Township Engineer.

At least one tree shall be planted in front of each semi-detached and single-family dwelling unit and at 15.0 m. maximum intervals adjacent to all multiple-family lots, blocks and parklands. Where the lot frontage exceeds 25 metres, a second tree per lot shall be planted.

Trees shall be placed along the flankage of all lots at the same spacing interval required for the frontages. A minimum of two trees shall be placed along the flankage side of each corner lot. For all industrial roads, trees must be planted at a maximum interval of 25.0 metres.

Trees shall be so located that development of a natural mature tree form in any species or variety used will not conflict with other essential street functions and services.

G 3.00 TIMING OF CONSTRUCTION

All trees are to be placed during either the Spring or Fall dormant season in unfrozen soil.

G 4.00 TYPES

The species of trees to be planted shall be selected from trees hardy to the Scugog area and commonly used in municipal tree planting programmes. The species of trees and the percentages of each species to be used in each development shall be submitted and approved in writing by the Township prior to the commencement of the planting program.

The following list of trees, includes, but does not limit those acceptable for this purpose.

Red Oak	Little Leaf Linden	Emerald Queen Maple
English Oak	Red Maple	Columnar Maple (tight locations)
Pyramidal English Oak	Deborah Maple	Sugar Maple
Japanese Lilac (Parks)	Green/Red Ash	Chanticleer Ornamental Pear (Parks)

Trees shall be planted in tree pits, large enough to accommodate the root system of the tree when properly spread out for planting. Minimum size for tree pits shall be 1000 mm in diameter and 1000 mm deep. Trees shall be planted in a mixture of 1/3 peat moss and 2/3 genuine topsoil, properly filled in around the tree roots to eliminate air pockets.

Trees shall be protected by steel "T" rail posts, placed on both sides of the tree and in a line parallel with the street line. A #9 gauge wire protected by a vinyl tubing shall be used to support the tree to the steel posts.

SECTION G - STREET TREE PLANTING

G.400 TYPES - (cont'd)

Trees shall be planted in accordance with the appropriate planting details shown on the Standard Detail Drawings.

All trees that die or fail to grow prior to "Final Acceptance" of the subdivision shall be replaced by the Developer.

G 5.00 QUALITY AND SOURCE

All trees shall be #1 quality nursery grown stock, 2.25 m. to 4.0 m. in height with a minimum trunk diameter of 70 mm. measured at a minimum of 1.2 m. above ground level. All trees shall be free from physical damage, insects, pests and diseases and must have at least three quarters of the root system intact. All trees must meet with the standards of the Canadian Nurserymen's Association.

G 6.00 SCREENING

A screening acceptable to the Township, suitable for the purpose, shall be placed adjacent to the rear or side property lines of all lands abutting collector or arterial roads where 0.30 m. reserves are provided. The screening shall be placed on the road allowance or the 0.30 m. reserve. The species and spacing of proposed tree screening shall be submitted to and approved in writing by the Township Engineer prior to the commencement of the planting program. All tree screening shall be installed during the Spring or Fall dormant season.

The following list of coniferous trees, includes, but does not limit those acceptable for the purpose of screening and buffering:

Large Coniferous Trees

- Austrian Pine
- White Pine
- Colorado Blue Spruce
- Canadian Hemlock
- Japanese Larch
- White Spruce
- Douglas Fir
- Norway Spruce

Small Coniferous Trees

- Mountbatten Juniper
- Wichita Blue Juniper
- Emerald Cedar

Coniferous Shrubs

- Mugho Pine
- Pfitzer Juniper
- Japanese Yew
- Globe Cedar
- Pyramidal Cedar

Deciduous Shrubs

- Spirea
  - Bridlewreath
  - Gold Flame
  - Gold Mound
- Dogwood
  - Red Osier
  - Silver Leaf
- Potentilla
  - Golddrop
  - Goldfinger
- Purpleleaf Sandcherry
- Catawbiense Rhododendron

All forms of screening and buffering shall be identified on the engineering drawings and will be subject to the Township's approval.

SECTION G - STREET TREE PLANTING

G 7.00 SUBMISSIONS

The Developer shall submit two (2) copies of the streetscape or tree-planting plans to the Township Engineer, who will co-ordinate the review, subsequent submissions and approval of the plans with the Township of Scugog.

SECTION H - DEVELOPMENT OF OPEN SPACE

H 1.00 GENERAL REQUIREMENTS

This section is intended to cover the requirements of the Township of Scugog for the development of dedicated open space, which may include parks, trails, bicycle paths, walkways or other recreational lands dedicated or otherwise deeded to the Township by the Developer.

The Developer shall retain a Landscape Architect or Designer who is a member in good standing of any or all of the following organizations:

Ontario Association of Landscape Architects
Canadian Society of Landscape Architects
American Society of Landscape Architects

The architect will be engaged to design and prepare all plans and drawings required to enable the proper development of open space lands.

Where public open space is located adjacent to one or more school sites, the Landscape Architect, at the Developer's expense, shall meet with representatives of the Township and officials of the appropriate Board(s) of Education to develop a comprehensive site landscape plan acceptable to all parties concerned.

The Landscape Architect shall prepare the site landscape plan and all related drawings for each site and submit same for written approval of the Township before conditions can be incorporated into the Subdivision Agreement.

Such plans shall show all existing trees and features that are in conformity with the end use of the open space that are to remain. All dead trees and other features not in conformity to the end use of the open space shall be removed by the Developer.

The plans shall form part of the approved Engineering Drawings.

H 2.00 BASIC PARK DEVELOPMENT

The Developer is required to provide and carry out, at no cost to the Township of Scugog, a "basic" park development in accordance with the approved plans, drawings and specifications. A "basic" park development is defined as follows:-

32. to undertake, amongst other matters, the rough grading, fine grading, topsoiling, sodding or seeding and the installation of perimeter fencing and drainage facilities in new parkland.

Parks shall be fine graded in accordance with the approved grading plan with particular care being taken to avoid damage to those trees or features that are to remain. All graded areas shall be covered with a minimum of 200mm of approved topsoil and shall be seeded and fertilized in accordance with the specifications of the Township. The seed mixture proposed shall be approved by the Township prior to placement. All park blocks less than 0.4 ha. in size shall be sodded on 200mm of topsoil. All stones and debris shall be removed and disposed of by the Developer prior to the seeding or sodding of any park.

SECTION H - DEVELOPMENT OF OPEN SPACE

H 2.00 BASIC PARK DEVELOPMENT (cont'd)

Where required by the Township of Scugog, underground primary or secondary electrical cables shall be placed from the road allowance to designated locations within the open space.

Water service connection and sanitary and storm sewer lateral connections to the street line for open space, if required by the Township of Scugog. Metering requirements for water service connections shall be confirmed with the Regional Municipality of Durham.

In the absence of municipal services, an acceptable water supply complete with well and all required plumbing fixtures shall be provided by the Developer.

Vinyl coated chain link fence (Standard Drawing SS-311), 1.2 metres high on the perimeter of each open space block.

Identification sign for each park site entrance or trail, according to Township standards for such signs. The signs will be manufactured by the Township and the costs billed to the Developer. In general, park entrances shall be provided from a cul-de-sac.

Wherever possible, the use of retaining walls is discouraged in new developments. Where retaining walls are required as a result of no other viable alternatives, no retaining wall shall exceed 1.0m in height where it is located within a front or exterior side yard or adjacent to public lands or roadways. Retaining walls must be constructed of textured concrete utilizing earth tone colours or natural limestone or granite blocks, subject to the Township's approval. No retaining wall shall be constructed using wood. A retaining wall may be stepped such that no face of the wall exceeds 1.0m in height provided that there is a 1.0m planting strip between any section of a retaining wall and these lands are used exclusively for landscaping materials that will visually buffer the wall. Prior to construction of retaining walls, the Owner shall prepare and submit six (6) sets of shop drawings, stamped by a professional engineer, to the Township of Scugog for review.

H 3.00 FINISHED PARK DEVELOPMENT

The Township of Scugog shall determine the requirements in providing a "finished" park development. A "finished" park development is defined as follows:-

- to undertake, amongst other matters, the installation of the following types of features:

  a) playground equipment;
  b) equipment for playing fields (i.e. lighting, backstops, home run fencing, soccer goal posts);
  c) walkways, benches, waste receptacles & landscaping; and
  d) parking areas.

H 4.00 PLANS

Upon receipt of written approval from the Township on the preliminary site concept and all detail drawings, the Developer's Consultant shall prepare final drawings and detail plans of all component requirements as stipulated in Section H 2.00 for final written approval by the Township.

SECTION H - DEVELOPMENT OF OPEN SPACE

The Consultant shall prepare and submit the following plans on mylar on a scale of 1:500.

- Site Design Concept.
- Grading Plan.
- Detailed drawings for water supply.
- Detailed drawings on location of underground utilities or services within the site(s).
- Detailed drawings for retaining wall structures.
- Detailed drawings for any other components required as a condition of subdivision approval.

In addition to the foregoing, the Township shall be supplied with one coloured print of the Site Design Concept, one Site Design Concept in mylar, reduced to 8 1/2" x 11" and three prints of all mylar drawings.

H 5.00 TIMING OF CONSTRUCTION

Parkland in subdivisions will be developed to the "basic" park development stage by the Developer within one (1) year of the date of the registration of the first phase of the subdivision. The timing of the development of the park may be altered by the Township of Scugog as necessary, depending on such site specific matters as access to the new park, split development, location of the park related to phases being registered, house occupancy levels in the subdivision, timing of registration in respect to growing season or other considerations.

The Township of Scugog will schedule the completion of the "finished" park in subdivisions at approximately the time that ten (10) homes in the plan of subdivision are occupied.

Seeding must be carried out during the desirable months of May, August or September.

H 6.00 MAINTENANCE

The Developer shall be responsible for the maintenance, fertilizing and mowing of open space until "Final Acceptance".

In addition the Developer upon satisfactory completion of all works shall guarantee and maintain the water supply until "Final Acceptance".

Building materials or equipment shall not be stored on open space. No dumping of debris will be permitted over open space.

SECTION I - STREET LIGHTING

I 1.00 GENERAL

Street lighting systems for roadways in the Township of Scugog shall meet the requirements of the Township's designated hydro representative in addition to the Electrical Safety Authority (ESA).

The street lighting system is to consist of two types of lighting standards and these are post-top luminaires and horizontal type luminaires for local and collector roads.

The Developer shall arrange with both the ESA and Supply Authority for the inspection, connection and energization of all lighting systems. The Developer shall provide the local electrical supply authority with easements wherever they are required. The entire system must be energized prior to the release of building permits.

I 2.00 STREET LIGHT POLES

The type of street light pole will be as outlined on the approved Engineering Drawings. Contact Township Engineer for further information on types of poles used.

Pole lengths shall be 7.6m for post top fixtures and 9.3m for horizontal type fixtures. Poles are to be installed a minimum of 1.7m or 15% of the pole length in the ground and backfilled and compacted with limestone screenings.

Poles for post top fixtures shall be direct burial type octagonal Midnight Lace concrete as per Stress-crete Catalogue Number E250-APO-G-S10 SIF 170, Utility Structure Catalogue Number MA-250-A-2-ML-60-F or Sky Cast Inc. Catalogue Number SC 076 BOC NSP DFG P. The street light pole shall conform with the requirements of the Township designated Hydro representative.

Poles for horizontal type fixtures shall be direct burial type round concrete, C.S.A. Standard A 14.1 "Concrete Poles" complete with 2.40m aluminum tapered elliptical arm, with connecting bracket for elliptical arm made by Sylvania or equivalent, 100 mm by 175 mm handhole and cover, ground lug at the handhole and two below grade wiring apertures.

I 3.00 CONTROL AND SUPPLY

Street lighting systems are usually supplied from distribution transformers serving residential and commercial loads. Street lights are normally connected in parallel across a 120 volt supply, each luminaire is to be controlled by an integral photocell. The photo electric control is to be designed to automatically switch "ON" when the natural illumination decreases to 50 lux and to switch "OFF" when illumination reaches not more then 200 lux. Both operations are to be delayed 10 to 15 seconds so that control will not respond to transient changes in lighting such as lightning flashes.

The Developer shall be responsible for the payment of all fees, electrical consumption charges and costs required to be paid to the Supply Authority for the operation of the street lighting system, until "Final Acceptance" of the subdivision. If at any time, prior to "Final Acceptance" the Township pays for any of the above fees, charges or costs, then such cost to the Township shall be billed back to the Developer for payment.

SECTION I - STREET LIGHTING

I3.00 CONTROL AND SUPPLY - (cont'd)

Prior to energization of the street light and electrical distribution system the Developer shall schedule the Electrical Safety Authority (ESA) (1-800-305-7383) for the inspection of the street light and electrical distribution system works, arrange for a copy of the ESA'S "Connection Authorization" to be forwarded to the Township Engineer and arrange for the Supply Authority to provide the Township with 48 hours notification of their intent to energize the street light and electrical distribution system.

I 4.00 WIRING

The wiring for the street light system shall conform to the requirements of the Township's Designated Hydro representative.

Fuse holders shall be inserted between the raceway and the streetlight wire. The wiring between the above mentioned circuits and the fuse holders and between the fuse holders and the luminaires shall be single #12 - 2NM090 solid copper, 600 V TWH insulation.

I 5.00 STREET LIGHTING LUMINAIRES

All luminaires shall comply with all applicable requirements of CSA Standard C22.2 No. 7 "Electrical Lighting Fixtures".

Type 'A' luminaire shall be 100 watt High Pressure Sodium horizontal type with type II medium semi-cutoff c/w 120/240 volt outdoor ballast, photo electric control and lamp. Emergi-Lite Catalogue No. SCIIS-02119 or reviewed alternate.

The Type 'B' luminaire shall be 100 watt High Pressure Sodium post-top type c/w photo electric control, acrylic refractor and lamp. Refer to the Township's designated hydro representative for further details.

Ballasts shall be of the constant wattage isolated secondary transformer type and shall be of Class H (180°C) insulation, 60 Hertz, low temperature (-35°C) and power factor not less than 0.90.

The photometric characteristics of units depend on the installation. Contact the Township of Scugog's designated hydro representative for further information.

I 6.00 ILLUMINATION LEVELS AND RESTRICTIONS

Averaged maintained illuminance shall not be less than the values shown in the following table. The ratio of the average to the minimum maintained illuminance shall not exceed 3 to 1 except on local residential streets the ratio shall not exceed 4 to 1. The ratio of the maximum to minimum maintained illuminance shall not exceed 6 to 1 except on local residential streets the ratio shall not exceed 8 to 1.

Roadway	Average Maintained Illuminance
Local	0.6 fc (6.5 lux)
Collector	1.0 fc (11 lux)
Arterial	1.4 fc (15 lux)

SECTION I - STREET LIGHTING

I 6.00 ILLUMINATION LEVELS AND RESTRICTIONS - (cont'd)

Where possible, pole locations are to be placed opposite side lot lines. Where site individual super mail boxes are proposed within a plan of subdivision, street lights must be located immediately adjacent to the super mail boxes.

No street lights should be placed within 3.0m of a transformer.

Staggered arrangements of luminaire poles is acceptable.

On curving roadways, lights are to be placed on outer radii, where possible.

The following arrangement of poles and fixture types shall be complied with during the design of new subdivisions.

RESIDENTIAL SUBDIVISIONS

Type of Road	*Road Width*	*Arrangement*	*Fixture Type*
Local - Open Ditch	6.7 m	One Side	Horizontal Type Luminaire
Local - Urban	8.0 m	Staggered	Decorative Post-Top Luminaire
Minor Collector	9.5 m	One Side	Horiztonal Type Luminaire
Major Collector	11.0 m	Staggered	Horizontal Type Luminaire
Major Collector	11.0 m	One Side	Horizontal Type Luminaire
INDUSTRIAL SUBDIVISIONS			
Local	7.0-9.5 m	One Side	Horizontal Type Luminaire
Collector	11.0 m	One Side	Horiztonal Type Luminaire

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 1.00 SITE PLAN AGREEMENT

The Developer of lands under Site Plan Control, as specified in the Township's Official Plan and Site Plan Control By-law shall be required to enter into a "Site Plan Agreement" with the Township of Scugog prior to the commencement of construction of any building or services within the parcel of land. The Developer shall be responsible for posting a "Letter of Credit" in a form acceptable to the Township, as a condition of entering into a Site Plan Agreement with the Township of Scugog.

J 2.00 REGIONAL MUNICIPALITY OF DURHAM RESPONSIBILITY

The Region of Durham is responsible for all sanitary sewers and watermains that are constructed or proposed for construction on all road allowances, blocks and registered easements within the Township of Scugog.

The Region of Durham is also responsible for the collection of revenue for water consumption and therefore the "metering" arrangement for the subject property shall also be approved by the Region of Durham.

J 3.00 TOWNSHIP OF SCUGOG REQUIREMENTS

Drawings showing the location, size, grade invert elevations, material and bedding requirements for all storm, sanitary and watermain service connections shall be prepared and submitted to the Township of Scugog for approval. Engineering drawings shall also be prepared for all sanitary and storm sewers and watermains that are required to be constructed within road allowances or Registered easements to service the subject property.

Site Plan Drawings shall be prepared showing location of all Buildings and Structures to be erected as well as all facilities and works to be provided in conjunction with the Development.

These drawings are to be prepared to the Township of Scugog's requirements.

J 4.00 PROFESSIONAL ENGINEER

The Developer shall retain a qualified Professional Engineer to prepare all engineering drawings and to supervise the construction of all engineering services. The Consulting Engineer shall act as the Developer's representative in all matters pertaining to the design and construction of the services in the development.

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 5.00 ENGINEERING DRAWINGS

J 5.01 REQUIREMENTS

Engineering drawings will be required for each development. These drawings shall be titled as follows:

(a) Site Grading Plan
(b) Site Services Plan
(c) Landscaping Plan
(d) Electrical Services Plan
(e) Drainage Area Plan

Additional engineering drawings shall be prepared where required or when requested by the Township Engineer. Prior to receiving a building permit, all plans must be approved by the Township.

All storm drainage facilities proposed must be constructed before receiving a Building Permit.

All engineering drawings shall be prepared from one base plan prepared at a minimum scale of 1:200 and shall contain the following information:

(a) a key plan at a scale of 1:10,000 showing the site location
(b) a north arrow
(c) the street names, lot and Registered Plan numbers, and property dimensions
(d) the outline of all buildings with the building numbers and unit numbers indicated and garage locations within the unit
(e) the roadway and driveways
(f) adjacent lands
(g) existing land features (trees, watermains, etc.)
(h) the reference benchmark (geodetic) used to establish vertical control and the site benchmarks to be used for construction.

J 5.02 SITE GRADING PLAN

The site grading plan shall show the following information:

(a) centreline grades at 15 m. intervals along all existing streets bounding the property and existing grades
(b) a legend indicating which are existing and proposed elevations
(c) contours at maximum 0.5 m. intervals to indicate the existing elevations of the site. These contours are to extend to a minimum distance of 15 m. beyond the property limits to indicate the grading and drainage patterns of the adjacent lands. As an alternate to contours, spot elevations may be noted on the drawings to illustrate existing grade conditions providing that these elevations were obtained from field survey on a regular grid pattern with the interval not to exceed 15 metres.
(d) cross sections as required to clarify the proposed grading, particularly in relation to adjacent lands
(e) proposed elevations on paved areas, around proposed buildings, along swales, along roadways, parking areas, driveways, catchbasin rim elevations, and any other elevations necessary to establish the grading and drainage patterns for the development. Arrows to be used to indicate direction of the surface drainage

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 5.02 SITE GRADING PLAN (cont'd)

(f) all manholes, catchbasins, hydrants, valves to be shown by a symbol with a legend provided
(g) all sidewalks and walkways
(h) all building elevations to be established and referenced to a "Finished First Floor" or a "Finished Entrance Floor" elevation and a "Finished Basement Floor" elevation
(i) a typical roadway cross section to indicate the pavement and granular base design
(j) roadway dimensions and curb radii
(k) the location and detail of all curbs
(l) the location of embankments, retaining walls, stairs, play areas, swimming pools, etc.
(m) the location and width of all curb depressions
(n) the location of wells, waste disposal tile bed areas, etc.
(o) The lot grading plan shall show all proposed retaining wall structures with respect to heights, types and locations.
(p) Buffer Strips - Buffer strips shall be provided between commercial/industrial and residential developments. Buffer strips shall include a solid wood fence with a minimum height of 1.8m to a maximum height of 2.4m, in a location approved by the Township. Coniferous tree plantings shall be provided at 4m intervals with a minimum caliper of 45mm along any portion of the fence that is visible from a public street. Preferred species include whit spruce, eastern white cedar and Austrian pine. Where the buffer strip is located at least 30m from any residential swimming pool, one in three may be a deciduous tree. Preferred species include red oak, little leaf linden, deborah maple, schwedler maple, green ash and white ash.

J 5.03 SITE SERVICES PLAN

The Site Services Plan shall show the following information:

(a) all existing underground services on the streets and easements adjacent to the property
(b) the location, size, grade, invert elevations of all storm and sanitary service connections to the property
(c) the location and size of all watermain connections to the property
(d) the basement floor elevations of all buildings to be constructed
(e) the location, size, length, grade, material and bedding requirements for all sanitary services to be constructed within the development
(f) the location, size, length, grade, material and bedding requirements for all storm sewers to be constructed within the development
(g) the location, size and material specifications for all watermains to be constructed within the development
(h) the location, invert elevation and rim elevations for all sanitary and storm manholes to be constructed
(i) the location of all hydrants, valves and water meters within the development
(j) the location and size of all sanitary, storm and water service connections to the individual units
(k) the location of all roof water leaders that are to be connected to the storm sewer
(l) all construction notes required to describe the construction detail or requirements

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 5.03 SITE SERVICES PLAN - (cont'd)

(m) the locations of prime and reserve tile bed areas, including mantles where required

(n) the locations of water supply wells to be constructed within the development

J 5.04 LANDSCAPING PLAN

The Landscaping Plan shall be prepared by a qualified Landscape Architect if required by the Township. The Landscaping Plan shall show all landscaping details as required by the Site Plan Agreement and the appropriate zoning by-law.

The Landscaping Plan shall identify all proposed buffering (i.e. fencing, berms, plantings, etc.).

All manholes, catchbasins, hydrants, valves, street lights and other servicing features that appear above grade shall also be shown on the landscaping plan.

J 5.05 ELECTRICAL SERVICES PLAN

The Electrical Services Plan shall be prepared by a qualified Electrical Consultant. The Electrical Services Plan shall show all details of the electrical distribution system and the street and parking lot lighting systems.

The design of parking lot illumination must be in accordance with the guidelines of the Illuminating Engineering Society of Canada.

To confirm the average maintained lighting level and the absolute minimum lighting level, a computer printout of the lighting levels throughout the parking lots may be required. The computer printout must identify lighting levels 10 metres beyond the property line in all directions in order for the Township Engineer to assess light trespass.

Resulting lighting levels must be produced for the following elevations where development is proposed adjacent to residential areas:

- at grade
- 2.0 metres above grade
- 3.0 metres above grade

The Electrical Services Plan shall be submitted to the applicable Hydro Authority for approval.

J 5.06 DRAINAGE AREA PLAN

A plan shall be prepared to a scale of 1:1,000 or 1:2,000 dependent upon the size of the watershed area, to show the nature of the drainage of the lands surrounding the development site and to show all external drainage areas that are contributory to the drainage system for the development. The external drainage areas shall be divided into smaller tributary areas and the area and the location to which the tributary area is considered in the design shall be clearly shown. The Plan shall clearly show all existing contours used to justify the limits of the external drainage areas.

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 5.06 DRAINAGE AREA PLAN - (cont'd)

In lieu of precise information on development on the whole or any part of a watershed area, the latest zoning by-law and official plan issued by the Township of Scugog shall be used to determine the correct values of the run-off parameters to be used for all external areas in the design and to determine the specific areas to which these values apply.

An internal storm drainage plan shall be prepared to a scale of 1:200 and shall include all streets, lots, blocks and other lands within the development. The proposed storm sewer system shall be shown on this plan with all manholes numbered consecutively from the outlet. These manholes shall be the tributary points in the design and the area contributing to each manhole shall be clearly outlined on this plan. The area, in hectares, of each contributing area (to the nearest hundredth) and the run-off parameter used shall be shown in a circle located within the contributing area. In cases where areas of different run-off parameters may be tributary to the same manhole, the areas and the parameters shall be separately indicated on the plan.

Storm water management techniques shall be employed over all sites in accordance with requirements indentified under Sections C 5.03 and C 6.04, subject to the Township Engineer's approval.

J 5.07 SITE PLAN

All Site Plan Drawings should include the following:

a) Road widenings

b) Access locations to and from the site

c) Vehicular loading and parking facilities

d) Walkways and ramps

e) Lighting facilities

f) Walls, fences, hedges, trees, shrubs, and other ground cover or facilities for landscaping or buffering of adjacent properties

g) All easements

h) Site statistics

i) Storage areas and enclosures for garbage and waste materials.

j) Snow storage locations.

J 5.08 ELEVATION PLAN

Elevation Drawings are to show massing and conceptual design of the proposed buildings; relationships of proposed buildings to adjacent buildings, streets and public exterior areas; and public interior areas, open spaces and walkways.

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

J 6.00 DESIGN REQUIREMENTS

J 6.01 SITE GRADING DESIGN

(a) The drainage of the site is to be self-contained.
(b) The grading of the site is to be compatible with the elevation of the surrounding lands.
(c) All grassed embankments shall have a maximum slope of 3:1.
(d) The grade of grassed or other landscaped areas shall have a maximum slope of 10% and a minimum slope of 1%.
(e) Swales on grassed areas shall have a minimum slope of 1.5% and a maximum slope such that the velocity for the flow contained does not exceed 1.25 metres per second.
(f) The maximum length for any drainage swale shall be 75 m.
(g) The minimum depth for any drainage swale shall be 300 mm.
(h) The maximum depth for any drainage swale shall be 750 mm.
(i) The maximum side slope on any drainage swale shall be 3:1.
(j) All driveways shall have positive drainage towards the roadway.
(k) Wherever possible, the use of retaining walls is discouraged in new developments. Where retaining walls are required as a result of no other viable alternatives, no retaining wall shall exceed 1.0m in height where it is located within a front or exterior side yard or adjacent to public lands or roadways. Retaining walls must be constructed of textured concrete utilizing earth tone colours or natural limestone or granite blocks, subject to the Township's approval. No retaining wall shall be constructed using wood. A retaining wall may be stepped such that no face of the wall exceeds 1.0m in height provided that there is a 1.0m planting strip between any section of a retaining wall and these lands are used exclusively for landscaping materials that will visually buffer the wall. Prior to construction of retaining walls, the Owner shall prepare and submit six (6) sets of shop drawings, stamped by a professional engineer, to the Township of Scugog for review.

J 6.02 ROADWAY DESIGN

(a) All roadways shall be designed in accordance with the most recent engineering requirements of the Township of Scugog.
(b) The minimum pavement design for all multiple-family roadways shall be:
- subgrade compacted to 95% proctor density
- 300 mm. compacted depth of Granular "B"
- 150 mm. compacted depth of Granular "A" or crushed limestone
- 50 mm. compacted depth of HL8 Asphalt basecourse
- 40 mm. compacted depth of HL3 Asphalt surface course

(c) All driveways in multiple-family projects shall be paved with asphalt or an approved alternate from the edge of the roadway to the garage. The minimum asphalt pavement design for all driveways shall be:
- subgrade compacted to 95% proctor density
- 150 mm. compacted depth of Granular "A" or crushed limestone
- 50 mm. compacted depth of HL3 asphalt

(d) The minimum width of a multiple-family roadway for two way traffic with no street parking shall be 7.50 m.

SECTION J - LANDS DEVELOPED UNDER SITE PLAN CONTROL

(e) All roadways serving multiple-family projects shall be designed to facilitate passage of emergency and service vehicles. Curb returns having a 8.0 m. radius and inside bends having at least a 15.0 m. radius are required. On dead end streets provision shall be provided for vehicle turning.

(f) The minimum grade for any multiple-family roadway shall be 1.0% and the maximum grade shall be 6%.

(g) The minimum grade for any driveway in the multiple-family project shall be 1% and the maximum grade shall be 7.0%. This maximum grade creates an undesirable condition and should be used only when necessary due to site conditions.

(h) The minimum pavement design for all private entrance roadways shall be:

(i) subgrade compacted to 95% proctor density
(j) 300mm compacted depth of Granular "B"
(k) 150mm compacted depth of Granular "A" or crushed limestone

A qualified Geotechnical Representative, at no cost to the Township of Scugog, shall certify that the proposed pavement structure and subgrade will support the expected loads imposed by fire fighting equipment in accordance with Section 3.2.5.6 (c) of the Ontario Building Code.

(i) The location of driveway entrances on Township roads must be such that the minimum sight distance is maintained on the Township's road in both directions. The following criteria will apply to new driveway entrances:

Posted Speed Limit (km/h)	Minimum Sight Distance (metres)
40	45
50	65
60	90
70	120
80	150

J 6.03 SITE SERVICES DESIGN

(a) All sanitary and storm sewers shall be designed in accordance with the requirements of the Ontario Plumbing Code and the Township of Scugog. The provisions of Section 24, Ontario Water Resources Act, R.S.O., 1980, may apply to sanitary and storm sewer works.

(b) All storm sewers shall be located within the limits of the roadway with storm service connections being provided for the roof water leaders along the front of the building. Weeping tile foundation drains shall also be connected to the storm sewer.

(c) All storm sewer connections shall be sized according to the requirements of the Ontario Plumbing Code and shall be installed on a minimum grade of 2.0%.

(d) Yard catchbasins shall be provided where required for drainage of landscaped areas.

(e) Catchbasin manholes may be used for roadway drainage.

(f) All watermains shall be designed in accordance with the requirements of the Ontario Plumbing Code, and Township of Scugog Fire Department. The watermain design shall be submitted to the Township of Scugog Fire Department for approval of the watermain layout and the hydrant locations. The provisions of Section 23, Ontario Water Resources Act, R.S.O. 1980 may apply to the watermain works.

J 6.04 PRIVATE SERVICES

All private wells and/or waste disposal systems shall be constructed in accordance with the appropriate legislation and regulation administered by the Ontario Ministry of the Environment and such requirements specified by the Durham Region Department of Health Services.

J 6.05 LANDSCAPING DESIGN

The landscaping requirements shall be detailed in the Site Plan Agreement.

J 6.06 ELECTRICAL DESIGN REQUIREMENTS

The requirements for the design of the electrical distribution system and the street lighting shall be agreed upon with the applicable Hydro authority and the Township of Scugog.

J 7.00 "AS CONSTRUCTED" DRAWINGS

After all construction is complete, the design drawings shall be amended to incorporate the changes and alterations made during construction in order that the drawings as amended represent the services and conditions as constructed. Four sets of "As-Constructed" drawings must be submitted to the Township of Scugog.

J 8.00 CERTIFICATION

Upon completion of construction the Consulting Engineer shall provide written certification to the Township of Scugog that all works have been constructed in accordance with the approved plans and specifications and in accordance with good engineering practices.

J 9.00 FINAL INSPECTION

Upon completion of all construction the Developer shall request the Township of Scugog to carry out a final inspection of the works. All deficiencies found during this final inspection shall be immediately corrected by the Developer. This final inspection is carried out for the benefit of the Township of Scugog and shall in no way relieve the Developer of his obligations under the Condominium Act and the Site Plan Agreement.

SECTION K - GENERAL ENGINEERING AND DESIGN REQUIREMENTS

K 1.00 SPECIFICATIONS AND APPROVAL

K 1.01 Unless otherwise provided, all work to be completed by any Subdivider under any Agreement (herein called "the Subdivider" and "the Subdivision Agreement", respectively) shall be according to the specifications of the Township, and shall be subject to the approval of the Township Engineer. The construction of Works must be approved by the Township Engineer prior to the application for a building permit unless otherwise specifically agreed to between the Subdivider and the Township.

K 1.02 The Subdivider shall have all engineering drawings, cost estimates and designs approved by the Township Engineer, and where applicable the Region of Durham Commissioner of Works, all in accordance with the current standards, requirements and specifications of both the Township of Scugog and the Region of Durham.

K 1.03 All engineering drawings and specifications relating to watermains, sanitary sewers and related facilities shall be approved by the Region of Durham, Commissioner of Works and such approval shall be indicated by the signature of the Commissioner of Works on said plans and specifications. This signature shall not absolve the Subdivider or its consulting engineers from the responsibility for any errors in or omissions from such plans.

K 2.00 QUALITATIVE OR QUANTITATIVE TESTS

K2.01 The Township Engineer may demand qualitative or quantitative tests to be made of any materials which have been or are proposed to be used in the construction of any Works and the costs of such tests shall be borne by the Subdivider. When considered necessary by the Township Engineer, the Subdivider shall have tests carried out by independent testing laboratories, approved by the Township Engineer, to investigate and report on the stability of the soil and its abilities to sustain super imposed loads from building and filling operations and to furnish free of cost to the Township certified copies of the results thereof for examination by the Township Engineer prior to the issuance of building permits. This general provision is in addition to any specific tests required as set out in any of the Schedules to a Subdivision Agreement.

K 3.00 INSPECTION BY TOWNSHIP

K 3.01 The Township Engineer and/or the Building Inspector and/or the Director of Public Works shall have the right to inspect the installation of Works at all times. If at any time construction of Works is, in the opinion of the Township Engineer, not being carried out in accordance with the plans and specifications or in accordance with good engineering practice, then the Township Engineer may stop all or any part of the construction or the installation of the Works for any length of time until such time as the Works have been placed in satisfactory condition. In the event that the Township Engineer deems that the construction has not been proceeded with in a proper manner, then he may stop construction by that contractor and require that another contractor be placed on the job to complete such Works, and the cost involved in such replacement and completion of the Works shall be paid for by the Subdivider.

SECTION K - GENERAL ENGINEERING AND DESIGN REQUIREMENTS

K 4.00 CONSULTING ENGINEERS

K 4.01 The Subdivider shall retain a Professional Engineer, who holds a certificate of authorization, as required by the Professional Engineers Act of the Province of Ontario, as the Consulting Engineer for the Subdivider to carry out all the necessary engineering including design, contract administration and resident supervision of construction required for the development of the subdivision as follows:

a) To prepare designs;

b) To prepare and furnish all required drawings;

c) To prepare the necessary contract(s);

d) To obtain the necessary approvals in conjunction with the Township Engineer;

e) To provide the field layout, the contract administration and the resident supervision of construction. "Resident Supervision" shall mean and imply a degree of service much greater than that provided under contract administration (which normally includes periodic visits to the site by senior personnel during construction, attending job meetings, approval of construction schedules and progress reports), and is provided to supplement contract administration. Resident Supervision implies the placement of competent supervision, inspection and layout of staff on the project to provide continuous service during all phases of construction of the Works, and shall include the following functions:

(i) Providing line and grade to the contractors and restaking where necessary.

(ii) Carrying out inspection of construction to ensure that work is done in specific accordance with the contract documents.

(iii) Arranging for the Township's Geotechnical Consultant to carry out all necessary field testing of materials and equipment installed, including, without limiting the generality of the foregoing, testing shall include:

SECTION K - GENERAL ENGINEERING AND DESIGN REQUIREMENTS

K4.00 CONSULTING ENGINEERS - (cont'd)

(aa) Roads

Subgrade compacting tests shall be carried out in trenches or the weakest areas, to depths specified by the Township Engineer or 600 mm below subgrade elevation. Tests shall be taken 1 per each 150 metres of road, but at least 1 per street, or more often if conditions dictate. Granular materials shall be tested according to M.T.O. procedures. Prior to placing of any Granular "B" or Granular "A" material, the source shall be designated and checked for quality, supply and reliability. Samples shall be taken on the job and tested to ensure compliance with specifications and uniformity. Asphalt shall be tested in accordance with M.T.O. procedures. Prior to commencement of construction, samples of the aggregate and materials shall be submitted and a trial mix designed by an approved testing company. On the job testing shall be completed when necessary. Any change in source must be approved by the Consulting Engineer. Concrete source and mixes shall be approved by the Consulting Engineer prior to commencement of any work. Testing shall be carried out if required.

(bb) Storm Sewers, Watermains & House Connections

Tests shall be carried out in accordance with the contract documents, the Township of Scugog's standards and requirements and the Regional Municipality of Durham's standards and requirements.

(iv) Investigating, reporting and advising on unusual circumstances which may arise during construction.

(v) Carrying out periodic inspections, as required, including inspections at the conclusion of construction contracts and at the end of the maintenance period as part of the acceptance program of the Township and the Regional Municipality of Durham.

(vi) Obtaining field information during and upon completion of construction necessary for the modification of the Engineering Drawings to show the work "as-built". The drawings shall be modified and submitted to the Township and the Regional Municipality of Durham, for their permanent records.

f) To submit the original inked tracings of the Engineering Drawings to the Township Engineer and the Regional Municipality of Durham prior to Final Acceptance of the Subdivision Agreement. These drawings shall be incorporated into all approved revisions and "as-built" conditions shall be on material specified in the Township's requirements for Engineering Drawings;

g) To act as the Subdivider's representative in all matters pertaining to the construction;

SECTION K - GENERAL ENGINEERING AND DESIGN REQUIREMENTS

K4.00 CONSULTING ENGINEERS - (cont'd)

h) To provide coordination and scheduling to comply with the timing provisions of this agreement and the requirements of the Township Engineer and the Regional Municipality of Durham for all the Works specified in this Agreement;

i) To furnish the Township Engineer with a certificate with respect to each lot or building block for which a building permit application is made, certifying that the proposed construction is in conformity with the overall grading plan;

j) To prepare and provide the Township Engineer, for each lot or block within the plan, an "as-built" lot grading plan indicating that the property has been developed in conformity with the overall grading plan.

K4.02 The Resident Supervisor and staff shall be fully qualified to carry out all the aforementioned functions namely: the resident supervision, inspection and layout. A detailed resume of the experience, background and qualifications of the Resident Supervisor shall be submitted to the Township for approval. When approved, the Resident Supervisor shall be retained until the work provided for in the particular Agreement is completed, unless subsequent approval or direction to the contrary is obtained from the Township Engineer and the Regional Municipality of Durham.

K4.03 The employment of the Consulting Engineer by the Subdivider shall be pursuant to a written contract setting out the aforesaid scope of services and such other services as the Township Engineer may require, and a copy of the said contract shall be filed with the Township. The Consulting Engineer and the contract for the employment of the Consulting Engineer shall be subject to the approval of the Township, and the Subdivider shall obtain a written acknowledgment from the Consulting Engineer addressed to the Township and filed with the Township to the following effect:

a) That he has received a copy of the Subdivision Agreement and By-law 83-90, as amended, and is aware of all of the terms and conditions contained therein;

b) That the Consulting Engineer will perform his services for the Subdivider in accordance with the terms of the Subdivision Agreement and By-law 83-90, as amended;

c) That the Consulting Engineer will keep the Township Engineer advised of any and all material facts, changes or developments, pertaining to the Lands, the Plan, the Works, the Subdivision Agreement or any default thereunder, and the contravention of any Laws pertaining to the foregoing to the extent that he is aware of such contraventions;

d) That the Consulting Engineer will not withdraw his services pursuant to his contract with the Subdivider and in connection with the Subdivision Agreement without giving prior notice to the Township for a period of thirty (30) days before withdrawing his services.

SECTION K - GENERAL ENGINEERING AND DESIGN REQUIREMENTS

K 4.04 In the event the Consulting Engineer fails to provide services in accordance with the contract with the Subdivider as herein provided, or in accordance with the terms of the Subdivision Agreement, or should the Consulting Engineer withdraw his services for the Subdivider, such failure or withdrawal shall be deemed to be a default pursuant to the Subdivision Agreement.

K 4.05 The Subdivider shall retain the Engineers until the works provided in the Subdivision Agreement are completed and formally accepted in writing by the Township and the Regional Municipality of Durham.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 1.00 GENERAL

L 1.01 All services to be installed by the Subdivider under the Subdivision Agreement are to be constructed in accordance with the current specifications, design criteria and standards of the Township as well as the requirements of the Ministries of the Environment, Natural Resources, and Transportation, and those of the Regional Municipality of Durham, the relevant Conservation Authority, and those of any other authority where required.

L 2.00 CONSTRUCTION OF WORKS

L 2.01 The Subdivider shall prepare and submit a Schedule showing the timing of construction of the Works for the approval of the Township Engineer and the Region of Durham Commissioner of Works. In the event the Subdivider desires to construct the roads and lots in two or more separate and complete phases, he shall submit a plan showing the extent of work included and the timing of each and all phases of construction of Works for approval of the Township Engineer.

L 2.02 If construction of the Works as provided for in the Subdivision Agreement has not commenced within one year of the date of approval of the engineer's drawings, the said drawings shall be resubmitted for review, revision and reapproval.

L 2.03 The Subdivider shall not commence the construction of water services or sanitary services on any street until the watermains or sanitary sewers servicing such street are completed to the satisfaction of the Region of Durham Commissioner of Works and have passed the required tests.

L 3.00 NOTIFICATION OF COMMENCEMENT

L 3.01 The Subdivider shall not commence the construction of any of the Works pertaining to the subdivision until the Plan of Subdivision Agreement has been registered and the Subdivider has provided forty-eight (48) hours written notice to the Township Engineer and the Region of Durham Commissioner of Works.

L 3.02 The Subdivider shall, after any cessation or interruption of construction, provide forty-eight (48) hours written notice to the Township Engineer and the Region of Durham Commissioner of Works, of the Subdivider's intension to recommence Works.

L 4.00 QUALITY OF WORK

L 4.01 All work carried out by the Subdivider shall be completed and carried out in a good and workmanlike manner.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 5.00 ADDITIONAL WORKS

L 5.01 If at any time and from time to time during the development of the subdivision, the Township Engineer is of the opinion that Additional Works are necessary to provide adequately any of the public services required by the Plan, the Subdivider shall construct, install or perform such Additional Works at the request of the Township. If at any time and from time to time during the construction of Works, the Township Engineer is of the opinion that a modification of design of any services is occasioned by site conditions, or is necessary to maintain the standard of any of the Works required by the Subdivision Agreement, the Subdivider shall construct, install or perform such modifications as may be required.

L 6.00 LOT GRADING AND DRAINAGE

L 6.01 All lots in the plan of subdivision shall be graded to drain in accordance with the approved lot grading plan which forms part of the engineering drawings as approved by the Township Engineer.

L 6.02 Until the roads laid out according to the said plan have been expressly Assumed by the Township as part of the Township road system, the Subdivider shall provide adequate drainage of the surface water from the area subdivided. The Subdivider shall lay out such roads and grade the same together with the lands surrounding same in such a manner that no damage shall result by reason of the drainage therefrom to persons outside the subdivision or to lands within the subdivision.

L 6.03 The Subdivider shall grant such easements for future drainage as are necessary to the Township as specified in the Schedules to the Subdivision Agreement.

L 6.04 If the drainage work required to drain the subdivision lands results in drainage through lands other than the subdivision lands, all such work shall be carried out by means of a storm drain and appurtenances of sufficient size for the drainage requirements of the area, as approved by the Township Engineer. The Subdivider shall obtain from adjoining landowners all easements required across the adjacent properties to properly facilitate drainage of the lands to be subdivided and the contributing areas.

L 6.05 If as the subdivision develops it becomes apparent to the Township that further drainage works would be necessary either upon the subject lands being developed or beyond the boundaries thereof, the subdivider shall provide the same upon receipt of written notice from the Township, the necessity of such drainage work being in the sole discretion of the Township Engineer.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L6.00 LOT GRADING AND DRAINAGE - (cont'd)

L 6.06 The Subdivider shall construct all piped storm sewers, channels, erosion and siltation control measures and other miscellaneous drainage facilities in accordance with the details outlined in the approved engineering drawings, standard drawings and in accordance with a storm water drainage report prepared to the satisfaction of the Ministry of Natural Resources, the appropriate Conservation Authority, and the Township. In addition, the Subdivider shall prepare a detailed engineering report, acceptable to the same authorities, which will describe the means whereby erosion and siltation and their effects will be contained and minimized on the site before and during the construction period. Any temporary or permanent erosion and siltation control devices or storm water management facilities shall be approved by the same authorities and shall be maintained in good working order by the Subdivider.

L 6.07 The Subdivider shall ensure that all eavestrough downpipes discharge onto proper splash pads and outfall to the side yard only, all in accordance with Scugog standards for downpipe drainage.

L 7.00 WEEDS

L. 7.01 The Subdivider shall cut all weeds, including grasses, a minimum of once a year and at no time shall any growth exceed 150 mm in height.

L 8.00 TOPSOIL AND SOD

L 8.01 All topsoil removed from the lands shall be stockpiled during grading operations and as each building is completed, shall be replaced to a minimum depth of 100 mm on all surfaces not covered by buildings, driveways or pavement. Topsoil shall be removed off site only with the written approval of the Township. The Subdivider is solely responsible for ensuring that sufficient topsoil is available for the plan of subdivision to comply with the terms of the Subdivision Agreement. The Township Engineer's approval shall be obtained for the location and method of storage of topsoil.

L 8.02 The Subdivider shall sod or seed all yards where the vegetation has been disturbed on lots on the Plan upon the completion of the construction of each dwelling on such lot in order to achieve a healthy growth to the satisfaction of the Township Engineer.

L 9.00 TREES

L 9.01 No trees, other than diseased or dead trees, shall be removed without the prior written approval of the Township. All dead trees or diseased trees required to be removed for construction purposes or located along lot limits shall be removed by the Subdivider prior to the issuance of any building permits. The question of whether or not any tree is dead or diseased shall be determined conclusively by the Township.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L9.00 TREES - (cont'd)

L 9.02 The Subdivider shall comply with the minimum requirements set out in Township of Scugog criteria regarding street tree planting, with regard to new trees to be planted in the subdivision. Trees shall be planted prior to the issuance of any occupancy certificate. All trees shall be nursery grown stock 2.25 metres to 4.0 metres in height with a minimum calliper of seventy (70) millimeters. The species of trees to be planted shall be selected from trees hardy to the Scugog area and commonly used in municipal tree planting programs (Ref. Section G 4.00). All trees shall be planted in accordance with the Township current standards and pits filled with topsoil and properly staked and supported.

L 9.03 The Subdivider shall submit a landscaping plan to the Township Engineer and the Township for approval which shows the location, type of trees proposed, planting details, planting schedules and other pertinent information.

L 9.04 Trees shall be planted in accordance with the appropriate planting details, as shown in "A Reference Guide for Developing Planting Details" produced by Landscape Ontario Horticultural Trades Association. All trees shall be #1 quality nursery grown balled and burlapped stock. All trees must meet the standards of the Canadian Nursery and Landscape Association. Where possible, trees should be locally grown stock, or stock grown in a hardiness zone of 5 or less. Plant material will be guaranteed for a full two growing seasons, at which time the Developer will remove all stakes and ties. If at the end of two years there is a question on the health of the trees, the Developer will replace the suspect trees and guarantee the trees for a further two years or supply a report from an independent certified arborist attesting to acceptable health of plant material.

L 10.00 STREET NAME AND TRAFFIC CONTROL SIGNS

L 10.01 The Township shall allocate all dwelling house numbers to be used within the Plan. It shall be the responsibility of the Subdivider to furnish the subsequent purchaser of each lot with correct house numbers.

L 10.02 Street name signs must be erected by the Developer at the completion of the base course asphalt road construction and prior to issuance of building permits. Signs must be maintained by the Developer until "Final Acceptance" by the Township of Scugog. In addition, the Subdivider shall provide and install all traffic control signs specified in the engineering drawings referred to in the Subdivision Agreement, and as may be further required by Provincial legislation and/or Regional or Township By-Laws.

L 11.00 DEBRIS AND FILL

L 11.01 Any lands or easements to be conveyed to the Township will not be used by the Subdivider for the depositing of debris obtained from the development of the Lands and the Subdivider shall remove at its own expense any junk, debris, refuse upon the Lands as required by the Township Engineer.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 11.00 DEBRIS AND FILL - (cont'd)

L 11.02 The Subdivider shall neither dump or permit to be dumped any fill or debris on, nor remove or permit to be removed any fill or existing materials from any public lands other than for the actual construction of roads in or abutting the subdivision without the written consent of the authority responsible for such lands. The Subdivider shall, on request, supply the Township with an acknowledgment from such authority of the Subdivider's compliance of this clause.

L 12.00 REMOVAL OF CONTAMINATED MATERIAL

L 12.01 If at any time during the construction of any of the roads in the subdivision any of the granular material used in said construction should, in the opinion of the Township Engineer, become contaminated, then the Subdivider shall at the direction of the Township Engineer remove such contaminated granular material and replace the same with uncontaminated granular material.

L 13.00 ELECTRICAL DISTRIBUTION AND STREET LIGHTING

L 13.01 The Subdivider shall provide and submit to the Township Engineer for approval a street lighting and below ground electrical distribution system for this subdivision designed in accordance with the current specifications, design criteria and standards satisfactory to the Township and the applicable Hydro authority, as applicable. The Township owns only the street lighting system, not the electrical distribution system.

L 13.02 The Subdivider shall install street lighting in accordance with the approved engineering drawings and Township standard drawings, such luminaries being approved by the Township Engineer.

L 13.03 The Subdivider shall install all house electrical connections.

L 13.04 The Subdivider shall be responsible for all financial arrangements and obligations with the applicable Hydro authority, as applicable, for the installation of the below ground electrical distribution system and street lighting and shall submit proof of this arrangement to the Township. In the event that the applicable Hydro authority charges part of or all of the cost of installation of the below ground electrical distribution system and street lighting system to the Township, the Subdivider shall immediately reimburse the Township for the costs incurred and, if required by the Township, shall deposit a further letter of credit approved by the Township in the amount of ONE HUNDRED PERCENT (100%) of the cost of the installation of the below ground electrical distribution system and the street lighting system.

L 13.05 The Subdivider shall ensure that no shrubs or trees are planted closer than one (1) m from three sides of any hydro transformer and not within two (2) metres of any door or opening to said transformer.

L 13.06 The Subdivider shall obtain, at his expense, all approvals, licences or easements necessary to implement the street lighting and electrical distribution plans, as approved by the Township Engineer and the applicable Hydro authority, and shall submit satisfactory proof to the Township Engineer that such approvals, licences and easements have been obtained.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 14.00 OTHER UTILITIES AND RELOCATION OF EXISTING SERVICES

L 14.01 The Subdivider shall be responsible for all financial arrangements and obligations with the Bell Canada, Consumers Gas, Cable TV, and other utilities for the installation of these services for this subdivision.

L 14.02 In the event that any of the above utilities charge part of all of the cost of installation of its' services to the Township, the Subdivider shall immediately reimburse the Township for the costs incurred and, if required by the Township, shall deposit a further Letter of Credit approved by the Township in the amount of 100% of the cost of the installation of the services.

L 14.03 The Subdivider shall obtain at his expense, all approvals, licences or easements necessary for the construction of the above utilities and shall submit to the Township Engineer, copies of all Agreements, with the above utilities, cost estimate and distribution plans and all required approvals, licences and easements.

L 14.04 The Subdivider shall pay the cost of relocating any existing services and utilities as may be made necessary by the subdivision work, within ten (10) days of the account for same being rendered by the Township or the Regional Municipality of Durham as the case may be. The Subdivider shall similarly pay the costs of moving any services or utilities installed under the Subdivision Agreement in driveways or so close thereto that in the opinion of the Township Engineer same would interfere with the use of the driveway.

L 15.00 REPAIR OF DAMAGE

L 15.01 The Subdivider shall be responsible for the repair of any damage (including the removal of foreign materials on Township owned lands) caused as a result of any construction being performed by the Subdivider pursuant to the provisions of the Subdivision Agreement or pursuant to any building permit issued by the Township to the Subdivider.

L 16.00 EMERGENCY REPAIRS

L 16.01 Employees or agents of the Township may enter the lands at any time or from time to time for the purpose of making emergency repairs to any of the Public Services. If, in the opinion of the Township Engineer, the Subdivider is not prosecuting or causing to be prosecuted the work required in connection with the Subdivision Agreement so as to ensure completion of such work within the time limited by the Subdivision Agreement, or is improperly performing the work, or if the Subdivider shall neglect or abandon the work before completion, or unreasonably delay the same so that the conditions of the Subdivision Agreement are being violated, or if the work is being carelessly executed, or is not being proceeded with diligently or in good faith so as to meet all requirements of the Subdivision Agreement, or if the Subdivider neglects or refuses to repair or replace or again perform such work as may be rejected by the Township Engineer as defective or unsuitable or if the Subdivider in any other manner, in the opinion of the Township Engineer acting in good faith and not unreasonably, makes default in performance of the terms of the Subdivision Agreement, then in any such case the Township Engineer may notify the Subdivider and its surety in writing of such default or neglect and of any steps to remedy same which must be taken by the Subdivider and if the defaults complained of are not remedied and the notice complied with within ten calendar days after such notice, then in that case the Township

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L16.00 EMERGENCY REPAIRS - (cont'd)

Engineer shall thereupon have full authority and power immediately to purchase such materials and rent such tools and machinery and to employ such workmen as in his opinion shall be required for the proper completion of the said work in accordance with the requirements of the Subdivision Agreement and may complete the said work at the cost and expense of the Subdivider and its surety. If, in the opinion of the Township Engineer, such work must be done quickly because of any emergency, of the existence of which the Township Engieer shall be the sole judge, then such work may be done without prior notice to the Subdivider or Surety, but the Subdivider or Surety shall be forthwith notified. The cost of any work done by the Township pursuant to this clause shall be calculated by the Township Engineer whose decision shall be final and such costs shall include a management fee of ten percent (10%) of the cost of all labour, materials and equipment, time charges incurred to complete the work, and further a fee of 10% of the charges so determined as compensation to the Township for the work of the Township Engineer and for the dislocation and inconvenience caused to the Township as a result of such default on the part of the Subdivider, it being hereby declared and agreed that the assuming by the Subdivider of the obligations imposed by this paragraph is one of the considerations without which the Township would not have executed the Subdivision Agreement. The Township may at any time use all or part of the letter of credit or cash security deposit to pay the cost of said work and the management fee as above calculated. In the event that the security deposit is not sufficient to pay such amount, then the Subdivider shall on demand pay to the Township any such additional cost.

L 17.00 CLEAN UP AND MAINTENANCE OF ROADS

L 17.01 The Subdivider shall at all times keep the streets and boulevards in the Plan free and clear of all materials and obstructions which might interfere with the installation of electric, telephone, gas or other utilities.

L 17.02 All streets within and abutting the Plan and to be used for access during the construction of the houses or other buildings in the subdivision shall be kept in good and usable condition during the said construction, and if damaged, shall be restored immediately. All trucks making delivery to or taking materials from the Lands shall be adequately covered and not unreasonably unloaded so as to scatter refuse, rubbish or debris on the streets abutting. Debris or mud deposited on streets by traffic from the subdivision shall be removed immediately and if not removed after one day's notice from the Township, the deposited material may be removed by the Township's forces at the Subdivider's expense. If any dwelling becomes occupied adjacent to roads or parts thereof that have not received a base course of asphalt pavement, the Subdivider shall snowplough and sand such roads from such occupied dwelling to existing Township roads including alternative means of access where available. Such snowploughing and sanding shall be done from time to time when the Township's Engineer deems conditions warrant and until such time as the roads receive a base course of asphalt and the Township Engineer is so advised in writing by the Subdivider. Should the Subdivider not snowplough and sand, when in the opinion of the Township Engineer it is necessary, The Township may complete this work at the Subdivider's expense. Any snowploughing or sanding carried out by the Township forces, whether or not the Subdivider is in default, shall be done entirely at the Subdivider's risk and expense

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 18.00 MAINTENANCE

L 18.01 The Subdivider shall keep in a proper state of repair and operation all Works for a minimum period of two (2) years from the date of the issuance of the Certificate of Completion for such Works, and in any event until Final Acceptance thereof.

L 18.02 Without limiting the generality of any of the foregoing, the Subdivider shall, during the maintenance period and until Final Acceptance:

(a) rectify, replace, or repair any Works not constructed in accordance with the approved Plans and Specifications or in accordance with the "as-constructed" drawings provided by the Subdivider upon completion of construction;

(b) maintain all roads within the Plan in a mud and dust free condition and free of debris and obstructions;

(c) cut all grasses and weeds on the Lands that are not occupied at any time and from time to time to prevent growth in excess of 150 mm in height;

(d) do all maintenance and repairs as the Subdivider may be directed to do in writing by the Township Engineer;

(e) set the manholes level with base course asphalt and raise the manholes to final grade of surface course asphalt;

(f) raise or lower all valves, hydrants, water boxes and any other Works as may be required and in accordance with the directions of the Township Engineer;

(g) plug all openings in the building drains to prevent the entry of earth or any foreign materials into any storm or sanitary sewer;

(h) keep visible, replace and maintain all water boxes, survey stakes, and any other Works required to be kept visible and maintained pursuant to the Subdivision Agreement, or as directed by the Township Engineer.

(i) maintain the street lighting in good working order;

(j) rectify and repair all settlements, depressions or any other defect on the roadway;

(k) provide curb depressions adjacent to any approved driveway entrance to a roadway, and replace any original depressions not required or approved with curbs in accordance with the specifications of the Township Engineer;

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 18.00 MAINTENANCE - (cont'd)

(l) keep clear of snow and ice any roadways that provide access to dwellings constructed within the Plan, including a secondary means of access if required by the Township. Provided however, the Township may in its sole discretion perform this obligation for or on behalf of the Subdivider, and in so doing charge the Subdivider a fee for such work. The Township shall not be responsible for any damage to Works as a result of this work, and in the event the Township damages its equipment as a result of any breach by the Subdivider of the terms of the Subdivision Agreement, the Subdivider shall pay all costs and expenses for the repair or replacement of such equipment. Nothing herein shall be construed as maintenance by the Township for the purposes of creating any statutory duty on the Township for the maintenance of public highways or with respect to the Assumption of the roadways as public highways, it being understood that the Township status in this capacity is as a subcontractor or agent of the Subdivider and not as a municipality.

L 18.03 If during any maintenance period provided herein, in the opinion of the Township or the Township Engineer, the Subdivider is not adequately performing its obligations pursuant to the Subdivision Agreement, or such obligations are not being performed expeditiously or in the best interests of the Township, the Township may, without prior written notice to the Subdivider, enter upon the Lands and repair, replace or otherwise maintain the services at the Subdivider's expense.

L 19.00 ACCEPTANCE OF WORKS

L 19.01 The Township may accept all or a part of the Works as completed upon the issuance of a Certificate of Completion and after the expiry of all maintenance periods provided herein, and the Township may refuse to accept all or a part of the Works unless:

(a) the Subdivider has complied with all of the provisions of the Subdivision Agreement and is not in default pursuant to any of the provisions of the Subdivision Agreement;

(b) the Subdivider has complied with all applicable Laws;

(c) the Subdivider has furnished a current statutory declaration to the Township whereby the Subdivider declares that it has paid all accounts that are payable in connection with the construction of the services and that there are no outstanding claims or liens with respect thereto;

(d) the Township has received from an Ontario Land Surveyor a current certificate certifying that he has found or replaced all iron bars or monuments shown on the Plan as registered and as shown on any reference plan prepared for the purposes of any easements required pursuant to the Subdivision Agreement;

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L19.00 ACCEPTANCE OF WORKS - (cont'd)

(e) the Consulting Engineer has provided the Township with a certificate certifying that the Works have been constructed in conformity with the Subdivision Agreement and in accordance with the approved Plans, Specifications and Township's Design Criteria, subject to any variation or amendment as approved in writing by the Township or the Township Engineer as the case may be;

(f) payment of a cash security deposit or the posting of an irrevocable Letter of Credit in favour of the Township in an amount and on such terms to be determined by the Township as security for services for any lot for which an occupancy certificate has not been issued at the time of final acceptance;

(g) the Subdivider has supplied the Township with the original tracings or drawings of all engineering drawings for the Works, to show the final "as-constructed" conditions;

(h) the Subdivider has supplied to the Township such additional surveys, plans, conveyances, easements and documents as requested by the Township; and

(i) the Township has issued unconditional occupancy certificates pursuant to the provisions of the Subdivision Agreement for not less than eighty-five percent (85%) of the lots.

L 19.02 Only upon the Township being satisfied that all of the Works required to be constructed pursuant to the Subdivision Agreement have been constructed in compliance herewith, and such Works are able to perform the function for which they are intended, and upon the termination of the guarantee or maintenance periods, and upon maintenance of the said Works having been carried out to the satisfaction of the Township Engineer, and upon compliance with all laws, and upon the Township having considered the Subdivision Agreement and all of the terms and conditions contained therein and upon a By-law of Council of the Township to the effect that the Township is prepared to accept all or a part of the Works, then the Township may in writing indicate such Final Acceptance of such Works whereupon:

(i) except as to matters intended to survive such event, or unless otherwise agreed to in writing, the Subdivider shall be released from any further obligations pursuant to the Subdivision Agreement with respect to such Works for which Final Acceptance has been given;

(ii) any streets dedicated as a condition of the Subdivision Agreement or by virtue of the registration of the Plan and included in such Final Acceptance shall then be deemed Assumed by the Township and notwithstanding anything else contained in the Subdivision Agreement or any actions by the Township at any time prior to such event, such roads shall not be deemed to be Assumed by the Township until Final Acceptance thereof as herein provided.

SECTION L - GENERAL PROVISIONS APPLICABLE TO CONSTRUCTION

L 19.03 Notwithstanding any actions of the Township prior to Final Acceptance as aforesaid, no Works shall be deemed Assumed by the Township for any purpose whatsoever, and the Subdivider shall at all times be liable for the performance and maintenance of such Works until Final Acceptance thereof.

SECTION M - RESIDENTIAL INFILLING POLICY

M1.00 GENERAL

It is an objective of Council to ensure that any "infilling" which occurs within existing developed residential neighbourhoods conforms to the requirements of this Residential Infilling Policy. The Township Building Department is responsible for ensuring that the "infilling" lot owners comply with the requirements of this policy.

The proposed grading and drainage of the "infill" lot shall be carefully designed and constructed to provide satisfactory drainage from the lot and any lands draining onto the lot. In this regard, the lot owner shall retain the services of a Professional Engineer, or an Ontario Land Surveyor (O.L.S.), hereinafter referred to as the "Infill Grading Designer", who will be responsible for ensuring that the proposed lot grading is designed and constructed in accordance with the following criteria and conditions.

The Infill Grading Designer will prepare and submit an "Infill Lot Grading Plan" to the Building Department for review and approval. The Building Department will review the Infill Lot Grading Plan with the Public Works Department prior to the approval of the plan.

M2.00 LOT GRADING DESIGN AND APPROVAL

M2.01 Prior to application for the building permit, the "Infill Grading Designer" shall prepare and submit the Infill lot Grading Plan to the Chief Building Official for approval. The Infill Lot Grading Plan shall be prepared in accordance with Sections 2.02 and 2.03 of this policy and include the following:

1. Lot description including Registered Plan Number.
2. Dimensioned property limits and house location.
3. House type; normal, side split, back split etc.
4. Finished first floor elevation.
5. Finished garage floor elevation.
6. Finished and original grades over septic tile beds.
7. Finished basement floor elevation (all locations).
8. Elevation of underside and top of footings.
9. Top of foundation wall (all locations).
10. Existing lot grades for each of the corners of the lot and intermediate points of grade change.
11. Existing trees to be maintained.
12. Driveway locations, widths and proposed grades.
13. Finished road grades adjacent to the lot.
14. Location of house entrances.
15. Location of rainwater downspouts.
16. Location of walkways.
17. Arrows indicating the direction of all surface drainage and swales.
18. Location and elevation of swales.
19. Location of patios, decks and/or porches.
20. Location of terraces, retaining walls and tree wells.
21. Location of dimensions of all easements.
22. All yard catchbasins with rim elevations.
23. Curb cut locations and dimensions.
24. All services located in front of or on the infill lot, such as hydrants, luminaire poles, bell and cable TV pedestals, hydro transformers and point of supply for Hydro service.
25. Location and type of any private sewage disposal system and reserve areas and private wells.

SECTION M - RESIDENTIAL INFILLING POLICY

M2.00 LOT GRADING DESIGN AND APPROVAL - (cont'd)

26. Durham Region Department of Health Services Certificate of Approval placed on individual plans for private sewage disposal systems.
27. Location of all road features along frontage and flankage of lots (curb lines, catch basins, sidewalks, etc.).
28. Site Benchmark.
29. Proposed street number as assigned and approved by the Township of Scugog, Clerk's Department.

M2.02 LOT GRADING PLAN

1. Drawing Size: 11" x 17"

2. Scale: 1:200 or 1:500

3. Existing contours are to be shown at maximum 0.3 m intervals and existing spot elevations shall be shown within the infill lot and 15 metres beyond the lot limits in all directions.

4. Existing centreline road elevations shall be shown opposite all lot corners.

5. Existing elevations are to be shown for all lot corners and intermediate points of grade change along the lot line.

6. The proposed lot grade shall be shown at a location 7.62m from the street line. For "split" type drainage patterms, the proposed rear of house grade shall be shown. The minimum basement floor elevation for the infill lot shall also be shown.

7. The direction of the surface water run-off from the rear of the lot shall be indicated by means of an arrow pointing in the direction of the run-off.

8. All swales are to be shown along with the invert elevation of the swale at regular intervals.

9. All existing or proposed rear yard catchbasins shall be shown along with the rim elevation of the catchbasin and the invert elevation of the outlet pipe.

10. All terracing required shall be shown with the intermediate grades specified.

11. Existing spot elevations shall be shown on all adjacent lands, for an approximate width of 15 metres or greater if required, from the infill lot limit to enable assessment of the grading between the lot and the adjacent areas. The Infill Lot Grading Plan must address existing drainage problems on adjacent lands which can only be resolved by permitting drainage through the infill lot.

12. The lot grading plan shall identify which of the enclosed Township of Scugog Standard Drawings are applicable to the grading of the infill lot (ie. SS-401, SS-402, SS-403 or SS-404). The Township reserves the right to refuse any house type which is incompatible with the lot grading design specified for the lot.

SECTION M - RESIDENTIAL INFILLING POLICY

M2.00 LOT GRADING DESIGN AND APPROVAL - (cont'd)

M2.02 LOT GRADING PLAN - (cont'd)

13. A 0.15 metre wide strip of land shall be left undisturbed along the boundary of the infill lot next to adjacent properties unless grading of this strip is required to eliminate drainage problems on adjacent properties.

14. The lot grading plan shall show proposed locations for building envelopes and envelopes for private sewage disposal systems.

15. The lot grading plan shall show all existing or proposed easements.

16. The lot grading plan shall show all proposed retaining wall structures with respect to heights, types and locations.

M2.03 LOT GRADING DESIGN

1. The proposed lot grade shall be calculated in accordance with the Lot Grading Detail Sections included in the Township of Scugog Standard Drawings.

2. The front yards of all lots shall be graded to drain towards the street.

3. All boulevard areas shall be graded with a constant slope from the curb to the street limit (minimum slope to be 2%, maximum slope to be 5%) and all water boxes, manhole covers, valve boxes, etc. shall be set flush with the finished sod surface.

4. Driveways shall not be used as outlets for any swales.

5. All rear yard drainage shall be directed away from the houses in defined swales which outlet at the curb, sidewalk or a catchbasin. Overland flow routes must be provided for all rear round catchbasins.

6. All lot surfaces shall be constructed to a minimum grade of 2.0%.

7. All lot surfaces shall be constructed to a maximum lot grade of 12% (calculated from the difference in lot elevations between the rear wall of the house and property line - embankments included).

8. Maximum slope between all terraces and embankments shall be 3:1 when the vertical difference does <u>not</u> exceed 1 metre and 4:1 when the vertical difference exceeds 1 metre. Between successive terraces, an intermediate level area of at least 1.50 metres in width must be provided.

9. The maximum length of a rear yard swale between outlets shall be 60 metres. Where rear yard swales provide drainage for more than 1 lot, the swale must be located within a 6.0 metre minimum easement over the total length of the swale.

10. All swales on the lot shall have a minimum slope of 1.5%.

11. Minimum depth of any swale to be 250 mm.

SECTION M - RESIDENTIAL INFILLING POLICY

M2.03 LOT GRADING DESIGN - (cont'd)

12. Maximum depth for a rear yard swale to be 750 mm.

13. Maximum depth for a side yard swale to be 450 mm.

14. Maximum side slope on any swale shall be 3:1.

15. Rear yard catchbasins shall be located 2.0 metres from the lot line.

16. The maximum permissible design grade for the driveway shall be 6.0%. The maximum "As-Constructed" grade for the driveway shall be 7.0%. These maximum grades are not recommended and should be employed only in exceptional cases where physical conditions prohibit the use of lesser grades. The minimum driveway grade shall be 1.0%. The use of negative grade driveways is actively discouraged. Negative sloping driveways will only be considered in estate residential areas under special circumstances. Where negative sloping driveways are used, a positive slope of at least 2.5% must be maintained from the garage over a minimum distance of 10.0 metres.

17. Where sump pumps are installed, the discharge pipelines shall not be placed within the Township's ditchlines of the road allowances. Direct discharging to the Township's ditchlines is prohibited. Sump pump discharge pipelines shall be directed to rear or side yard drainage swales. Where discharge pipelines are placed near the fronts of dwellings, they shall be located a maximum distance of 3.5 metres from the front of the dwelling, measured parallel to the adjacent lot line.

18. The Township of Scugog may require the Infill Lot Grading Designer to prepare and submit a stormwater management report to the Township Building Department for approval if a natural watercourse or an existing municipal drainage system is located on the infill lot.

    In general, the Township discourages watercourse diversions, alterations, pipings and channelization except where these are needed for flood and/or erosion control. Permits for such work or any work in or adjacent to an existing watercourse shall be obtained under existing legislation from the Township of Scugog, the appropriate Conservation Authority and the Ministry of Natural Resources.

    Conservation Authorities endeavour to restrict the construction of all buildings and structures from within prescribed limits as described in accordance with their 'Fill, Construction and Alteration to Waterways' regulations.

19. Wherever possible, the use of retaining walls is discouraged in new developments. Where retaining walls are required as a result of no other viable alternatives, no retaining wall shall exceed 1.0m in height where it is located within a front or exterior side yard or adjacent to public lands or roadways. Retaining walls must be constructed of textured concrete utilizing earth tone colours or natural limestone or granite blocks, subject to the Township's approval. No retaining wall shall be constructed using wood.

SECTION M - RESIDENTIAL INFILLING POLICY

A retaining wall may be stepped such that no face of the wall exceeds 1.0m in height provided that there is a 1.0m planting strip between any section of a retaining wall and these lands are used exclusively for landscaping materials that will visually buffer the wall. Prior to construction of retaining walls, the Owner shall prepare and submit six (6) sets of shop drawings, stamped by a professional engineer, to the Township of Scugog for review.

M3.00 ENTRANCE PERMITS FOR THE PUBLIC WORKS DEPARTMENT

M3.01 Open Ditch Developments

The infill lot owner shall apply for and obtain an Entrance Permit for the installation of an entrance culvert by the Public Works Department.

Where required to extend roads to service infill lot owners, low volume roads (AADT<400) where approved by the Township are to be constructed in accordance with details provided in the standard drawings.

M3.02 Curb and Gutter Developments

The infill lot owner shall, at their sole expense, arrange for the Township designated Contractor to saw cut the concrete curb to provide for a depressed curb in accordance with SS-341. The infill lot owner shall contact the Director of Public Works to obtain the name and phone number of the Township designated Contractor.

M4.00 UTILITIES

The infill lot owner is responsible for the protection of all utilities during construction. The infill lot owner shall have all existing utilities on the lot and on the boulevard in front of the lot located by the Utility Companies prior to the start of any construction including any excavation.

M5.00 LOT GRADING CERTIFICATION

The "Infill Grading Designer" shall provide written certification to the Township of Scugog Building Department that the grading and drainage of the lot is in accordance with the approved lot grading and drainage plan, hereinafter referred to as the Infill Lot Grading and Drainage Certificate. If the grading differs from the approved lot grading plan, the Infill Grading Designer shall provide details of the variance from the approved plans and shall include a recommendation for rectification of the variance, if required.

'As-Built' Lot Grading Plans for the infill lot shall be submitted to the Chief Building Official by the Infill Grading Designer, prior to issuance of a 'Final Occupancy Certificate'. 'As-Built' Lot Grading Plans shall include all requirements identified under Section 2.01.

A street number shall be posted for each dwelling in accordance with the provisions of By-Law No. 82-90, as amended, prior to occupancy.

SECTION M - RESIDENTIAL INFILLING POLICY

M6.00 FINAL INSPECTION

Upon completion of the lot grading, and the submission of the Infill Lot Grading and Drainage Certificate, the 'Infill Grading Designer' shall request the Township of Scugog Building Department to carry out a final inspection of the grading and drainage. All deficiencies found during this final inspection shall be immediately corrected by the lot owner. This final inspection is carried out for the benefit of the Township of Scugog and shall in no way relieve the lot owner of his obligations to comply with the Approved Lot Grading and Drainage Plan.

FORM A1 - APPENDIX A
INFORMATION CHECKLIST FOR DETAILED ENGINEERING SUBMISSIONS TO THE TOWNSHIP OF SCUGOG

1. General Information

1.1 Applicant

Name (attach proof)

Address | City/Province

Postal Code | Telephone number | Fax number

1.2 Consultant

☐ Same as owner ☐ Different than owner (provide details)

Name

Address | City/Province

Postal Code | Telephone number | Fax number

1.3 Description of Lands | Subdivision File

Lot and Concession, Ward

2. Information checklist

Documentation	Information provided		If no, give reason
a) Certified Information Checklist	☐ YES	☐ NO	
b) Copy of Approved Draft Plan	☐ YES	☐ NO	
c) Copy of Proposed Plan for Registration	☐ YES	☐ NO	
d) Consultant's declaration statement	☐ YES	☐ NO	
e) General Plan(s) of Services	☐ YES	☐ NO	
f) Lot Grading Plan(s)	☐ YES	☐ NO	
g) Area rough grading plan(s)	☐ YES	☐ NO	
h) Storm drainage plan(s)	☐ YES	☐ NO	
i) Supporting Calculations	☐ YES	☐ NO	
- storm sewer design sheet(s)	☐ YES	☐ NO	
- pipe strength and sewer bedding requirements	☐ YES	☐ NO	
j) Plan and Profile drawing(s)	☐ YES	☐ NO	
k) Park grading plan(s)	☐ YES	☐ NO	
l) Detail drawing(s)	☐ YES	☐ NO	
m) Other pertinent drawing(s)	☐ YES	☐ NO	
n) Other supporting calculations	☐ YES	☐ NO	
- hydraulic gradeline calculations (100 year storm)	☐ YES	☐ NO	
- minor/major storm system hydraulic calculations	☐ YES	☐ NO	
o) Geotechnical Investigation Report	☐ YES	☐ NO	
p) Illumination calculation	☐ YES	☐ NO	
q) Noise attenuation report	☐ YES	☐ NO	
r) Preliminary R-Plans	☐ YES	☐ NO	
s) Streetscape planting plan(s)	☐ YES	☐ NO	
t) Supplementary hydrogeologist's report(s)	☐ YES	☐ NO	
u) Traffic Management Plan(s)	☐ YES	☐ NO	

3. Statement/Signature

3.1 Statement by

I _____ of _____
Consulting Engineer | Consulting Firm

do hereby confirm that I am skilled and experienced in municipal work and land development projects. I am registered with the Professional Engineers of Ontario and possess a current certificate of authorization to practice professional engineering in accordance with the professional Engineers Acts.

By affixing my signature and seal hereto, I hereby warrant that the engineering information submitted is complete, checked by me personally and has been prepared in a manner meeting or exceeding normal engineering standards of practice.

_____
Consulting Engineer | Seal

APPENDIX "B"

TRAFFIC MANAGEMENT OF DEVELOPMENT

DRAFT PLAN SUBMISSION CHECKLIST

The contents of the draft plan submission pertaining to transportation shall include but not be limited to the following items. If required, a Traffic Impact Assessment Report will be used as a supplementary reference for traffic capacity and circulation.

SUBMISSION REQUIREMENTS		Yes	No
1.	A preliminary Traffic Management Plan at a size or scale sufficient to illustrate the road pattern, right-of-way and lotting.		
2.	Identify the road classification and design speed of all roads on the plan using Township and Regional Official Plan designations. Indicate lane configurations, all intersections as per the Traffic Impact Study recommendations.		
3.	Show the designation of through streets, stop controlled intersections (two-way or all-way) and location of traffic signal controlled intersection(s) or roundabouts.		
4.	Diagram, schematically and conceptually, any locations on the plan that are candidates for traffic calming measures (physical changes in pavement width and profile).		
5.	Show internal/external pedestrian patterns and preliminary schematic location of sidewalks.		
DETAILED REVIEW			
A	General Street Pattern		
1.	Does the road pattern conform to the Township and Region Official Plans? • Is the roadway hierarchy well established such that the street pattern reflects connectivity to ensure gradation of traffic function from local to arterial, i.e. will each street function according to its O.P. classification - right-of-way volume, speed, access spacing, building and sidewalk setbacks and roadway geometry?		
2.	Is there a need for road allowance widening(s) on adjacent roads to met O.P. standards?		
3.	If the plan is to be phased, is there adequate access to prevent excessive traffic on inappropriate classes of roads?		
4.	Are secondary (emergency access roads required during phased construction of the plan?		
5.	Is the overall subdivision layout conducive for the movement of children to the area schools? In this regard, close contact must be maintained with the School Boards with respect to proposed boundaries for existing and new schools. Arterial roads must be used when establishing school boundaries in order that students are not required to cross an arterial street, or require the assistance of a crossing guard.		
6.	If more than 100 units are located on a cul-de-sac or enclave, is there alternate emergency vehicle access, e.g. easements?		
7.	Ensure horizontal and vertical alignment geometry is appropriate for design speed (Township and TAC standards), and intersection locations to preclude sight deficiencies.		
B	Arterial Roads (Adhering to or satisfying these requirements does not preclude or implay that a review by the Region of Durham is not required)		

1.	Does intersection spacing, access spacing and access location conform to Regional O.P. criteria and TAC Geometric Design Guide Sections 3.2.9.8 and 3.2.9.9?		
2.	Has access control been considered for high density or commercial sites contained as blocks in a subdivision plan? (Township or Regional criteria). Depending on the number of new trips generated (100 trips as a guideline), a traffic impact assessment study may be requested.		
3.	Is there adequate setback access from adjacent intersections (TAX Geometric Design Guidelines Manual, Section 3.2.4.3)?		
4.	Identify the land configurations for affected intersections - storage, tapers and radii based on forecast traffic volumes as identified in a Traffic Impact Assessment Report. Are auxillary lanes required based on speed and volume of turning traffic?		
5.	Generally, local roads are not be intersect arterial roads. Any exceptions to this would require approval by the Region as most arterial roads are under its jurisdiction.		
6.	Ensure adequate intersection corner daylighting requirements based on type of traffic control, roadway approach, horizontal curvature and road allowance widths. (TAC standards vary by the above criteria).		
C	COLLECTOR ROADS		
1.	What is the proposed traffic control at intersecting roads? Collector to collector intersections requires investigation of future warrants for traffic signals or all-way stop controls. (Avoid all-way stop control by offsetting intersections or considering roundabout design).		
2.	Is commercial or high-density access to the collector road proposed? (Review access spacing and location as per arterial guidelines above)		
3.	Ensure horizontal and vertical alignment geometry is appropriate for design speed (Township and TAC standards), and intersection locations to preclude sight deficiencies.		
4.	Review length and connectivity of the collector road and forecast traffic volumes to ensure future operating conditions don't exceed the classification of the roadway.		
5.	Is width of pavement appropriate for forecast traffic and roadside conditions. e.g. on-street parking and transit requirements? Apply Township Standards for cross-section and consider the need for turn lanes that accommodate large vehicle turning paths at intersections.		
6.	Determine whether exclusive bike lanes or shared width bike lanes are required.		
7.	Check sight distance requirements for driveways.		
D	LOCAL ROADS		
1.	Does the subdivision layout provide an isolated pocket of units that will result in pedestrians short-cutting through or across private lands or creek valleys?		
2.	Confirm that the length of isolated street sections and specific courts do not exceed the maximum length of streets permitted before a secondary emergency access is required. In this regard it may be required to provide a temporary year-round secondary access until additional phases are constructed. In some cases it may be required to have a permanent year-round emergency access easement in the subdivision.		
3.	Identify maximum walking distance to transit routes. (<400m)?		
4.	Examine the uninterrupted length of local streets, i.e. through streets not interrupted by stop control or sharp curvature (candidates for traffic calming if over 250+/- of roadway is straight and uninterrupted.		

SIDEWALKS AND PATHS			
1.	Are walkways required to provide links to schools, parks, transit and/or street to street?		
2.	Have sidewalk locations been established that reflect anticipated pedestrian patterns and crossing locations - internal and external destinations?		
3.	Do any sidewalks terminate mid-block?		
4.	Have "safe routes" been reviewed and addressed to all school sites that will be influenced by this subdivision, i.e. minimized pedestrian crossing of collector roads, and avoided midblock crossings?		
5.	Consult with the Township for location and classification of on-road, greenways and off-road trails. Ensure that segments of trail created in the new plan can create closed circuits or complete other proposed trail loops.		
OTHER CONSIDERATIONS			
1.	Determine whether residential access to corner lots can be permitted from the lot frontage, depending on minimum corner clearances and driveway sight requirements (if so, at what point) or designate it to the side street.		
2.	Can access to a high-density site or commercial site be permitted to the arterial or collector street system or will access to the local street be detrimental to local traffic operations? (Township or Regional)		
3.	Is individual street access proposed to townhouses: if so, determine the impact to on-street parking in the neighbourhood and adjacent or opposite driveways or development at lower densities.		

APPENDIX "C"

TRAFFIC MANAGEMENT OF DEVELOPMENT

ENGINEERING REVIEW CHECKLIST

SUBMISSION REQUIREMENTS - TRAFFIC MANAGEMENT PLAN			
The contents of the engineering submission pertaining to transportation shall include but not be limited to the following items:			
		Yes	No
1.	A detailed Traffic Management Plan, typically the same size as the engineering drawings, showing the curb locations, right-of-way, daylighting and lotting.		
2.	Show the traffic controls and sign locations for: stop controlled intersections (two-way or all-way) and location of existing or future traffic signal controlled intersection(s) and pre-installation of signal underground equipment.		
3.	Provide final design of formal traffic calming measures including any proposed turning circles, intersection channelization, raised medians, speed control devices, etc.		
4.	Provide details of any traffic impact mitigation measures such as access controls, road widening, lane tapers, turn lanes and medians, in plan and by cross-section.		
5.	Pavement marking, traffic warning, parking and street name signs located as per Township of Scugog standards and the Ontario Traffic Manual.		
6.	A tabulated schedule of proposed traffic by-law provisions indicating parking and traffic control provisions suitable for attachment to a staff report to Council.		
7.	Streets that are dead ended on a temporary basis due to the phasing of the subdivision must not have driveways permitted off the end of the street.		
SIDEWALKS AND PATHWAYS			
1.	Sidewalks generally are not to terminate in a mid-block location. A mid-block location of a walkway on a court may require a sidewalk from the cross-street to the walkway but not to the end of the court.		
2.	Sidewalks must be reviewed with respect to which side of the street (one or both sides) and the proposed width.		
3.	Courts normally will not require a sidewalk unless it provides pedestrian access to a high pedestrian generator such as a school, apartment block or active parks, or is part of a pedestrian linkage between streets or courts.		
4.	Ensure that sidewalk stubs align on the opposite sides of the road. Particularly at "T" intersections, sidewalk stubs on one side of the street are not to lead to a driveway on the opposite side of the street. In such circumstances, modify or relocate the driveway away from the sidewalk stub.		
5.	Pavement markings and signage must accompany bike path design.		
6.	Transit stops must be accessible by sidewalk connections from collector roads.		
7.	Consider locations of sidewalks between streets (on easement) or accessing commercial blocks (ownership, design, lighting and maintenance).		

OTHER CONSIDERATIONS			
A	**Postal Boxes:** This is normally the responsibility of Canada Post; however, the Township should review the acceptance of proposed locations to ensure they will not create operational problems.		
	Are proposed postal boxes located away from high conflict locations, e.g. pedestrian crosswalks, high volume intersections or in locations requiring crossing of a high volume road?		
B	Streetscape Treatments		
1.	Determine if proposed plantings will affect operations such as snow clearing.		
2.	Sight triangles at intersection and major driveways must be in accordance with Township by-law standards or TAC Section 2.3.3., whichever is deemed to apply.		
3.	Critical review must be given to tree planting avoiding the picket fence effect that trees create when planted too close together on the major street, in close proximity to a minor or other major street intersection.		
4.	Review gateway/entry features for intersection sight requirements.		
5.	Review planting locations that may impede sight to traffic control signs, e.g. foilage blocking view of a stop sign.		
C	Street Naming		
1.	Ensure there are no duplications or confusing layouts such as courts intersecting courts or crescents that are not in fact crescents.		
2.	In general terms, roads running north/south are identified as "streets" and roads running east/west are identified as "avenues".		
3.	Submit proposed street names to the Township for approval.		
D	Future Traffic Signals		
1.	Determine where traffic signals might be placed in the future ad have underground duct and handwells placed to save future pavement disturbance.		
2.	Any required detector loops should be saw cut at the time of traffic signal installation.		
E	Street Lighting		
	Street lighting is a major component of street design in any subdivision. While the classification of the road will normally dictate the street light design features to be used, each development plan must be reviewed to ensure the street light designs are correct for the specific facility. Alternative street light designs in subdivisions also need to be reviewed on a site-specific basis.		
1.	Is street lighting required for a walkway or tunnel?		
2.	Are there raised median treatments or physical features in the roadway that require lighting for motorists to avoid physical conflicts?		

TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

Drawing Number	Description	Date of Issue	Revision Number	Date of Revision
100 SERIES	*MANHOLES AND APPURTENANCES*			
SS-101	Manhole Step	Apr./90		
SS-102	Manhole Frame and Cover	1980	1	Apr./90
SS-103	1200mm Precast Concrete Manhole	Apr./90		
SS-104	1500mm Precast Concrete Manhole	Apr./90		
SS-105	1800mm Precast Concrete Manhole	Apr./90		
SS-106	2400mm Precast Concrete Manhole	Apr./90		
SS-107	1200mm Diameter Precast Concrete Manhole with Cast-In-Place Base	1980	1	Apr./90
SS-108	Precast Flat Top Manhole, Storm Sewers	1980	1	Apr./90
SS-109	Precast Manhole Tee for Pipe Diameters >1500mm	1980	1	Apr./90
SS-110	Semi-Precast Concrete Manhole (Pipe Diameter >600mm)	1980	1	Apr./90
SS-112	Semi-Precast Catchbasin Manhole - No Benching	1980	1	Apr./90
SS-113	Benching Detail for Precast Concrete Manholes	1980	1	Apr./90
SS-114	Typical Benching Details for Semi-Precast Manholes	Apr./90		
SS-120	Manhole Adjustments Storm Sewers	1980	1	Apr./90
SS-125	Manhole Safety Grating for Precast Concrete Manhole	1980	1	Apr./90
SS-130	Drop Structure for Storm Sewer Manholes	1980	1	Apr./90
SS-132	Sewer Bedding for Plastic Pipes	Apr./90		
SS-135	Sewer Bedding Rigid Pipes	1980	1	Apr./90
SS-140	Storm Sewer Headwall	1980	1	Apr./90
SS-141	Gabion Headwall for Storm Sewer Outlets	Apr./90		
SS-145	Headwall Grate	1980	1	Apr./90
SS-151	Single Precast Catchbasin	Apr./90		
SS-152	Double Precast Catchbasin	1980	1	Apr./90
SS-155	Slant Top Catchbasin	1980	1	Apr./90
SS-156	Adjustment of Catchbasins	June/89	1	Apr./90
SS-158	Catchbasin Frame and Grate Flat Top	1980	2	May/03
SS-160	Catchbasin Frame and Grate Rear Lot - Pyramidal	1980		
SS-161	Service Location Single Family Residential	1980	2	May/03

TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

Drawing Number	Description	Date of Issue	Revision Number	Date of Revision
100 SERIES	*MANHOLES AND APPURTENANCES*			
SS-162	Service Location Semi-Detached Residential	1980	2	May/03
SS-165	Storm Sewer Service Connection	1980	1	Apr./90
SS-168	Storm Sewer Riser Connection	1980	1	Apr./90
SS-171	Methods of Supporting House Connections and Catchbasin Leads	1980	1	Apr./90
SS-172	Recommended Sump Pump Outlet Location	2003		
200 SERIES	*ROADWAYS AND ROADWAY DETAILS*			
SS-201	6.70m Rural Roadway Estate Residential	1980	2	Apr./90
SS-202	8.0m Estate Residential Roadway	1980	1	Apr./90
SS-203	8.0m Estate Residential Roadway Alternative for Forested Areas	1980	1	Apr./90
SS-204	8.0m Local Roadway Stage I Construction	1980	1	Apr./90
SS-205	8.0m Local Roadway Stage II Construction	1980	1	Apr./90
SS-206	9.50m Minor Collector Roadway Stage I Construction	1980	1	Apr./90
SS-207	9.50m Collector Roadway Stage II Construction	1980	1	Apr./90
SS-210	11.0m Major Collector Roadway	1980	1	Apr./90
SS-214	7.0m Rural Industrial Road Section with Open Ditches	Apr./90		
SS-215	9.5m Industrial Local Roadway	1980	1	Apr./90
SS-216	11.0m Industrial Collector Roadway	1980	1	Apr./90
SS-217	Typical Cul-De-Sac Rural Estate Residential	1980	1	Apr./90
SS-218	Typical Offset Cul-De-Sac for Rural Estate Residential Streets	Apr./90		
SS-219	Typical Cul-De-Sac for Urban Residential Streets	1980	1	Apr./90
SS-220	Typical Offset Cul-De-Sac for Urban Residential Streets	Apr./90		
SS-221	Typical Cul-De-Sac for Urban Industrial Streets	1980	1	Apr./90
SS-222	Typical Cul-De-Sac for Rural Industrial Streets	Apr./90		
SS-223	Temporary Turning Circle for Residential Streets	1980	1	Apr./90
SS-224	Typical Bulb Detail for Residential Crescents	1980	1	Apr./90

TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

Drawing Number	Description	Date of Issue	Revision Number	Date of Revision
200 SERIES	*ROADWAYS AND ROADWAY DETAILS*			
SS-225	Concrete Curb and Gutter	1980	1	Apr./90
SS-226	Mountable Concrete Curb and Gutter	1983	1	Apr./90
SS-227	Two Stage - Curb and Gutter	Apr./90		
SS-231	Concrete Sidewalk	1980	1	Apr./90
SS-235	Sidewalks at Intersection	1980	1	Apr./90
SS-240	Dead End Street Barricade Detail	1980	1	Apr./90
SS-241	Permanent Hammerhead Turning Area for Residential Streets	2003		
SS-242	Low Volume Road (AADT<400)	2003		
300 SERIES	*MISCELLANEOUS DETAILS*			
SS-301	Sodding of Side Slopes	1980	1	Apr./90
SS-302	Precast Concrete Splash Pad Detail	1980	1	Apr./90
SS-311	Chain Link Security Fence	1980	1	Apr./90
SS-312	Standard Farm Fence	Apr./90		
SS-313	Wood Privacy Fence	Apr./90		
SS-314	Post & Rail Fence	Feb./00		
SS-320	Pedestrian Walkway	1980	1	Apr./90
SS-331	Traffic Sign Details	1980	2	May/03
SS-332	School Zone Speed Limit Sign With Flashing Beacons, Underground Supply Installation	Oct./90		
SS-333	School Zone Speed Limit Sign With Flashing Beacons, Overhead Supply Installation	Oct./90		
SS-341	Driveway Approach Paving for Residential Driveways	1980	1	Apr./90
SS-342	Driveway Approach Paving, Commercial, Industrial and Apartments	1980	1	Apr./90
SS-345	Typical Joint Bell and Hydro Trench and Road Crossing sections	1980	2	May/03
SS-346	Catchbasin Sediment Trap Unpaved Areas Draining 2.0 ha to 4.0 ha	2003		
SS-347	Catchbasin Sediment Barrier R.L.C.B. or within unpaved areas Type "A"	2003		
SS-348	Catchbasin Sediment Barrier R.L.C.B. or within unpaved areas Type "B"	2003		
SS-349	Roadway Catchbasin Sediment Control Device Type "A"	2003		
SS-350	Roadway Catchbasin Sediment Control Device Type "B"	2003		
SS-351	Sediment Control Fence	2003		

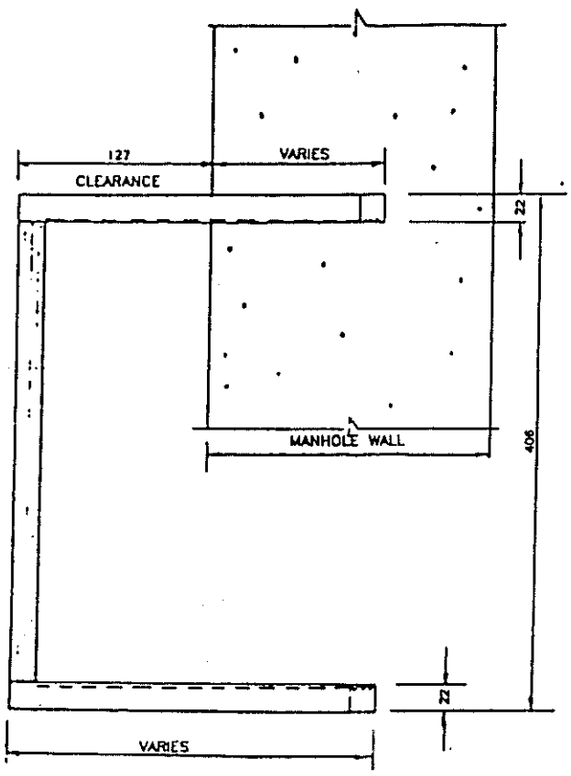
TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

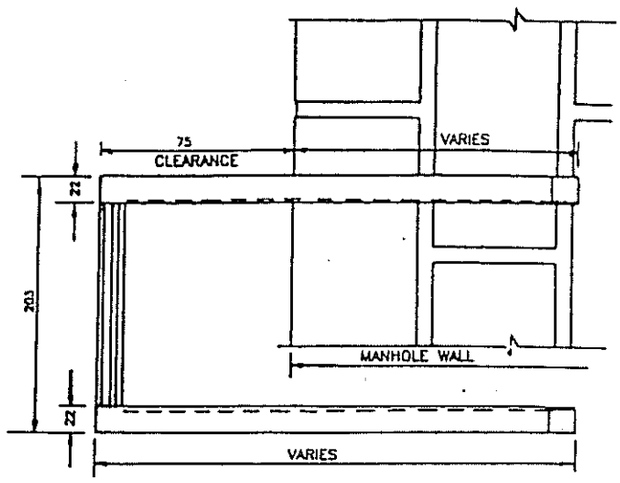
TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

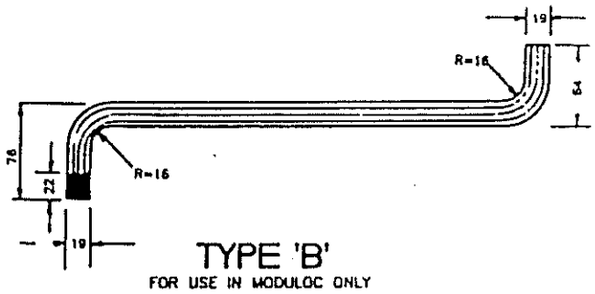
Drawing Number	Description	Date of Issue	Revision Number	Date of Revision
SS-352	Temporary Sediment Pond Warning Sign	2003		
SS-353	Temporary Storm Water Management Facility Warning Sign	2003		
SS-354	Stone Pad Construction Entrance	2003		
SS-355	Rock Check Dam	2003		
SS-356	SWM Pond Sign Identifying Naturalized Area	2003		
400 SERIES	*LOT GRADING DETAILS*			
SS-400	Typical Legend for Lot Grading Plan	1980	1	Apr./90
SS-401	Front Lot Drainage	1980	1	Apr./90
SS-402	Rear Lot Drainage	1980	1	Apr./90
SS-403	Rear Lot Drainage for W/O or B/S House	1980	1	Apr./90
SS-404	Front Lot Drainage for F/S House Type	1980	1	Apr./90
500 SERIES	*DRAFTING DETAILS*			
SS-500	Drawing Title Block	1980	1	Apr./90
600 SERIES	*HYDROLOGY DESIGN DATA*			
SS-600	Rainfall Intensity Duration Curves	Apr./90		
SS-601	Hydraulic Performance of Catchbasin Grates Located in Gutters	Apr./90		
700 SERIES	*STREET LIGHTING*			
SS-701	Horizontal Type Luminaire	Apr./90		
800 SERIES	*LANDSCAPING DETAILS*			
SS-801	Deciduous Tree Detail Larger Than 50mm Caliper	Apr./90		
SS-802	Deciduous Tree Detail 300cm, 50mm to 90mm Caliper	Apr./90		
SS-803	Deciduous Tree Planting on a Slope	Apr./90		
SS-810	Typical Coniferous Tree Detail, larger than 200cm height	Apr./90		
SS-811	Shrub Planting Detail	Apr./90		
SS-815	Street Tree Detail	Apr./90		

TOWNSHIP OF SCUGOG
THE REGIONAL MUNICIPALITY OF DURHAM
STANDARD DRAWING INDEX

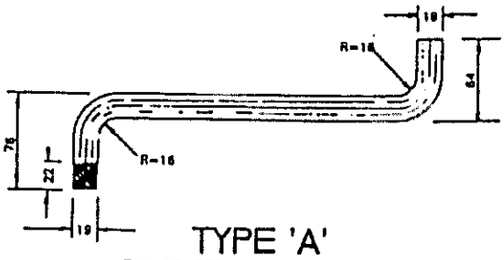
Drawing Number	Description	Date of Issue	Revision Number	Date of Revision
SS-816	Planter Detail	Apr./90		
SS-817	Typical Berm Planting	Apr./90		



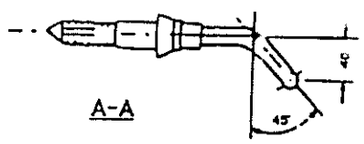




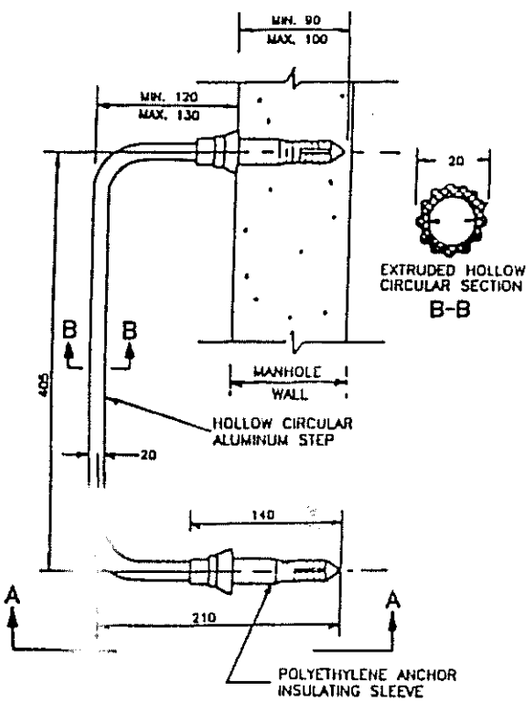
TYPE 'B'
FOR USE IN MODULOC ONLY



TYPE 'A'
FOR POURED IN PLACE MANHOLES



A-A

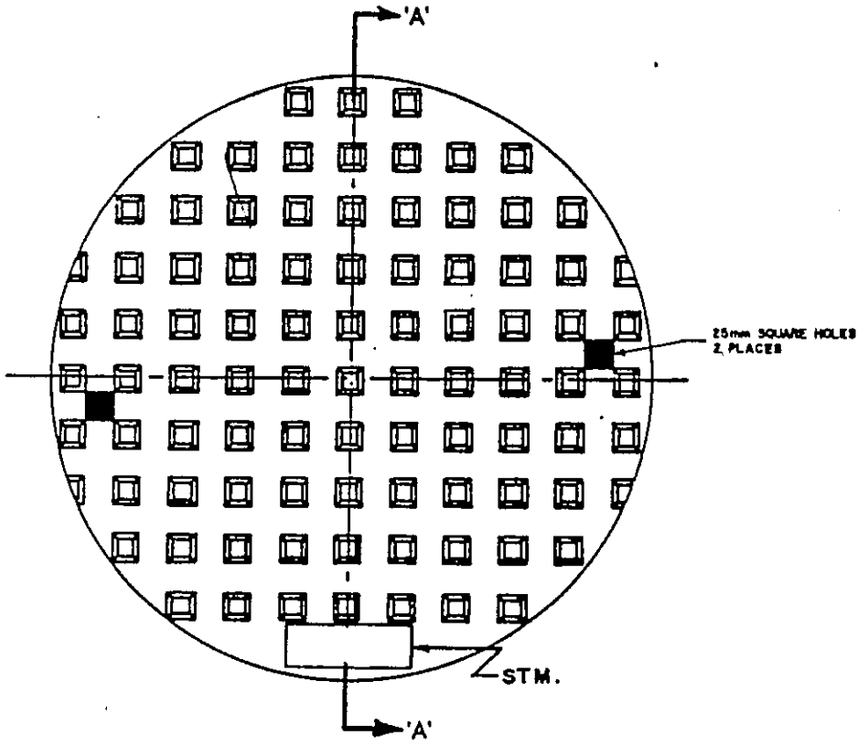


TYPE 'C'
FOR PRECAST MANHOLE SECTIONS.

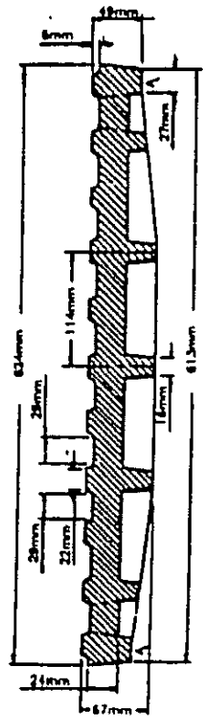
NOTES:

1. MATERIAL FOR STEPS TO BE ALUMINUM ALLOY 65 ST 4 (ALUMINUM CO. OF CANADA SPECIFICATIONS)
2. DISTANCE BETWEEN STEPS TO BE 300mm.
3. DISTANCE FROM STEP TO TOP OF BENCHING TO BE 300mm MAXIMUM.
4. DISTANCE FROM BASE OF FRAME TO FIRST STEP TO BE 75mm.
5. LAST STEP TO BE 300mm ABOVE BENCHING OR 600mm ABOVE INVERT FOR PIPES LARGER THAN 600mm Ø OR 150mm ABOVE SPRINGLINE FOR PIPES 1200mm Ø AND LARGER.
6. TWO COATS OF STATIC ASPHALT PAINT OR APPROVED EQUAL, ON EMBEDDED SECTION.
7. HOOK TO BE PLACED UPRIGHT IN MODULOC OR CONCRETE AS REQUIRED.
8. RUNGS TO BE PLACED ON BLANK WALL.

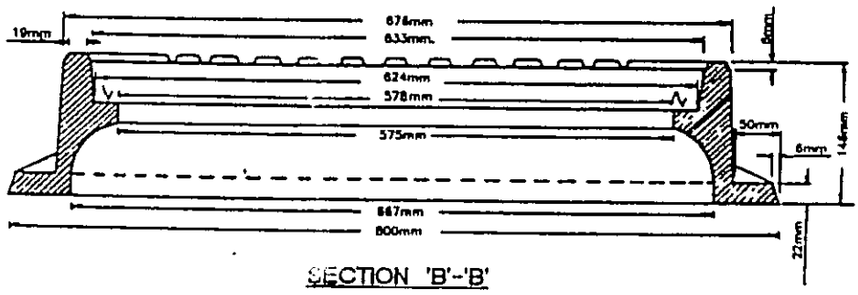
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION / DATE OF REVISION	MANHOLE STEP	DRAWING NO SS-101



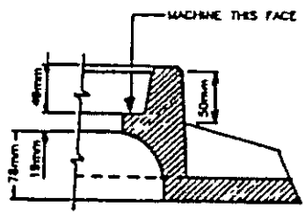
COVER



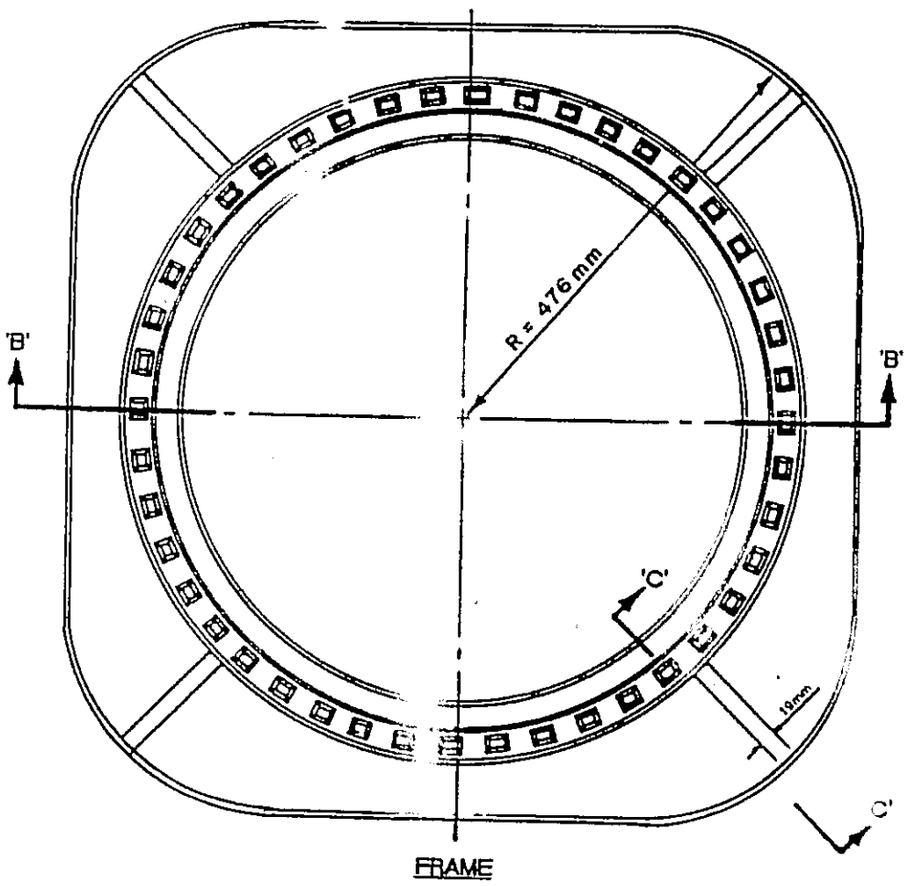
SECTION 'A'-'A'



SECTION 'B'-'B'



SECTION 'C'-'C'

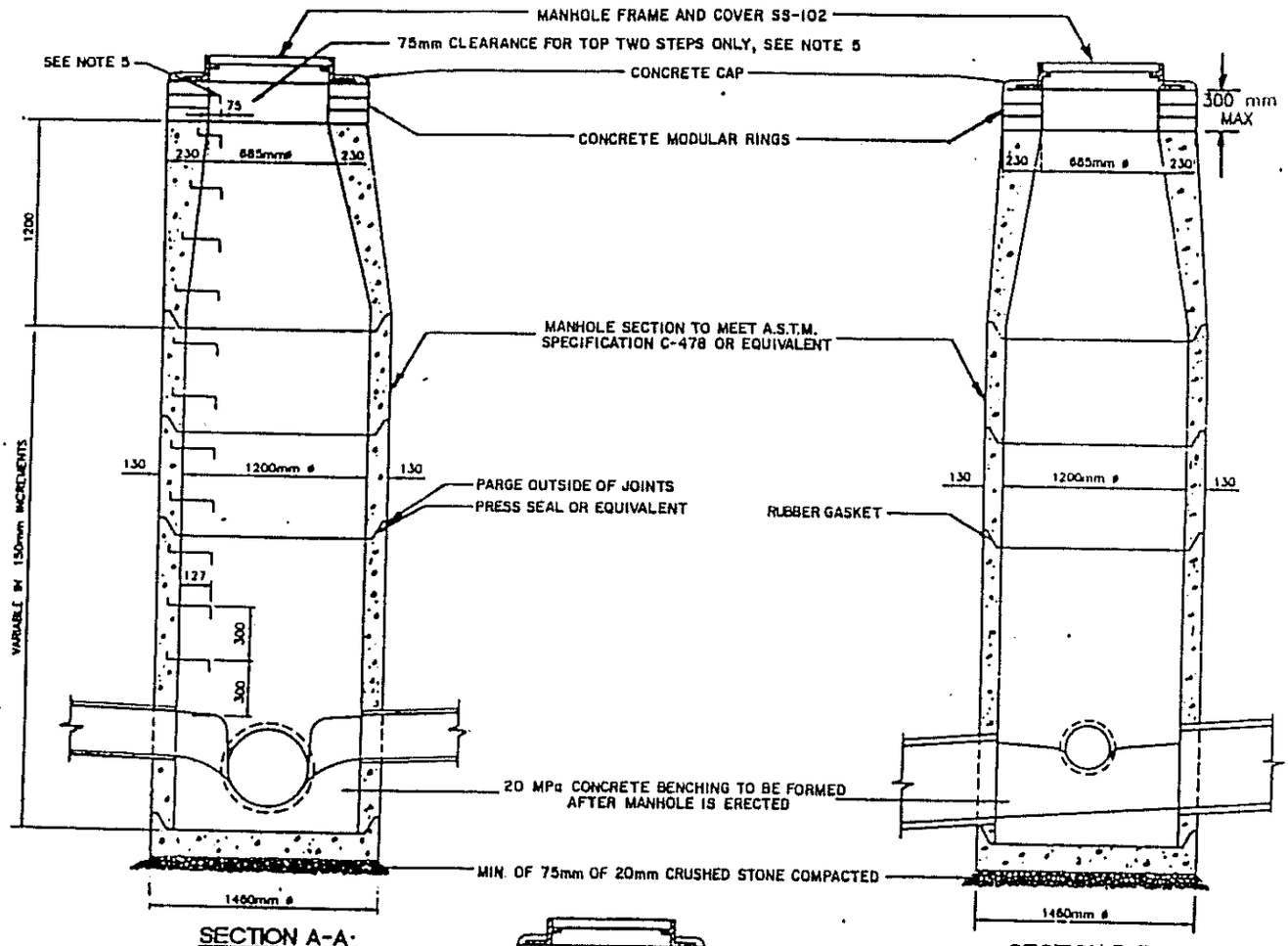


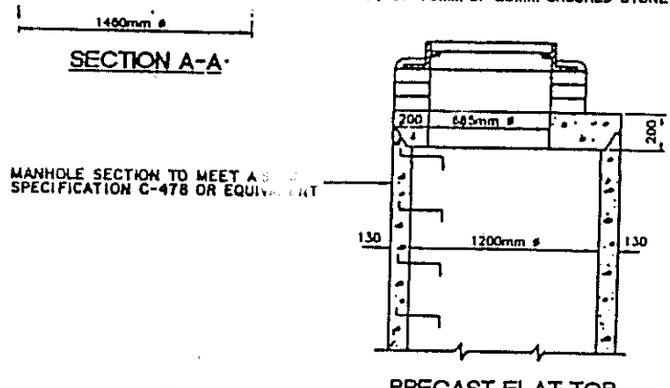
FRAME

NOTES:

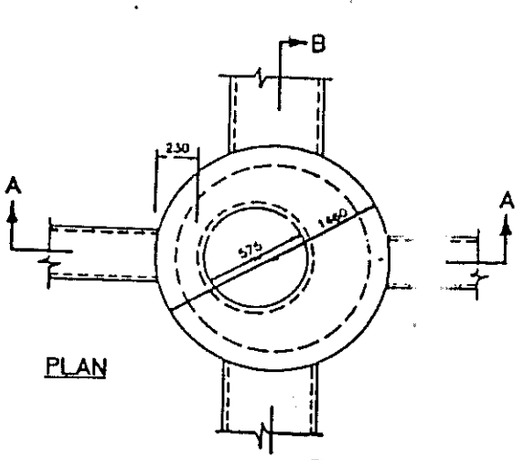
1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES AND ARE SUBJECT TO THE MANUFACTURERS TOLERANCES.
2. OPSD-401.01-TYPE 'A' MAY BE USED WHEN APPROVED BY THE TOWNSHIP ENGINEER.
3. THE INITIAL OR MARK OF THE MANUFACTURE ARE TO BE DISTINCTLY CAST IN RAISED LETTERS ON BOTH FRAME AND COVER AS WELL AS THE DESIGNATION SEWER.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	MANHOLE FRAME AND COVER	DRAWING No. SS-102
DATE OF REVISION APRIL 1990		





PRECAST FLAT TOP

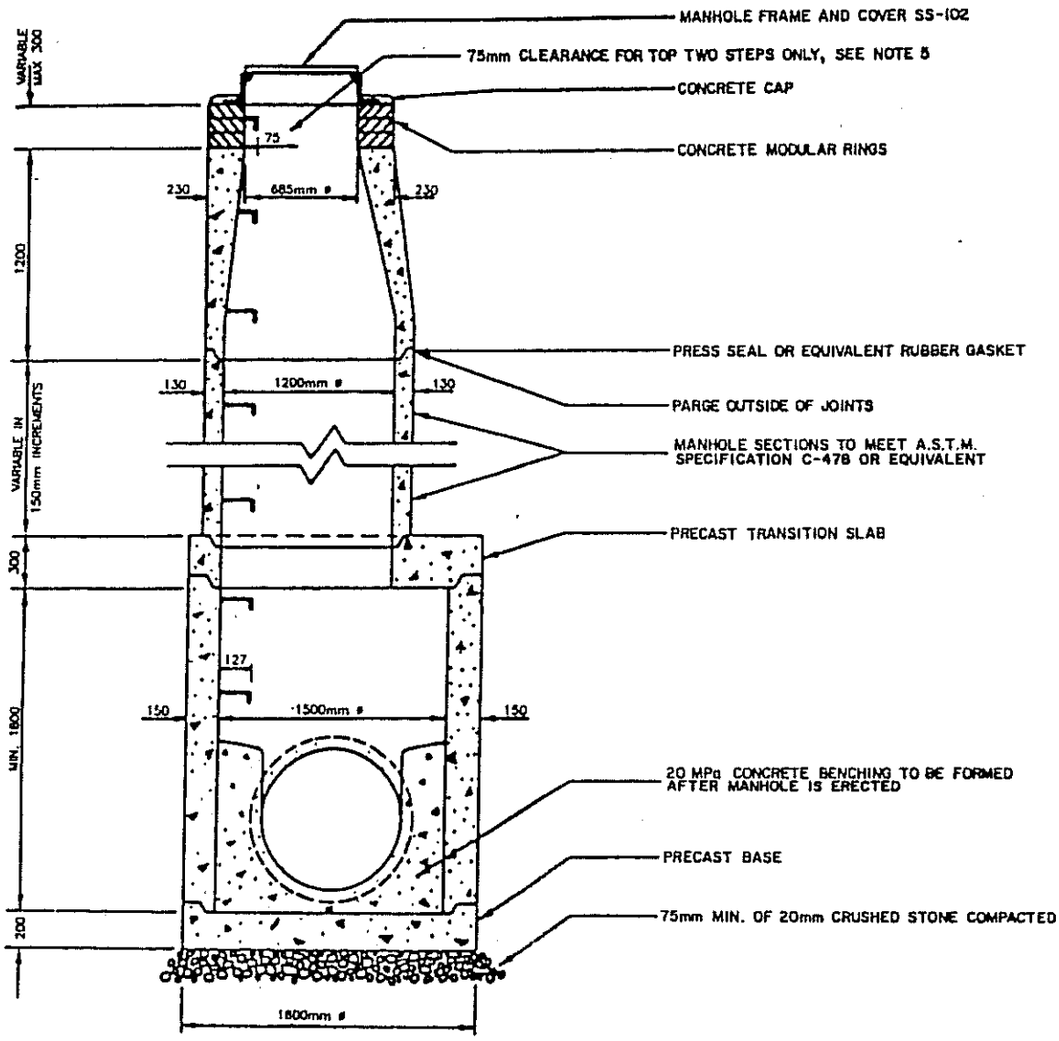


PLAN

NOTES:

1. PRECAST CONCRETE BASES SHALL BE USED ONLY WHEN GROUND CONDITIONS ARE DRY AND FIRM (STRUCTURALLY SOUND).
2. TOP OF BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. ANY PIPES ENTERING THE PRECAST SECTIONS, MUST NOT ENTER AT A MANHOLE SECTION JOINT.
4. LIFTING HOLES IN PRECAST SECTIONS TO BE COMPLETELY FILLED WITH 3 PARTS SAND, 1 PART CEMENT MORTAR AND POINTED BEFORE BACK-FILLING.
5. MANHOLE STEPS TO BE AS PER STANDARD SS-101.
6. PRECAST FLAT TOP TO BE USED WHEN TOTAL HEIGHT OF PRECAST SECTION IS LESS THAN 1.80m.
7. GASKETS TO BE PLACED AS PER MANUFACTURERS SPECIFICATIONS.
8. FOR MANHOLE DEPTHS GREATER THAN 5.0m A MANHOLE SAFETY GRATING IS REQUIRED MAXIMUM SPACING BETWEEN SAFETY GRATES IS 5.0m.
9. FOR DEPTHS GREATER THAN 7.5m THE MANHOLE MUST BE INDIVIDUALLY DESIGNED.
10. CONCRETE BEDDING SHALL BE PLACED UNDER ALL PIPES ENTERING THE MANHOLE TO THE FIRST JOINTS.
11. THE FIRST PIPE LENGTH OUT OF THE MANHOLE SHALL NOT EXCEED 1.8m.
12. FOR BENCHING DETAIL SEE STANDARD DRAWING No. SS-113.
13. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.

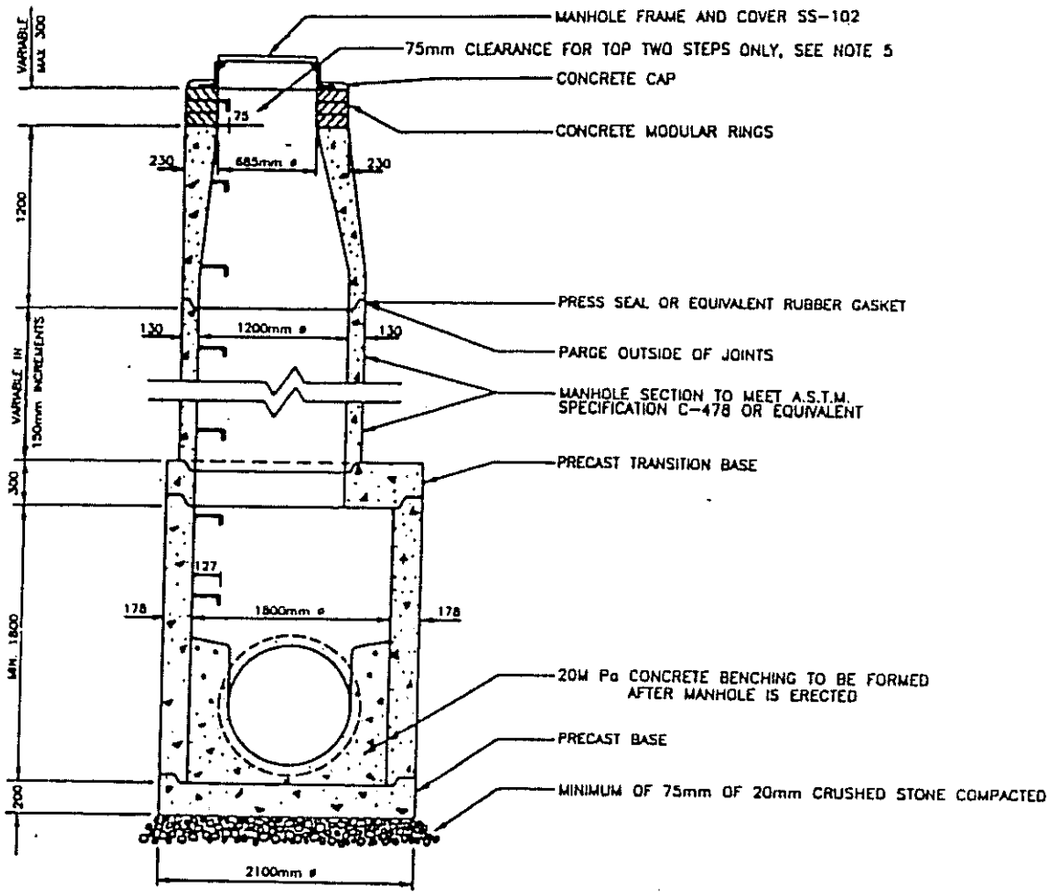
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG 1200 mm PRECAST CONCRETE MANHOLE (FOR SEWER SIZES UP TO 600 mm ON STRAIGHT RUNS)	DATE OF ISSUE APRIL 1990 DRAWING NO. SS - 103



NOTES:

1. PRECAST CONCRETE BASES SHALL BE USED ONLY WHEN GROUND CONDITIONS ARE DRY AND FIRM (STRUCTURALLY SOUND).
2. TOP OF BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. ANY PIPES ENTERING THE PRECAST SECTIONS, MUST NOT ENTER AT MANHOLE SECTION JOINT..
4. LIFTING HOLES IN PRECAST SECTIONS TO BE COMPLETELY FILLED WITH 3 PARTS SAND, 1 PART CEMENT MORTAR AND POINTED BEFORE BACKFILLING.
5. MANHOLE STEPS AS PER SS-101.
6. PRECAST FLAT TOP TO BE USED WHEN TOTAL HEIGHT OF PRECAST SECTION IS LESS THAN 1800mm.
7. GASKETS TO BE PLACED AS PER MANUFACTURERS SPECIFICATIONS.
8. FOR DEPTHS GREATER THAN 5.0m, A MANHOLE SAFETY GRATING IS REQUIRED. MAXIMUM SPACING BETWEEN SAFETY GRATES IS 5.0m.
9. FOR DEPTHS GREATER THAN 7.5m, THE MANHOLE MUST BE INDIVIDUALLY DESIGNED IF NECESSARY.
10. CONCRETE BEDDING SHALL BE PLACED UNDER ALL PIPES ENTERING THE MANHOLE TO THE FIRST JOINTS.
11. THE FIRST PIPE LENGTH OUT OF THE MANHOLE SHALL NOT EXCEED 1.8m.
12. FOR BENCHING DETAIL SEE STD. DWG. No. SS-113.
13. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.

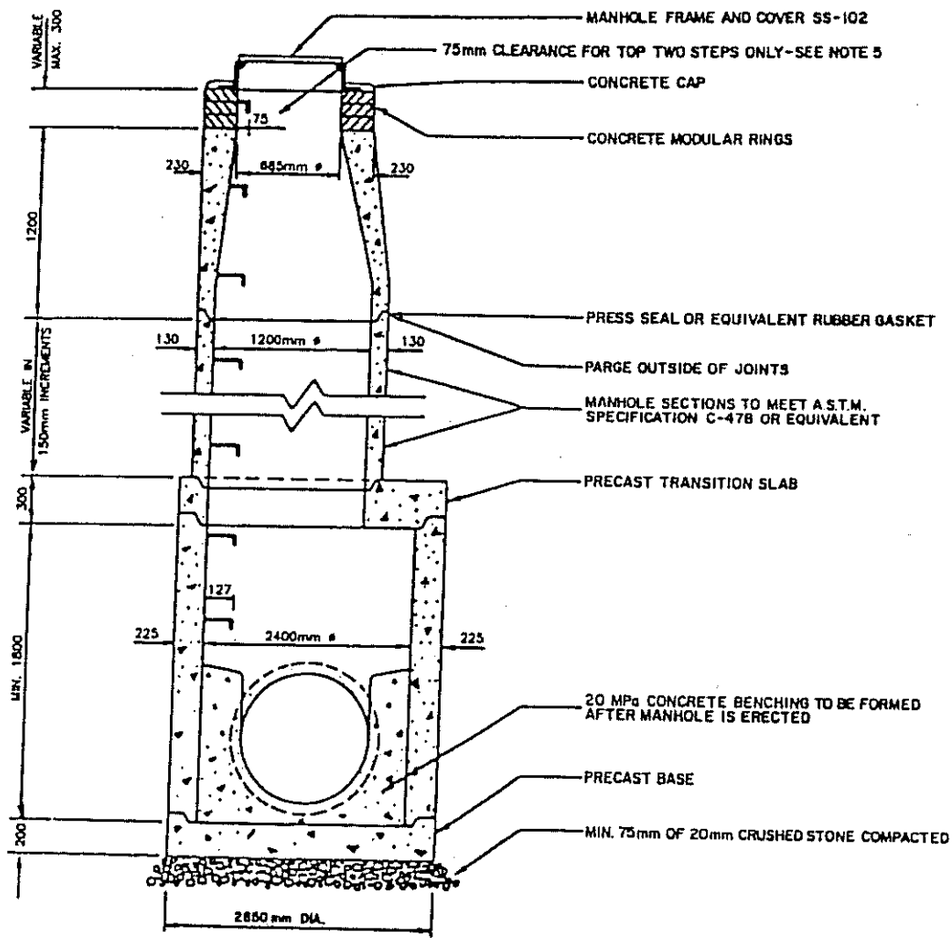
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	1500 mm PRECAST CONCRETE MANHOLE (FOR SEWER SIZES UP TO 825mm ON STRAIGHT RUNS)	DRAWING NO. SS - 104
DATE OF REVISION		



NOTES:

1. PRECAST CONCRETE BASES SHALL BE USED ONLY WHEN GROUND CONDITIONS ARE DRY AND FIRM (STRUCTURALLY SOUND).
2. TOP OF BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. ANY PIPES ENTERING THE PRECAST SECTIONS, MUST NOT ENTER AT A MANHOLE SECTION JOINT.
4. LIFTING HOLES IN PRECAST SECTIONS TO BE COMPLETELY FILLED WITH 3 PARTS SAND, 1 PART CEMENT MORTAR AND POINTED BEFORE BACK-FILLING.
5. MANHOLE STEPS TO BE AS PER SS-101.
6. PRECAST FLAT TOP TO BE USED WHEN TOTAL HEIGHT OF PRECAST SECTION IS LESS THAN 1800mm.
7. GASKETS TO BE PLACED AS PER MANUFACTURERS SPECIFICATIONS.
8. FOR DEPTHS GREATER THAN 5.0m, A MANHOLE SAFETY GRATING IS REQUIRED. MAXIMUM SPACING BETWEEN SAFETY GRATES IS 5.0m.
9. FOR DEPTHS GREATER THAN 7.5m, THE MANHOLE MUST BE INDIVIDUALLY DESIGNED IF NECESSARY.
10. CONCRETE BEDDING SHALL BE PLACED UNDER ALL PIPES ENTERING THE MANHOLE TO THE FIRST JOINTS.
11. THE FIRST PIPE LENGTH OUT OF THE MANHOLE SHALL NOT EXCEED 1.8m.
12. FOR BENCHING DETAILS SEE STANDARD DRAWING No. SS-113.
13. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.

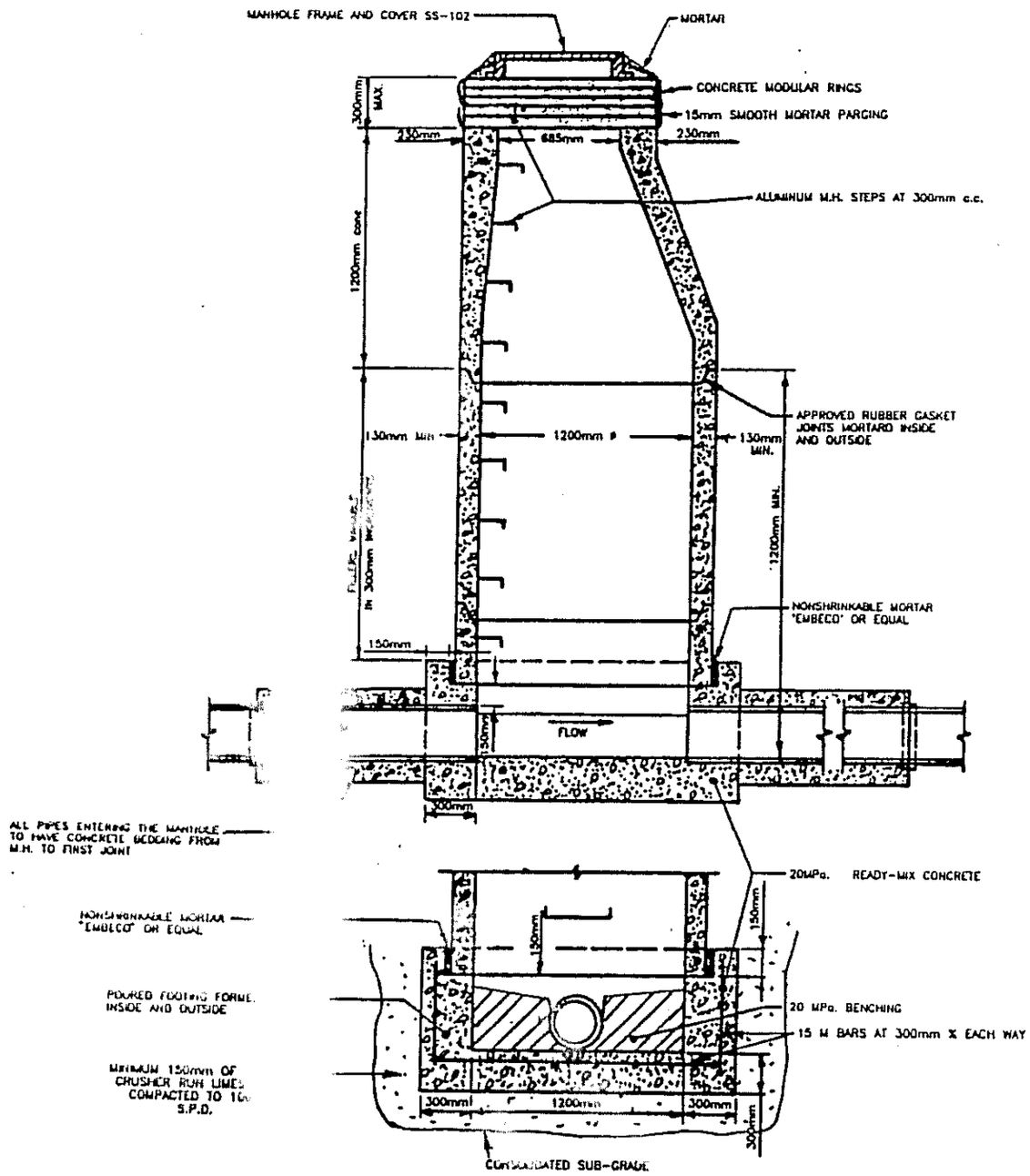
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG 1800 mm PRECAST CONCRETE MANHOLE (FOR SEWER SIZES UP TO 1050mm ON STRAIGHT RUNS)	DATE OF ISSUE APRIL 1990 DRAWING NO. SS - 105



NOTES:

1. PRECAST CONCRETE BASES SHALL BE USED ONLY WHEN GROUND CONDITIONS ARE DRY AND FIRM (STRUCTURALLY SOUND).
2. TOP OF BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. ANY PIPES ENTERING THE PRECAST SECTIONS, MUST NOT ENTER AT A MANHOLE SECTION JOINT.
4. LIFTING HOLES IN PRECAST SECTIONS TO BE COMPLETELY FILLED WITH 3 PARTS SAND, 1 PART CEMENT MORTAR AND POINTED BEFORE BACK-FILLING.
5. MANHOLE STEPS TO BE AS PER SS-101.
6. PRECAST FLAT TOP TO BE USED WHEN TOTAL HEIGHT OF PRECAST SECTION IS LESS THAN 1800mm.
7. GASKETS TO BE PLACED AS PER MANUFACTURERS SPECIFICATIONS.
8. FOR DEPTHS GREATER THAN 5.0m, A MANHOLE SAFETY GRATING IS REQUIRED MAXIMUM SPACING BETWEEN SAFETY GRATES IS 5.0m.
9. FOR DEPTHS GREATER THAN 7.5m, THE MANHOLE MUST BE INDIVIDUALLY DESIGNED IF NECESSARY.
10. CONCRETE BEDDING SHALL BE PLACED UNDER ALL PIPES ENTERING THE MANHOLE TO THE FIRST JOINTS.
11. THE FIRST PIPE LENGTH CUT OFF THE MANHOLE SHALL NOT EXCEED 1.8m.
12. FOR BENCHING DETAILS SEE STANDARD DRAWING No. SS-113.
13. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.

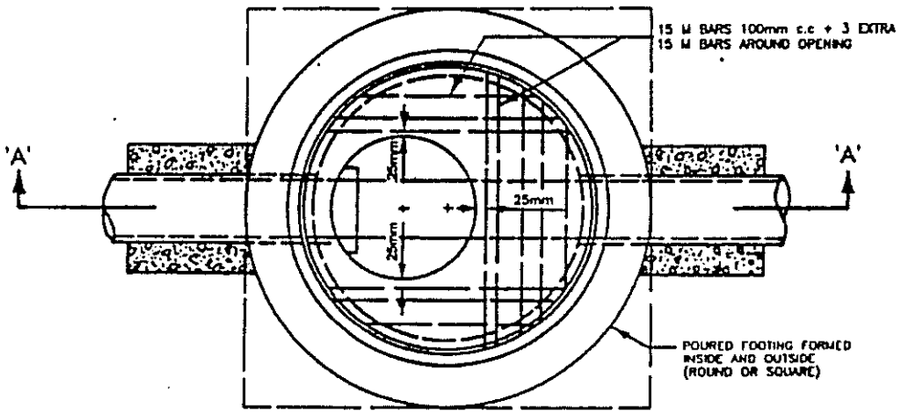
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	2400 mm PRECAST CONCRETE MANHOLE (FOR SEWER SIZES UP TO 1500 mm ON STRAIGHT RUNS)	DRAWING NO. SS-106
DATE OF REVISION		



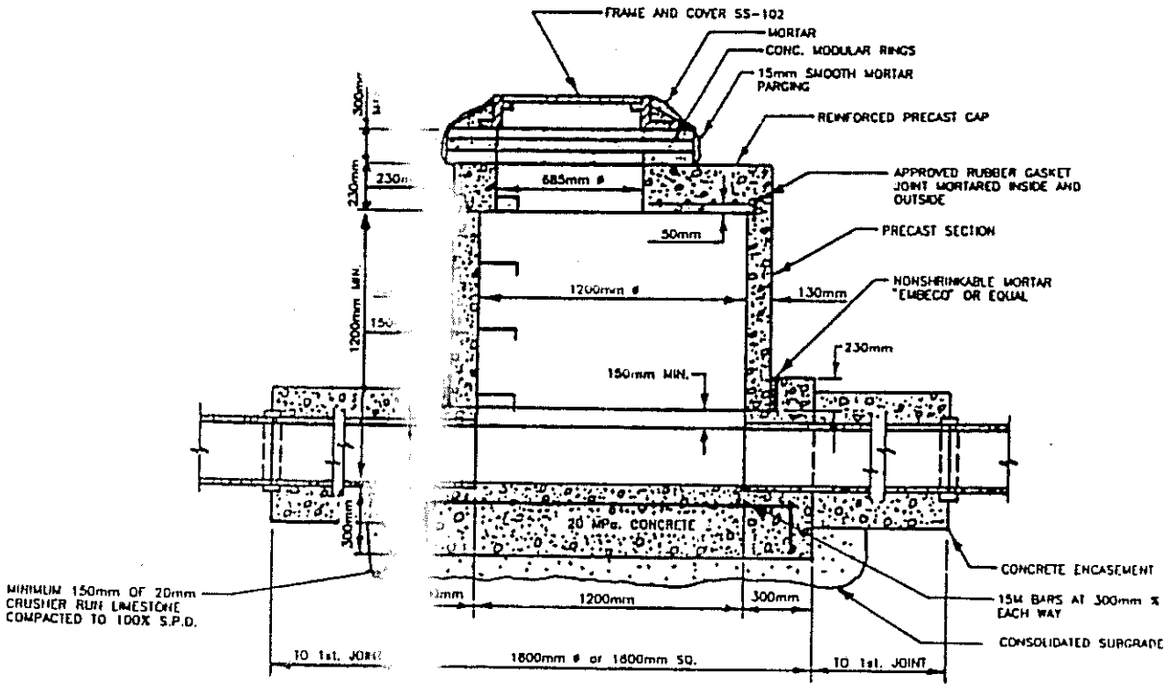
NOTES:

1. PRECAST MANHOLE SECTIONS TO BE ...CTURED TO A.S.T.M. SPECIFICATION C-478-M LATEST REV...
2. FOR MANHOLE DEPTHS LESS THAN 2.... PRECAST FLAT-TOP SECTION SHALL BE USED IN PLACE OF ...CONE SECTION.
3. SAFETY GRATING IS REQUIRED IF MAN... DEEPER THAN 5.0m.
4. THIS STANDARD IS NOT TO BE USED ...NHOLES OVER 7.62m DEEP UNLESS DETAILED ANALYSIS OF ...URAL SUITABILITY IS CARRIED OUT BY CONSULTANT.
5. MAXIMUM HEIGHT OF MODULAR RING... 300mm.
6. BENCHING OF ALL MANHOLES TO BE ... STANDARD DRAWING SS-114.
7. OPSD-701.01 MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.
8. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
9. IN ROADWAYS-MANHOLE FRAME AND COVER TO BE SET FLUSH WITH SURFACE OF BASE COURSE ASPHALT. ADJUSTMENT TO FINAL GRADE AT THE TIME OF PLACING OF SURFACE ASPHALT SHALL BE MADE BY RESETTING THE FRAME.
10. GRANULAR 'A' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300... ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
11. MONOLITH... BASES WILL BE PERMITTED FOR MAXIMUM STRAIGHT THROUGH PIPE SIZE OF 600mm.
12. FILL JOINT... LIFTING HOLES AND PIPE CONNECTIONS AND PARGE MODULAR RINGS ON OUTSIDE 15mm THICK WITH 1:3 NON SHRINK MORTAR MIX.
13. FOR PIPE SIZE GREATER THAN OR EQUAL TO 450mm, LADDER RUNS TO BE LOCATED 90 DEGREES TO LOCATION SHOWN ON DETAIL.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	1200 MM DIAMETER PRECAST CONCRETE MANHOLE WITH CAST-IN-PLACE BASE	DRAWING No. SS-107
DATE OF REVISION APRIL 1990		



PLAN

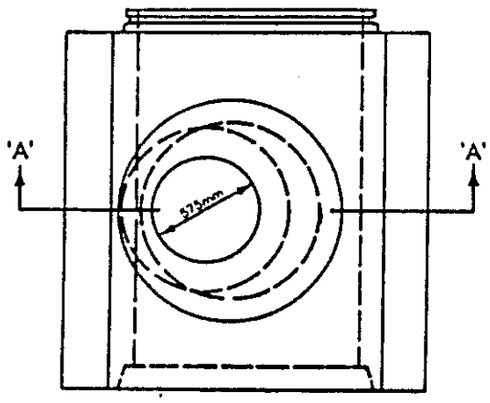


SECTION 'A'-'A'

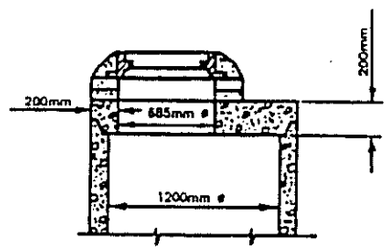
NOTES:

1. PRECAST MANHOLE SECTIONS TO BE ICTURED TO A.S.T.M. SPECIFICATION C-478-M LA VISION.
2. MAXIMUM HEIGHT OF MODULAR RIN E 300mm.
3. ALL DIMENSIONS ARE IN MILLIMETRES
4. SAFETY GRATING IS REQUIRED IF MA S DEEPER THAN 5.0m.
5. BENCHING OF ALL MANHOLES TO BE AS PER STD. DWG. No. SS-114.
6. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. MONOLITHIC BASES WILL BE PERMITTED FOR MAXIMUM STRAIGHT THROUGH PIPE SIZE OF 600mm.
8. OPSD-701.03 MAY BE USED WHEN APPROVED BY THE TOWNSHIP ENGINEER.
9. IN ROADWAYS - MANHOLE FRAME AND COVER TO BE SET FLUSH WITH SURFACE OF BASE COURSE ASPHALT. ADJUSTMENT TO FINAL GRADE AT THE TIME OF PLACING OF SURFACE COURSE ASPHALT SHALL BE MADE BY RESETTING THE FRAME.
10. FILL JOINTS, LIFTING HOLES AND PIPE CONNECTIONS AND PARGE MODULAR RINGS ON OUTSIDE 15mm THICK WITH 1:3 NON SHRINK MORTAR MIX.

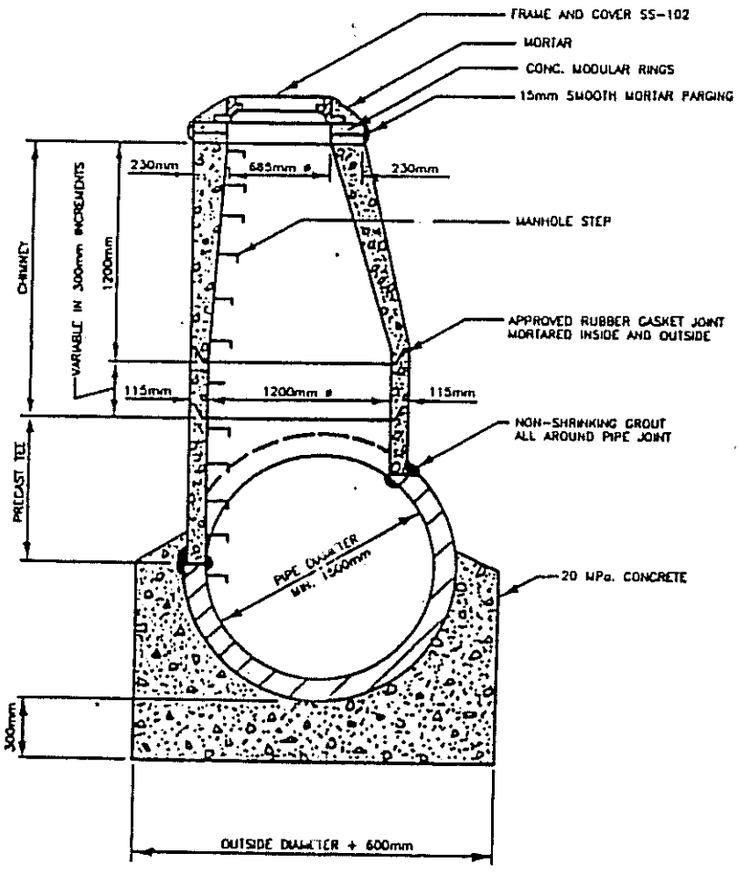
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	PRECAST FLAT TOP MANHOLE STORM SEWERS	DRAWING No. SS-108
DATE OF REVISION APRIL 1990		



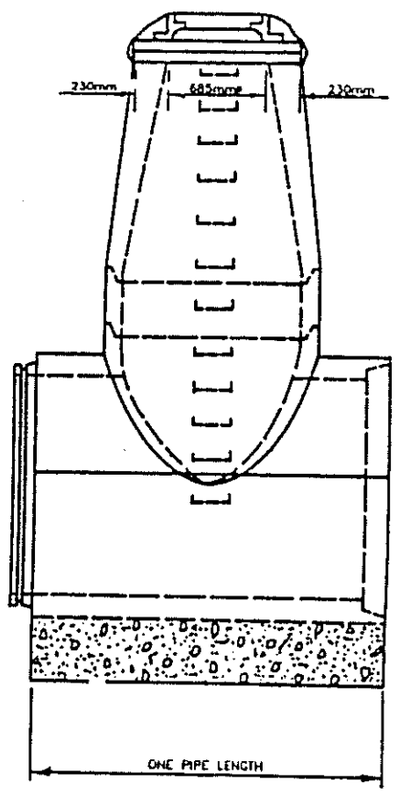
PLAN



PRECAST FLAT TOP



SECTION 'A'-'A'

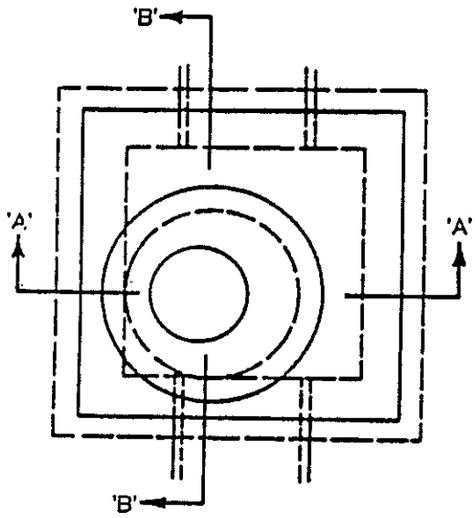


ELEVATION

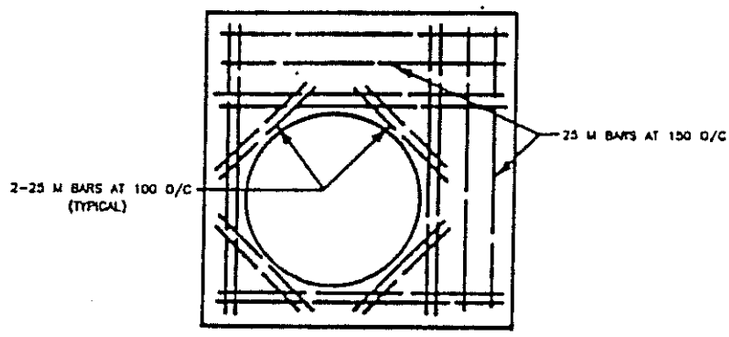
NOTES:

1. PRECAST MANHOLE SECTIONS TO BE MANUFACTURED TO A.S.T.M. SPECIFICATION C-478-M LATEST REVISION.
2. MAXIMUM HEIGHT OF MODULAR RINGS TO BE 300mm.
3. OPSD-707.01 MAY BE USED WHEN APPROVED BY THE TOWNSHIP ENGINEER.
4. PRECAST FLAT TOP TO BE USED WHEN TOTAL HEIGHT OF CHIMNEY IS LESS THAN 1200mm.
5. ALL STEEL REINFORCING TO BE WELDED TOGETHER AT JUNCTION OF CHIMNEY AND TEE.
6. MANHOLE TEE TO BE SHOP ASSEMBLED.
7. MANHOLE PIPE TO BE ONE CLASS HIGHER THAN ADJACENT SEWER PIPE.
8. SAFETY GRATING IS REQUIRED IF MANHOLE IS DEEPER THAN 5.0m.
9. ALL DIMENSIONS ARE IN MILLIMETRES.
10. IN ROADWAY-MANHOLE FRAME AND COVER TO BE SET FLUSH WITH SURFACE OF BASE ASPHALT. ADJUSTMENT TO FINAL GRADE AT THE TIME OF PLACING OF SURFACE ASPHALT SHALL BE MADE BY RESETTING THE FRAME.
11. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
12. THIS STANDARD MAY BE USED WHERE THERE IS NO CHANGE IN PIPE GRADE AND HORIZONTAL ALIGNMENT THROUGH THE MANHOLE.
13. FILL JOINTS, LIFTING HOLES AND PIPE CONNECTIONS AND PARGE MODULAR RINGS ON OUTSIDE 15mm THICK WITH 1:3 NON SHRINK MORTAR MIX.

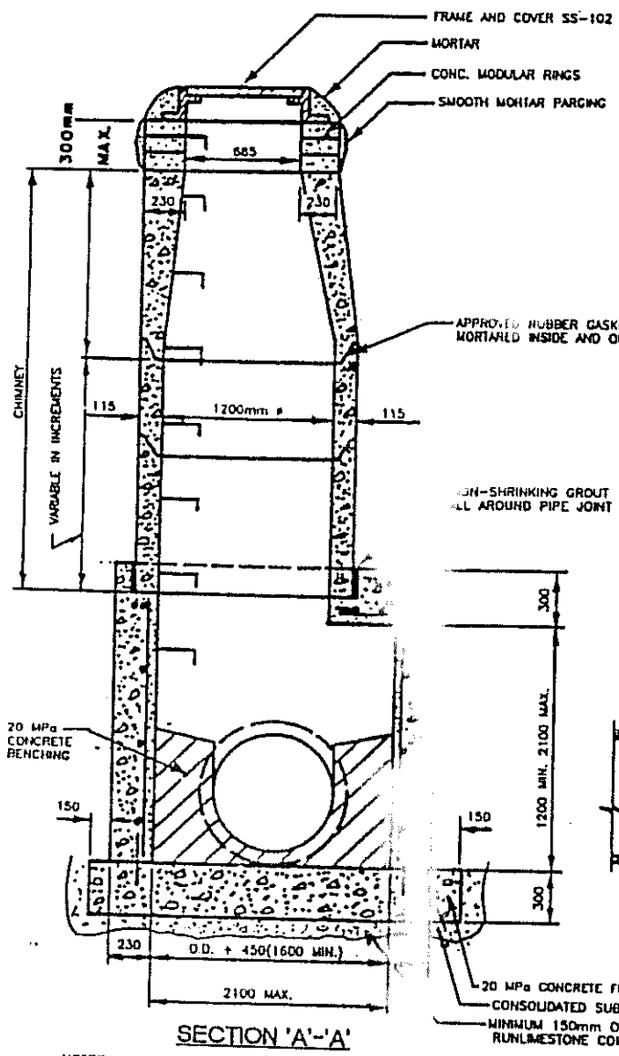
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	PRECAST MANHOLE TEE FOR PIPE DIAMETERS ≥ 1500mm	DRAWING No. SS-109
DATE OF REVISION APRIL 1990		



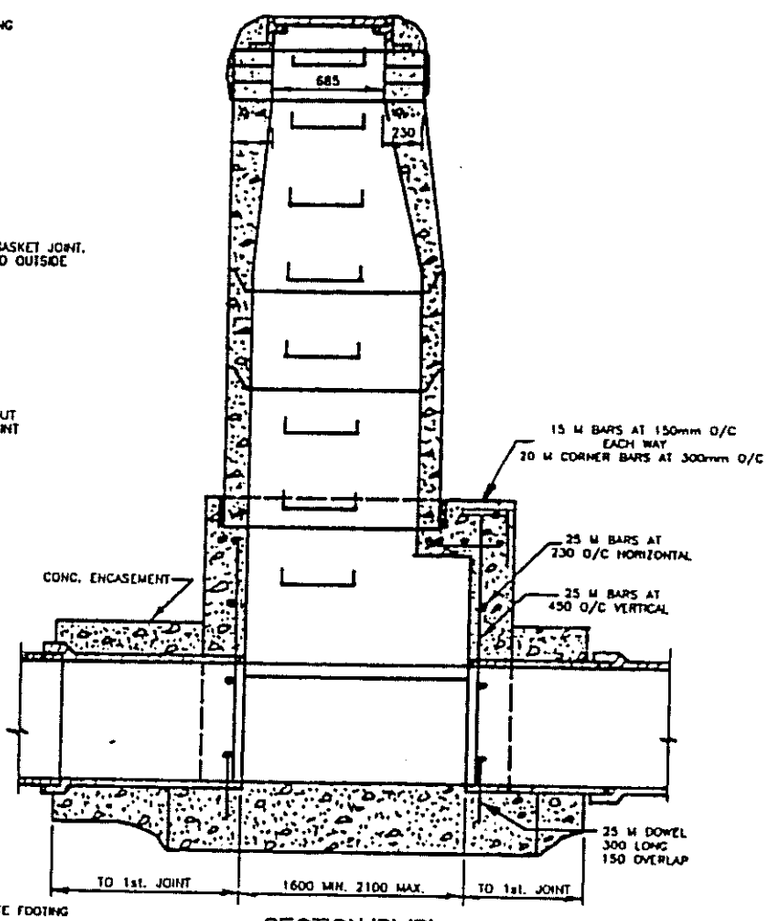
PLAN



SLAB REINFORCING SCHEDULE



SECTION 'A'-'A'

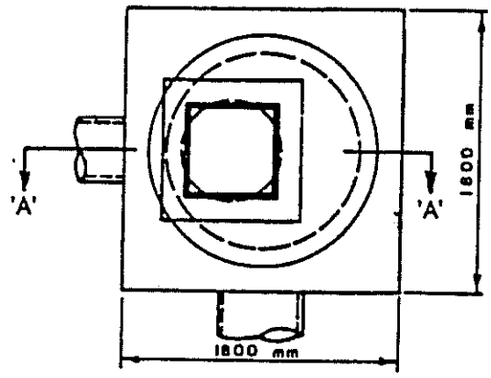


SECTION 'B'-'B'

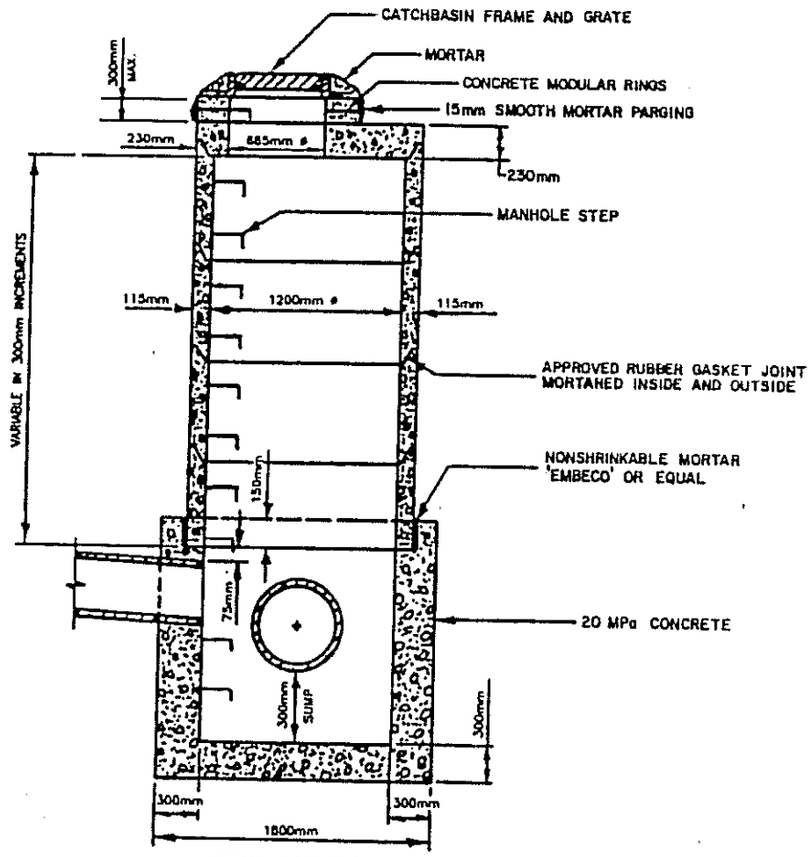
NOTES:

1. MANHOLE STRUCTURE TO BE 20MPa REINF[illegible] CONCRETE WITH 15M DEFORMED STEEL BARS WITH 100mm MINIM[illegible] COVER.
2. PRECAST MANHOLE SECTIONS TO BE MANUF[illegible]RED TO A.S.T.M. SPECIFICATION C-478-M LATEST REVISION.
3. MAXIMUM HEIGHT OF MODULAR RINGS TO BE [illegible]0mm.
4. PRECAST FLAT TOP TO BE USED WHEN TH[illegible]EIGHT OF CHIMNEY IS LESS THAN 1.2m.
5. SAFETY GRATING IS REQUIRED IF MANHOLE IS DEEPER THAN 5.0m.
6. IN ROADWAYS - MANHOLE FRAME AND COVER TO BE SET FLUSH WITH SURFACE OF BASE COURSE ASPHALT. ADJUSTMENT TO FINAL GRADE AT THE TIME OF PLACING OF SURFACE COURSE ASPHALT SHALL BE MADE BY RESETTING THE FRAME.
7. BENCHING OF ALL MANHOLES TO BE AS PER STD. DWG. No. SS-114.
8. OPSD-702.01, 702.02 AND 702.03 MAY BE USED WHEN APPROVED BY THE TOWNSHIP ENGINEER.
9. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
10. FILL JOINTS, LIFTING HOLES AND PIPE CONNECTIONS AND PARGE MODULAR RINGS ON OUTSIDE 15mm THICK WITH 1:3 NON SHRINK MORTAR MIX.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	SEMI-PRECAST CONCRETE MANHOLE (PIPE DIAMETER > 600mm)	DRAWING No. SS-110
DATE OF REVISION APRIL 1990		



PLAN

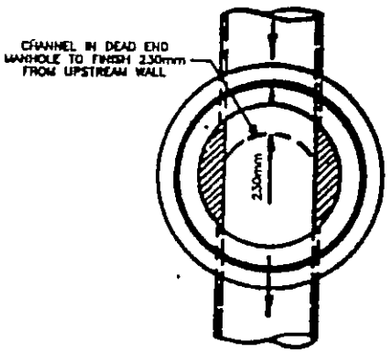


SECTION 'A'-'A'

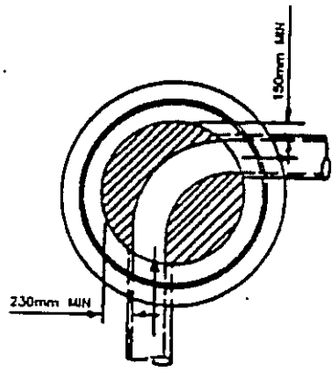
NOTES:

1. PRECAST CONCRETE MANHOLE SECTIONS TO COMPLY WITH CURRENT A.S.T.M. SPECIFICATION C-478-M.
2. MAXIMUM HEIGHT OF MODULAR RINGS TO BE 300mm.
3. ALL PIPES IN AND OUT OF THE MANHOLE TO HAVE CONCRETE BEDDING FROM MANHOLE TO FIRST JOINT.
4. GRANULAR 'C' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES COMPACTED TO 100% STANDARD PROCTOR DENSITY.
5. FILL JOINTS, LIFTING HOLES AND PIPE CONNECTIONS AND PARGE MODULAR RINGS ON OUTSIDE 15mm THICK WITH 1:3 NON SHRINK MORTAR MIX.
6. ALL DIMENSIONS ARE IN MILLIMETRES.
7. ROADWAYS - MANHOLE FRAME AND COVER TO BE SET FLUSH WITH SURFACE OF BASE COURSE ASPHALT. ADJUSTMENT TO FINAL GRADE AT THE TIME OF PLACING OF SURFACE ASPHALT SHALL BE MADE BY RESETTING THE FRAME.

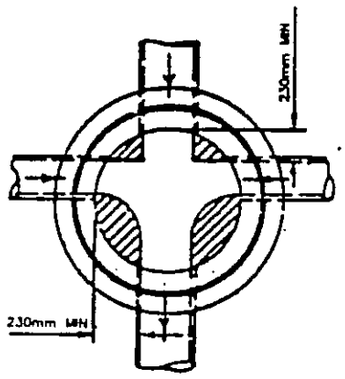
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	SEMI-PRECAST CATCHBASIN MANHOLE NO BENCHING	DRAWING No. SS-112
DATE OF REVISION APRIL 1990		



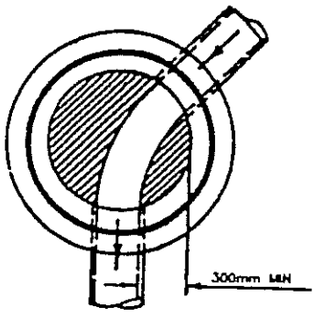
STRAIGHT RUN



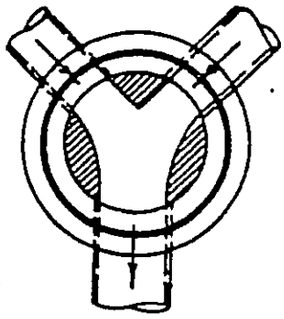
90° BEND



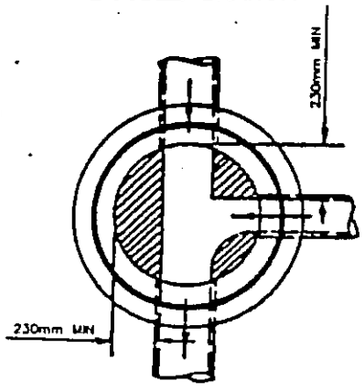
DOUBLE BRANCH



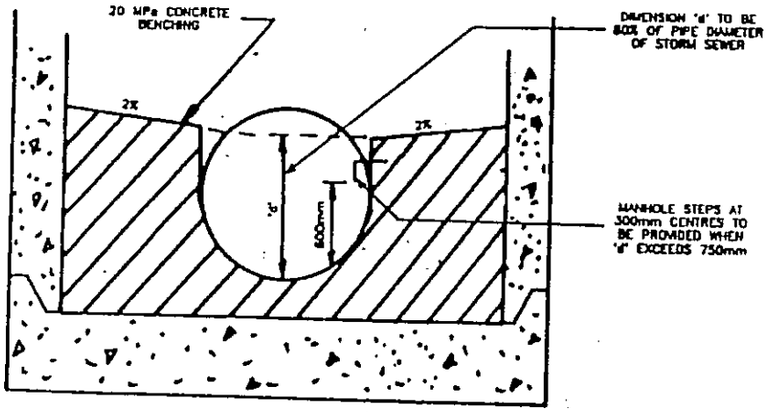
45° BEND

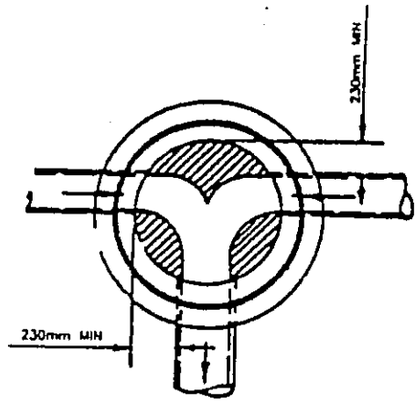


'Y' CONNECTION



SINGLE BRANCH





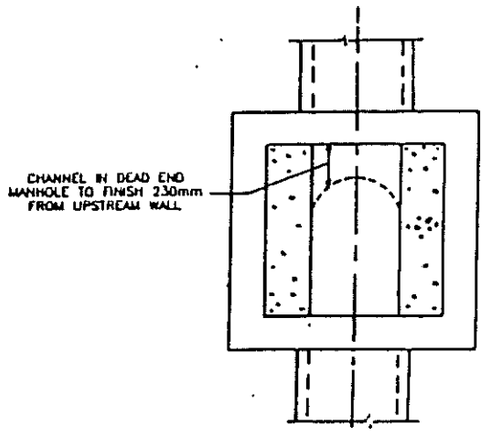
TEE JUNCTION

MAXIMUM PIPE SIZES ALLOWABLE FOR PRECAST MANHOLES						
MANHOLE DIAMETER	1200		1500		1800	
	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET
STRAIGHT RUN	600	600	825	825	1050	1050
45° BEND	525	525	750	750	900	900
90° BEND	450	450	675	675	825	825

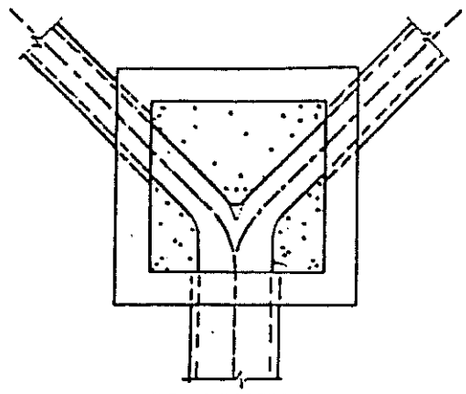
NOTES:

1. 20 MPa CONCRETE BENCHING TO BE FORMED AFTER MANHOLE IS ERECTED.
2. ALL BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. BENCHING TO BE 230mm MINIMUM WIDTH.
4. TO PROVIDE ADEQUATE BENCHING, THE CENTRELINE RADIUS OF THE MANHOLE BENCHING SHALL BE EQUAL TO OR GREATER THAN THE INSIDE DIAMETER OF THE LARGEST PIPE FOR JUNCTION OR TRANSITION MANHOLES WHERE THE CHANGE IN ALIGNMENT EXCEEDS 15%.
5. ALIGNMENT OF SEWER TO EXTEND A MINIMUM OF 150mm INTO MANHOLE BEFORE A CHANGE IN ALIGNMENT BEGINS.
6. THE MAXIMUM ALLOWABLE PIPE SIZES FOR PRECAST MANHOLES PROVIDED IN THE TABLE ARE TO BE USED FOR TRANSITION MANHOLES ONLY. THE SIZE OF MANHOLE REQUIRED FOR 'Y' AND 'T' JUNCTION WILL BE DETERMINED AT THE TIME OF ENGINEERING SUBMISSION.

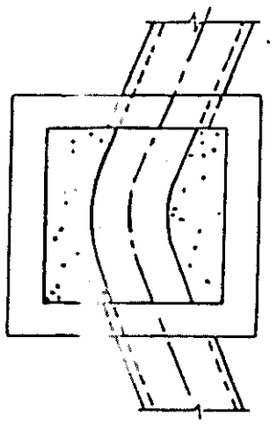
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	BENCHING DETAIL FOR PRECAST CONCRETE MANHOLES	DRAWING No. SS-113
ATE OF REVISION APRIL 1990		



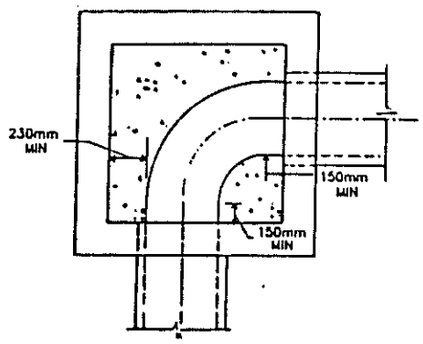
STRAIGHT RUN



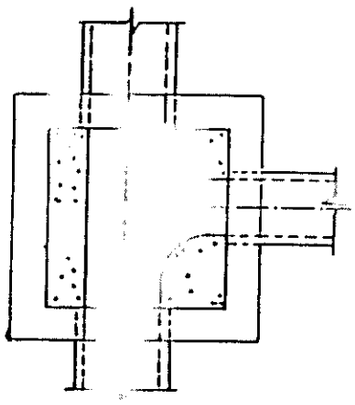
'Y' JUNCTION



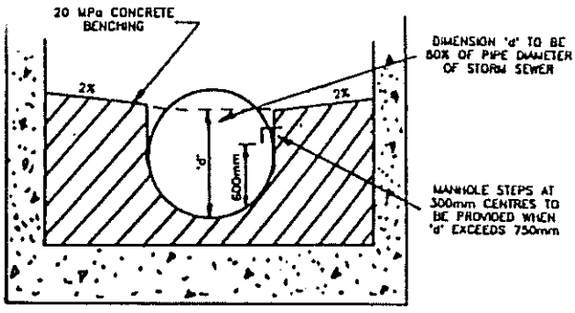
45° BEND



90° BEND



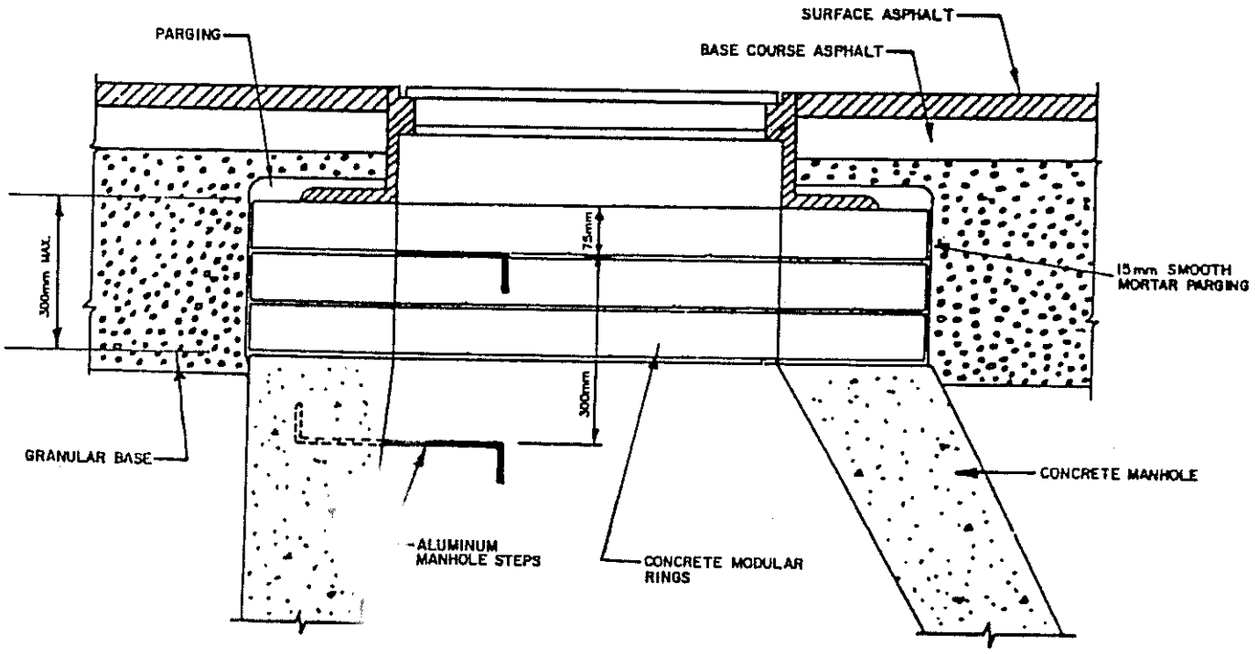
TEE JUNCTION



NOTES:

1. CONCRETE BENCHING TO BE FORMED AFTER MANHOLE ERECTED.
2. BENCHING TO BE SLOPED AT 2% TO CHANNEL.
3. BENCH TO BE 225mm MINIMUM WIDTH.
4. TO PROVIDE ADEQUATE BENCHING, THE CENTRELINE RADIUS OF BENCHING SHALL BE EQUAL TO OR GREATER THAN THE INSIDE DIAMETER OF THE LARGEST PIPE FOR JUNCTION OR TRANSITION MANHOLES WHERE THE CHANGE OF ALIGNMENT EXCEEDS 19 DEGREES.
5. ALIGNMENT OF SEWER TO EXTEND A MINIMUM OF 150mm INTO MANHOLE BEFORE A CHANGE IN ALIGNMENT BEGINS.

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG TYPICAL BENCHING DETAILS FOR SEMI-PRECAST MANHOLES	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-114



NOTES:

1. IN ROADWAYS – MANHOLE FRAME AND CO[illegible] BE SET FLUSH WITH SURFACE OF BASE COURSE ASPHALT. ADJU[illegible] TO FINAL GRADE AT THE TIME OF SURFACE ASPHALT SHALL [illegible]ADE BY RESETTING THE FRAME.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR [illegible].
3. PARGING TO BE 1:3 NON SHRINK MORTAR

PPROVED

EVISION
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TE OF REVISION
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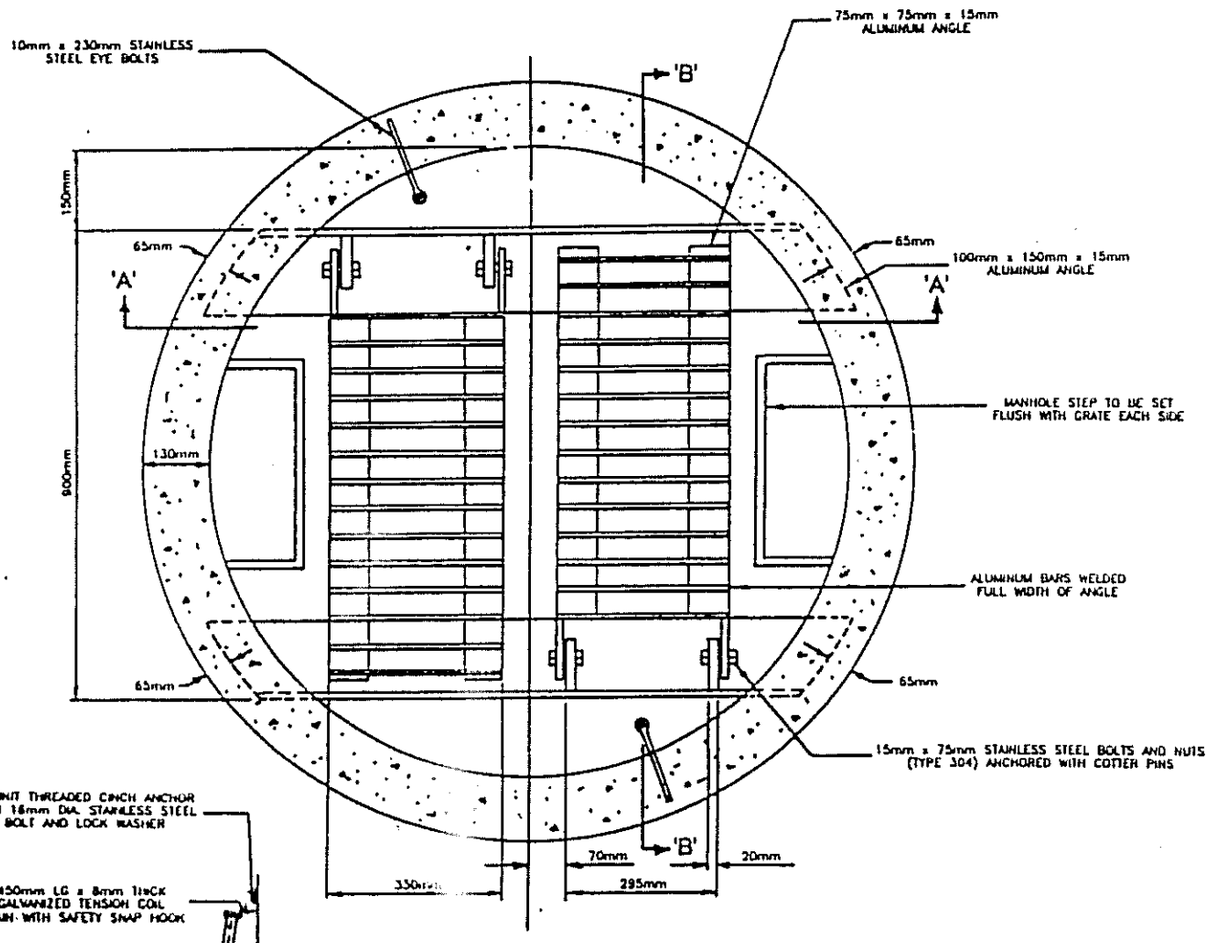
TOWNSHIP OF SCUGOG

DATE OF ISSUE
1980

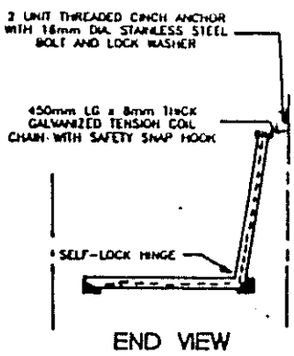
DRAWING No.

MANHOLE ADJUSTMENTS STORM SEWERS

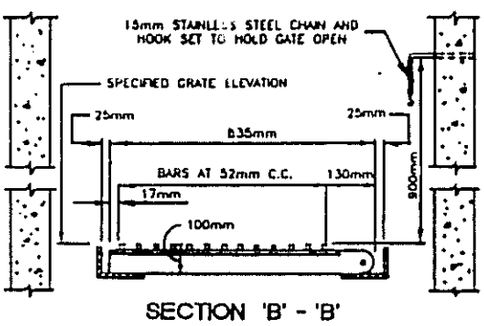
SS-120



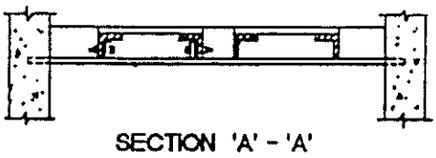
PLAN



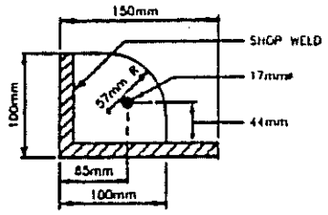
END VIEW
OPEN POSITION

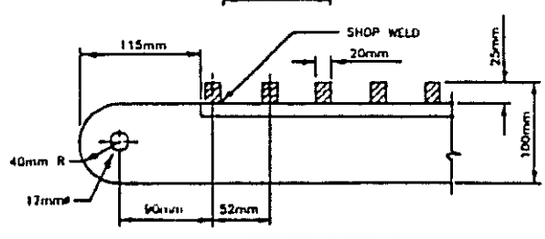


SECTION 'B' - 'B'



SECTION 'A' - 'A'



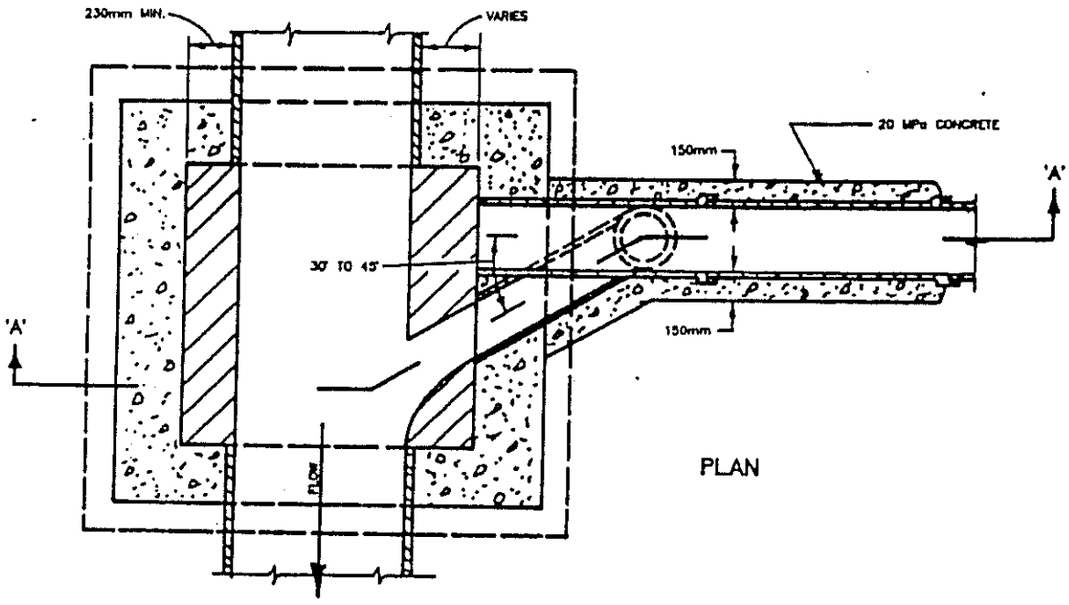


PIVOT DETAIL

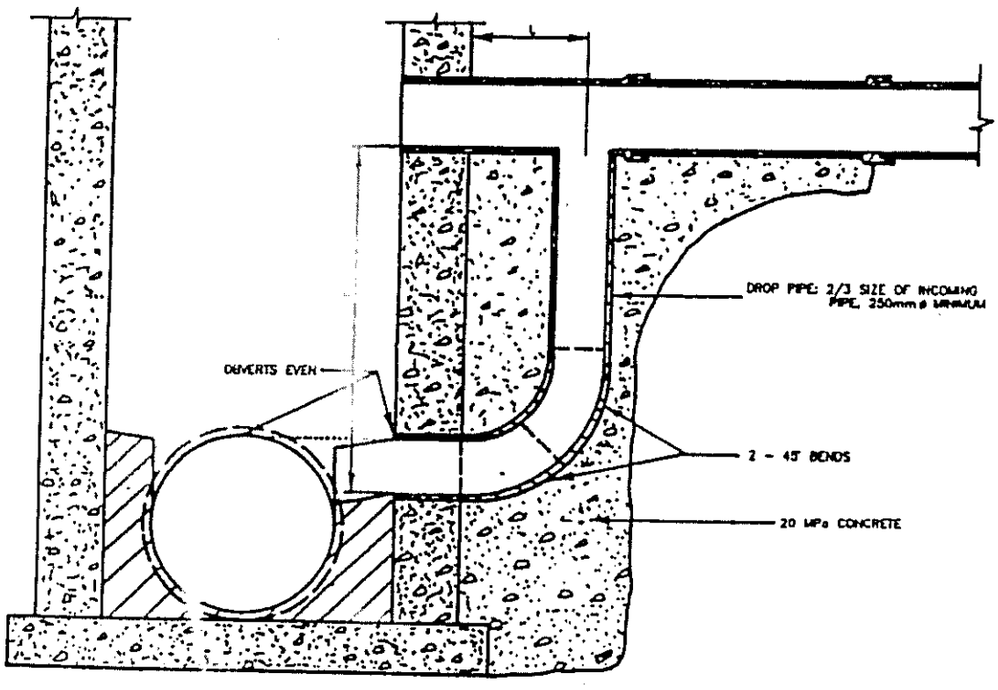
NOTES:

1. ALUMINUM MATERIALS TO CONFORM TO STD. No. 157 C.S.A.
2. ALL 100mm x 15mm ALUMINUM ANGLE SUPPORTS TO BE FACTORY CAST IN PLACE.
3. AT ALL POINTS WHERE ALUMINUM AND CONCRETE SURFACES COME INTO CONTACT (ENDS OF BASE ANGLES), BOTH SURFACES TO BE COATED WITH 2 COATS OF FLINTKOTE C-12 STATIC ASPHALT PAINT OR APPROVED EQUIVALENT.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
5. SAFETY GRATING IS REQUIRED IF MANHOLE IS DEEPER THAN 5.0m.
6. MANHOLE DEPTH BETWEEN 5m AND 10m, GRATE TO BE PLACED AT MID POINT, BETWEEN 10m AND 15m, GRATE PLACED AT THIRD POINTS.
7. OPSD-404.01 AND 404.02 MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	MANHOLE SAFETY GRATING FOR PRECAST CONCRETE MANHOLE	DRAWING No. SS-125
DATE OF REVISION APRIL 1990		



PLAN



SECTION 'A' - 'A'

NOTES:

1. WHEN VALUE OF D IS LESS THAN "D" MINIMUM AS SHOWN IN THE TABLE, USE A 90 DEGREE BEND ON LOWER INCOMING PIPE TO SUIT OUTLET.
2. DROP CONNECTION MUST BE USED WHEN DIFFERENCE IN INVERTS IS 900mm OR GREATER.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
4. WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE OBVERT OF THE INLET AND OUTLET PIPES EXCEED 600mm, A DROP STRUCTURE SHALL BE PLACED ON THE INLET PIPE.

SIZE OF DROP PIPE mm	D MIN. mm	L MIN. mm
250 TO 450	900	600
525	1000	650
600	1100	700
675	1200	750
750	1300	800
825	1400	850
900	1500	900

APPROVED

REVISION
1

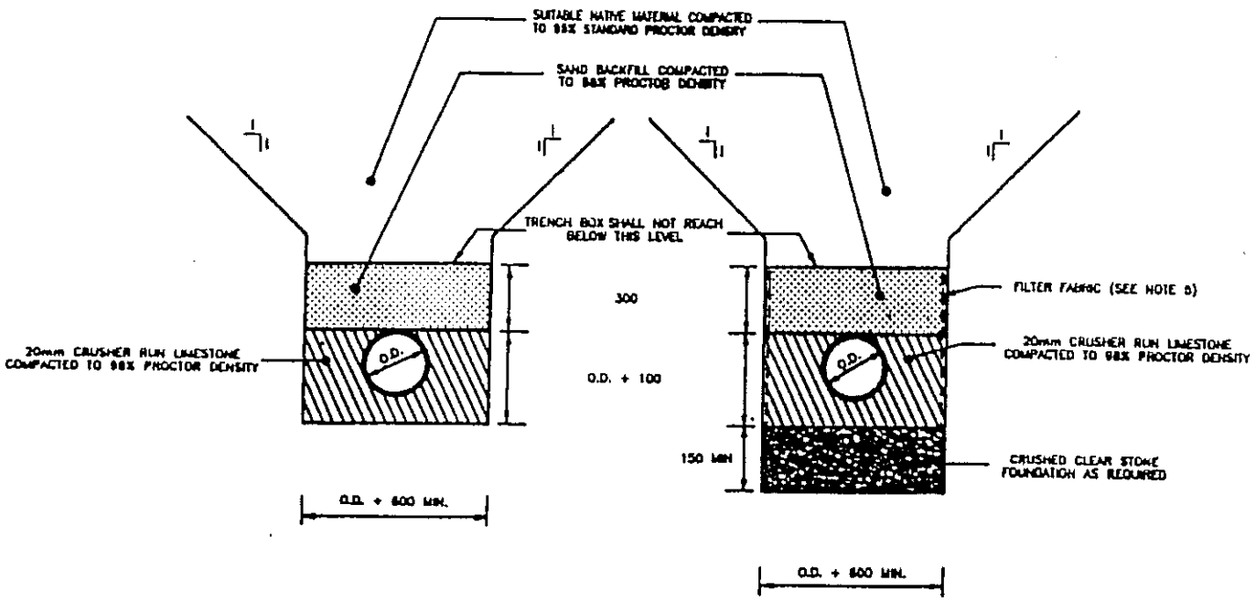
DATE OF REVISION
APRIL 1990

TOWNSHIP OF SCUGOG

DROP STRUCTURE FOR STORM SEWER MANHOLES

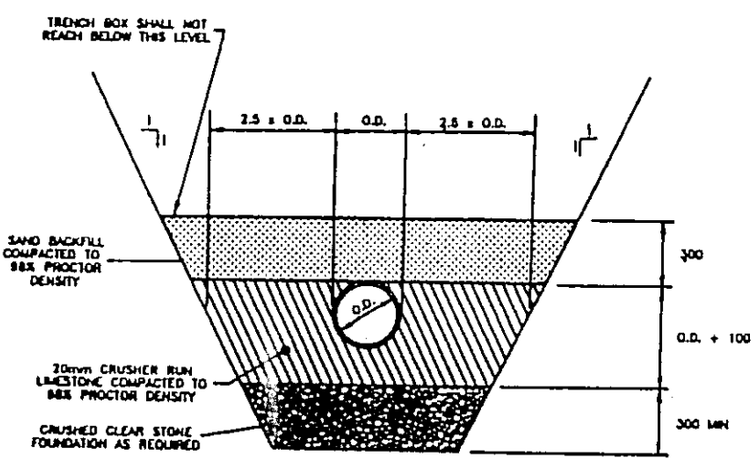
DATE OF ISSUE
1980

DRAWING No.
SS-130



DRY TRENCH

WET TRENCH

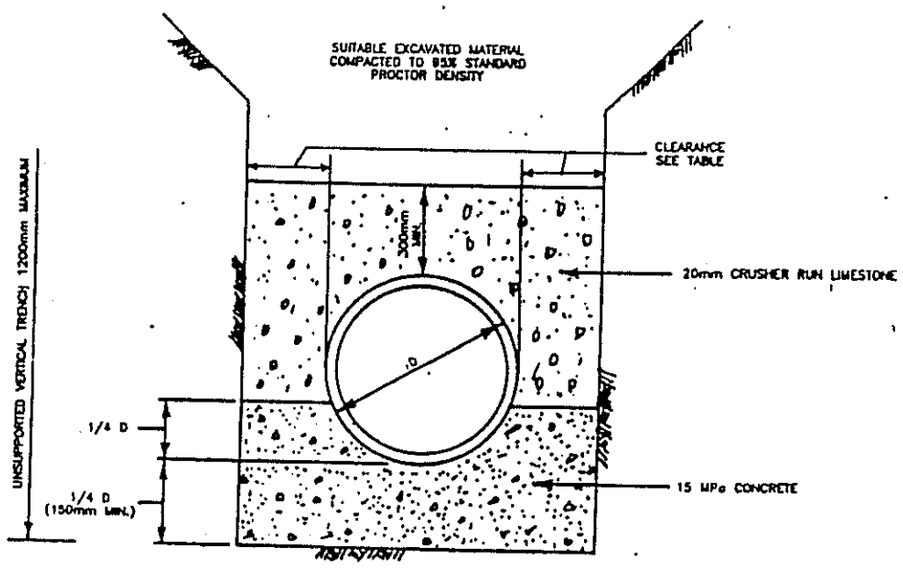


UNSTABLE TRENCH

NOTES:

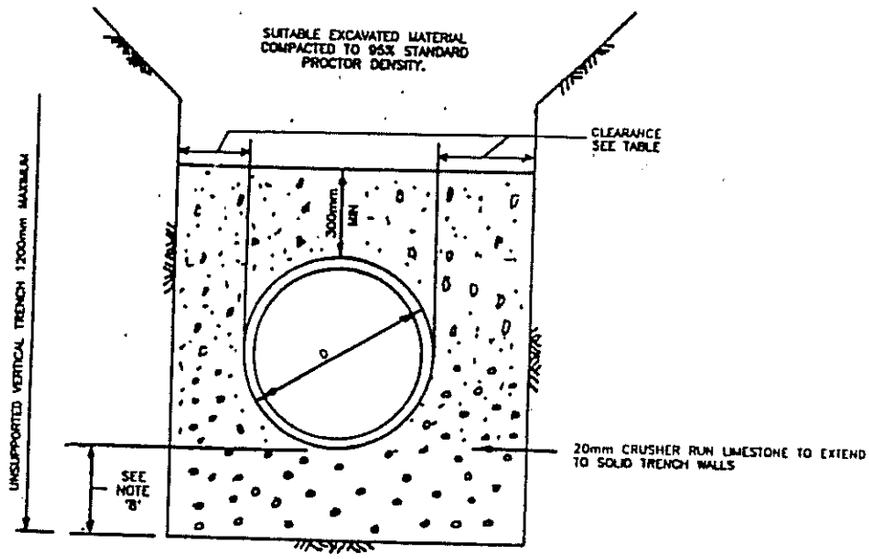
1. BEDDING MATERIALS SHALL BE FULLY EXTENDED AND COMPACTED AGAINST TRENCH WALLS. BEDDING MATERIALS SHALL BE PLACED IN 150mm LAYERS.
2. NO MECHANICAL COMPACTION EQUIPMENT SHALL BE USED ON TOP OF PIPE PRIOR TO PLACING A MINIMUM OF 300mm COVER.
3. PIPE SHALL BE BEDDED TO PROPOSED LINE AND GRADE WITH UNIFORM AND CONTINUOUS SUPPORT FROM BEDDING. BLOCKING WITH ANY HARD OBJECT SHALL NOT BE USED TO BRING THE PIPE TO GRADE.
4. CONCRETE SHALL NOT BE USED IN THE EMBEDMENT ZONE.
5. FILTER FABRIC SHALL BE USED IF GROUND WATER TABLE IS ABOVE THE TRENCH BED OR IF GROUND WATER IS FLOWING INTO THE TRENCH THROUGH THE EMBEDMENT ZONE.
6. ALL DIMENSIONS ARE IN MILLIMETRES.
7. MAXIMUM UNSUPPORTED VERTICAL TRENCH TO BE 1200mm.

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG SEWER BEDDING FOR PLASTIC PIPES	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-132



CONCRETE CRADLE
TYPE '1'

LOAD FACTOR–2.8 FOR UNREINFORCED CONCRETE OR
3.4 FOR REINFORCED CONCRETE



CRUSHED STONE
TYPE '2'

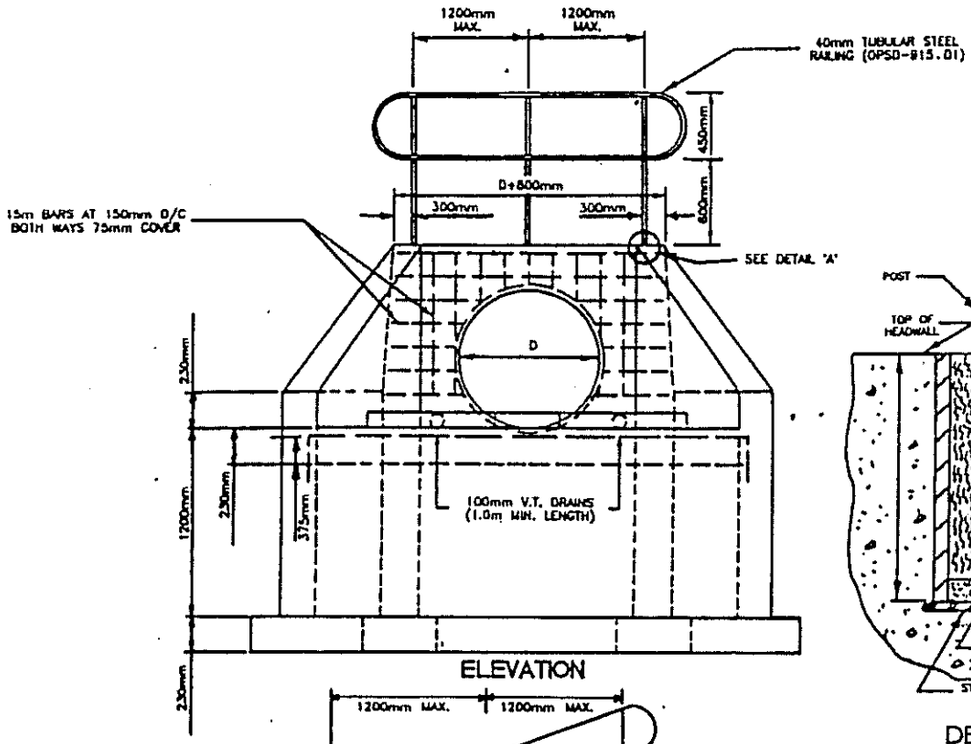
LOAD FACTOR–1.9

PIPE INSIDE DIAMETER (mm)	CLEARANCE (mm)
900 OR LESS	300
OVER 900	500

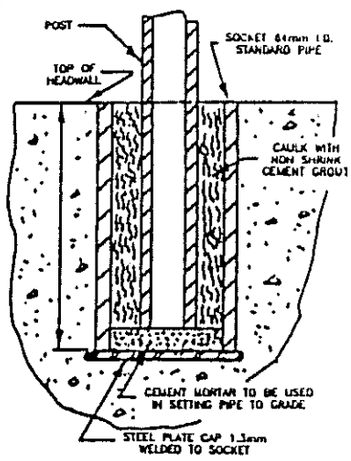
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
2. THE PIPE BED IS TO BE CAREFULLY SHAPED TO RECEIVE THE LOWEST SEGMENT OF THE PIPE.
3. OD IS NOT TO INCLUDE BELL.
4. STONE SIZE WITHIN 300mm OF SURFACE OF THE PIPE SHALL NOT EXCEED 75mm.
5. COMPACTION: TYPE '2' BEDDING – 95% STANDARD PROCTOR DENSITY
6. WHERE THE TRENCH IS SHEATHED, THE TRENCH WIDTH SHALL BE DEFINED AS THE DISTANCE BETWEEN FACES OF THE SHEATHING.
7. THIS STANDARD TO BE APPLIED IN STABLE CONDITIONS OR AFTER TRENCH HAS BEEN BROUGHT TO STABLE CONDITION.
8. THE MINIMUM DIMENSION SHALL BE 0.15D OR 150mm WHICHEVER IS THE GREATER EXCEPT IN AN UNYEILDING FOUNDATION THE MINIMUM DIMENSION SHALL BE 0.25D OR 300mm WHICHEVER IS THE LESSER.

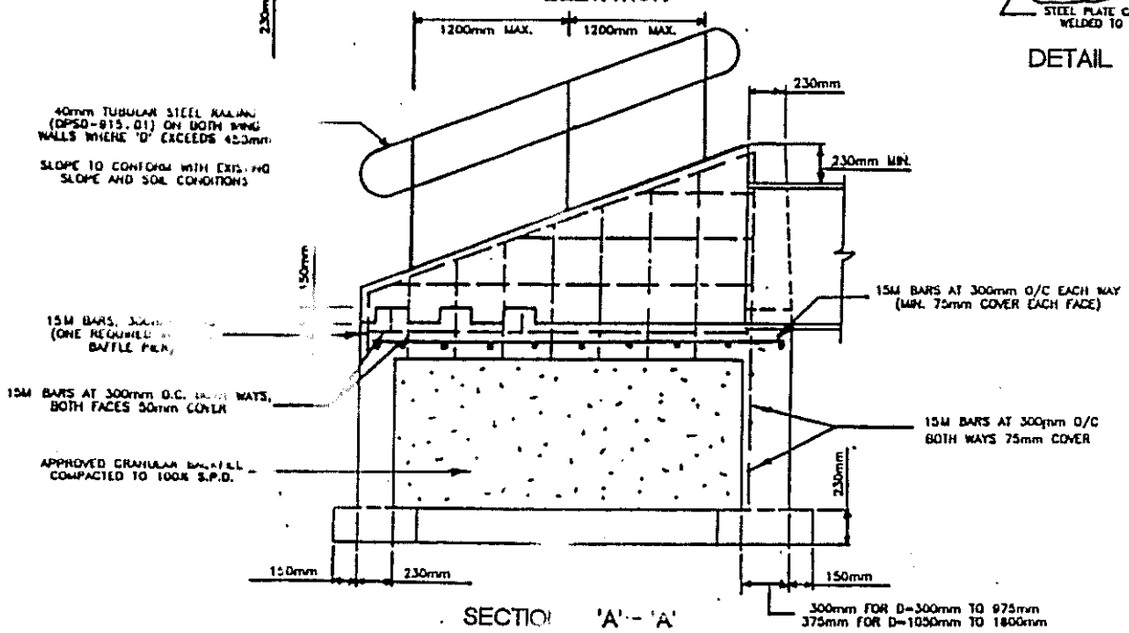
F REVISION L 1990	TOWNSHIP OF SCUGOG SEWER BEDDING RIGID PIPES	DATE OF ISSUE 1980 DRAWING No. SS-135



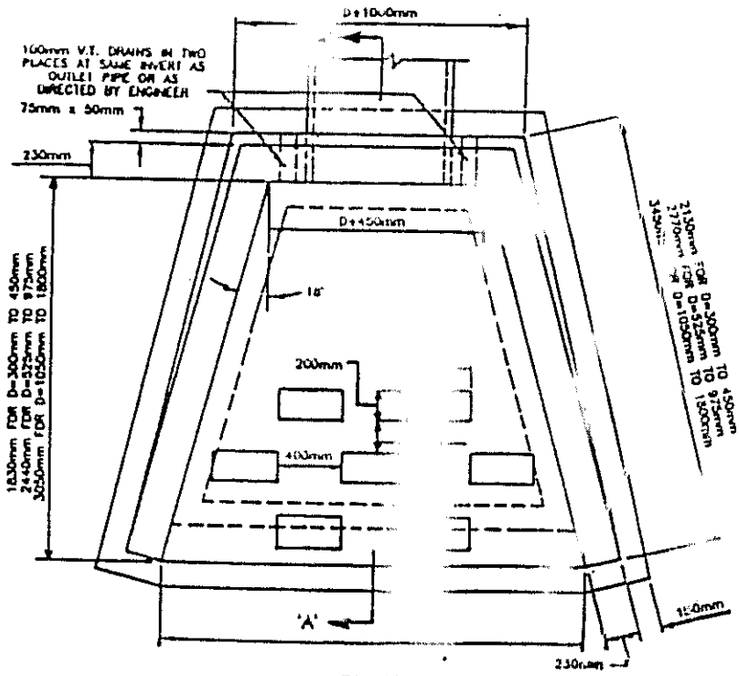
ELEVATION



DETAIL 'A'



SECTION 'A'-'A'



PLAN

NOTES:

1. ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 20 MPa AT 28 DAYS, 20mm MAXIMUM AGGREGATE SIZE, 5-7% AIR ENTRAINMENT.
2. ALL EXPOSED EDGES TO BE CHAMFERED 25mm.
3. REINFORCING STEEL TO BE HARD GRADE DEFORMED BARS AND SHALL COMPLY WITH C.S.A. STANDARD G.301.
4. CONCRETE FOOTINGS TO POURED ON ALL FOUR SIDES OF HEADWALL.
5. BAFFLE PIERS TO BE CONSTRUCTED WHEN WARRANTED. NUMBER AND ARRANGEMENT TO BE CONFIRMED BY DESIGNER.
6. ALL HEADWALLS ARE TO HAVE GRATINGS.
7. ALL DIMENSIONS ARE IN MILLIMETRES.
8. OPSD-804.04 MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.

D PIPE SIZE (mm)	300	375	450	525	600	675	750	825	900	975	1050	1200	1350	1500	1650	1800
W (mm)	1725	1600	1875	2310	2390	2460	2540	2615	2660	2770	3150	3300	3450	3600	3760	3910

APPROVED

REVISION 1

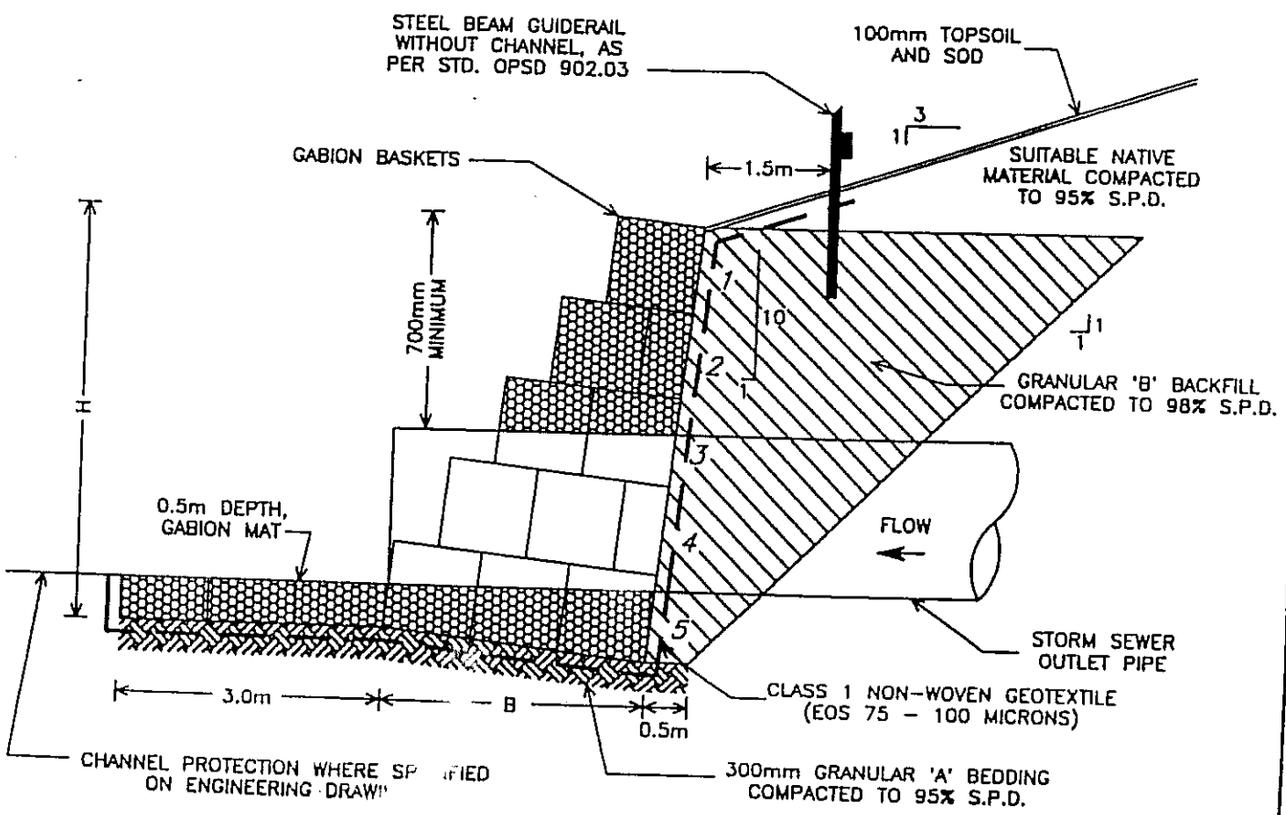
DATE OF REVISION APRIL 1990

TOWNSHIP OF SCUGOG

STORM SEWER HEADWALL

DATE OF ISSUE 1980

DRAWING No. SS-140

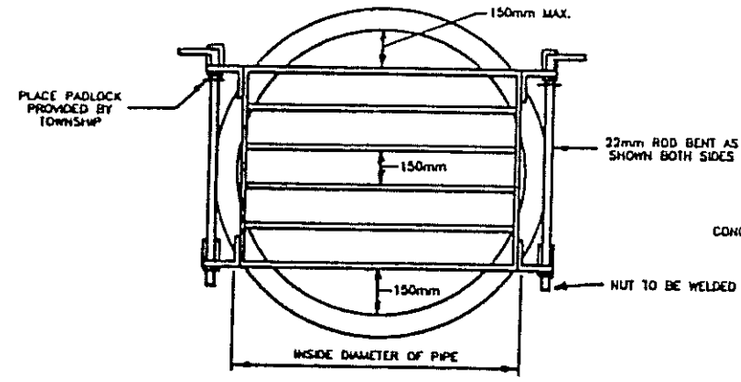


No. OF COURSES	H (m)	B (m)	OUTLET PIPE DIAMETERS (mm)	STEEL BEAM GUIDERAIL REQUIRED
1	1.0	1.0	---	
2	2.0	1.5	TO 750	
3	3.0	2.0	TO 1800	X
4	4.0	2.5	1950 TO 2700	X
5	5.0	3.0	OVER 2700	X

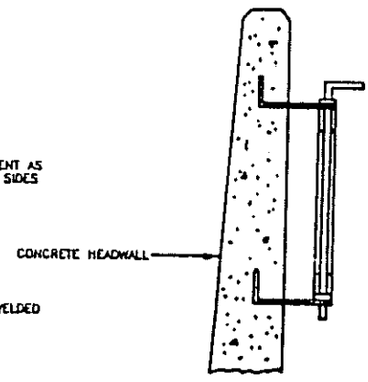
NOTES:

1. LENGTH OF GABION WALL STRUCTURE TO BE IDENTIFIED ON ENGINEERING DRAWINGS.
2. LENGTH OF GUIDERAIL PROTECTION TO BE IDENTIFIED ON ENGINEERING DRAWINGS.
3. GABION CONSTRUCTION SHALL BE IN ACCORDANCE WITH OPSS 511 LATEST REVISION.

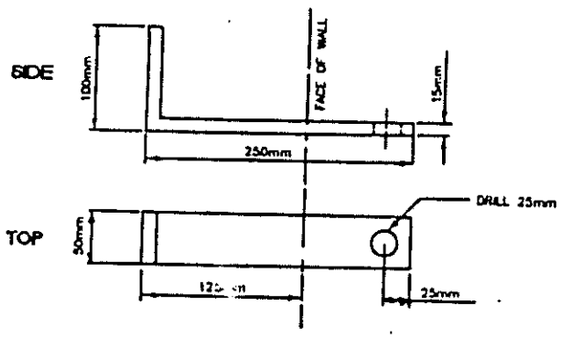
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG GABION HEADWALL FOR STORM SEWER OUTLETS	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-141



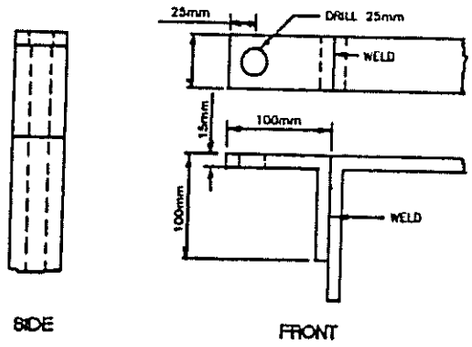
FRONT



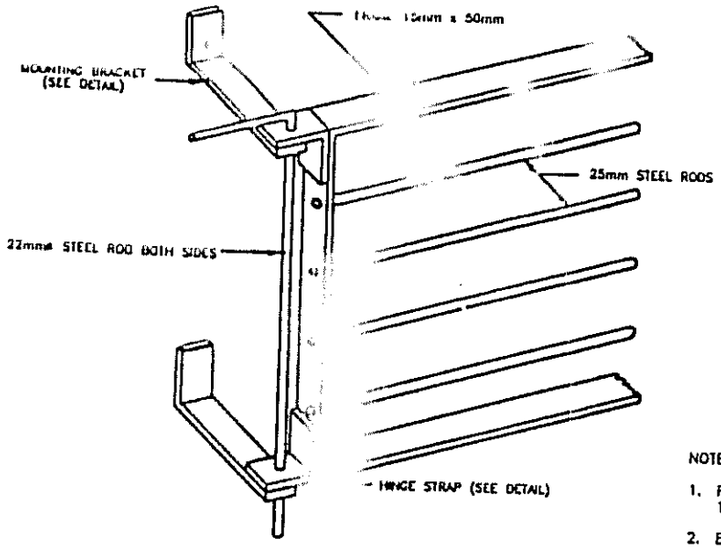
SIDE



DETAIL OF MOUNTING BRACKET



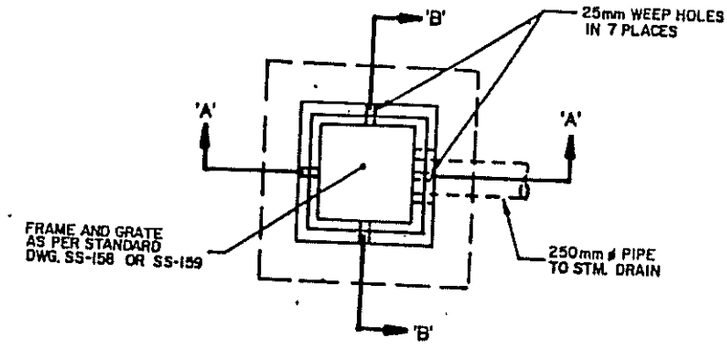
DETAIL OF HINGE STRAP



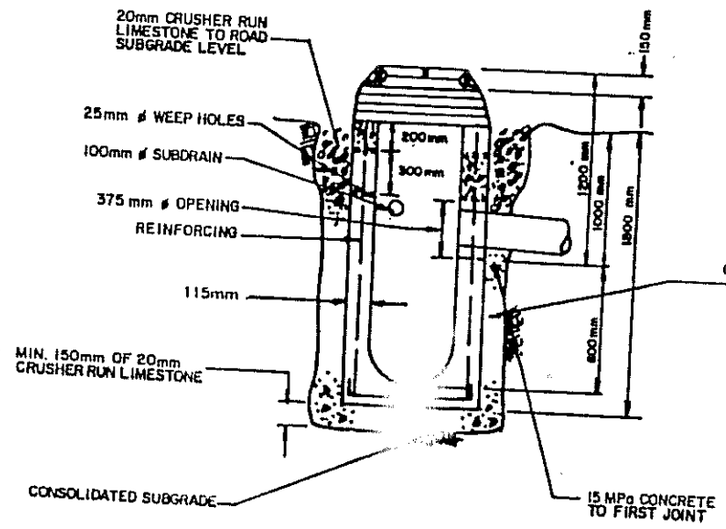
NOTES:

1. FRAME, HINGE STRAPS, AND MOUNTING BRACKETS TO BE 15mm x 50mm MEDIUM STEEL.
2. BARS TO BE 25mm STEEL.
3. MOUNTING BRACKETS TO BE PLACED WHEN POURING HEADWALL.
4. GRATINGS TO BE HOT GALVANIZED AFTER FABRICATION.
5. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
6. NUT TO BE WELDED ON HINGE SIDE OF STEEL ROD.
7. OUTSIDE ROD TO BE PROVIDED WITH PADLOCK.
8. OPSD-804.05 MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.

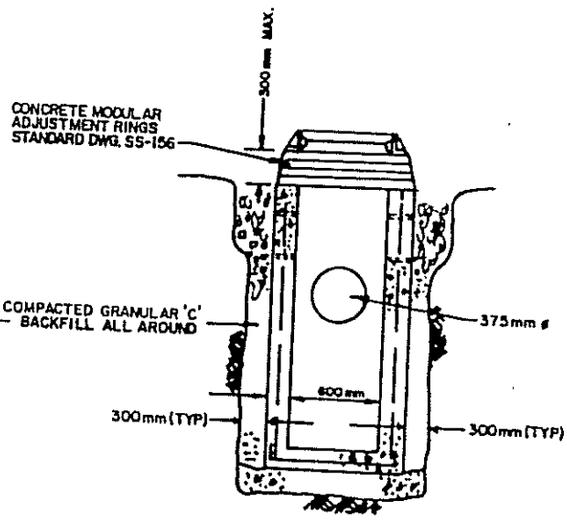
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	HEADWALL GRATE	DRAWING No. SS-145
DATE OF REVISION APRIL 1990		



PLAN



SE 'A' - 'A'

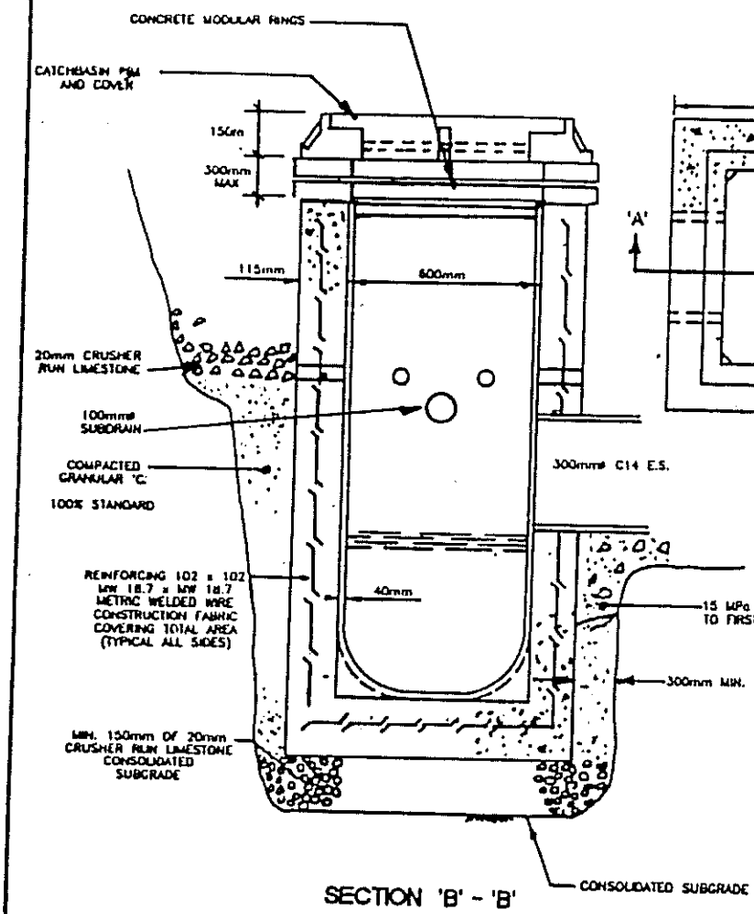


SECTION 'B' - 'B'

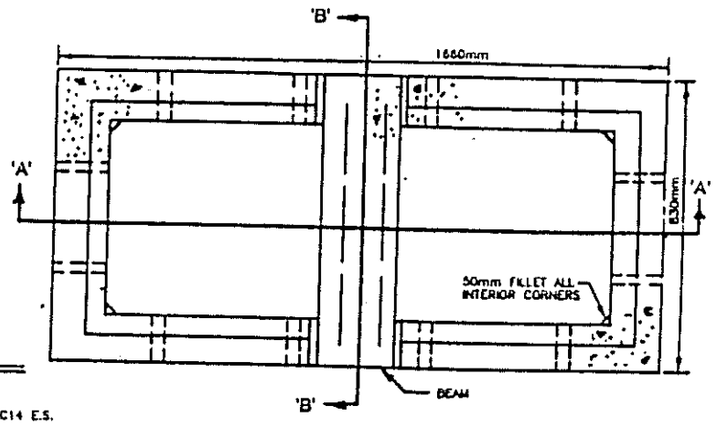
NOTES:

1. TOP OF PRECAST SECTI... ...E SET 300mm BELOW FINAL RIM ELEVATION. ADJUSTMENT TO FINAL ELEVATION SHALL BE AS ...TANDARD DRAWING SS-156.
2. CATCHBASIN TO BE BACK... ...WITH APPROVED GRANULAR "C" MATERIAL TO THICKNESS OF 300mm ON ALL SIDES.
3. ALL CONCRETE WORK TO ... ...RM TO THE REQUIREMENT OF OPSS 1350 CLASS OF CONCRETE: 30 MPa WITH 5% TO 7% ...TRAINMENT.
4. WIRE MESH 100mm AND ... ... 6/6 GAUGE.
5. WEEP HOLES SHALL PLAC... ...THAT THE BOTTOM OF THE WEEPER ON THE INSIDE AND THE TOP OF THE WEEPER ON THE OUTSIDE ... ...EVEL.
6. HINGE OF GRATE SHALL BE ...ALLEL AND ADJACENT TO CURB LINE.
7. MAXIMUM DEPTH ALLOWAN... ...R CATCHBASIN - 3.5m.
8. CATCHBASIN FRAME AND G... ...TO BE 600mm SQUARE.
9. ALL LIFT HOLES TO BE M... ...D INSIDE AND OUTSIDE.
10. CATCHBASIN INLET COTROL... ...BE MANUFACTURED BY SCEPTER MANUFACTURING, CROMIC ENTERPRISES, EZ-FLOW HOODS OR APPR... EQUAL.
11. THE INVERT OF THE SUBDR... ...O MATCH THE OBVERT OF THE CATCHBASIN LATERAL.
12. OPSD. 705.02 TYPE "A" MA... ...USED WHEN APPROVED BY TOWNSHIP ENGINEER.

APPROVED ...ISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
E OF REVISION	SINGLE PRECAST CATCHBASIN	DRAWING NO. SS-151



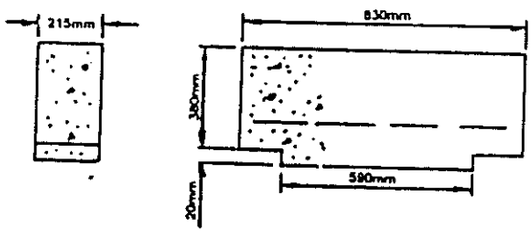
SECTION 'B' - 'B'



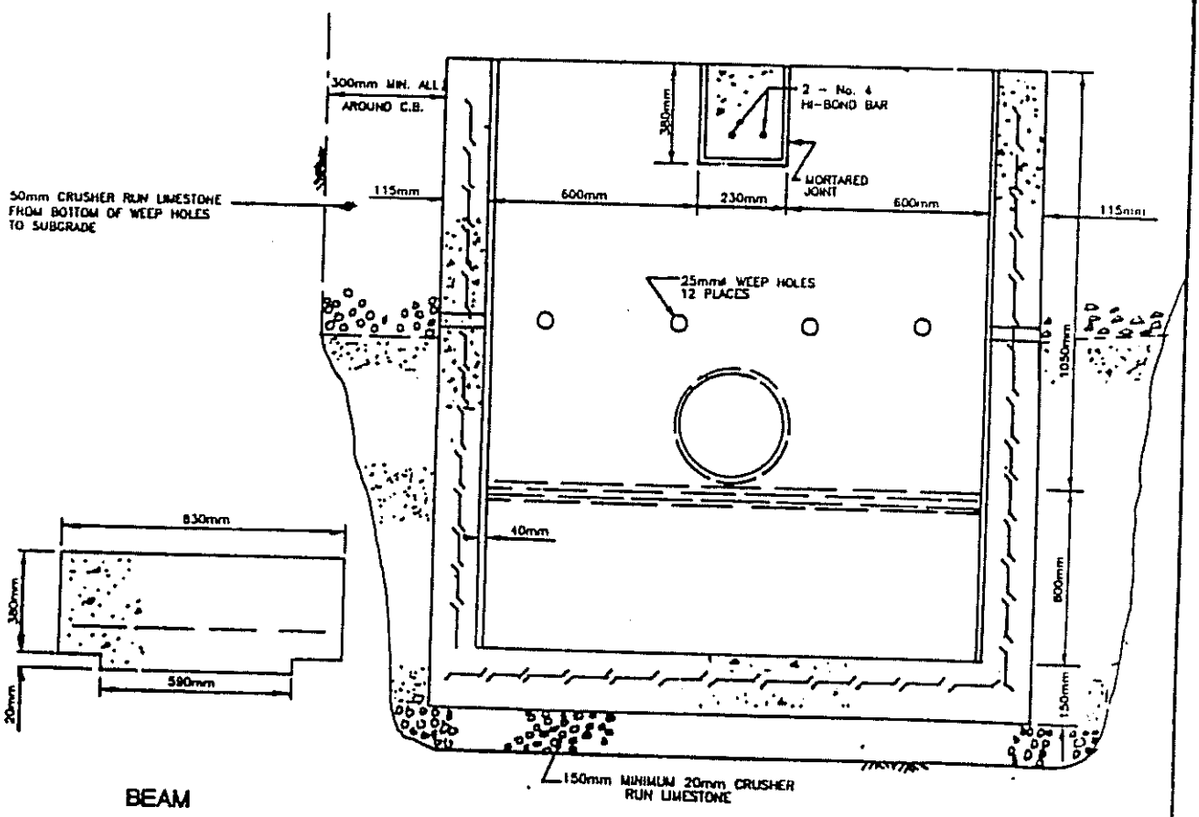
PLAN VIEW
GRATES REMOVED.

NOTES:

1. THE INVERT OF SUBDRAINS TO MATCH THE OBVERT OF THE CATCHBASIN LATERAL..
2. HINGE ON GRATE SHALL BE PARALLEL AND ADJACENT TO CURB LINE.
3. ALL CONCRETE WORK TO CONFORM TO THE REQUIREMENTS OF OPSS 1350.
4. ALL DIMENSIONS ARE IN MILLIMETRES.
5. OPSD-705.01 MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.
6. CONCRETE TO BE 25 MPa WITH 5-7% AIR ENTRAINMENT.
7. LIFT HOLES SHALL BE GROUT FILLED WITH CEMENT MORTAR PRIOR TO PLACING GRANULAR BACKFILL.

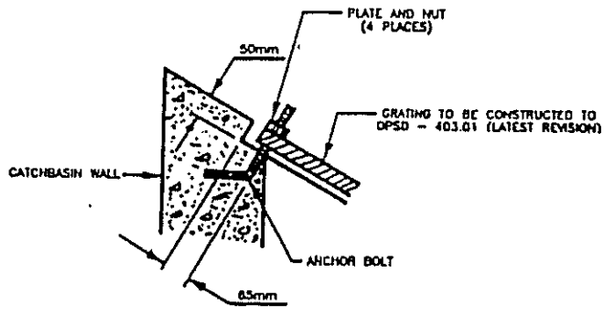


BEAM

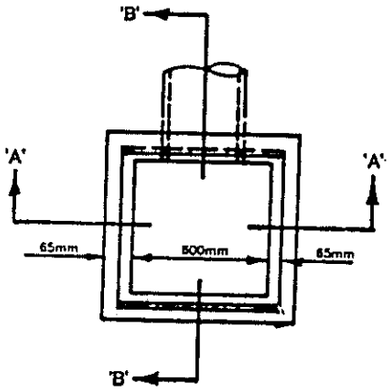


SECTION 'A' - 'A'

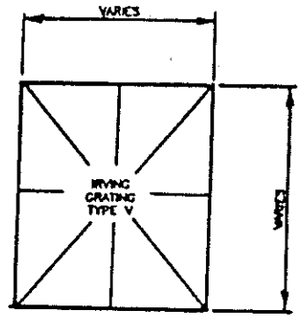
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	DOUBLE PRECAST CATCHBASIN	DRAWING No. SS-152
DATE OF REVISION APRIL 1990		



DETAIL 'A'



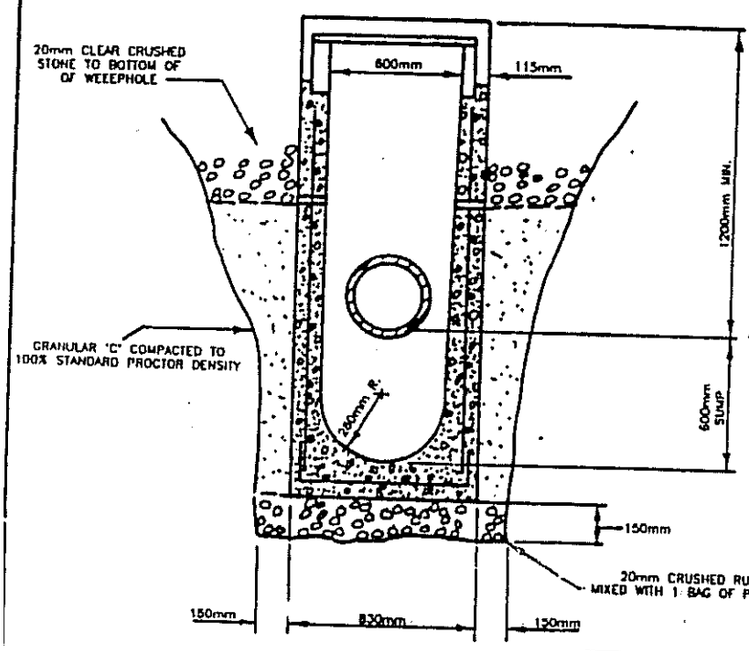
PLAN



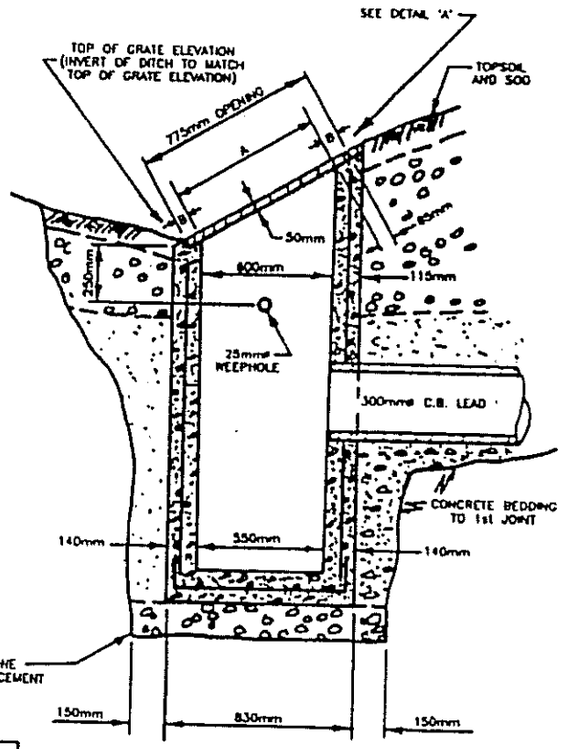
GRATING

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL LIFT HOLES TO BE MORTARED INSIDE AND OUTSIDE.
3. ALL CONCRETE WORK TO CONFORM TO THE REQUIREMENTS OF OPSD-1350.
4. OPSD-705.02 TYPE "B" MAY BE USED WHEN APPROVED BY TOWNSHIP ENGINEER.
5. FOR DITCH INLET SPACING CALCULATIONS, THE WORKING CAPACITY Q/W SHOULD NOT BE MORE THAN 0.5 TIMES THE CHART CAPACITY Q1. (REFERNECE M.T.O. DRAINAGE MANUAL VOLUME E3-26)



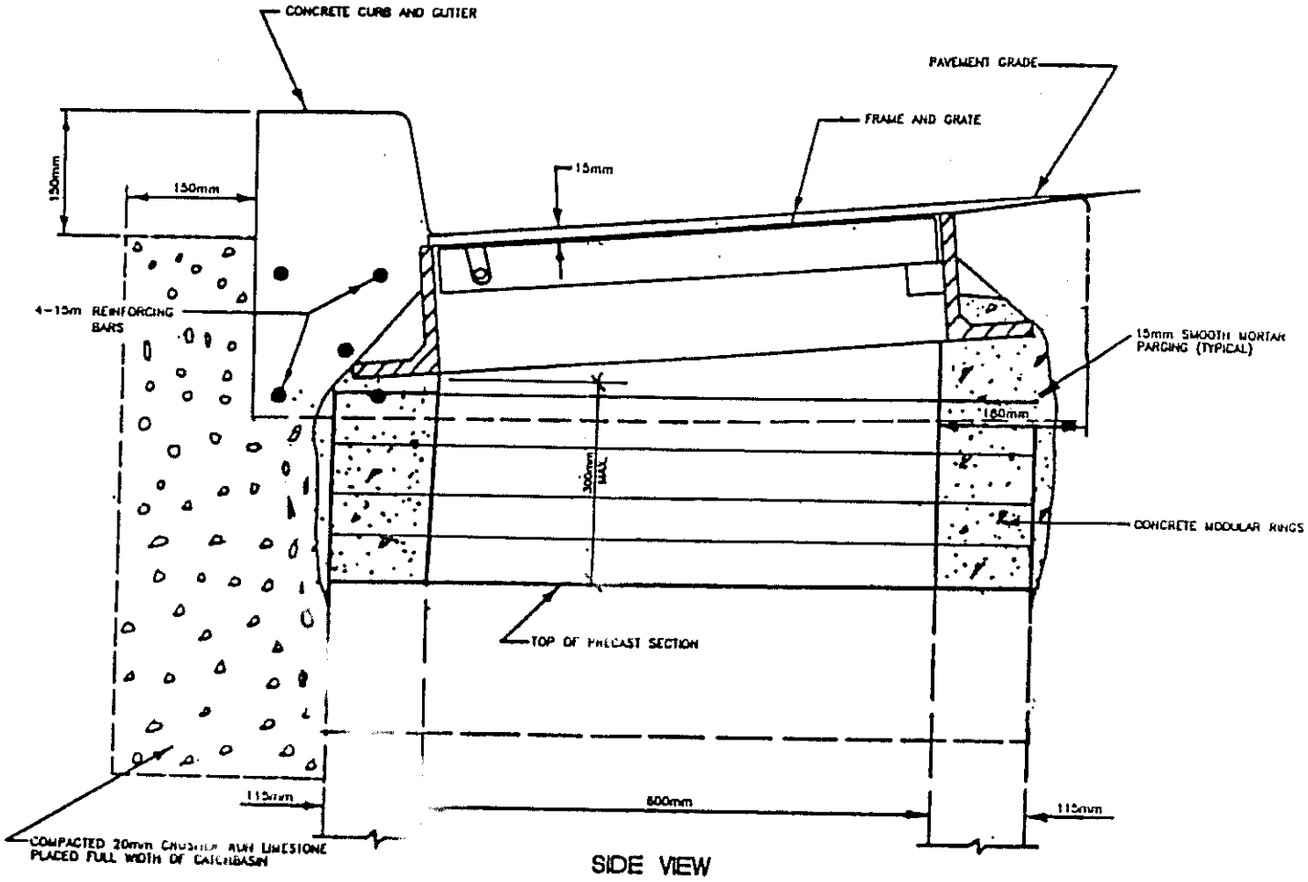
SECTION 'A' - 'A'



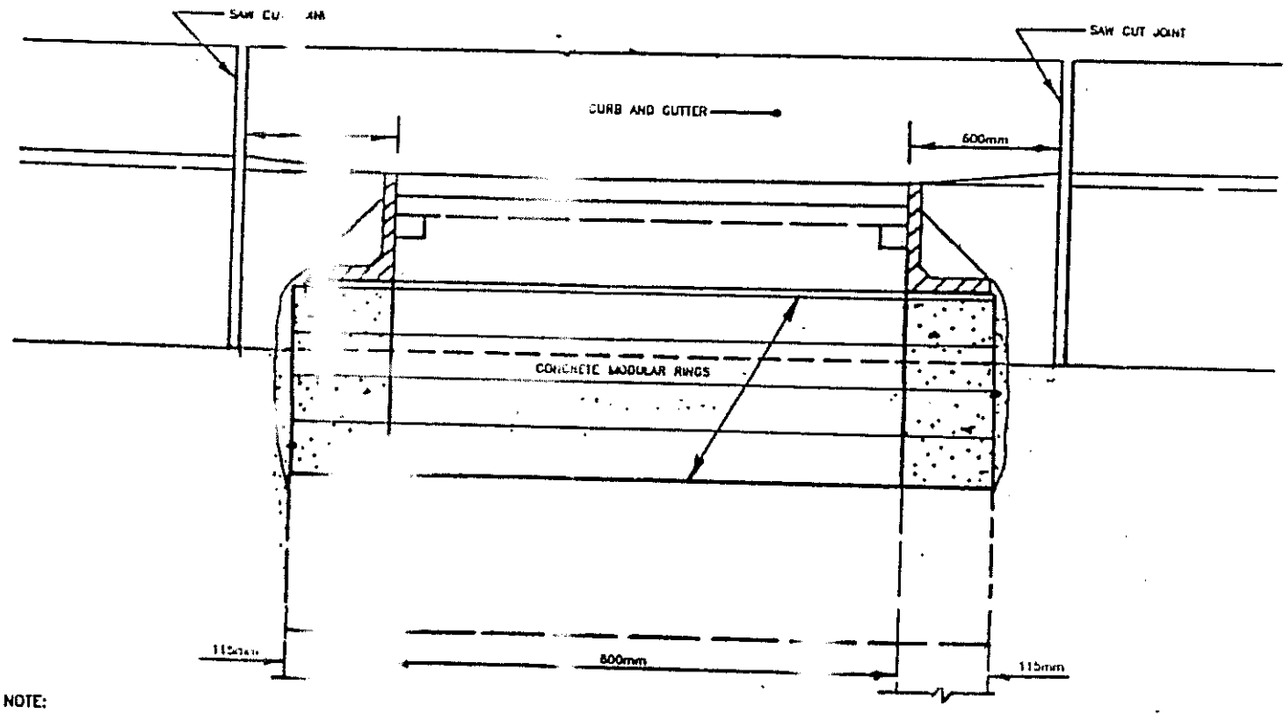
SECTION 'B' - 'B'

SLOPE OF GRADING	DIMENSIONS	
	A	B
2:1	675	50
3:1	645	65
4:1	625	75
6:1	605	85
8:1	605	85
10:1	605	85

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	SLANT TOP CATCHBASIN	DRAWING No. SS-155
DATE OF REVISION APRIL 1990		



SIDE VIEW

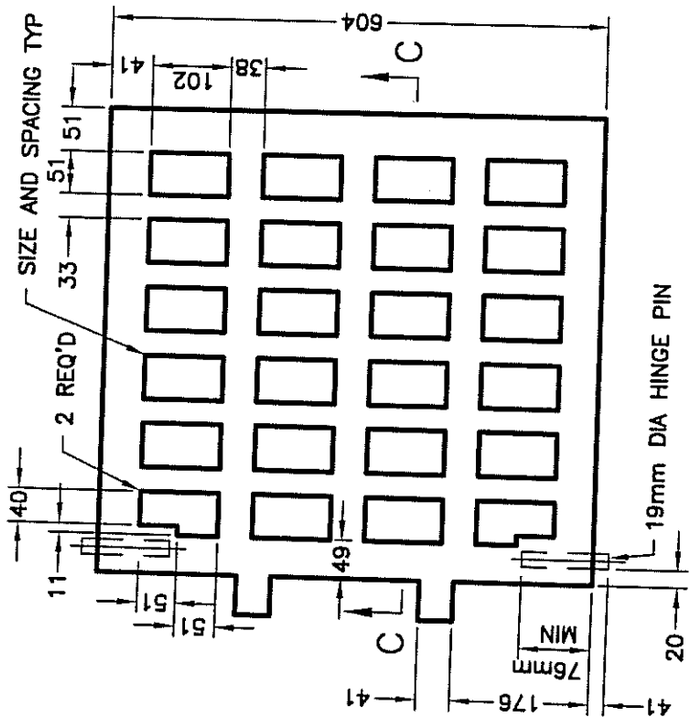


FRONT VIEW

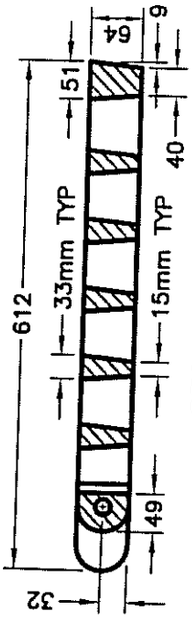
NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETRES.

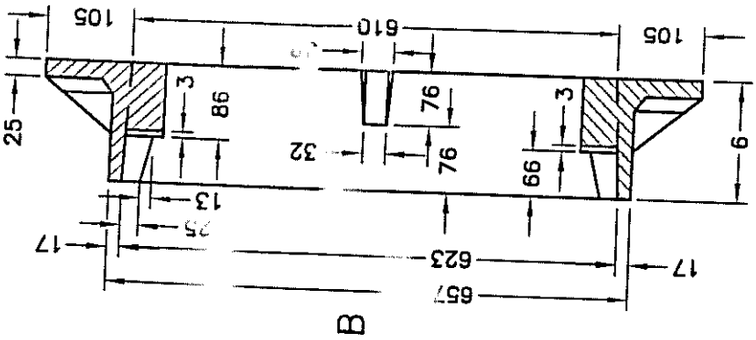
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE JUNE, 1989
REVISION 1	ADJUSTMENT OF CATCHBASINS	DRAWING No. SS-156
DATE OF REVISION APRIL 1990		



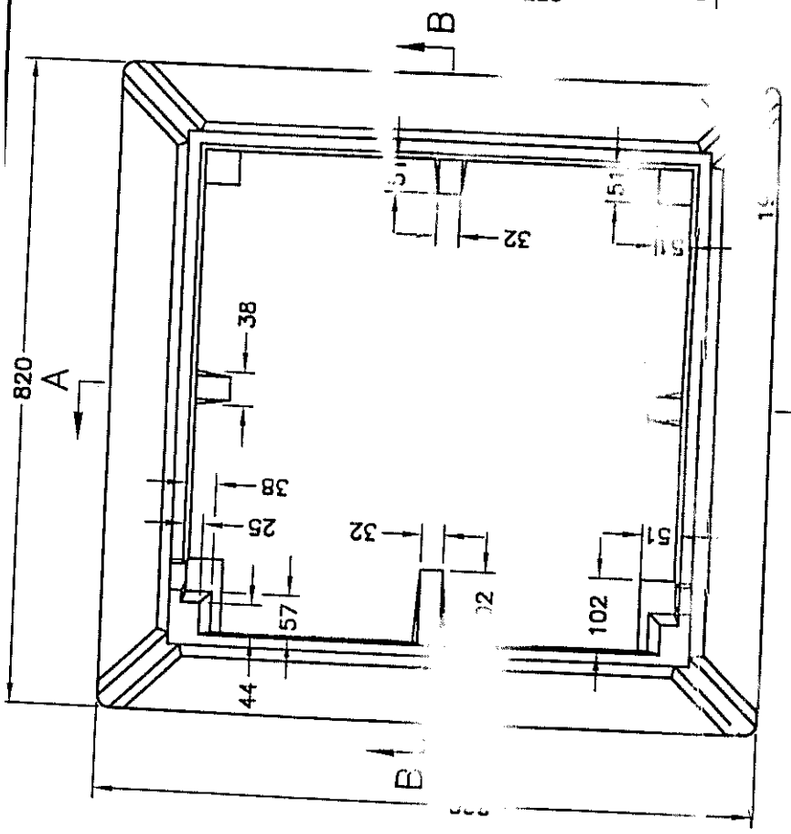
FRAME PLAN



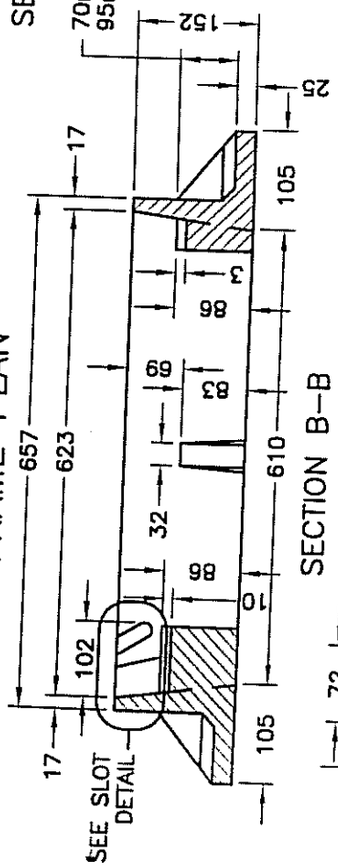
SECTION C–C



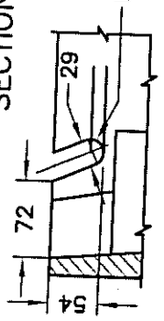
SECTION A–A



FRAME PLAN



SECTION B–B

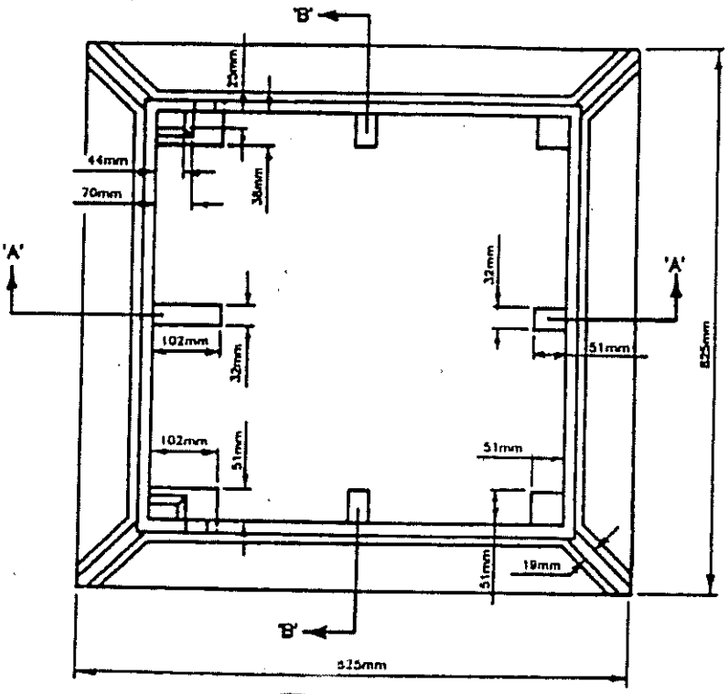


SLOT DETAIL

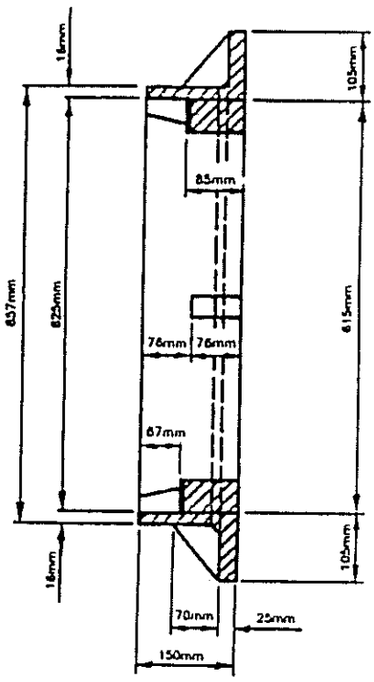
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

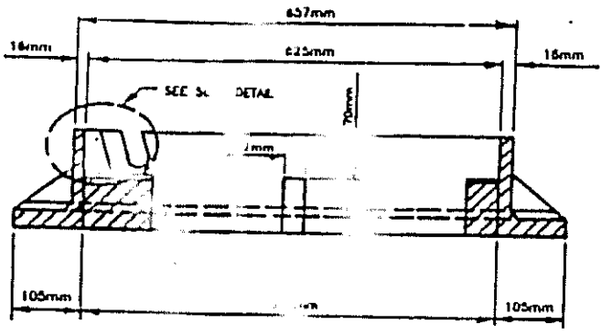
ROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
SION		
OF REVISION AY 2003	CATCHBASIN FRAME AND GRATE FLAT TOP	DRAWING No. SS–158



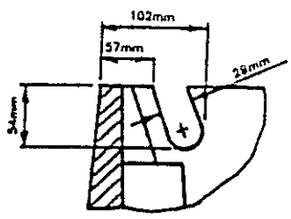
FRAME PLAN



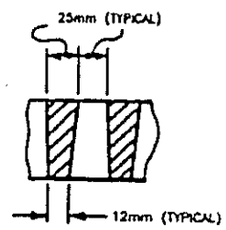
SECTION 'B' - 'B'



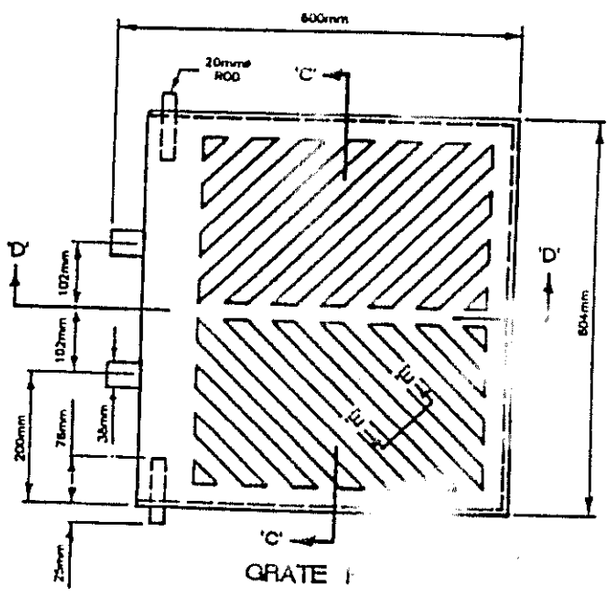
SE ION 'A' - 'A'



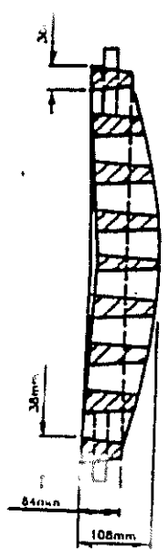
SLOT DETAIL



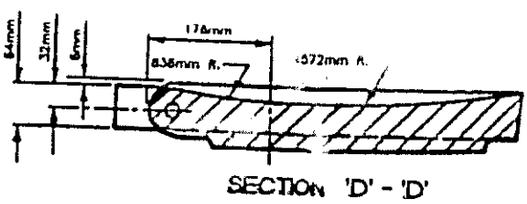
SECTION 'E' - 'E'



GRATE



SECTION 'C'



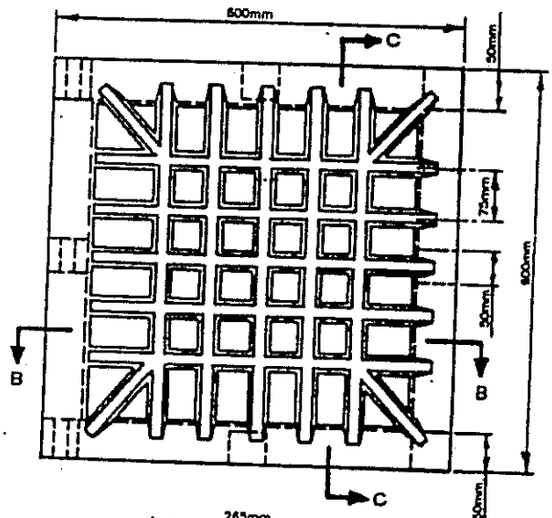
SECTION 'D' - 'D'

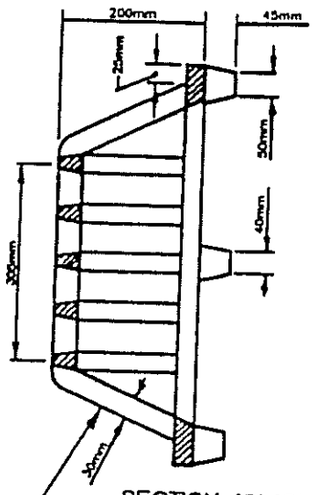
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. DISHED CATCHBASIN FRAME AND GRATE TO BE USED IN ALL ROADWAYS.

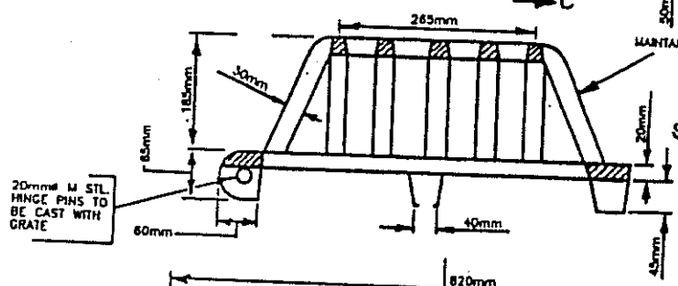
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	CATCHBASIN FRAME AND GRATE DISHED WITH LUGS	DRAWING No. SS-159
DATE OF REVISION APRIL 1990		

GRATE PLAN

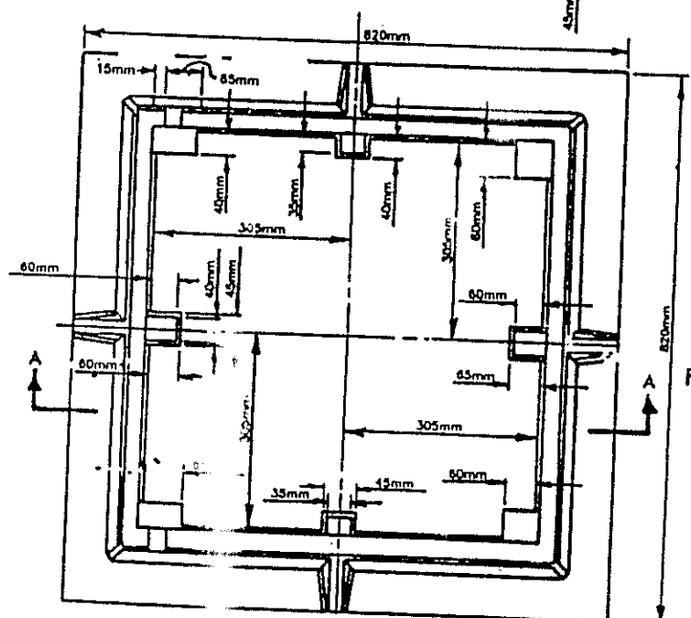




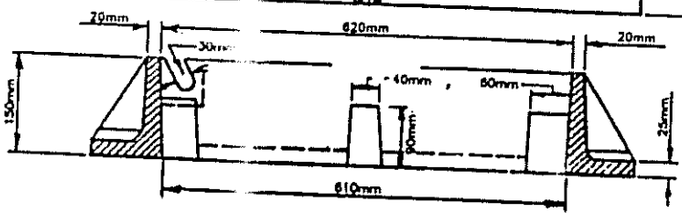
SECTION 'C'-'C'



SECTION 'B'-'B'



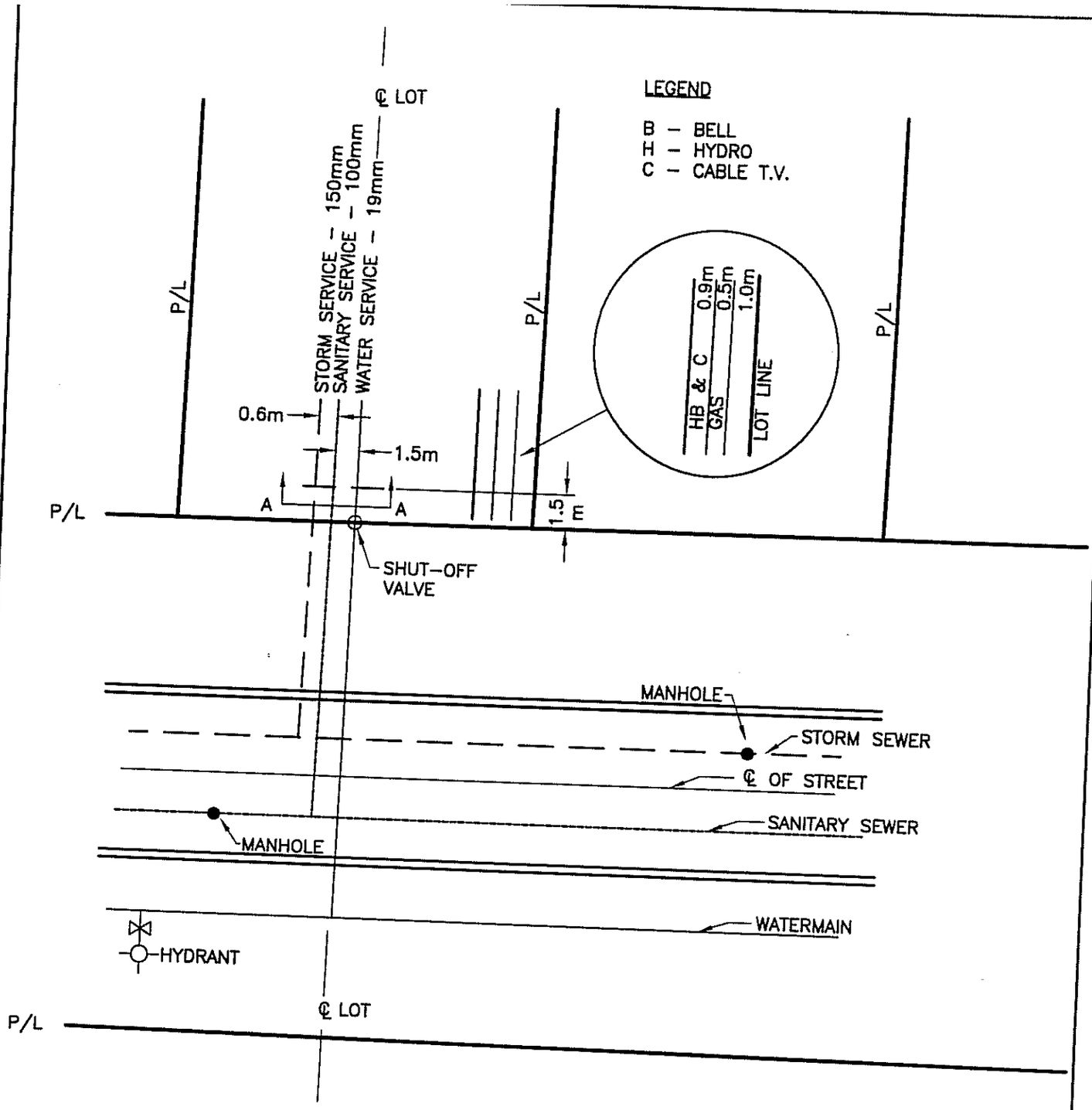
FRAME PLAN

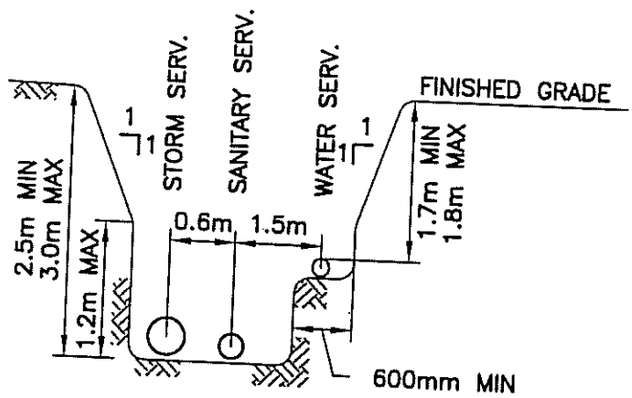


SECTION 'A'-'A'

NOTE:
ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED AND ARE SUBJECT TO MANUFACTURERS TOLERANCES.

ROVED ISION OF REVISION	TOWNSHIP OF SCUGOG CATCHBASIN FRAME AND GRATE REAR LOT-PYRAMIDAL	DATE OF ISSUE 1980 DRAWING No. SS-160



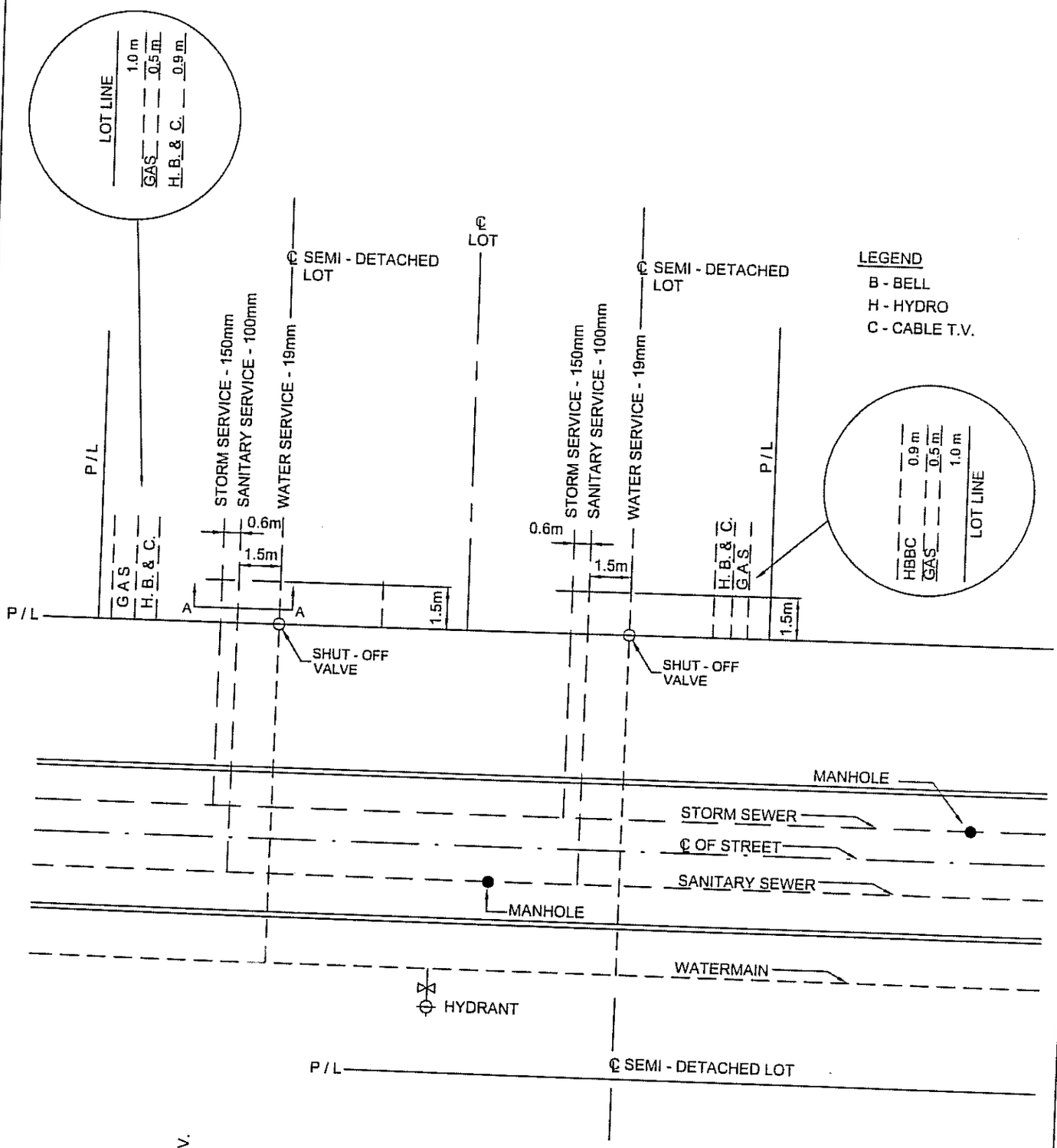


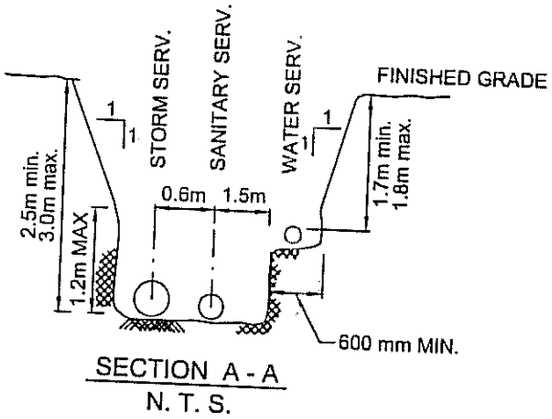
SECTION A–A
N.T.S

NOTES

1. SERVICE TO EXTEND 1.5m INSIDE PROPERTY LINE.
2. UNDER NO CIRCUMSTANCE SHALL SERVICES CROSS ONE ANOTHER.
3. EACH HOUSE MUST BE SUPPLIED WITH SEPARATE 150mm ø STORM SEWER SERVICE LATERAL. COMMON SERVICE CONNECTIONS WITH Y'S WILL NOT BE PERMITTED.
4. THE MINIMUM SIZE FOR STORM DRAIN CONNECTIONS SHALL BE 150mm AND INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
5. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 100mm ø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE.
6. ALL UNDERGROUND SERVICE CABLES TO BE PLACED MINIMUM 1.0m BELOW FINISHED GRADE OF LOTS.
7. SHUT–OFF VALVES TO BE PLACED ON PROPERTY LINE.
8. ALL DIMENSIONS ARE IN METRES.

OVED ION	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
OF REVISION AY 2003	SERVICE LOCATION SINGLE FAMILY RESIDENTIAL	DRAWING No. SS–161



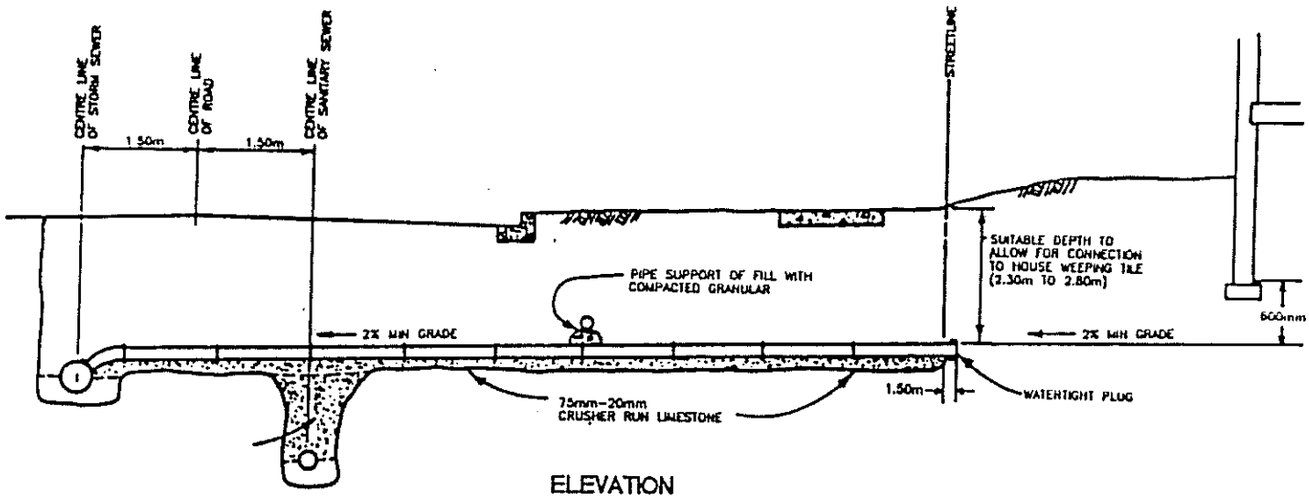


SECTION A - A
N. T. S.

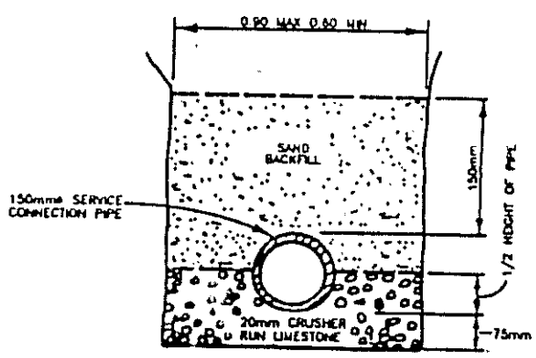
NOTES:

1. SERVICE TO EXTEND 1.5M INSIDE PROPERTY LINE.
2. UNDER NO CIRCUMSTANCE SHALL SERVICES CROSS ONE ANOTHER.
3. EACH HOUSE MUST BE SUPPLIED WITH A SEPARATE 150MMØ STORM SEWER SERVICE LATERAL. COMMON SERVICE CONNECTIONS WITH Y's WILL NOT BE PERMITTED.
4. THE MINIMUM SIZE FOR STORM DRAIN CONNECTION SHALL BE 150MMØ INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
5. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 100mmØ INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE.
6. ALL UNDERGROUND SERVICE CABLES TO BE PLACED MINIMUM 1.0m BELOW FINISHED GRADE OF LOTS.
7. SHUT-OFF VALVES TO BE PLACED ON PROPERTY LINE.
8. ALL DIMENSION IN METRES.

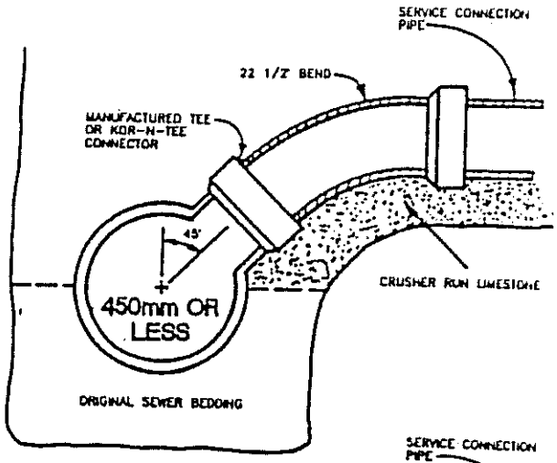
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
ISION 2	SERVICE LOCATION SEMI DETACHED RESIDENTIAL	DRAWING NO. SS - 162
E OF REVISION MAY 2003		

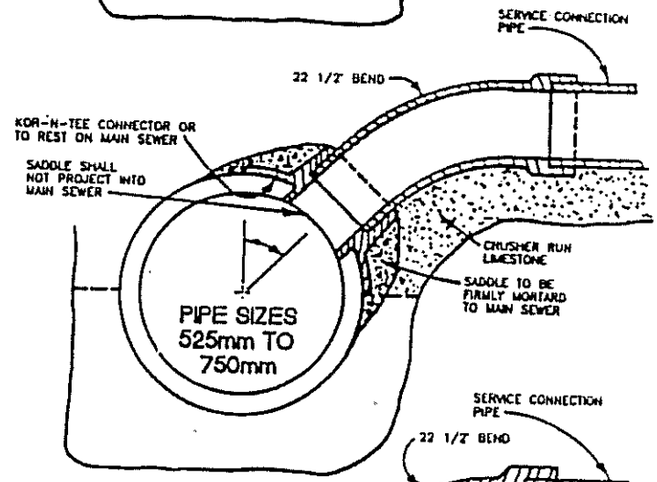


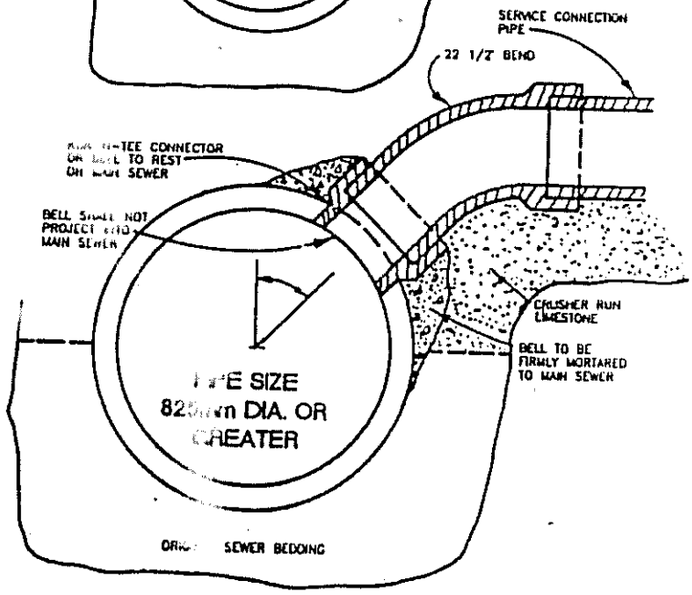
ELEVATION



SPECIFIED BEDDING



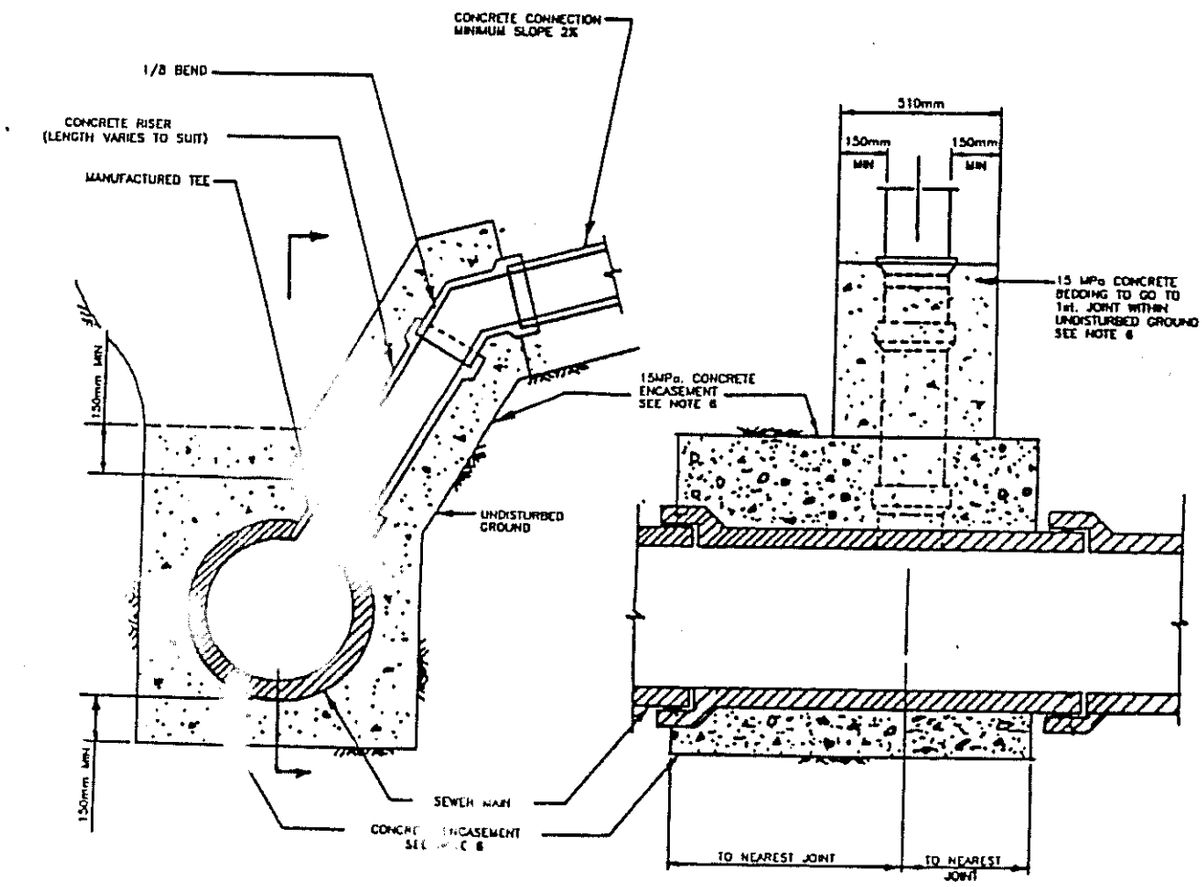




NOTES:

1. END OF PIPE AT PR[illegible]NE TO BE [illegible]GED.
2. STORM SERVICE CO[illegible]IPE TO BE FITTED WITH APPROVED RUBBER G[illegible]INTS.
3. IF CONTRACTOR TUNNELS [illegible]R WATERMAIN, MINIMUM LENGTH OF TUNNEL TO BE 1.83m [illegible]ALL VOIDS TO BE FILLED WITH 10MPa CONCRETE.
4. VERTICAL BEND AT PIPE [illegible]NOT TO EXCEED 5 DEGREES.
5. RISERS TO BE INSTALLED [illegible]E SPECIFIED [illegible]THE ENGINEERING DRAWINGS G[illegible]EN DEPTH TO [illegible] OF SEWER EXCEEDS 4.50m.
6. GRADE OF PIPE APPROACHING PROPER[illegible]E TO BE 2%.
7. SERVICE CONNECTION TO BE INSTAL[illegible]TRAIGHT LINE FROM SEWER TO STREETLINE.
8. THIS STANDARD IS NOT APPLICABLE [illegible]NNECTIONS GREATER THAN 250mm Ø.
9. ALL DIMENSIONS ARE IN MILLIMETRES [illegible]TRES UNLESS OTHERWISE SPECIFIED.
10. POLYVINYL CHLORIDE PIPE (SDR 28) [illegible]APPROVED EQUIVALENT TO CONCRETE PIPE FOR [illegible]E CONNECTIONS.
11. AS AN ALTERNATE 'KOR-N-TEE' CONN[illegible]S MAY BE USED FOR 150mm AND 200mm DIAMETER S[illegible] DRAIN CONNECTIONS.

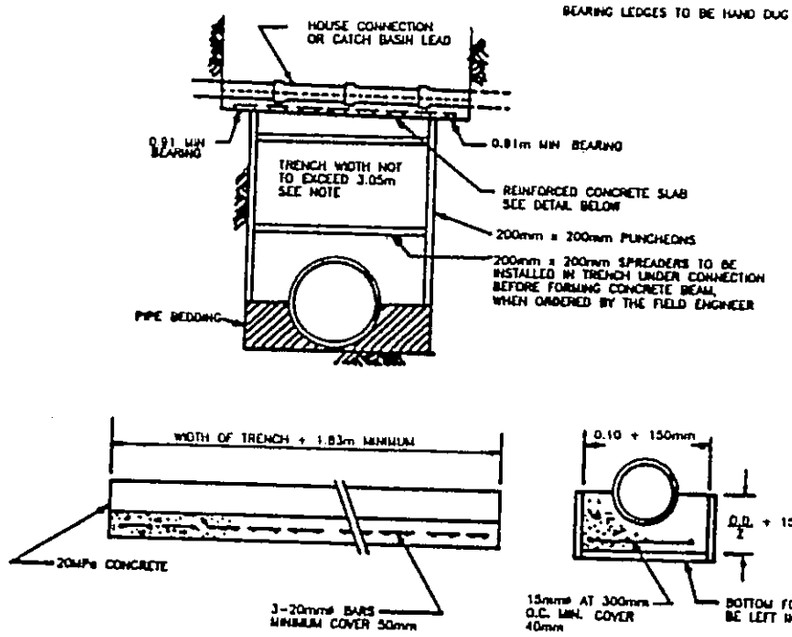
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	STORM SEWER SERVICE CONNECTION	DRAWING No. SS-165
DATE OF REVISION APRIL 1990		



NOTES:

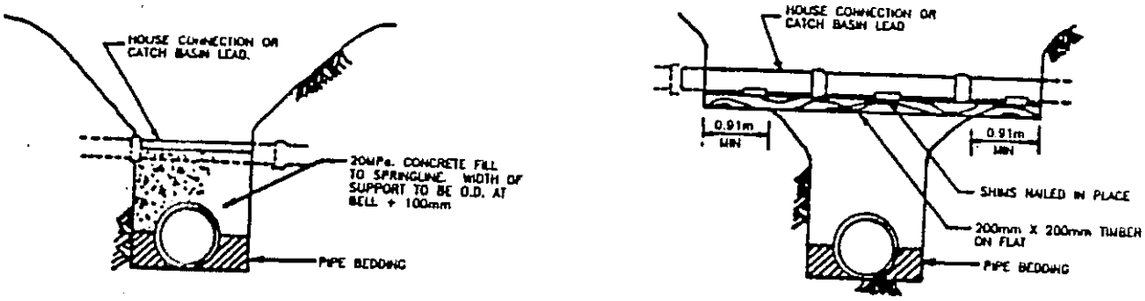
1. ALL CONCRETE BEDDING ... MPa OR BETTER.
2. FOR SEWER SIZES UP ... LUDING 450mm ø THE CONNECTION TO THE MAIN IS TO BE MADE BY MEANS OF ...CTURED TEE.
3. RISERS MUST NOT EXC... IN DEPTH.
4. RISER CONNECTION DE... BE USED WHEN DEPTH TO INVERT OF SEWER MA... CEEDS 4.50m.
5. ALL DIMENSIONS ARE IN ... ES OR METRES UNLESS OTHERWISE SPECIFIED.
6. POLYVINYL CHLORIDE P... CONNECTIONS. WHERE ... BLEND CLEAR STONE. ... B) IS AN APPROVED EQUIVALENT TO CONCRETE ... FOR SERVICE CHLORIDE PIPE IS USED, BEDDING MATERIAL SH... BE H.L. 8

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	STORM SEWER RISER CONNECTION	DRAWING No. SS-168
DATE OF REVISION APRIL 1990		



REINFORCED CONCRETE SUPPORT FOR HOUSE
CONNECTIONS AND CATCH BASIN LEADS
WHEN WIDTH OF TRENCH EXCEEDS 1.52m BUT LESS THAN 3.05m

NOTE: WHEN WIDTH OF TRENCH EXCEEDS 3.05m METHOD OF SUPPORTING HOUSE CONNECTIONS AND CATCH BASIN LEADS, WILL BE AS DIRECTED BY THE FIELD ENGINEER.

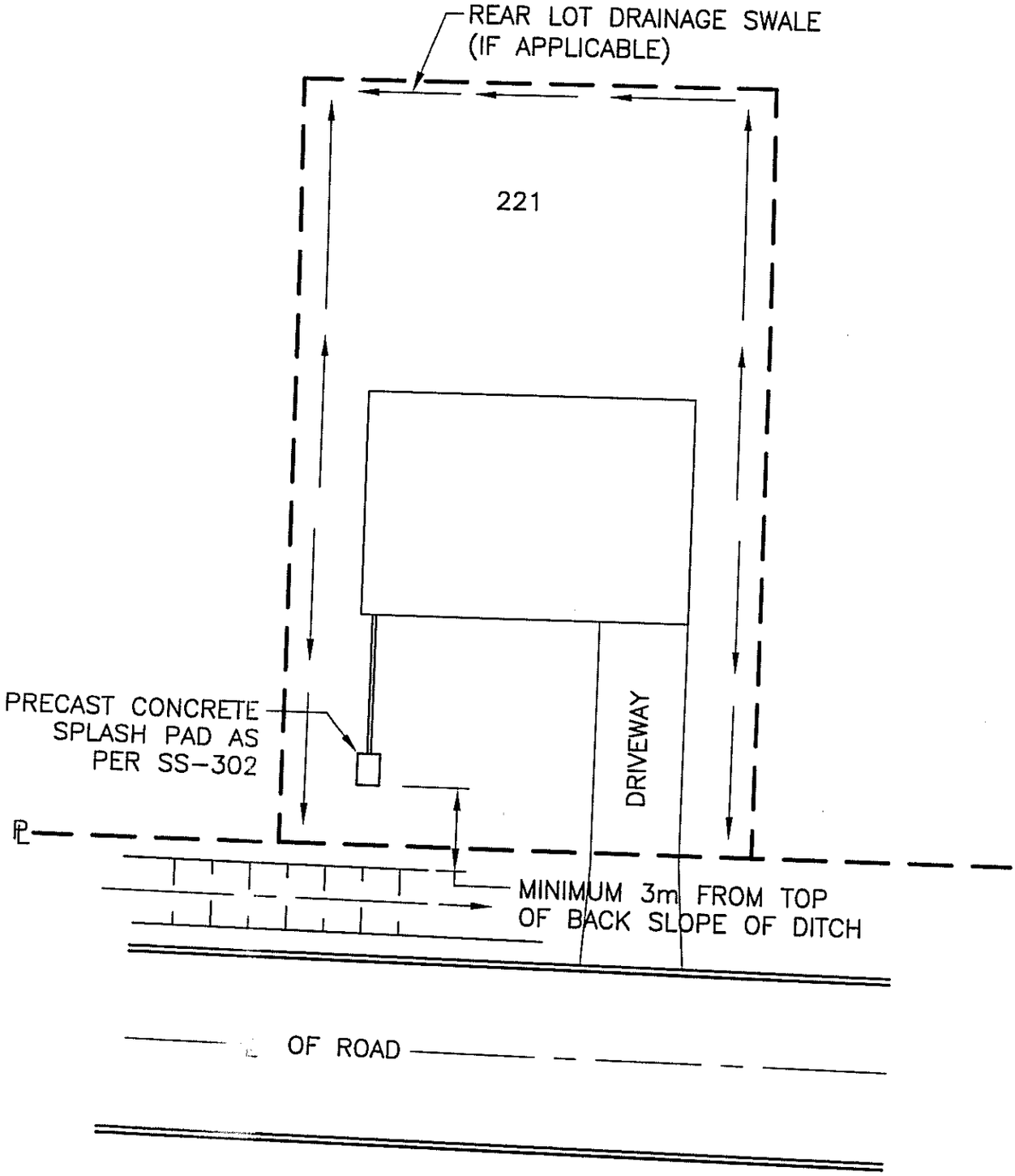


SUPPORT FOR CONNECTION CROSSING
TRENCH
WHEN WIDTH OF TRENCH IS LESS THAN 1.52m

NOTES:

1. WHERE HOUSE CONNECTIONS OR CATCHBASIN LEADS CROSS A SEWER TRENCH, THEY WILL BE SUPPORTED ON A NEW 200mm x 200mm TIMBER WHICH HAS A MINIMUM BEARING OF 0.91m AT EACH END, ON UNDISTURBED GROUND. CONNECTION MUST BE PROPERLY SHIMMED OR BEDDED ON 20MPa CONCRETE FILL, TO SPRINGLINE, AS PER DETAILS.
2. OPSD-1007.01 MAY BE USED WHEN APPROVED BY THE TOWNSHIP ENGINEER.
3. TO BE USED WHEN INSTALLING SEWER OR WATERMAIN ON EXISTING R.O.W.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
5. FOR ALL CROSSING OF GAS MAINS, CONTRACTOR TO CONTACT CONSUMERS GAS FOR LOCATES AND INSPECTIONS.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	METHODS OF SUPPORTING HOUSE CONNECTIONS AND CATCHBASIN LEADS	DRAWING No. SS-171
DATE OF REVISION APRIL 1990		



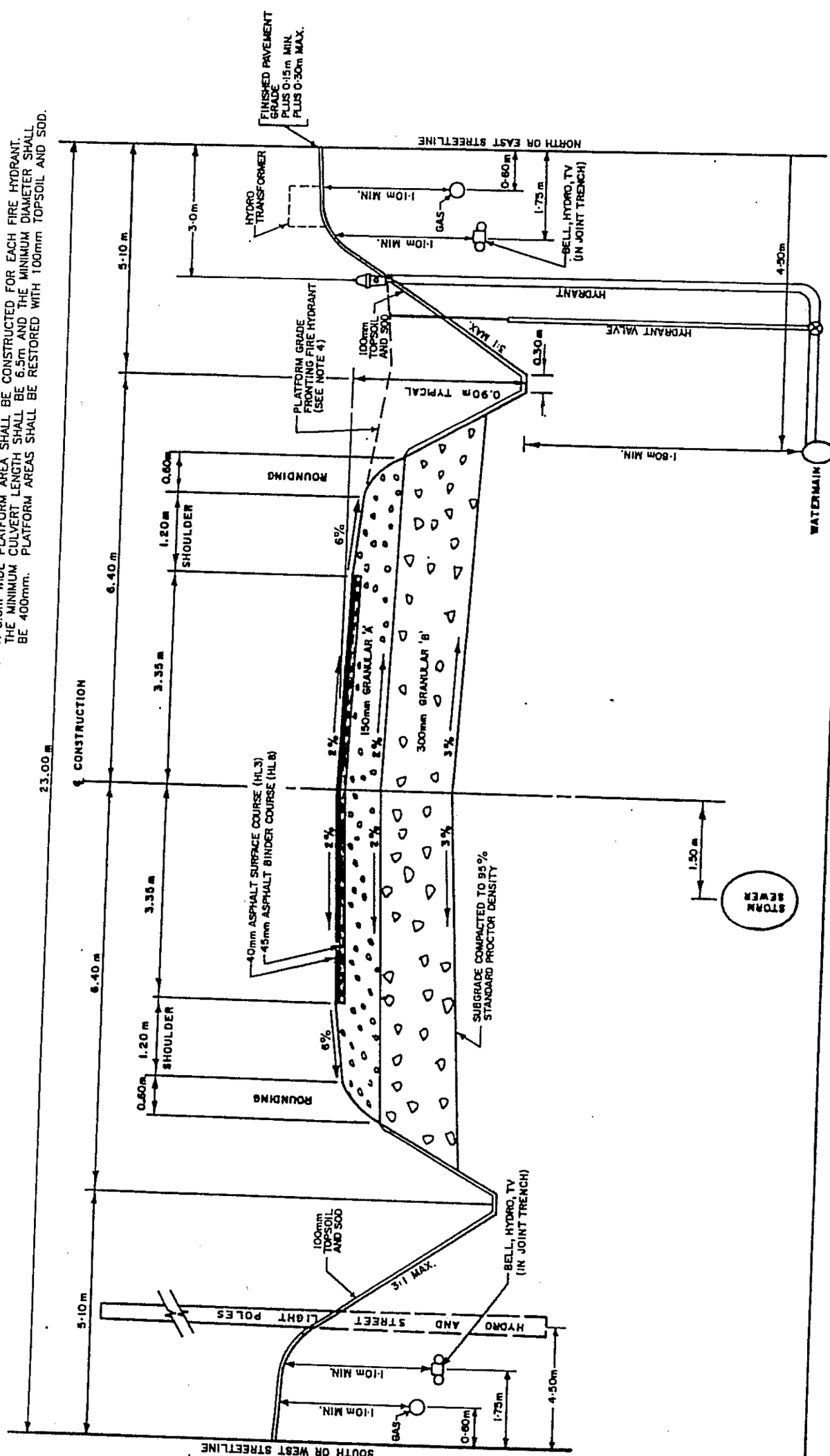
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. OUTLET TO BE LOCATED ON THE OPPOSITE SIDE OF THE DRIVEWAY.
3. OPTIONAL LOCATION FOR THE OUTLET LOCATION AT LOWEST GRADE AT THE REAR OF THE HOUSE.
4. ALTERNATE SUMP PUMP OUTLET TO BE DIRECTED TO REAR OR SIDE YARD DRAINAGE SWALES.
5. AS AN ALTERNATIVE TO THE PRECAST CONCRETE SPLASH PAD FOR THE SUMP PUMP OUTLET, A ROCK CHECK DAM CONSISTING OF 75mm MIN CLEAR STONE COULD BE UTILIZED.

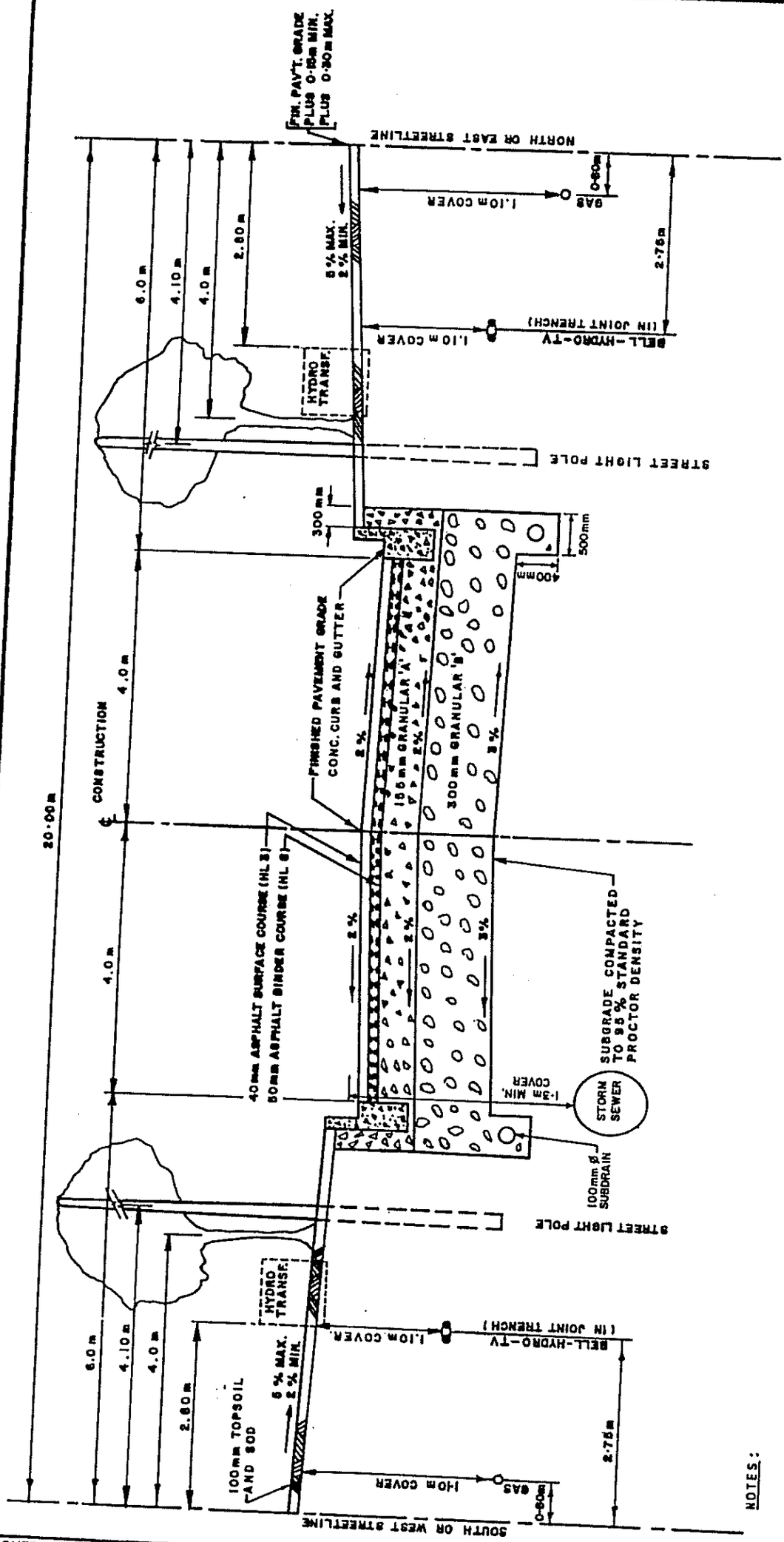
OVED ION OF REVISION	TOWNSHIP OF SCUGOG RECOMMENDED SUMP PUMP OUTLET LOCATION	DATE OF ISSUE 2003 DRAWING No. SS-172

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTER DENSITY.
3. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE.
4. A 3.0m WIDE PLATFORM AREA SHALL BE CONSTRUCTED FOR EACH FIRE HYDRANT. THE MINIMUM CULVERT LENGTH SHALL BE 6.5m AND THE MINIMUM DIAMETER SHALL BE 400mm. PLATFORM AREAS SHALL BE RESTORED WITH 100mm TOPSOIL AND SOD.



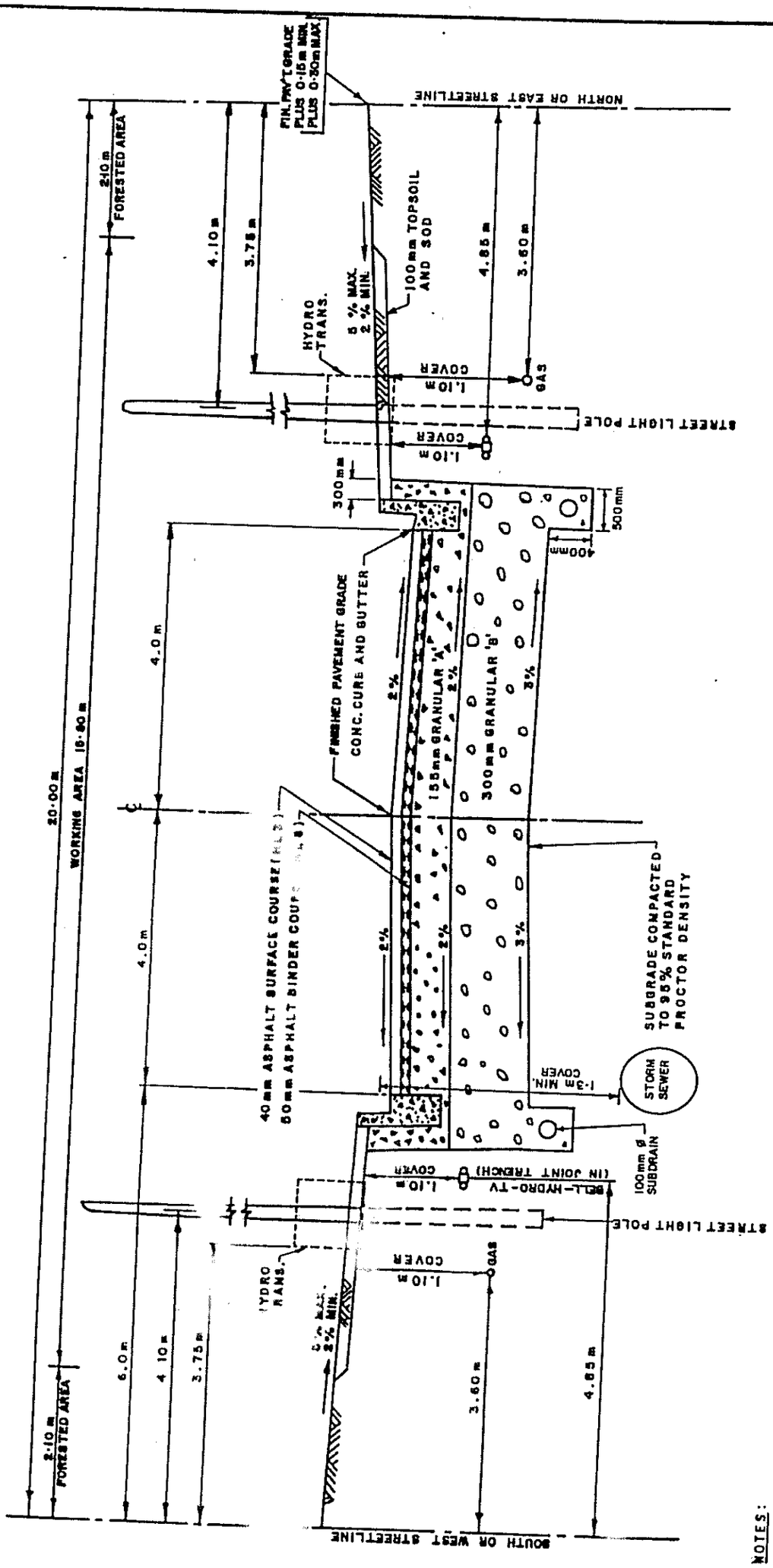
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
VISION 2	6·70 M RURAL ROADWAY ESTATE RESIDENTIAL	DRAWING No. SS-201
TE OF REVISION APRIL 1990		



NOTES:

1. ALL MANHOLES AND CATCHBASINS TO BE SET AT BASE ASPHALT GRADE. FINAL ADJUSTMENT OF FRAMES TO BE PERFORMED WHEN SURFACE COURSE ASPHALT PLACED.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
3. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
4. CATCHBASIN MANHOLES PERMITTED WITH SHALLOW STORM SEWERS.

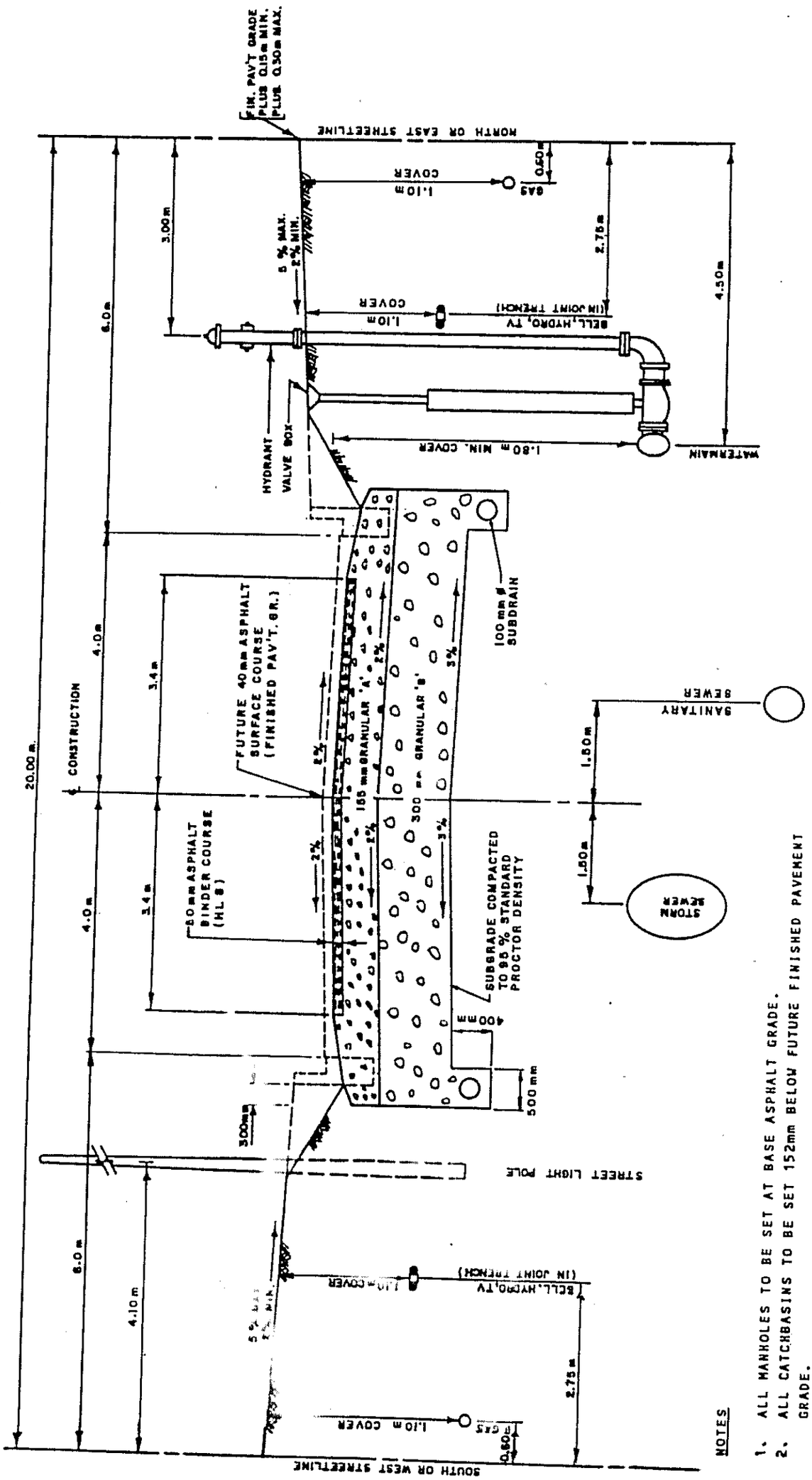
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	8.0M ESTATE RESIDENTIAL ROADWAY	DRAWING No. SS-202
TE OF REVISION APRIL 1990		



NOTES:

1. ALL MANHOLES AND CATCHBASINS TO BE SET AT BASE ASPHALT GRADE. FINAL ADJUSTMENT OF FRAMES TO BE PERFORMED WHEN SURFACE COURSE ASPHALT PLACED.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
3. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
4. CATCHBASIN MANHOLES PERMITTED WITH SHALLOW STORM SEWERS.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	8.0 M ESTATE RESIDENTIAL ROADWAY ALTERNATIVE: FOR FORESTED AREAS	DRAWING No. SS-203
DATE OF REVISION APRIL 1990		



NOTES

1. ALL MANHOLES TO BE SET AT BASE ASPHALT GRADE.
2. ALL CATCHBASINS TO BE SET 152mm BELOW FUTURE FINISHED PAVEMENT GRADE.
3. SEE STD. SS-205 FOR STAGE II CONSTRUCTION.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
5. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
6. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	8·00 M LOCAL ROADWAY STAGE I CONSTRUCTION	DRAWING No. SS-204
DATE OF REVISION APRIL 1990		

APPROVED

REVISION
1

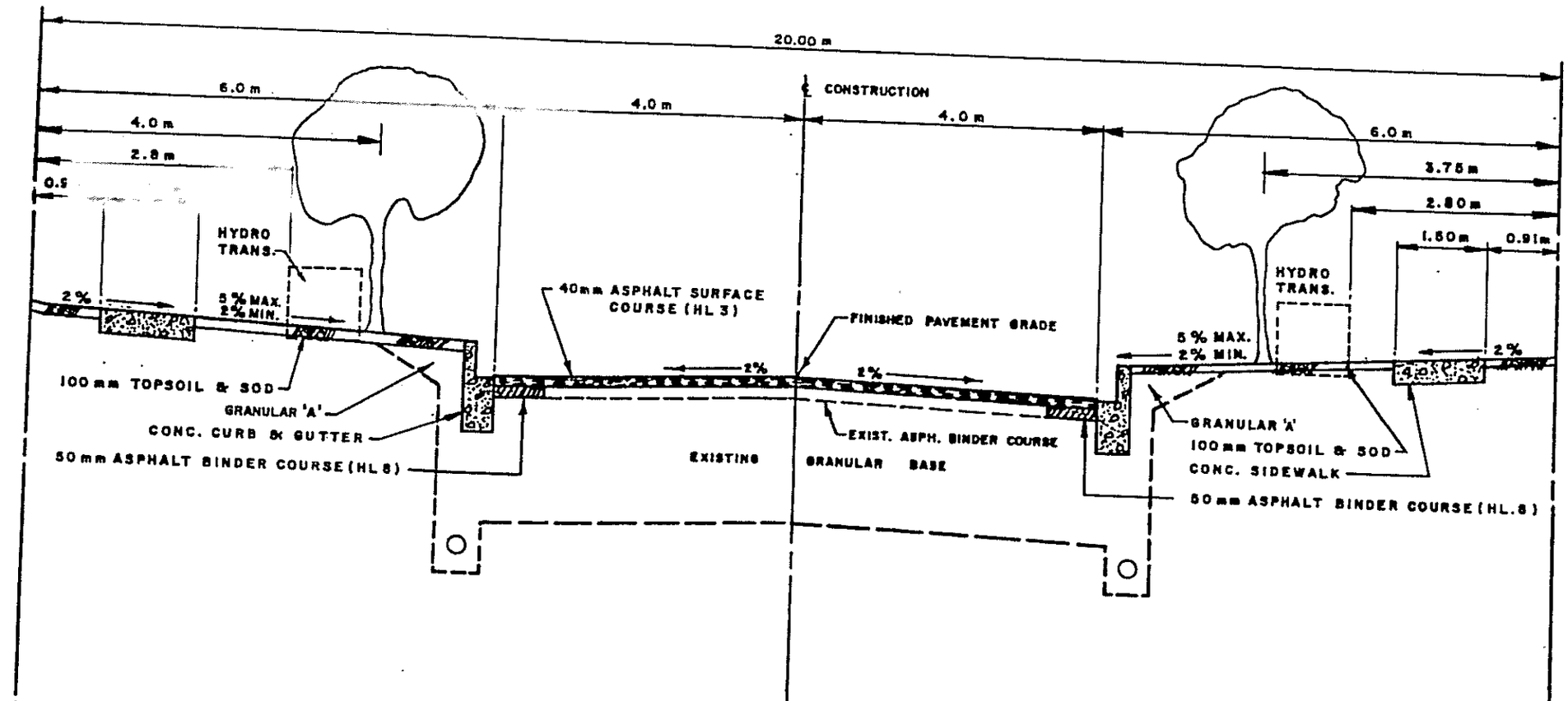
DATE OF REVISION
APRIL 1990

8.0 M LOCAL ROADWAY
STAGE II CONSTRUCTION

TOWNSHIP OF SCUGOG

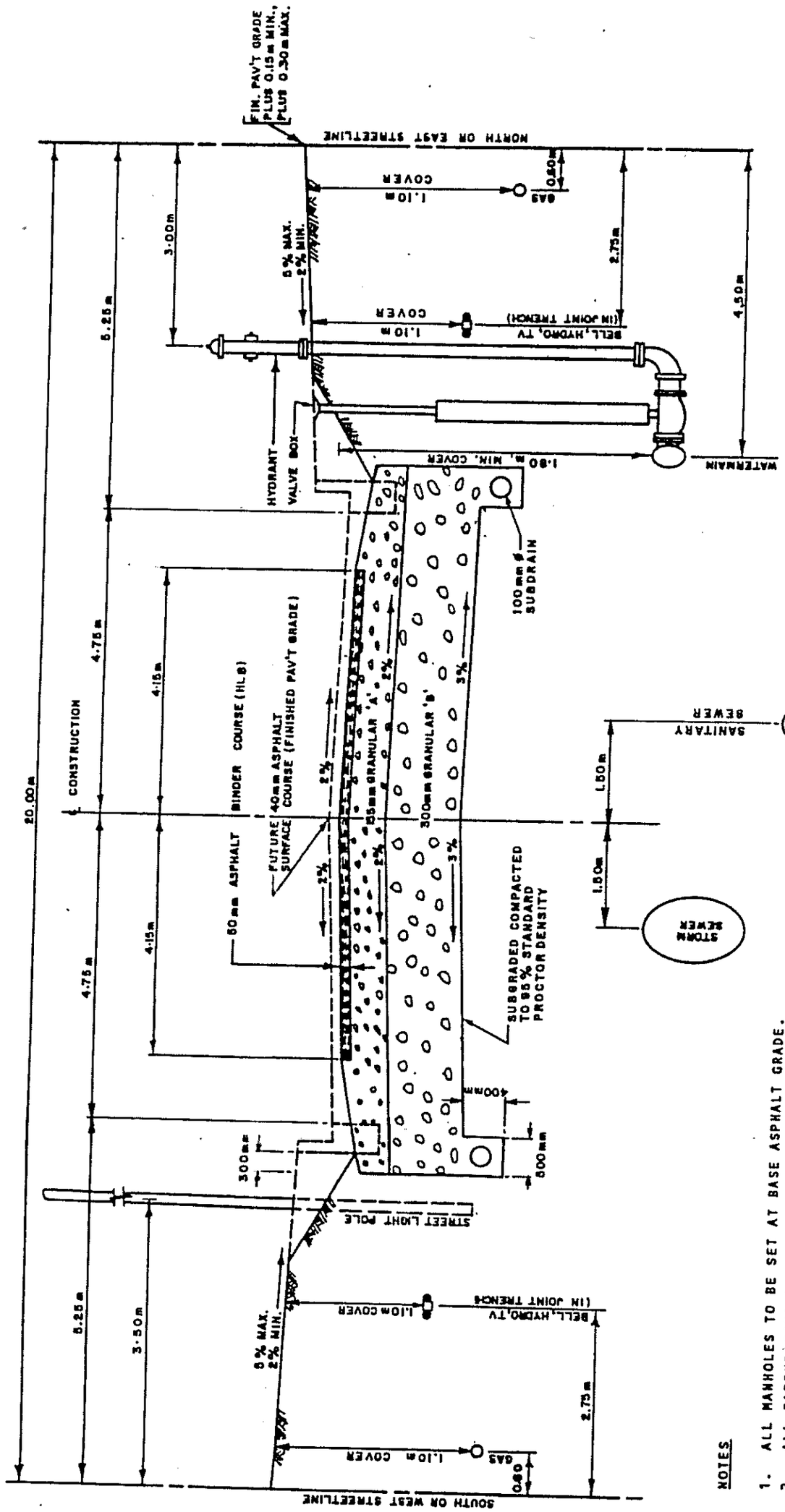
DRAWING No.
SS-205

DATE OF ISSUE
1980



NOTES

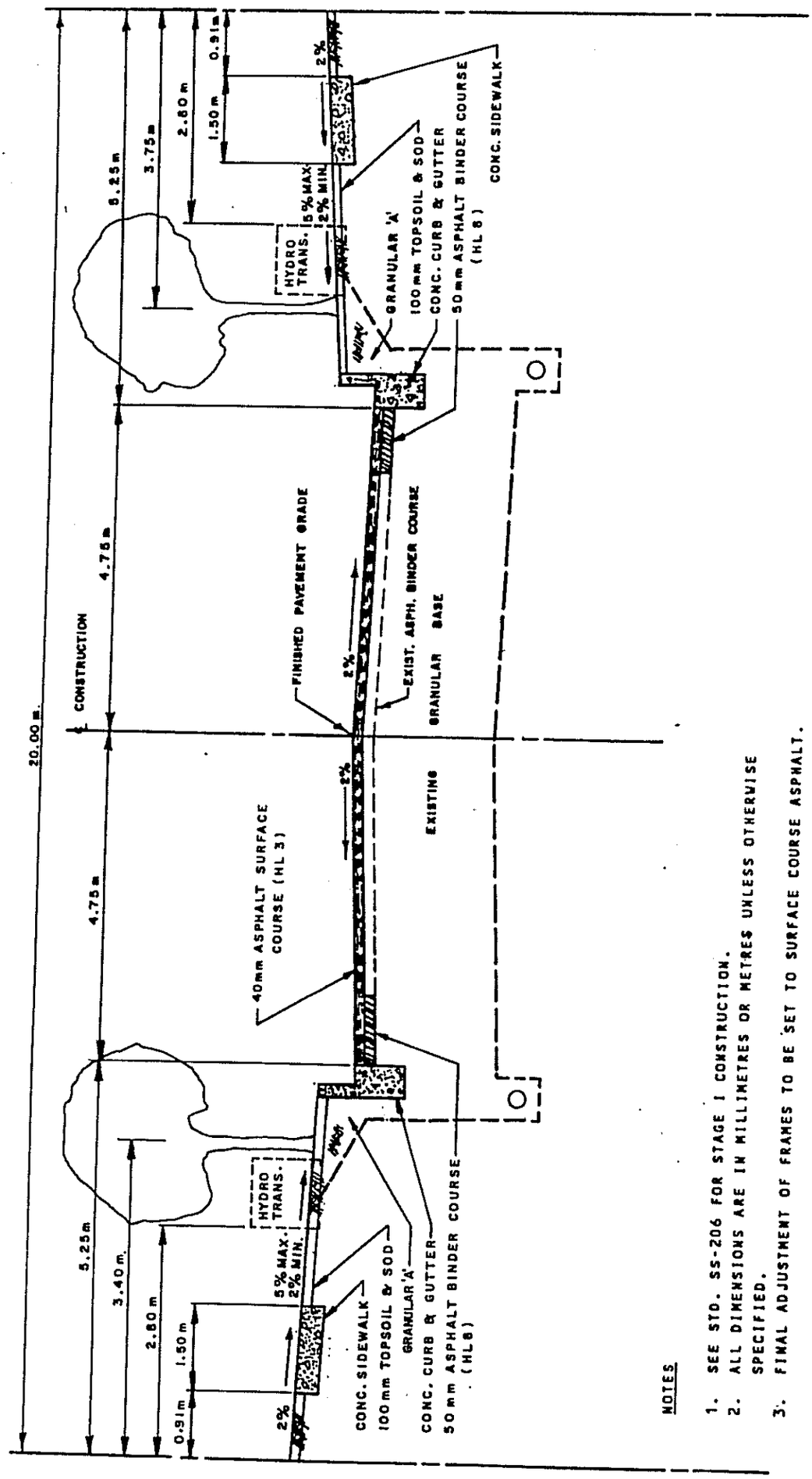
1. SEE STD. SS-204 FOR STAGE I CONSTRUCTION.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
3. FINAL ADJUSTMENT OF FRAMES TO BE SET TO SURFACE COURSE ASPHALT GRADE.



NOTES

1. ALL MANHOLES TO BE SET AT BASE ASPHALT GRADE.
2. ALL CATCHBASINS TO BE SET 0.15m BELOW FUTURE FINISHED PAVEMENT GRADE.
3. SEE STD. SS-207 FOR STAGE II CONSTRUCTION.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
5. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
6. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE.

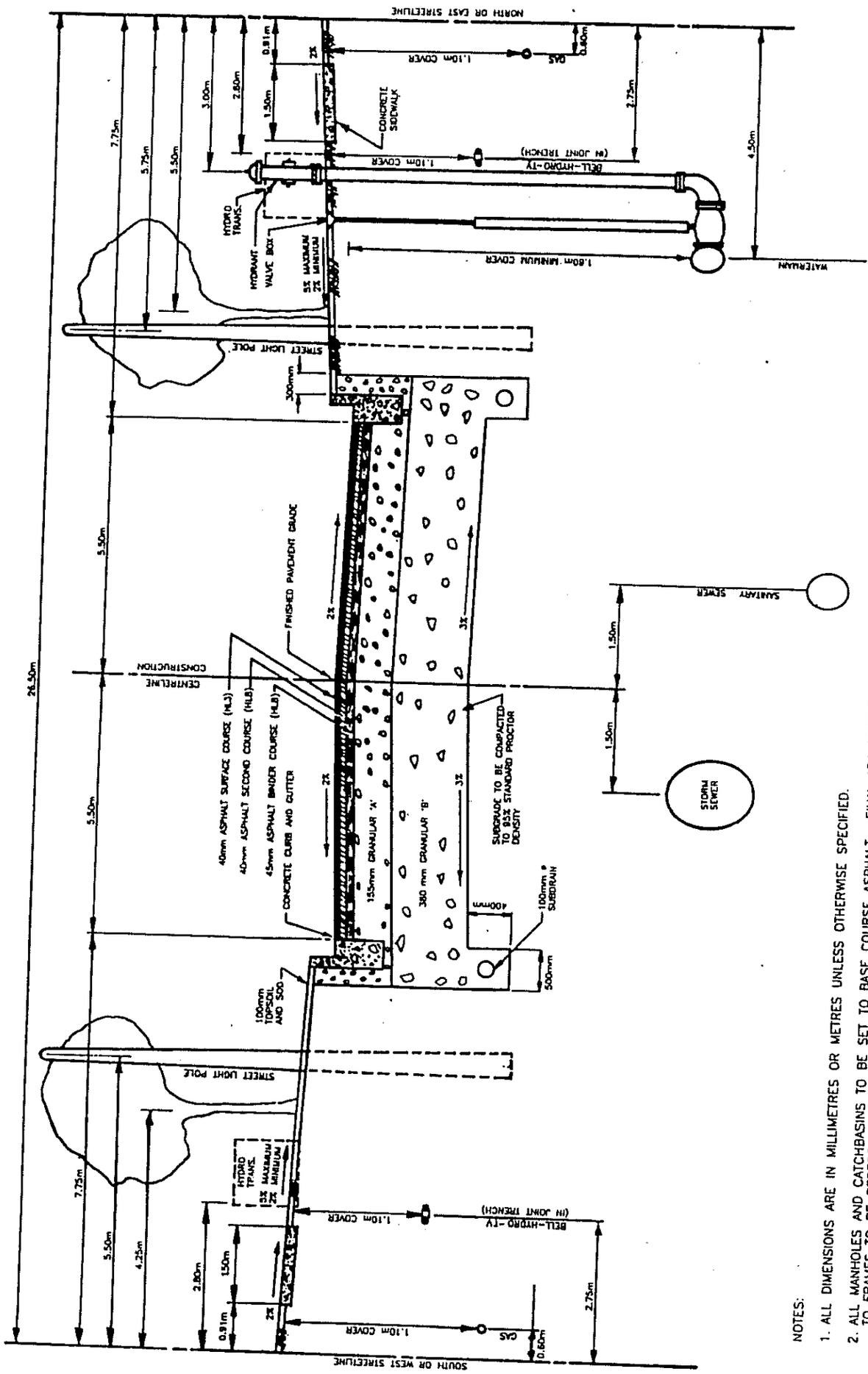
VED ON I OF REVISION PRIL 1990	TOWNSHIP OF SCUGOG 9.50 M MINOR COLLECTOR ROADWAY STAGE I CONSTRUCTION	DATE OF ISSUE 1980 DRAWING No. SS-206



NOTES

1. SEE STD. SS-206 FOR STAGE I CONSTRUCTION.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
3. FINAL ADJUSTMENT OF FRAMES TO BE SET TO SURFACE COURSE ASPHALT.

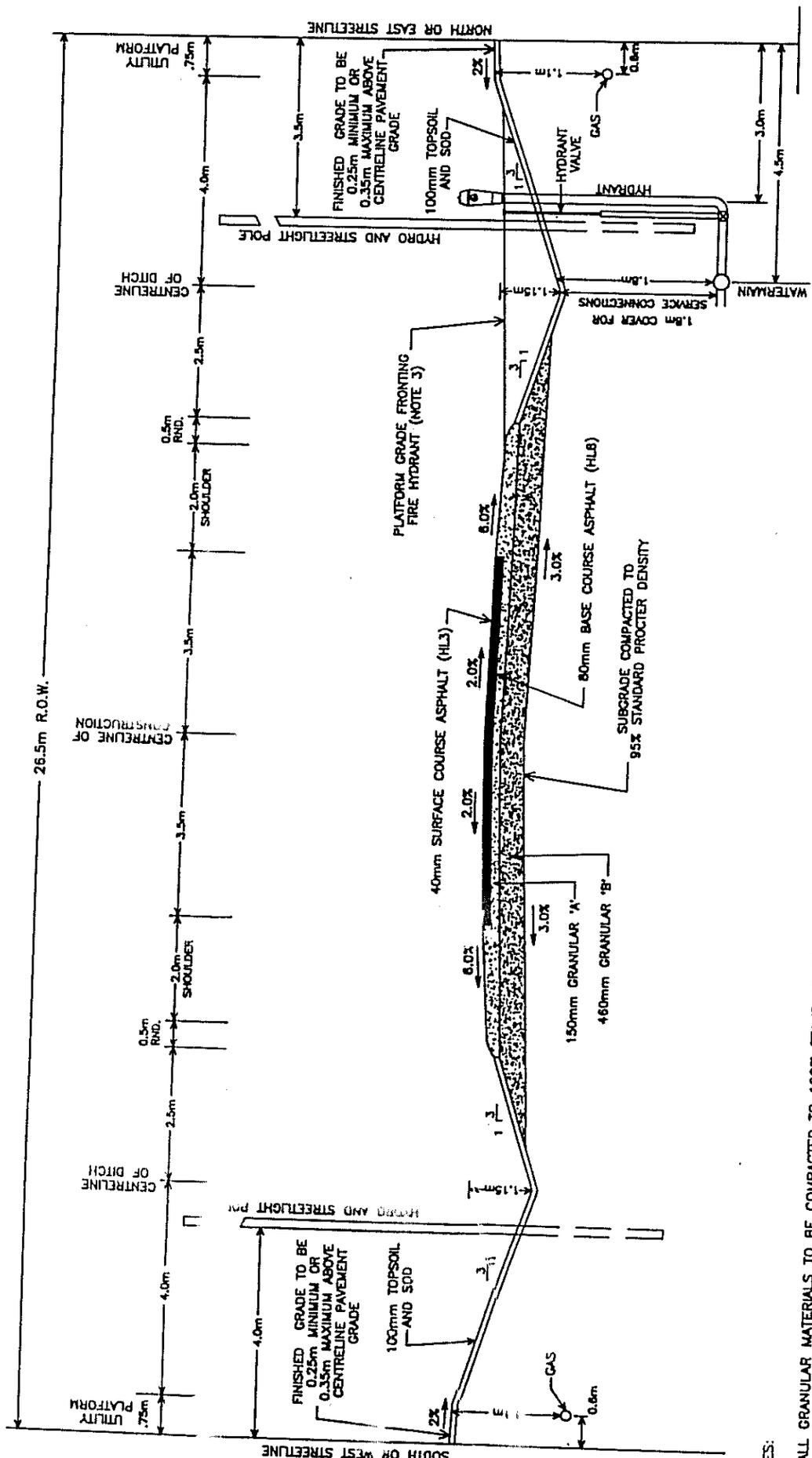
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	9.50 M MINOR COLLECTOR ROADWAY STAGE II CONSTRUCTION	DRAWING No. SS-207
DATE OF REVISION APRIL 1990		



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. ALL MANHOLES AND CATCHBASINS TO BE SET TO BASE COURSE ASPHALT. FINAL ADJUSTMENT TO FRAMES TO BE PERFORMED WHEN SURFACE COURSE ASPHALT PLACED.
3. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
4. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE.

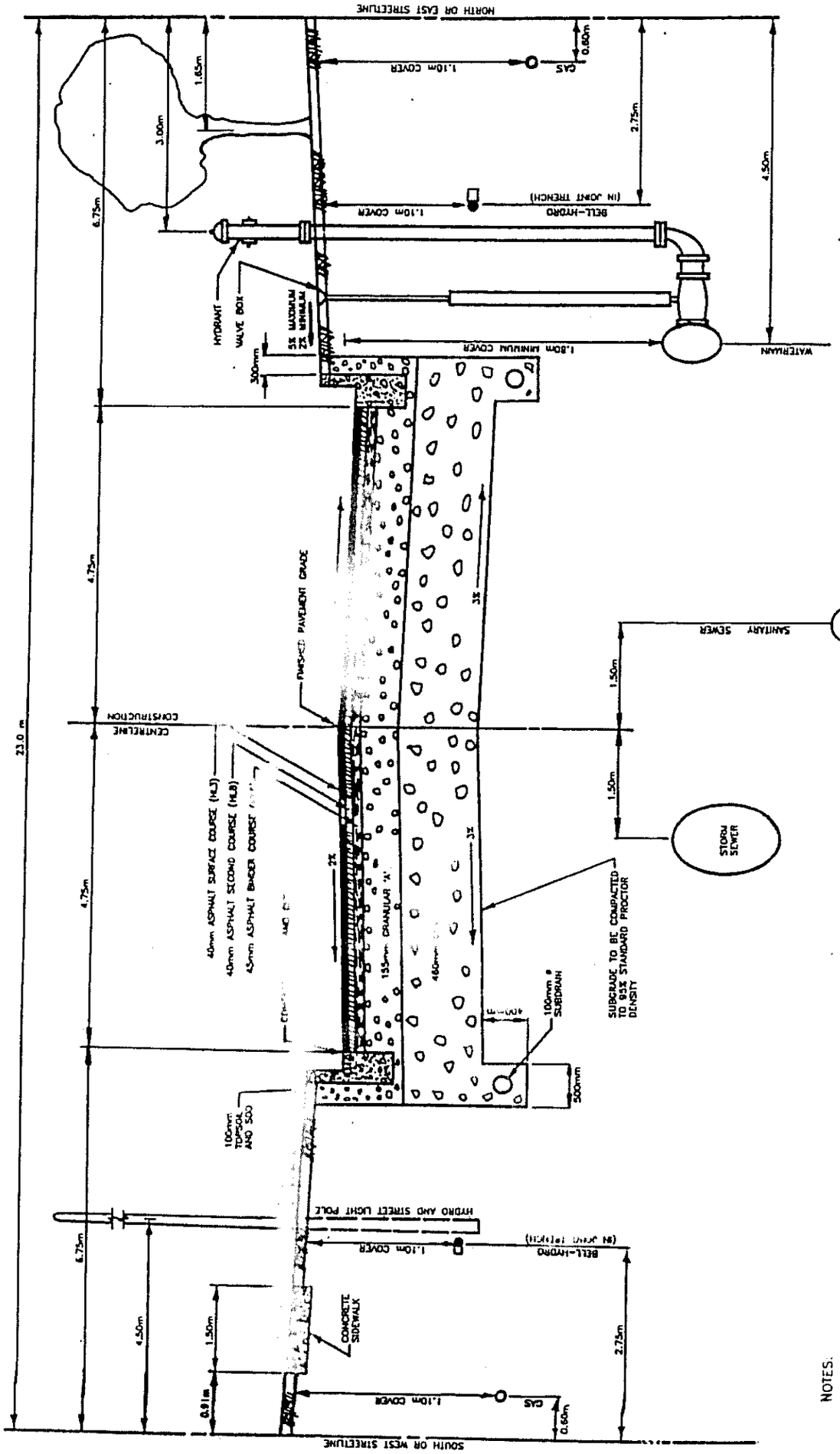
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	11.0M MAJOR COLLECTOR ROADWAY	DRAWING No. SS-210
DATE OF REVISION APRIL 1990		



NOTES:

1. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
2. CURB STOPS FOR WATER SERVICES TO BE LOCATED 3.0m FROM STREETLINE.
3. A 3.0m WIDE PLATFORM AREA SHALL BE CONSTRUCTED FOR EACH FIRE HYDRANT. THE MINIMUM CULVERT LENGTH SHALL BE 6.5m AND THE MINIMUM DIAMETER SHALL BE 400mm. PLATFORM AREAS SHALL BE RESTORED WITH 100mm TOPSOIL AND SOD.

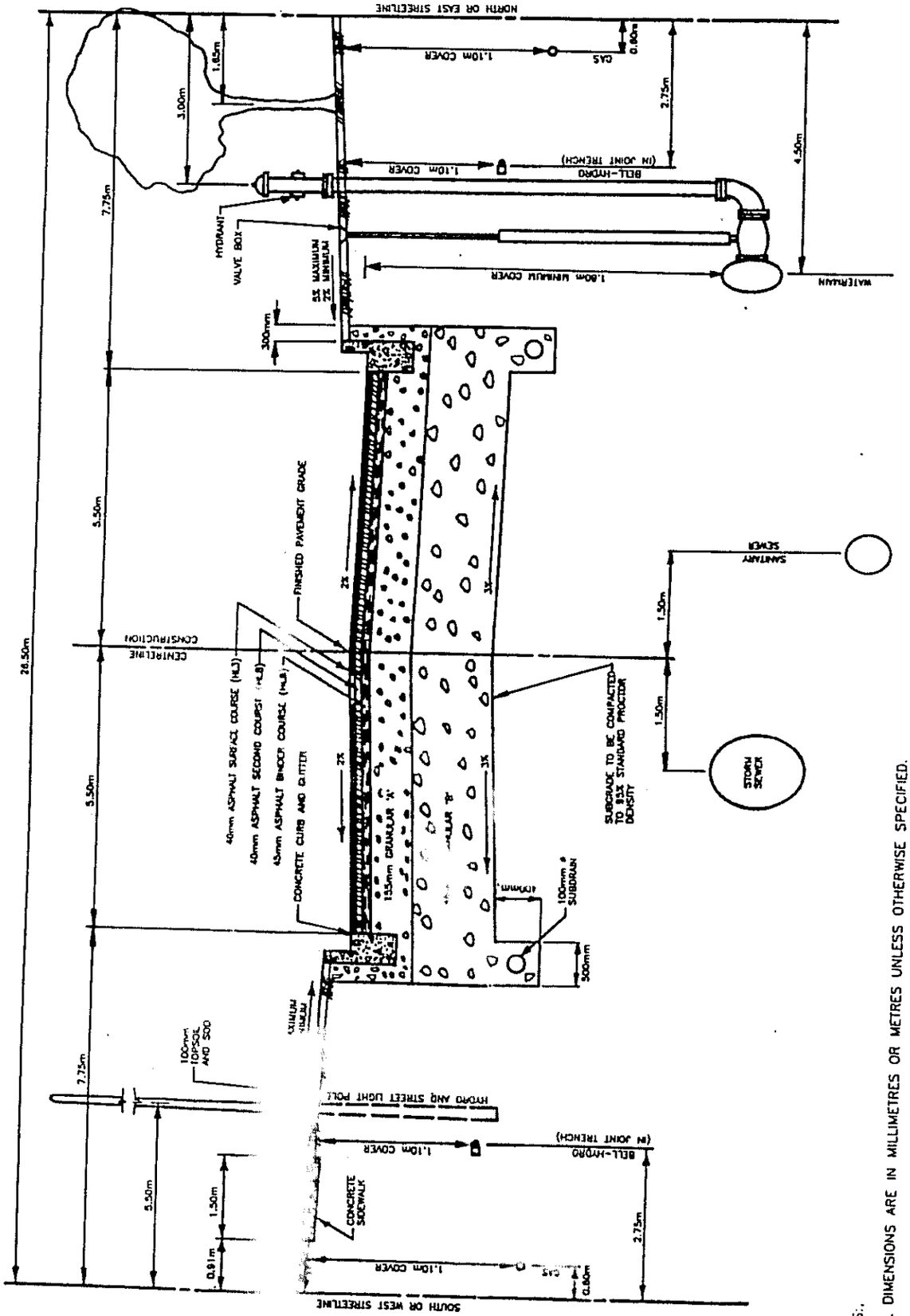
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	7.0m RURAL INDUSTRIAL ROAD SECTION WITH OPEN DITCHES	DRAWING NO. SS-214
DATE OF REVISION		



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. ALL MANHOLES AND CATCHBASINS TO BE SET TO BASE COURSE ASPHALT. FINAL ADJUSTMENT TO FRAMES TO BE PERFORMED WHEN SURFACE COURSE ASPHALT PLACED.
3. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
4. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE

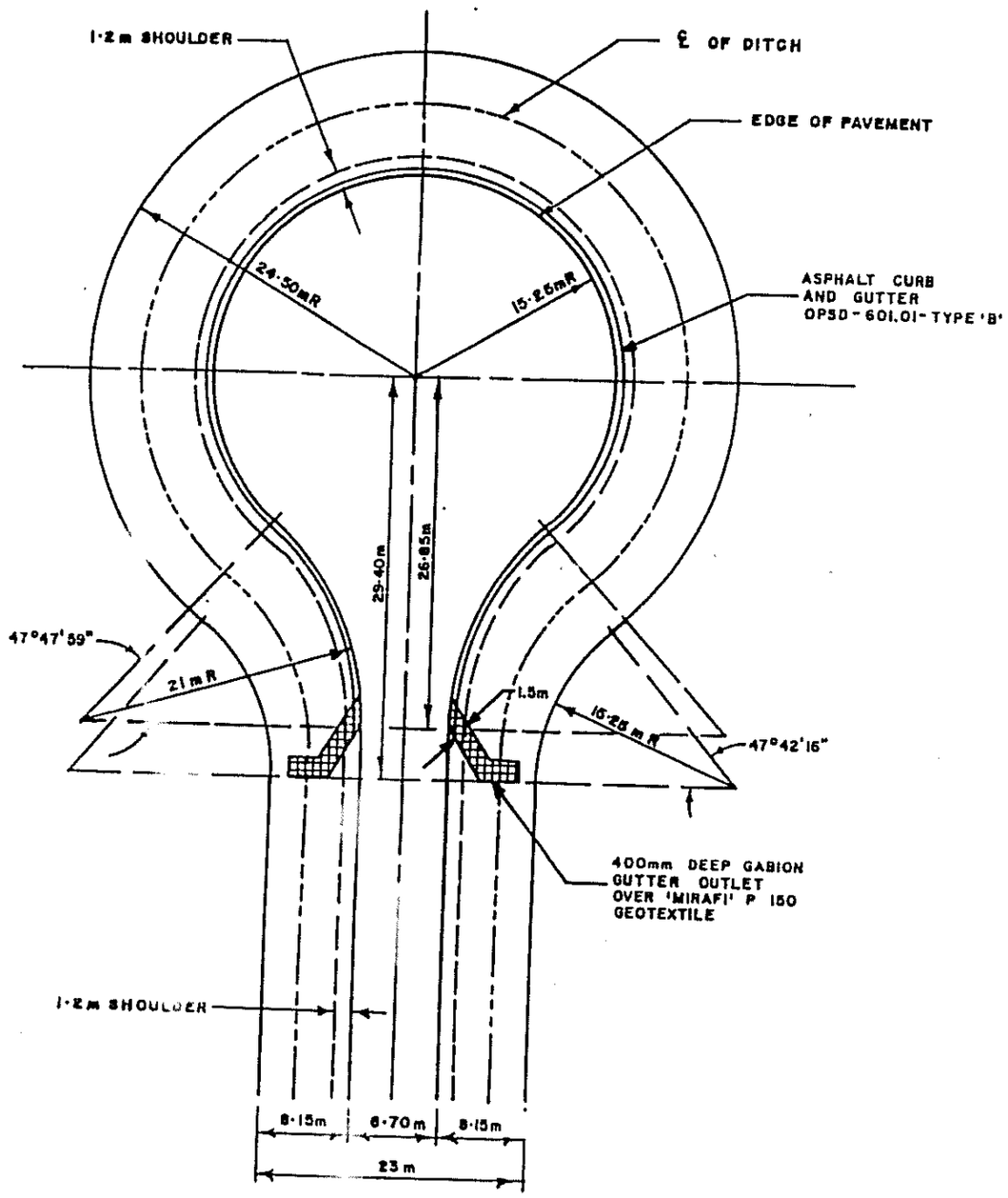
ROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
ISION 1	9·50M INDUSTRIAL LOCAL ROADWAY	DRAWING No. SS-215
E OF REVISION APRIL 1990		



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. ALL MANHOLES AND CATCHBASINS TO BE SET TO BASE COURSE ASPHALT. FINAL ADJUSTMENT TO FRAMES TO BE PERFORMED WHEN SURFACE COURSE ASPHALT PLACED
3. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
4. ALL WATER CURB STOPS TO BE PLACED 3.0m FROM STREETLINE.

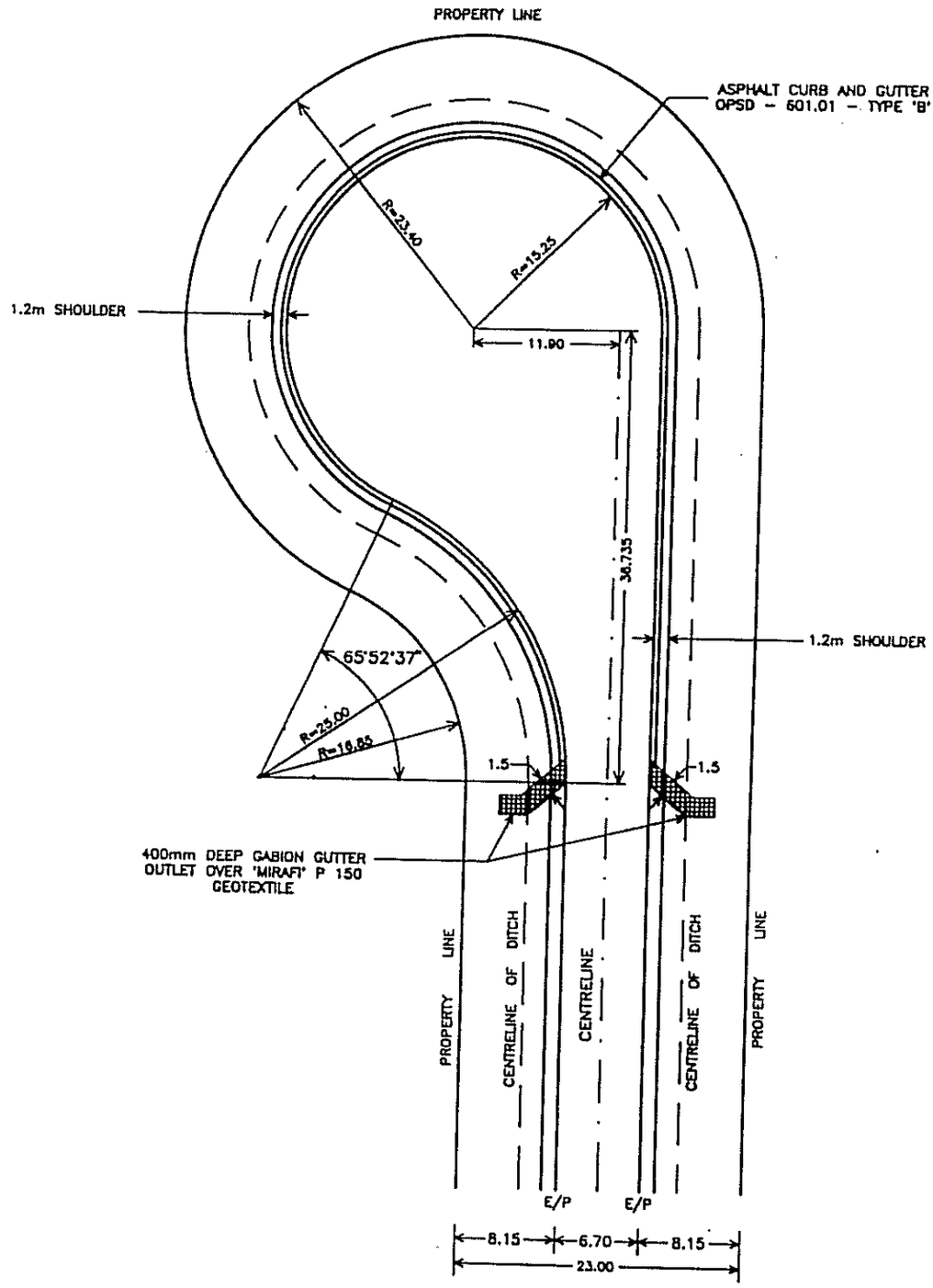
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	11·0 M INDUSTRIAL COLLECTOR ROADWAY	DRAWING No. SS-216
DATE OF REVISION APRIL 1990		



NOTES:

1. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SACS TO BE SHOWN ON PROFILE DRAWINGS.
2. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB. MINIMUM DITCH GRADE TO BE 2%.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

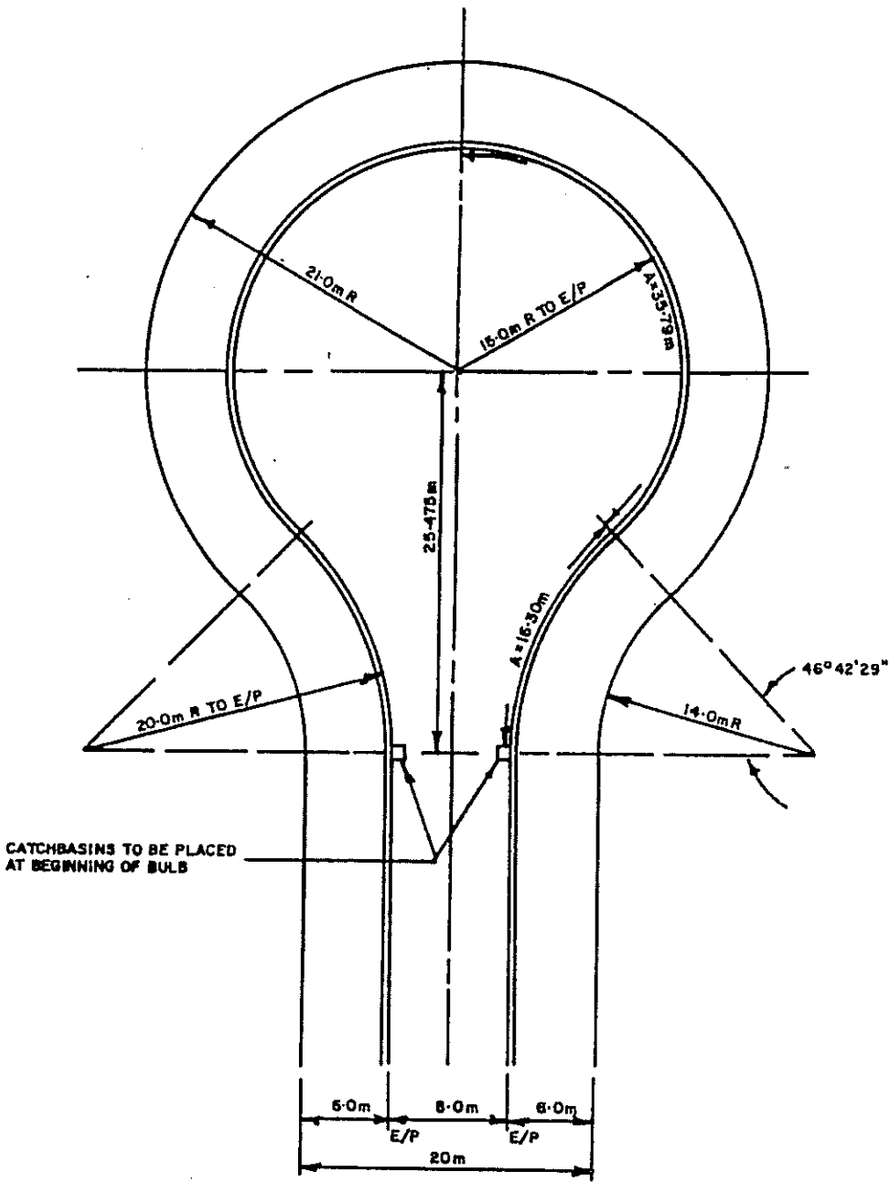
ED N	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
F REVISION RIL 1990	TYPICAL CUL-DE-SAC RURAL ESTATE RESIDENTIAL	DRAWING No. SS-217



NOTES:

1. MINIMUM LONGITUDINAL GRADE OF DITCHLINE AROUND CUL-DE-SAC TO BE 2%.
2. DETAIL OF GRADING OF BULB AREA OF CUL-DE-SAC TO BE SHOWN ON PLAN/PROFILE DRAWINGS.
3. ALL DIMENSIONS ARE IN METRES.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	TYPICAL OFFSET CUL-DE SAC FOR RURAL ESTATE RESIDENTIAL STREETS	DRAWING NO. SS-218
DATE OF REVISION		

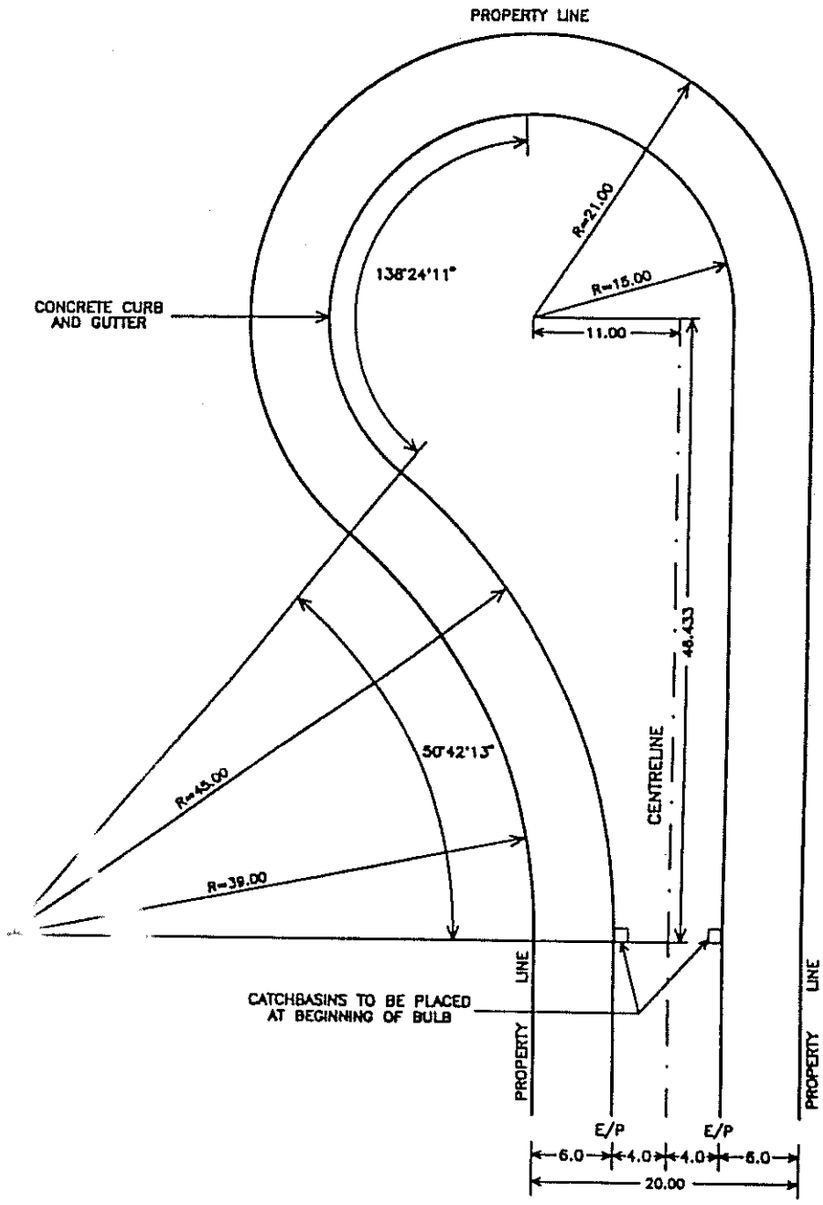


N.T.S.

NOTES

1. MINIMUM GUTTER SLOPE TO BE 1.00%.
2. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SACS TO BE SHOWN ON PROFILE DRAWINGS.
3. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

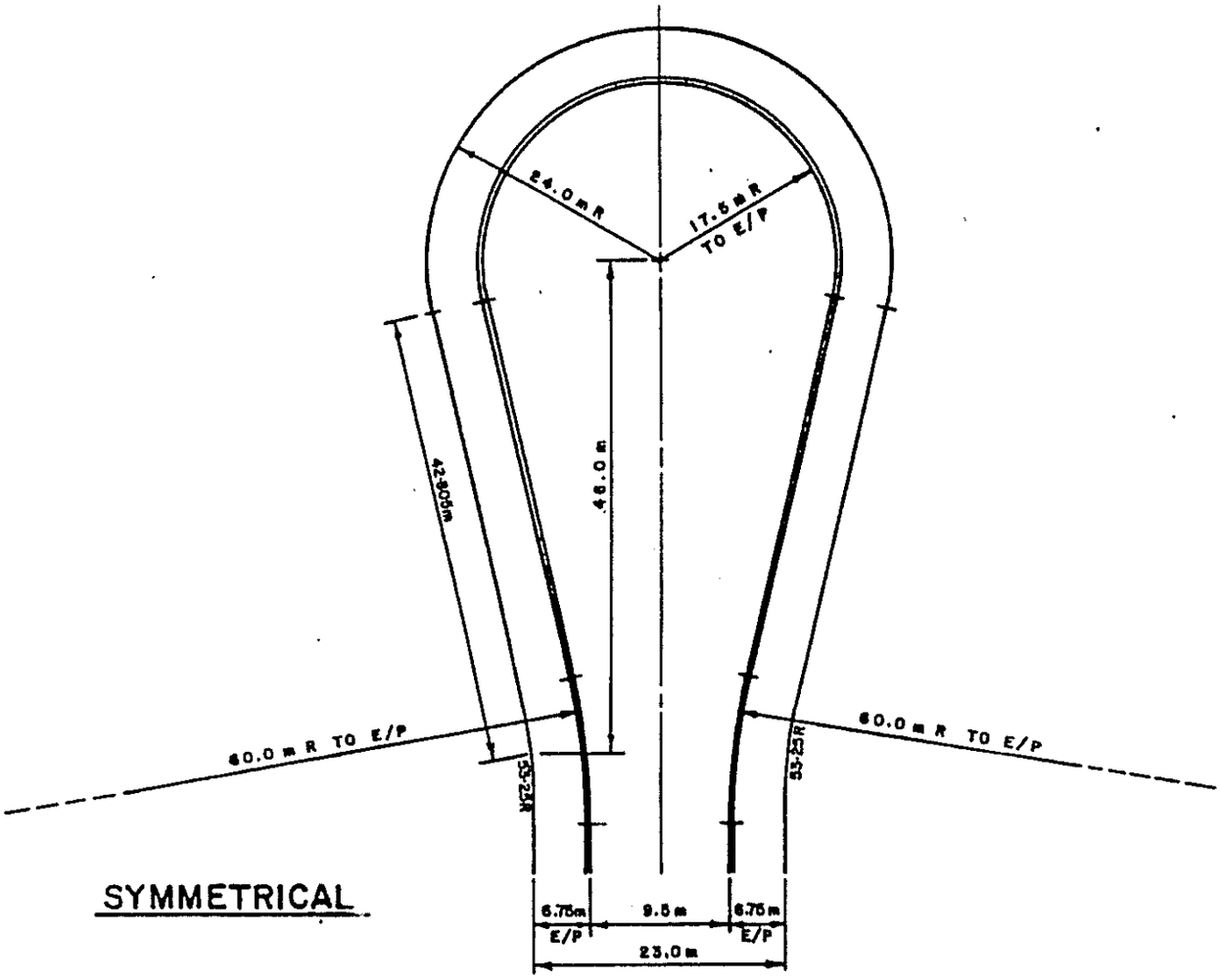
ROVED ISION 1 E OF REVISION	TOWNSHIP OF SCUGOG TYPICAL CUL-DE-SAC FOR URBAN RESIDENTIAL STREETS	DATE OF ISSUE 1980 DRAWING No. SS-219



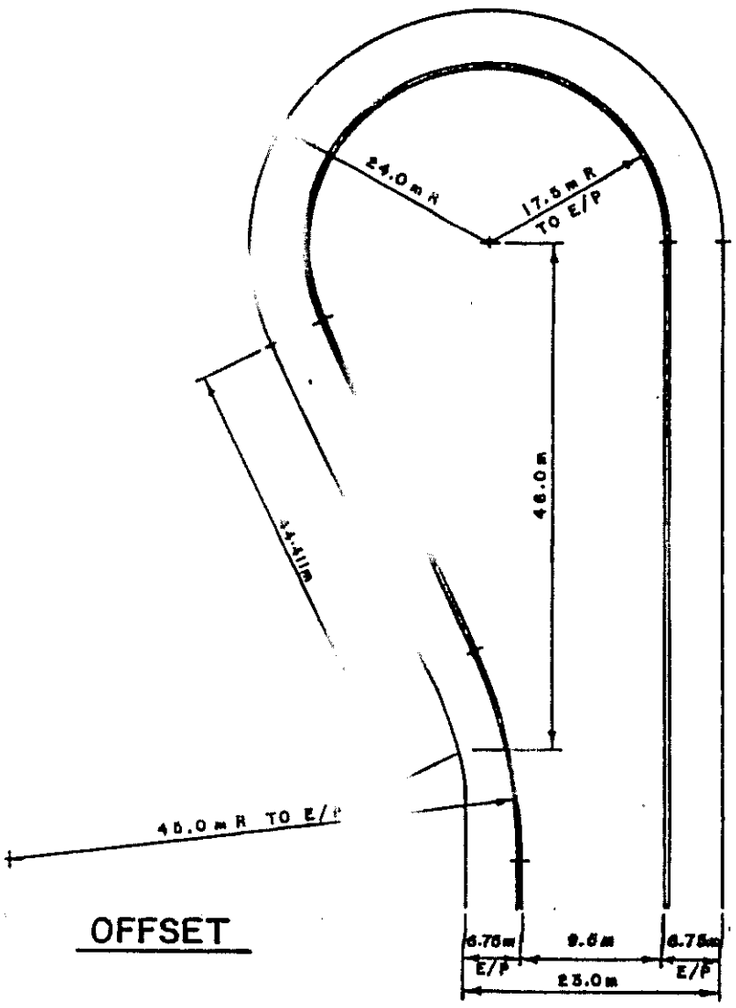
NOTES:

1. MINIMUM GUTTER SLOPE TO BE
2. DETAIL OF GRADING OF BULB TO BE SHOWN ON PLAN/PROFILE DRAWINGS. CUL-DE-SAC
3. CUL-DE-SAC DRAINAGE TO BE BEGINNING OF THE BULB. TOWARDS
4. ALL DIMENSIONS ARE IN METRES

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG TYPICAL OFFSET CUL-DE SAC FOR URBAN RESIDENTIAL STREETS	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-220



SYMMETRICAL

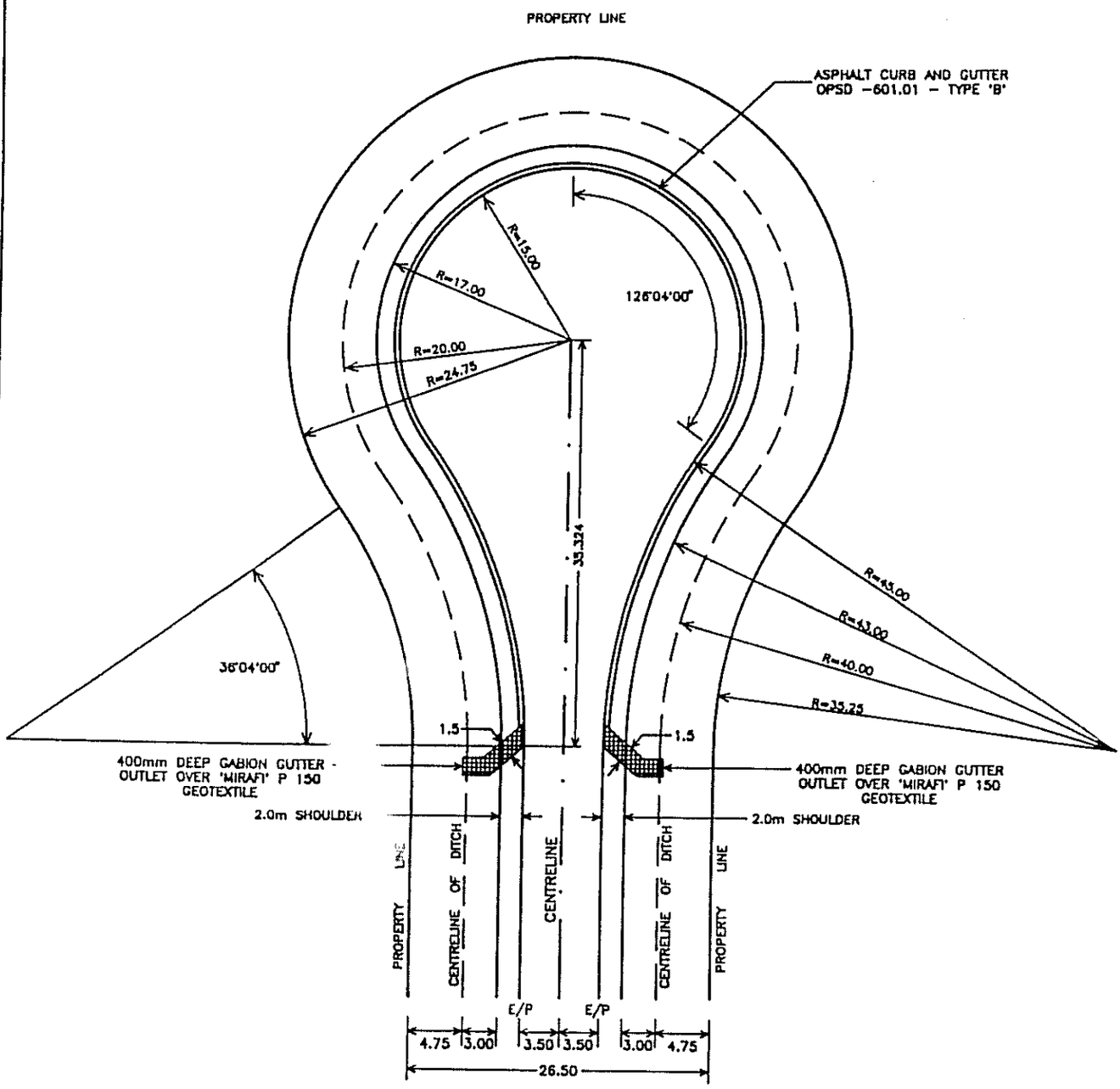


OFFSET

NOTES:

1. MINIMUM GUTTER SLOPE TO BE 1.0%.
2. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SACS TO BE SHOWN ON PROFILE DRAWINGS.
3. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

PPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	TYPICAL CUL-DE-SACS FOR URBAN INDUSTRIAL STREETS	DRAWING No. SS-221
ATE OF REVISION APRIL 1990		



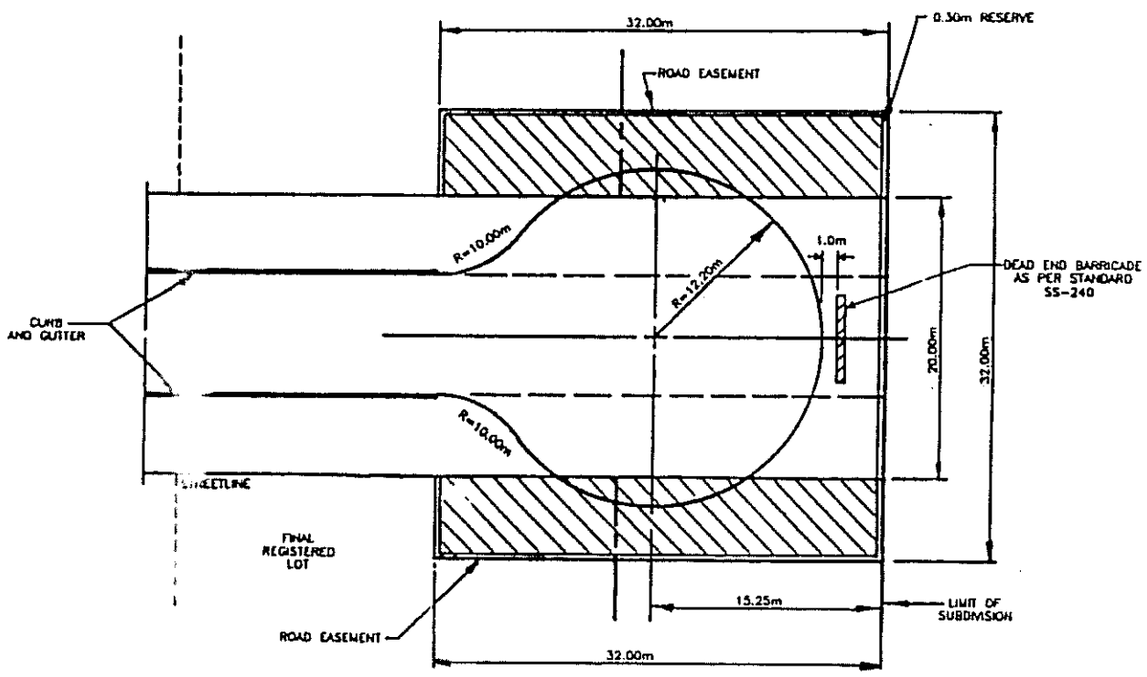
NOTES:

1. MINIMUM LONGITUDINAL GRADE OF DITCHLINE AROUND CUL-DE-SAC TO BE 2%.
2. DETAIL OF GRADING OF BULB AREA OF CUL-DE-SAC TO BE SHOWN ON PLAN/PROFILE DRAWINGS.
3. ALL DIMENSIONS ARE IN METRES.

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG TYPICAL CUL-DE SAC FOR RURAL INDUSTRIAL STREETS	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-222

TURNING CIRCLE PAVEMENT DESIGN:

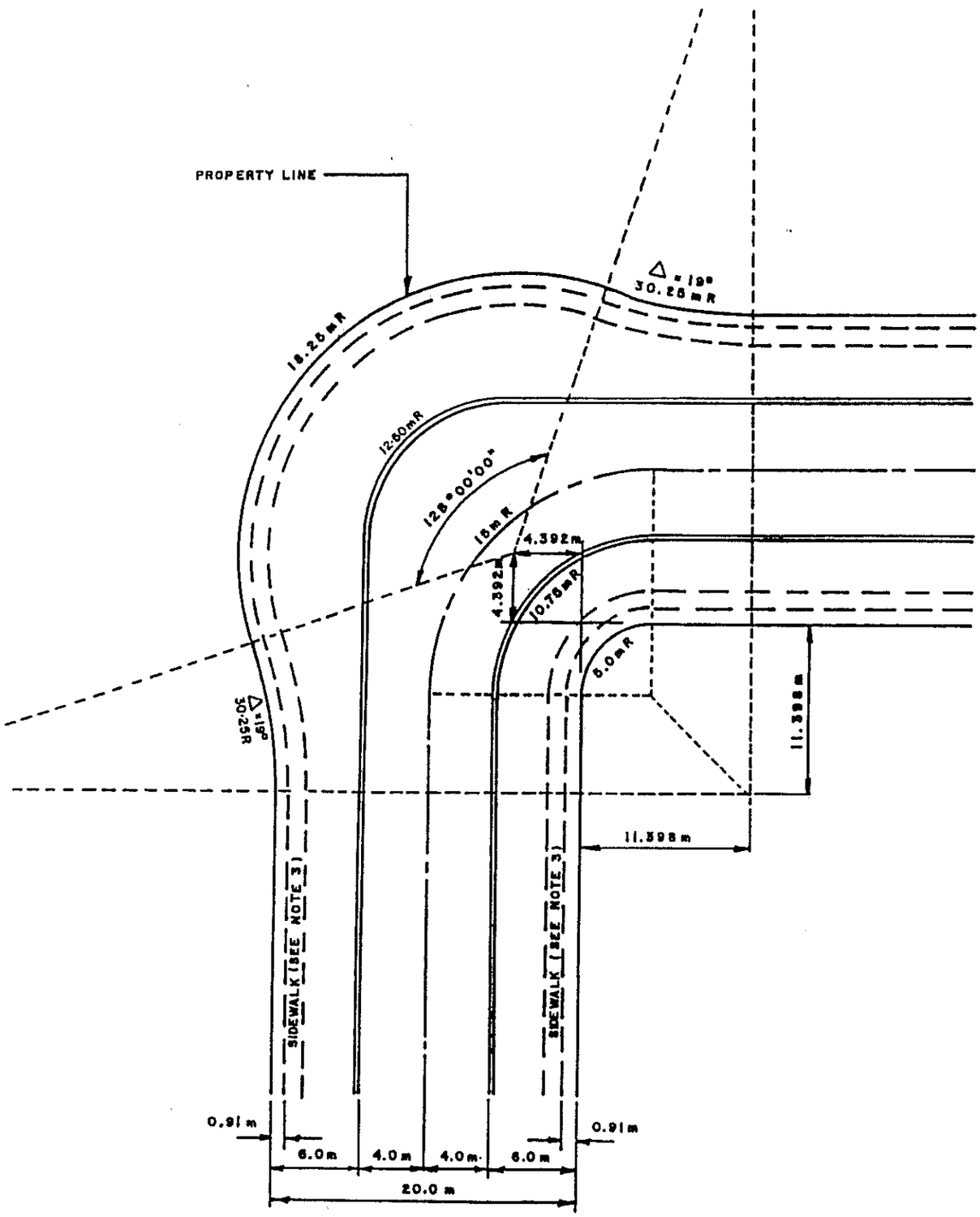
32mm ASPHALT SURFACE COURSE – H.L. 3
50mm ASPHALT BINDER COURSE – H.L. 8
150mm GRANULAR 'A'
300mm GRANULAR 'B'



NOTES:

1. TEMPORARY TURNING CIRCLES SHALL BE USED ONLY FOR PHASING OF RESIDENTIAL SUBDIVISIONS, SUBJECT TO THE TOWNSHIP ENGINEER'S APPROVAL.
2. THE SUBDIVIDER WILL DEPOSIT WITH THE TOWNSHIP AN AMOUNT WHICH THE TOWNSHIP ENGINEER CALCULATES TO BE THE COST OF REMOVING THE TURNING CIRCLE AND CONSTRUCTING THE STANDARD ROAD FROM THE START OF THE TURNING CIRCLE TO THE LIMIT OF SUBDIVISION.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.

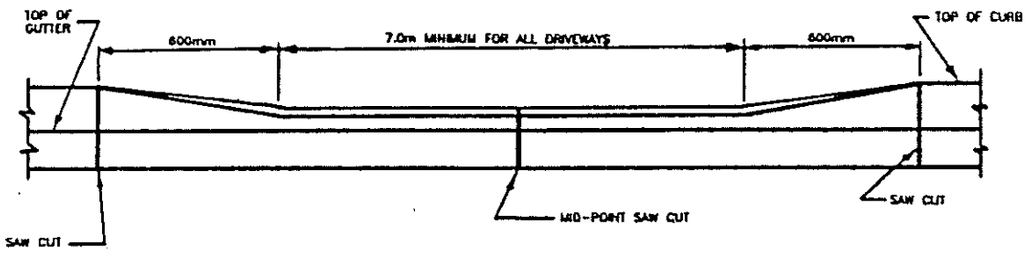
PPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	TEMPORARY TURNING CIRCLE FOR RESIDENTIAL STREETS	DRAWING No. SS-223
ATE OF REVISION APRIL 1990		



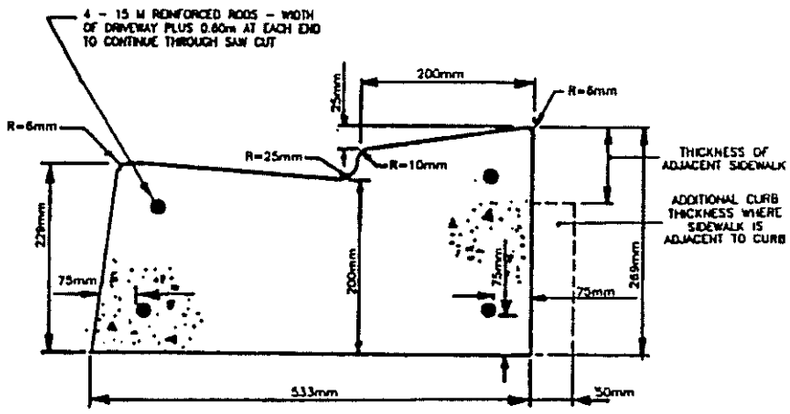
NOTES:

1. CHAINAGE TO BE CALCULATED USING A CENTRELINE RADIUS OF 15.0m.
2. GUTTER GRADES TO BE DETAILED ON THE ENGINEERING DRAWINGS. MINIMUM GRADE ALONG GUTTER TO BE 0.50%.
3. THE LOCATION OF ANY SIDEWALK IS TO BE DETAILED ON THE ENGINEERING DRAWINGS.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
5. ALL CURB RADII ARE TO EDGE OF PAVEMENT.

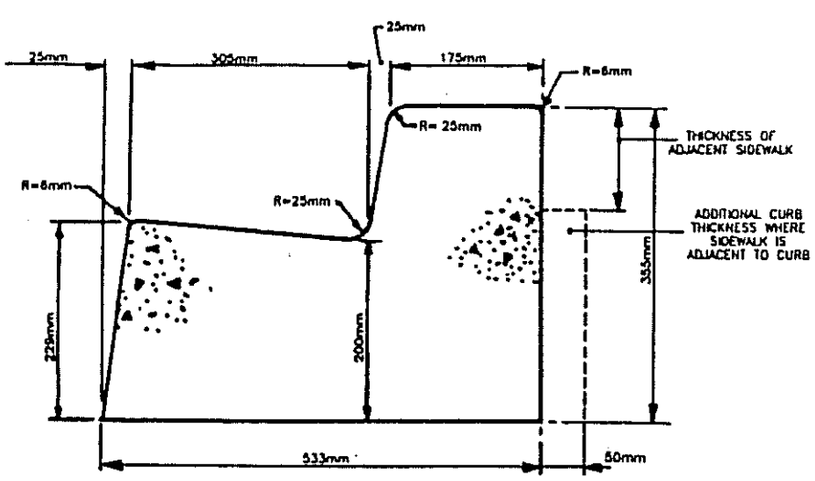
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	TYPICAL BULB DETAIL FOR RESIDENTIAL CRESCENTS	DRAWING NO. SS-224
DATE OF REVISION APRIL 1990		



ELEVATION AT DRIVEWAY
RESIDENTIAL AREAS



CURB AND GUTTER AT
DRIVEWAY DEPRESSION
SECTION

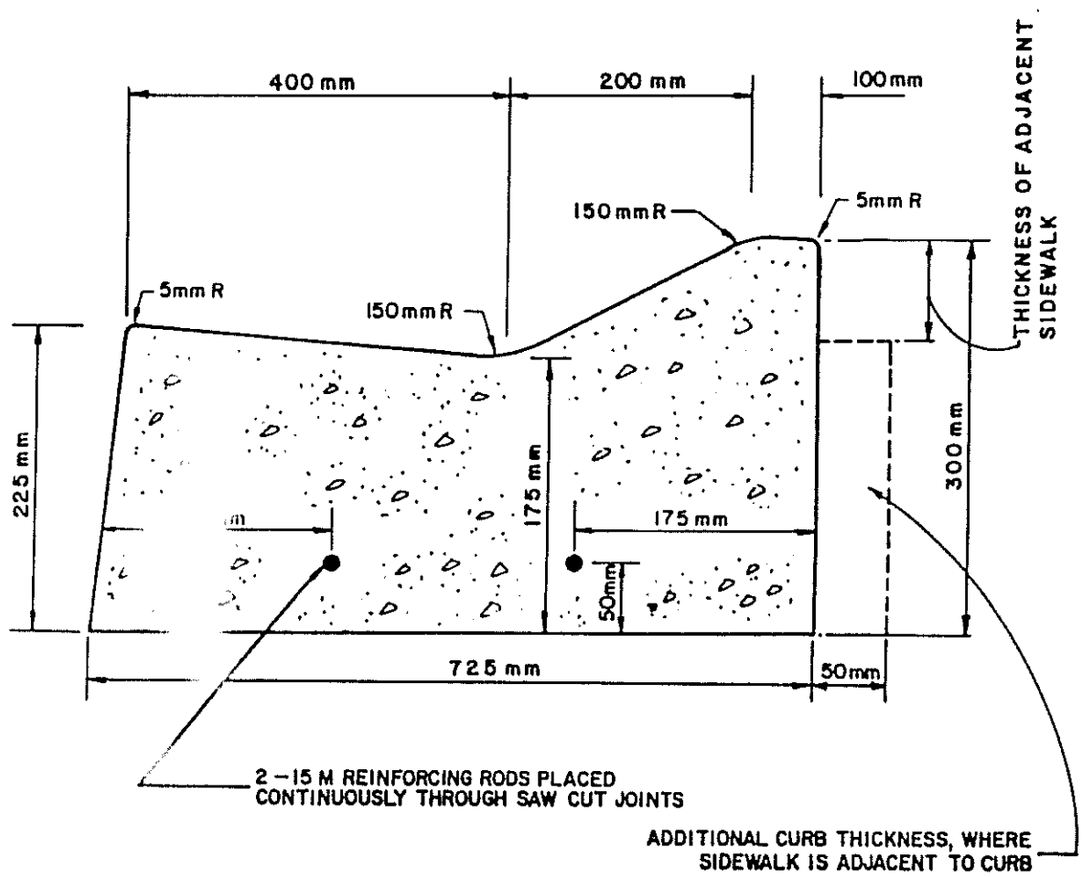


STRAIGHT RUN CURB AND GUTTER
SECTION

NOTES:

1. ALL CONCRETE TO BE 25 MPa. 5-7% AIR ENTRAINMENT, 20mm MAXIMUM AGGREGATE SIZE.
2. MAXIMUM SAW CUT JOINT SPACING TO BE 4.50m.
3. SEE STANDARD SS-341 FOR DRIVEWAY APPROACH DETAILS.
4. ALL DIMENSIONS SRE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

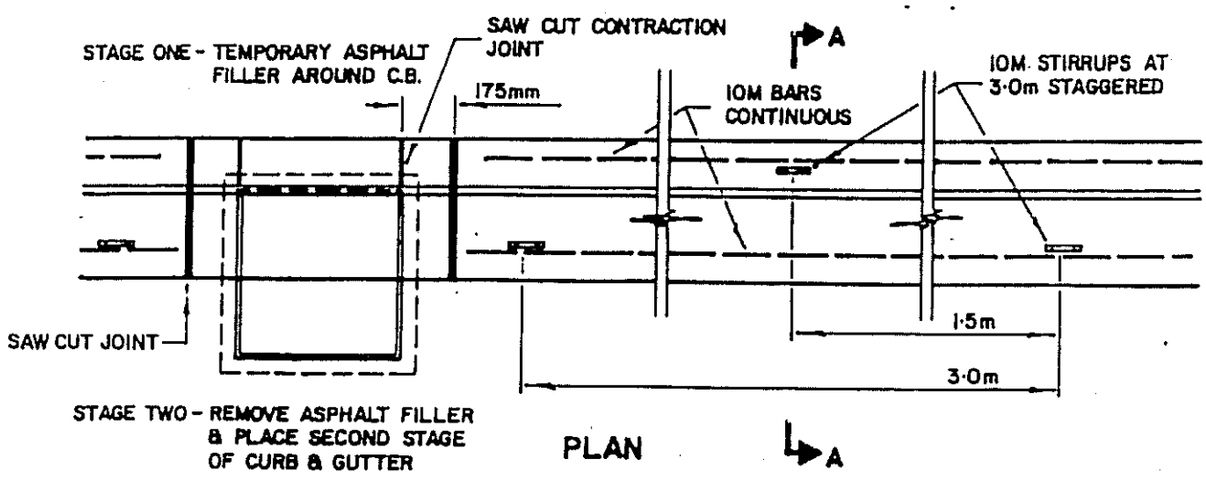
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
VISION 1	CONCRETE CURB AND GUTTER	DRAWING No. SS-225
TE OF REVISION APRIL 1990		

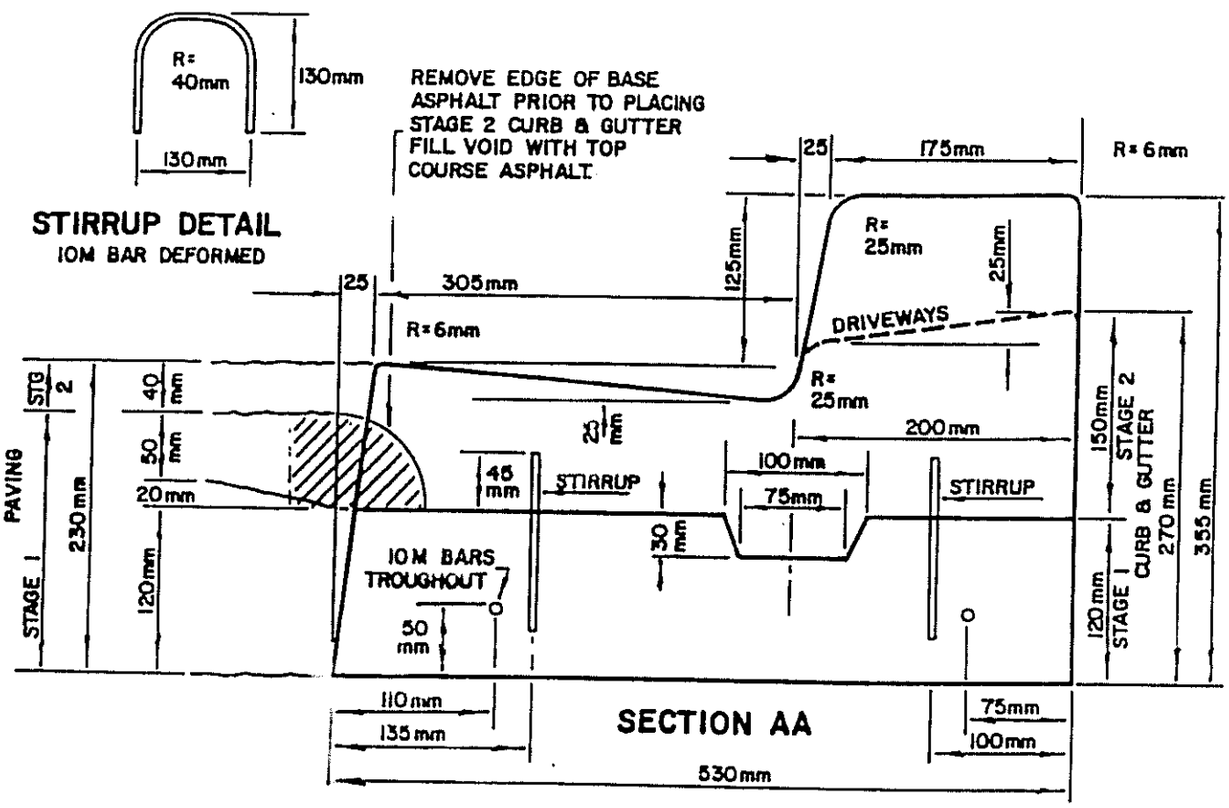


NOTES:

1. ALL CONCRETE 25MPa 5–7% AIR ENTRAINMENT, 20mm MAXIMUM AGGREGATE SIZE.
2. MAXIMUM SAW JOINT SPACING TO BE 4.50m.
3. SEE STANDARD 341 FOR DRIVEWAY APPROACH DETAILS.
4. ALL DIMENSIONS IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1983
REVISION 1	MOUNTABLE CONCRETE CURB AND GUTTER	DRAWING NO. SS-226
DATE OF REVISION APRIL 1990		

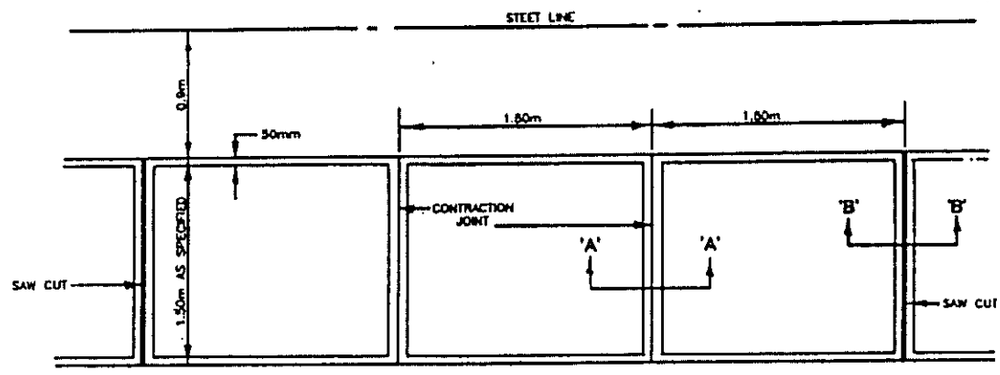




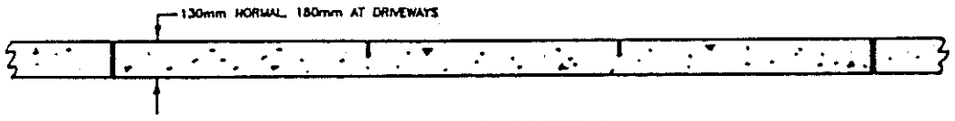
NOTES:

1. CURB CUT END SLOPES BE 4:1.
2. TRIM BASE COURSE ASPH EDGE PRIOR TO STAGE TWO INSTALLATION OF CURB.
3. CATCHBASIN GRATE TO BE AT 50mm BELOW FINISHED GRADE IN FIRST STAGE AND ADJUSTED WITH MODULOC UNITS (OR APPROVED) EQUAL) TO FINAL GRADE DURING STAGE TWO CONSTRUCTION.
4. CONCRETE TO CONFORM OPSS 1350, 25MPa, 5-7% AIR ENTRAINMENT AND MINIMUM 325kg/m³ CEMENT CON
5. STAGE ONE TO BE THOR LY CLEANED BY USE OF COMPRESSED AIR AND WATER OR OTHER APPROVED METHODS TO SFACTION OF THE TOWNSHIP ENGINEER PRIOR TO STAGE TWO INSTALLATION.
6. USE OF CURING COMPOU OR BONDING AGENTS ARE NOT PERMITTED BETWEEN STAGES.
7. CURING COMPOUND TO B PPLIED AFTER INSTALLATION OF STAGE TWO CURB AND GUTTER.
8. ALL DIMENSIONS IN MILLMETRES OR METRES.

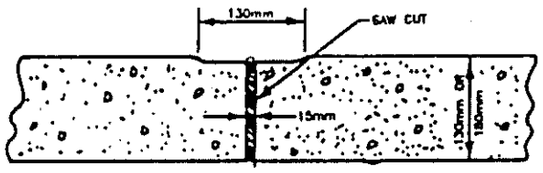
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
	TWO STAGE – CURB AND GUTTER	DRAWING NO. SS–227



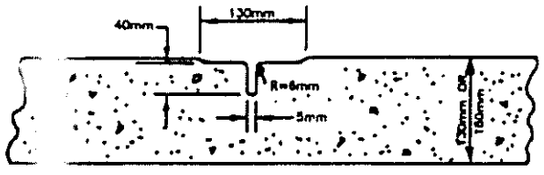
PLAN VIEW



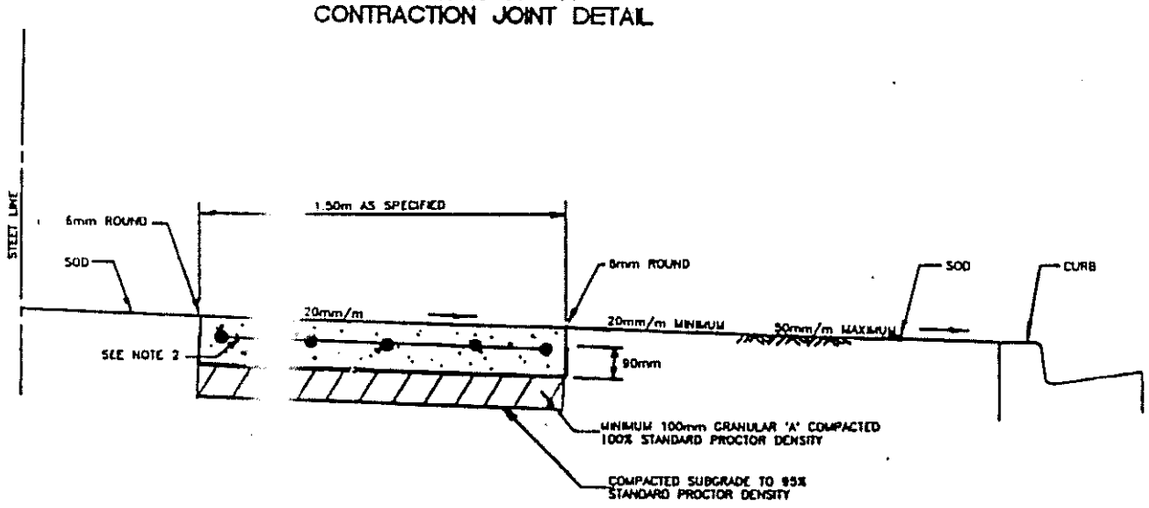
LONGITUDINAL SECTION



SECTION 'B' - 'B'
SAW CUT JOINT DETAIL



SECTION 'A' - 'A'
CONTRACTION JOINT DETAIL

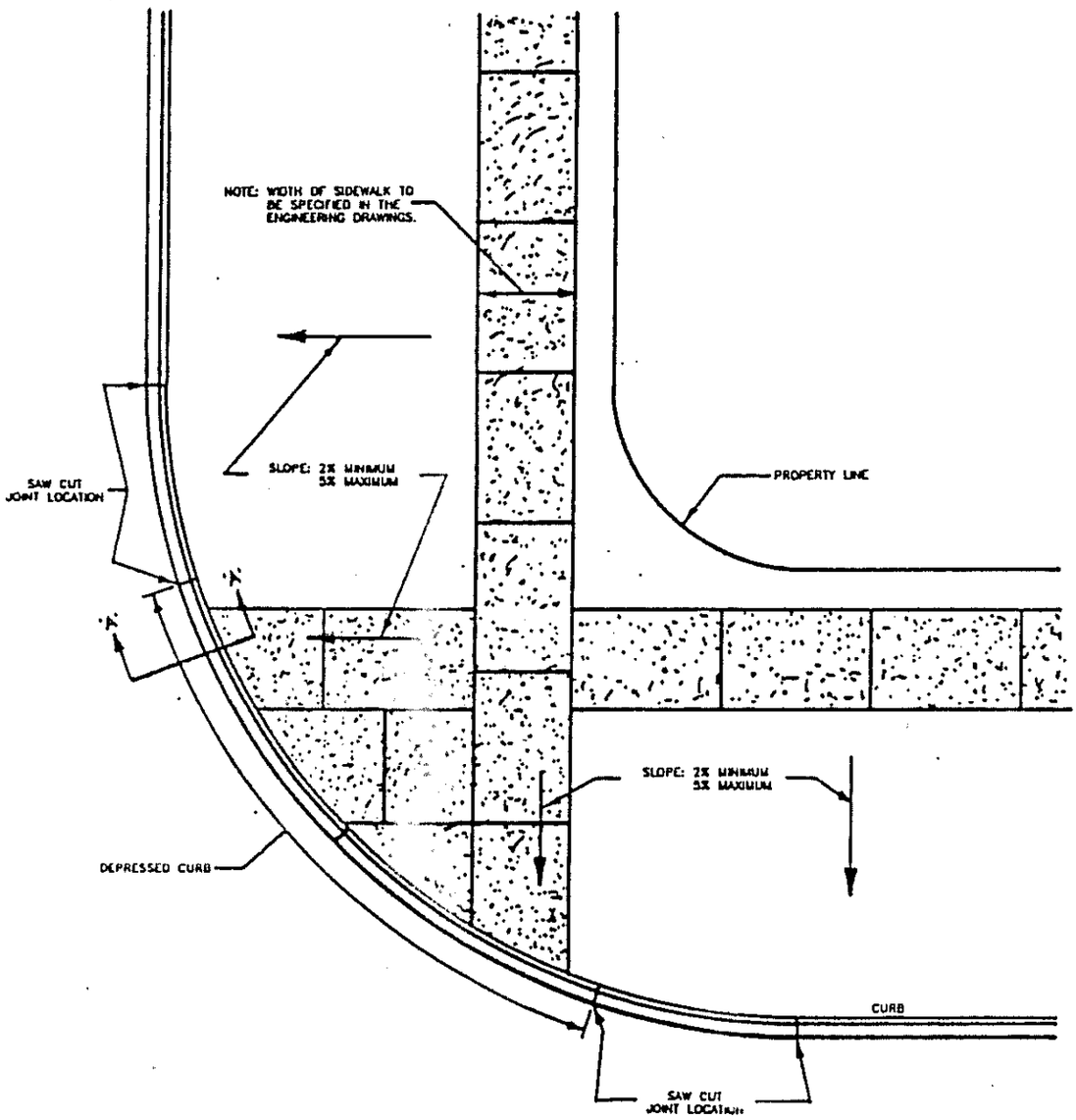


BOULEVARD SECTION

NOTES:

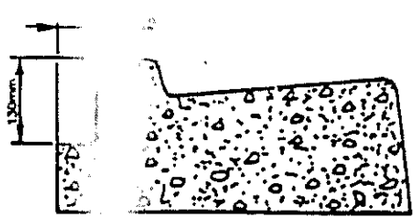
1. CONCRETE TO BE ...MPa, 5-7% AIR ENTRAINMENT WITH 20mm MAXIMUM AGGREGATE SIZE.
2. FOR COMMERCIAL, INDUSTRIAL AND APARTMENT DRIVEWAYS, SIDEWALK TO BE REINFORCED WITH 152mm x ...mm MW 18.7 x MW 18.7 METRIC WELDED WIRE MESH.
3. SAW CUT JOINTS ... ALSO REQUIRED WHERE SIDEWALK ABUTS OTHER CONCRETE STRUCTURES, WALKS, CURBS, UTILITY POLES, HYDRANTS, MANHOLES AND AT CERTAIN LOCATIONS AT DISCRETION OF THE ENGINEER.
4. CONTRACTION JOINTS TO BE FORMED AFTER THE CONCRETE HAS RECEIVED ITS INITIAL SET.
5. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	CONCRETE SIDEWALK	DRAWING No. SS-231
DATE OF REVISION APRIL 1990		



PLAN

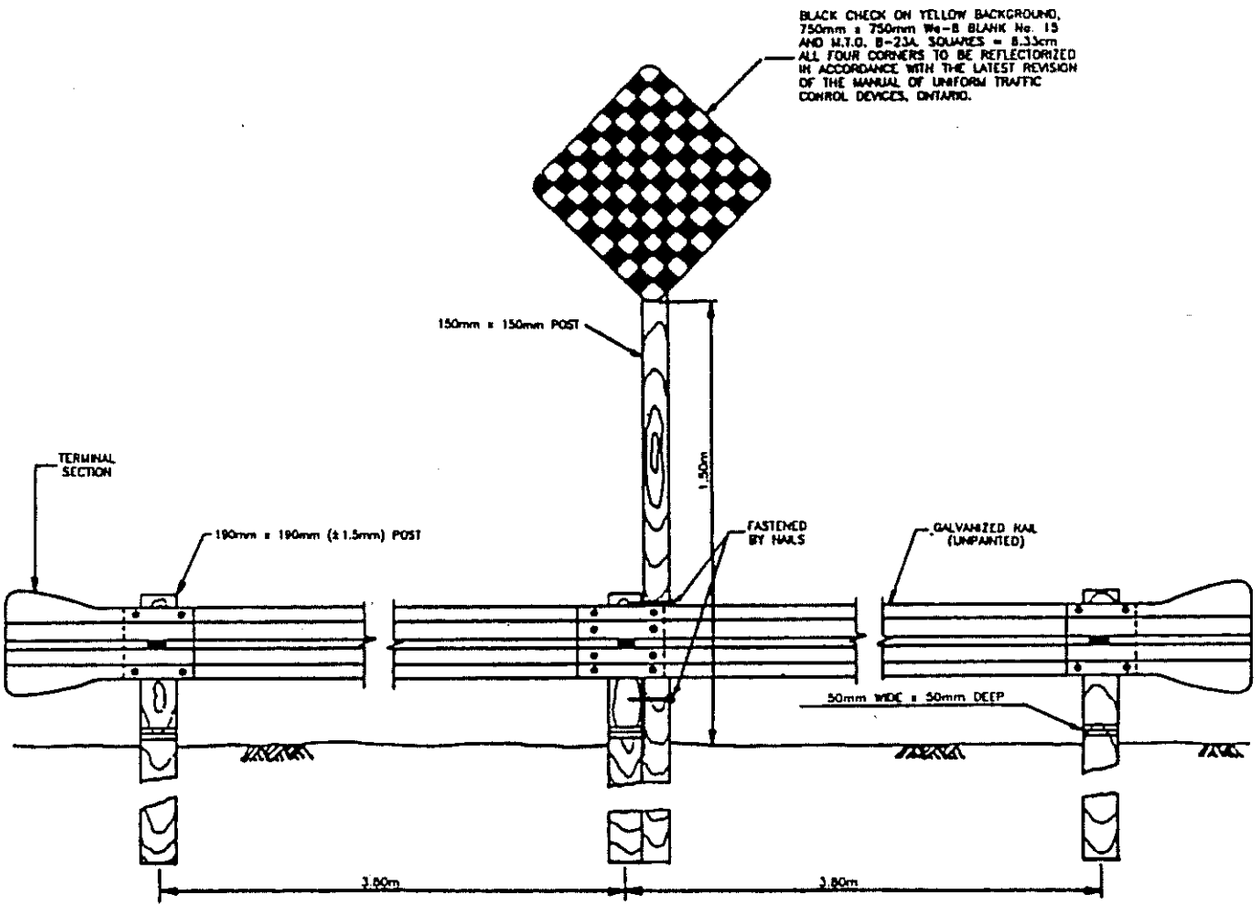
SECTION 'A' - 'A'



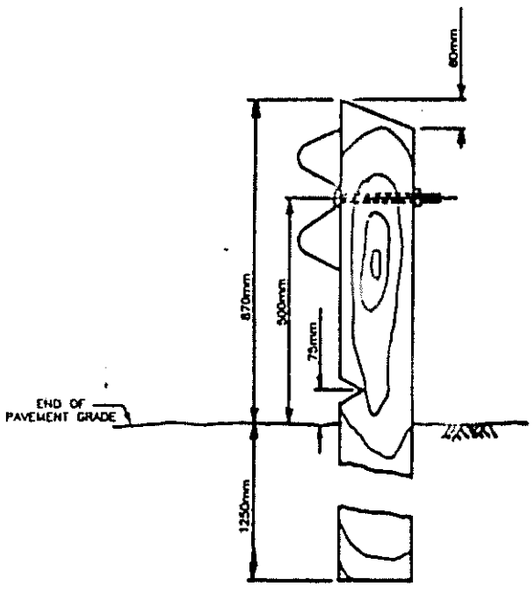
NOTES:

1. ALL SIDEWALKS TO BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SS-231.
2. ALL CONCRETE CURBS TO BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SS-225.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

PPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	SIDEWALKS AT INTERSECTIONS	DRAWING No. SS-235
ATE OF REVISION APRIL 1990		



BARRICADE DETAIL

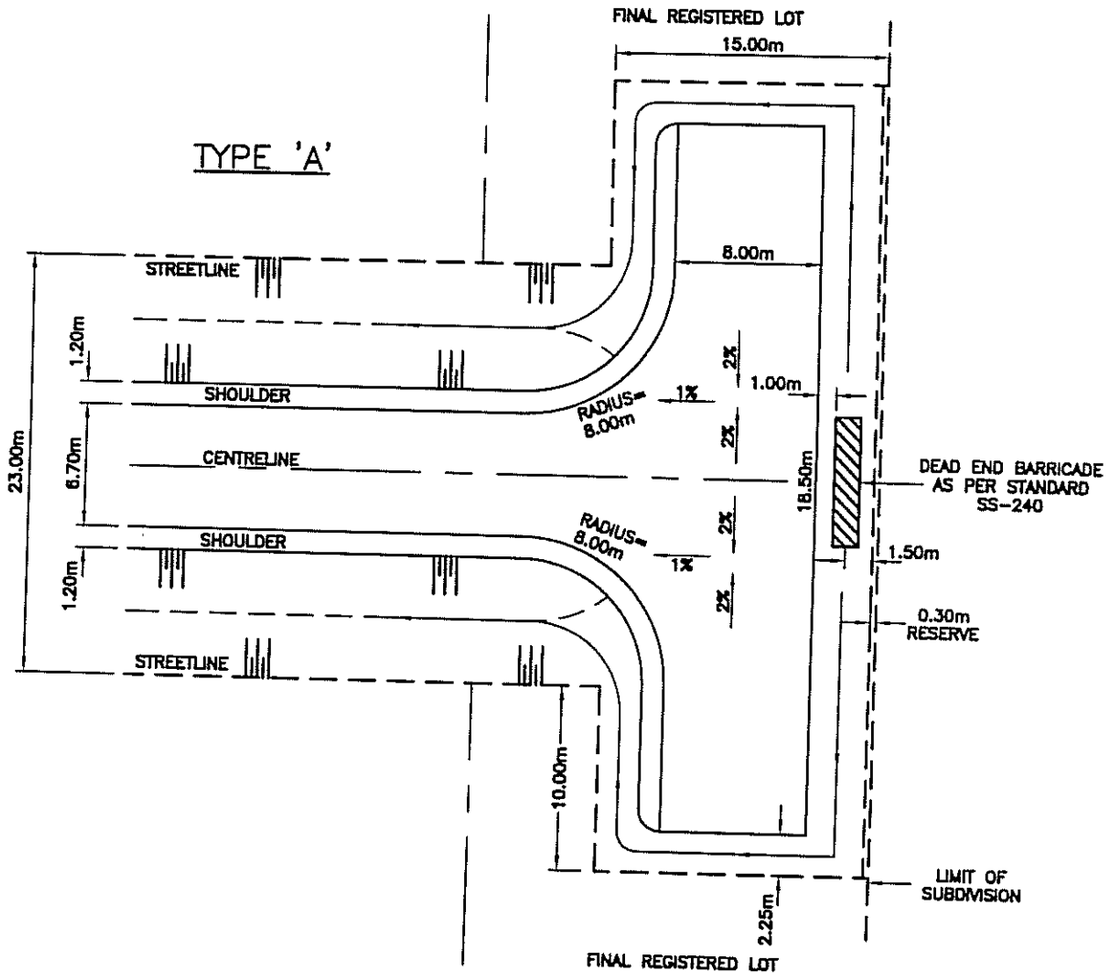


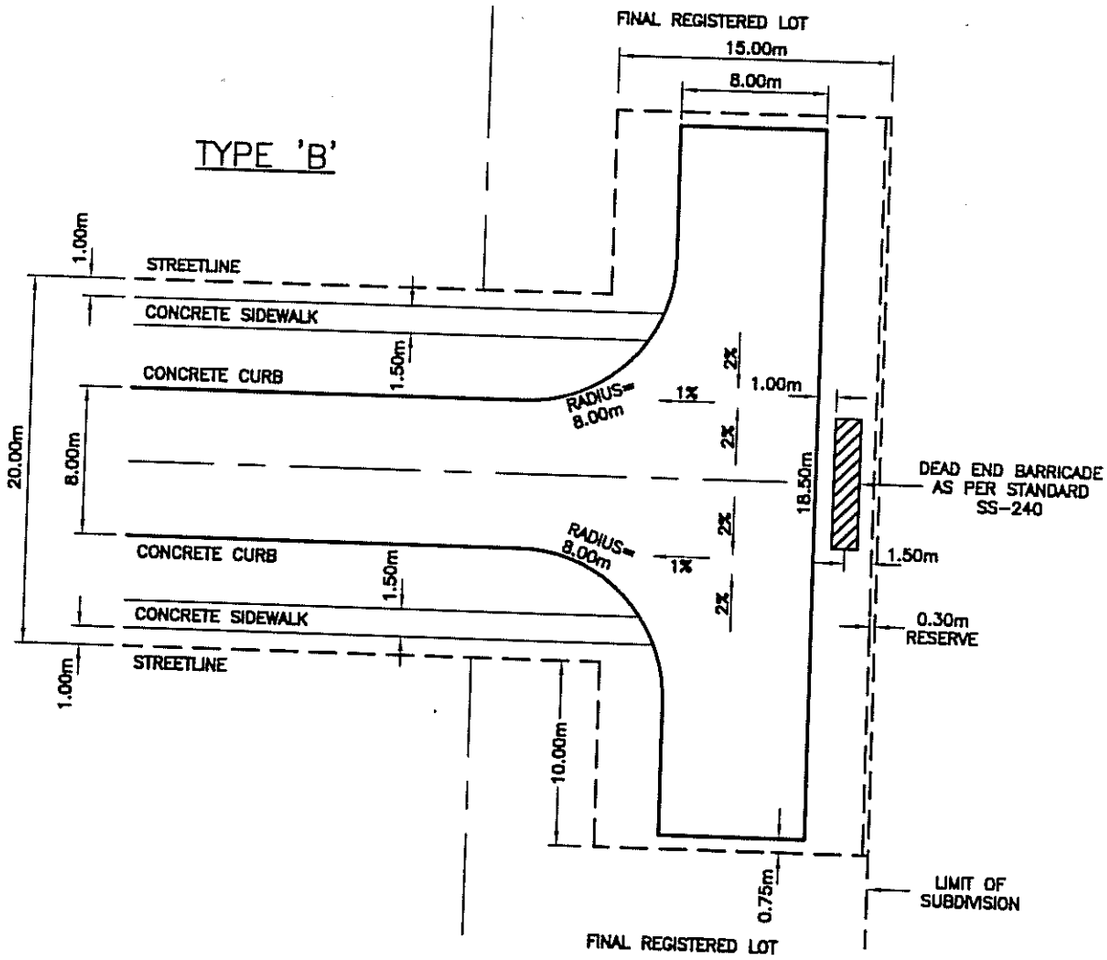
SECTION

NOTES:

1. ALL DIMENSIOMS SUBJECT TO MANUFACTURING TOLERANCES.
2. LENGTH OF ELEMENT 3.80m CENTRE TO CENTRE OF POST BOLT SLOTS.
3. RAIL TO BE 10 GAUGE OR AS SPECIFIED.
4. RAIL TO BE GALVANIZED 300g. PER METRE SQUARE ON BOTH SIDES.
5. FOR PAVEMENT WIDTHS IN EXCESS OF 8.50m, ADDITIONAL SECTIONS TO BE ADDED SO THAT ENDS OF SECTIONS ARE AT LEAST TO FACE OF CURB.
6. BARRICADE TO BE PLACED AT END OF ASPHALT PAVEMENT.
7. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
8. POST AND OFFSET BLOCKS TO BE PRESSURE TREATED WITH 5% PENTACHLOROPHENOL IN OIL, MINIMUM RETENTION OF 96kg/m^3 OR CHROMATED COPPER ARSENATE TO A NET RETENTION OF 6.8kg/m^3 (CSA-080).

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	DEAD END STREET BARRICADE DETAIL	DRAWING No. SS-240
DATE OF REVISION APRIL 1990		

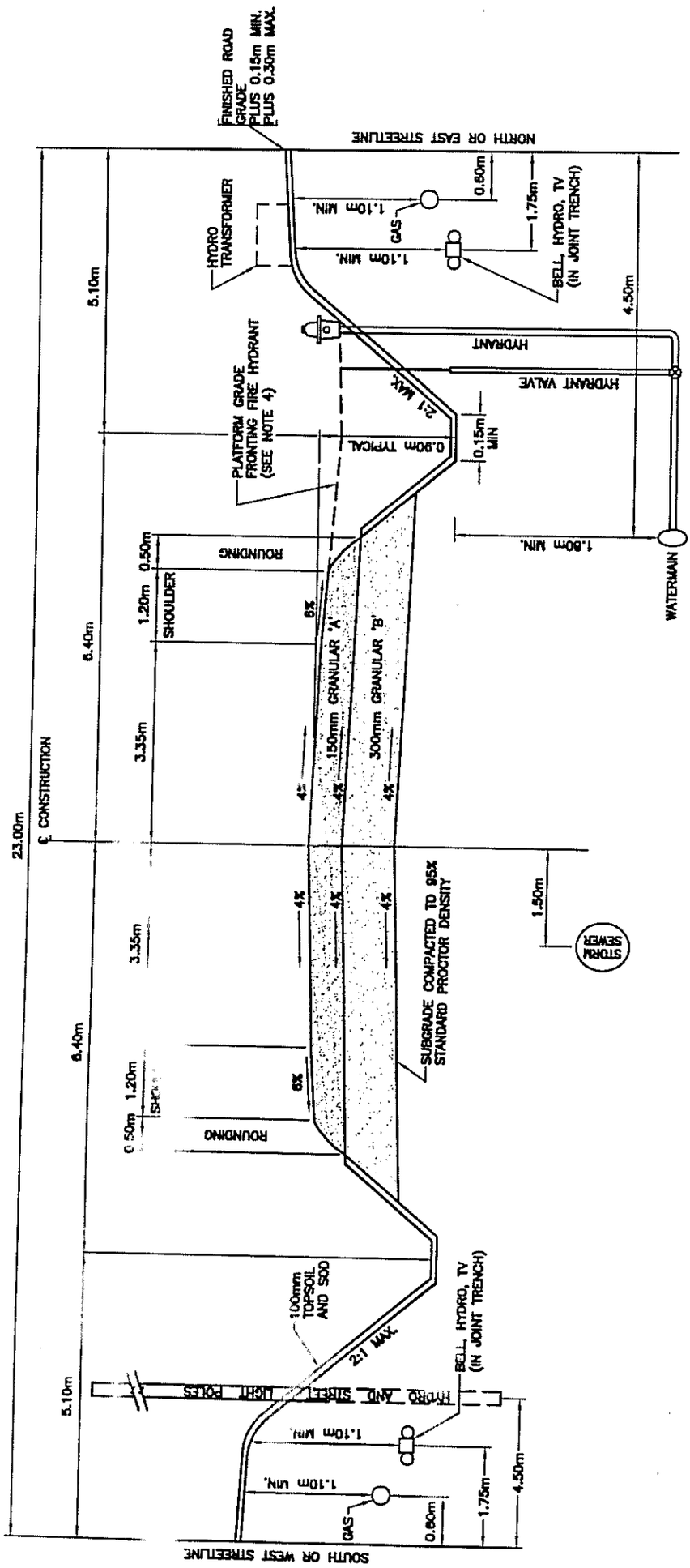




NOTES

1. GUTTER GRADES TO BE DETAILED ON ENGINEERING DRAWINGS. MINIMUM GRADE TO BE 1%.
2. THE LOCATION OF SIDEWALK TO BE DETAILED ON THE ENGINEERING DRAWINGS.
3. ALL CURB RADII ARE TO FACE OF CURBS.

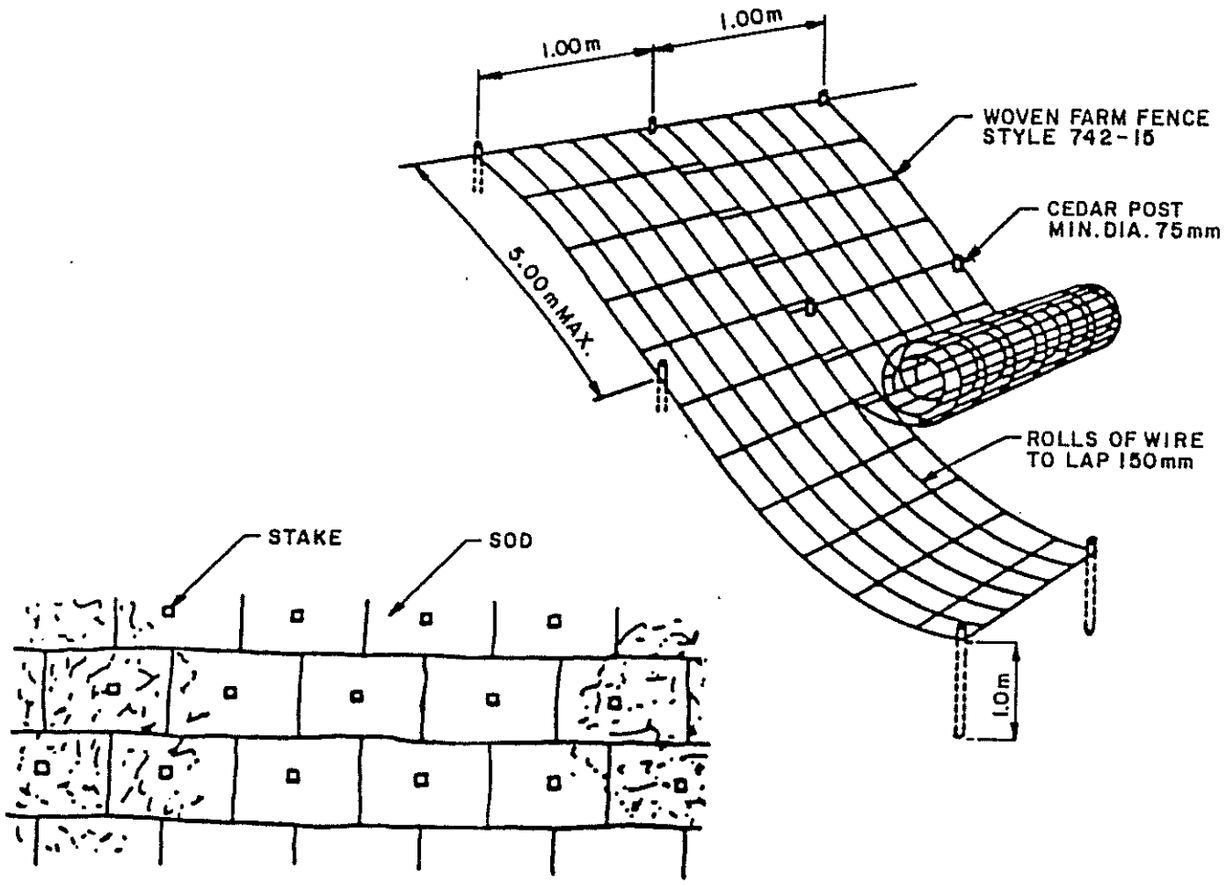
PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION	PERMANENT HAMMERHEAD TURNING AREA FOR RESIDENTIAL STREETS	DRAWING No. SS-241
TE OF REVISION		



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
3. ALL WATER CURB STOPS TO BE PLACED AT STREETLINE.
4. A 3.0m WIDE PLATFORM AREA SHALL BE CONSTRUCTED FOR EACH FIRE HYDRANT. THE MINIMUM CULVERT LENGTH SHALL BE 6.5m AND THE MINIMUM DIAMETER SHALL BE 450mm. PLATFORM AREAS SHALL BE RESTORED WITH 100mm TOPSOIL AND SOD.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
REVISION	LOW VOLUME ROAD (AADT<400)	DRAWING No. SS-242
DATE OF REVISION		



MINIMUM SIZE OF SODS

A. NURSERY SOD – 400mm x 350mm x 30mm THICKNESS

B. FIELD SOD – 350mm x 300mm x 30mm THICKNESS

PEGGING OF SODS

A. MINIMUM SIZE OF STAKES – 25mm x 25mm NOMINAL x 300mm (LONGER IF NECESARY TO SECURE SODS).

B. ON SLOPES STEEPER THAN 1 3/4:1 EVERY SOD SHALL BE STAKED.

C. ON SLOPES OF 1 3/4:1 TO 3:1 EVERY SOD SHALL BE STAKED IN THE BOTTOM THREE ROWS AND IN EVERY THIRD ROW ABOVE.

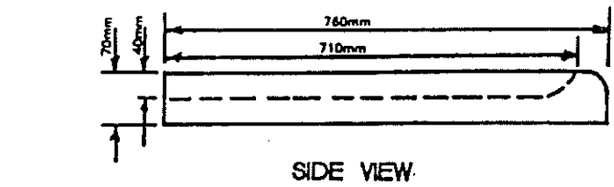
D. STAKES SHALL BE DRIVEN FLUSH BUT NOT DEEPER.

E. THE SPACE BETWEEN STAKES REGARDLESS OF SOD SIZE, SHALL NOT EXCEED 600mm ACROSS THE FACE. OF THE SLOPE.

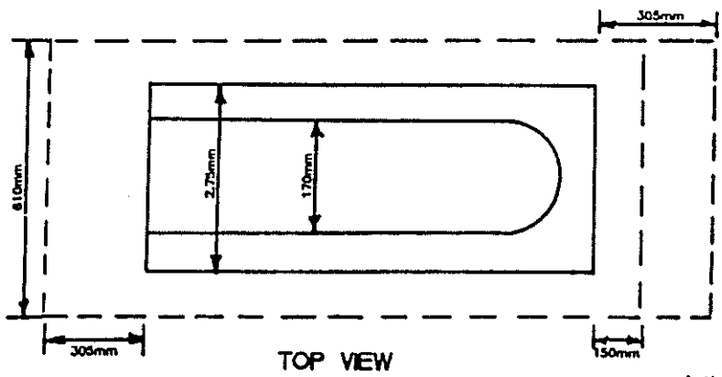
NOTES:

1. ON PREPARED SLOPE[S] AS DESIGNATED BY THE ENGINEER, WIRE MESH SHALL BE STRETCHED FROM TOP TO BOTTOM OF THE SLOPE, AND SHALL BE SECURED BY WIRING WITH No. 9 WIRE TO CEDAR POSTS SUNK 1.00m INTO THE GROUND AT INTERVALS ACROSS THE SLOPE NOT EXCEEDING 1.00m.
2. ONE ROW OF POSTS SHALL BE PLACED AT THE TOP OF SLOPE, ONE ROW AT THE BOTTOM OF SLOPE AND INTERMEDIATE ROWS AT MAXIMUM DISTANCES OF 5.00m UP OR DOWN THE SLOPE.
3. THE METHOD OF SECURING THE MESH TO THE POSTS SHALL BE ARRANGED AS TO PERMIT THE LOOP TO MOVE DOWN THE POST AS THE FILL SETTLES.
4. THE POSTS SHALL BE CUT OFF AT SOD LEVEL.
5. SODDING IS TO BE CARRIED TO EDGE OF PAVING AND TO BE COUNTERSUNK TO EXISTING GRADE LEVEL AT EDGES OF SHOULDERS AND DITCHES TO ALLOW FREE FLOW OF WATER ACROSS THE JOINT BETWEEN EXISTING GRADE AND NEW SODDING.
6. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

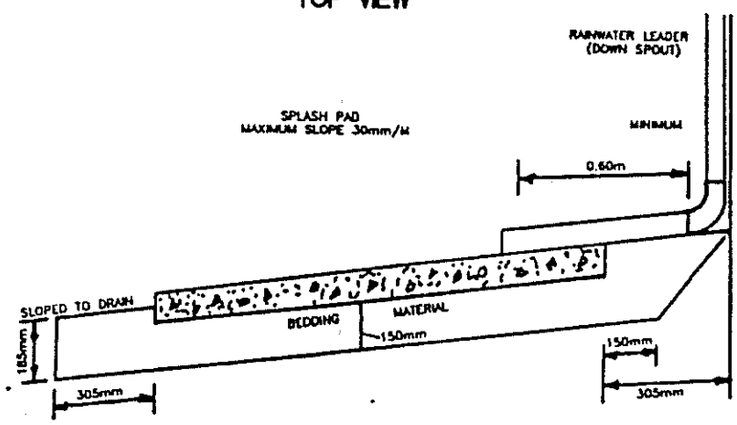
APPROVED REVISION 1 DATE OF REVISION APRIL 1990	TOWNSHIP OF SCUGOG SODDING OF SIDE SLOPES	DATE OF ISSUE 1980 DRAWING NO. SS–301



SIDE VIEW



TOP VIEW

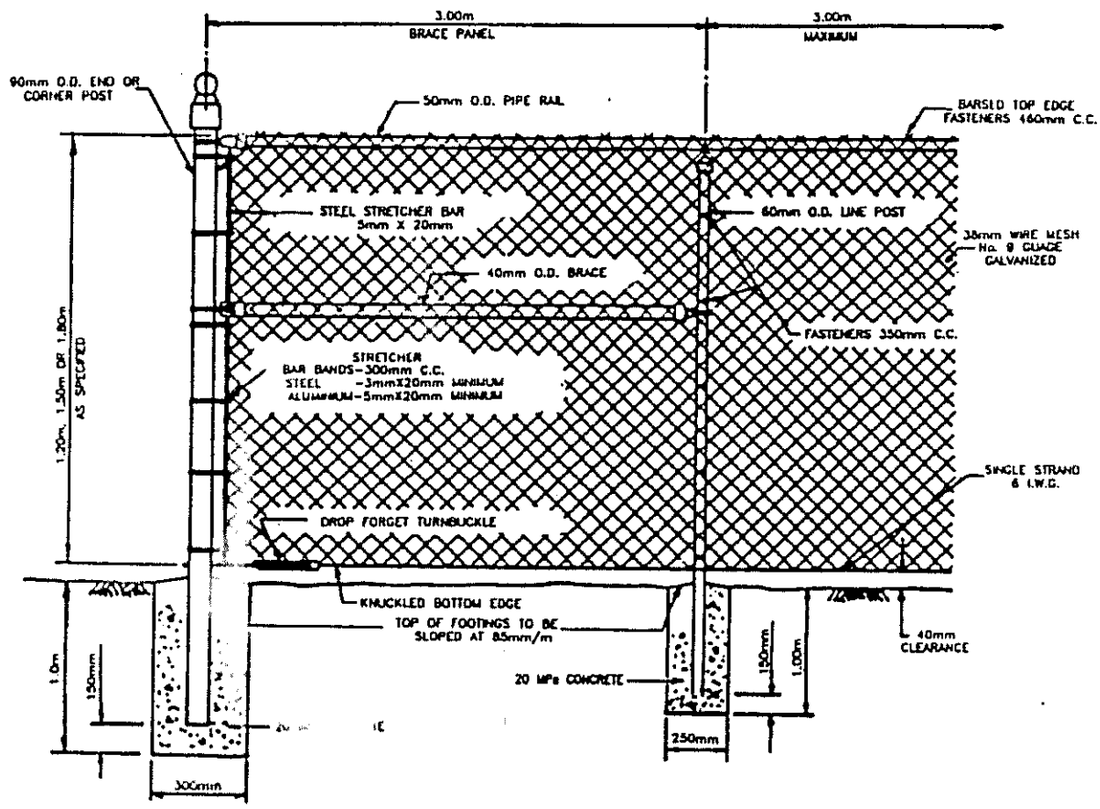


NOTES:

1. MINIMUM CONCRETE STRENGTH SHALL BE 20 MPa.
2. BEDDING MATERIAL SHALL BE 19mm CLEAR STONE OR EQUIVALENT.
3. PRECAST CONCRETE SPLASH PADS SHALL BE PLACED AT EACH RAINWATER LEADER DOWNSPOUT.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	PRECAST CONCRETE SPLASH PAD DETAIL	DRAWING NO. SS-302
DATE OF REVISION APRIL 1990		

SCHEDULE OF APPLICATIONS	
ADJACENT LAND USE	HEIGHT
PARKLANDS	1.8m
HAZARD LANDS	1.2m
OPEN CHANNELS	1.2m
CEMETERIES	1.2m
PUBLIC WALKWAYS	1.2m
MUNICIPALLY OWNED COMMUNITY FACILITIES (COMMUNITY CENTRES, ARENAS, LIBRARIES, FIREHALLS, ETC.)	1.2m
SCHOOL YARDS	1.8m, SUBJECT TO SCHOOL BOARD APPROVAL



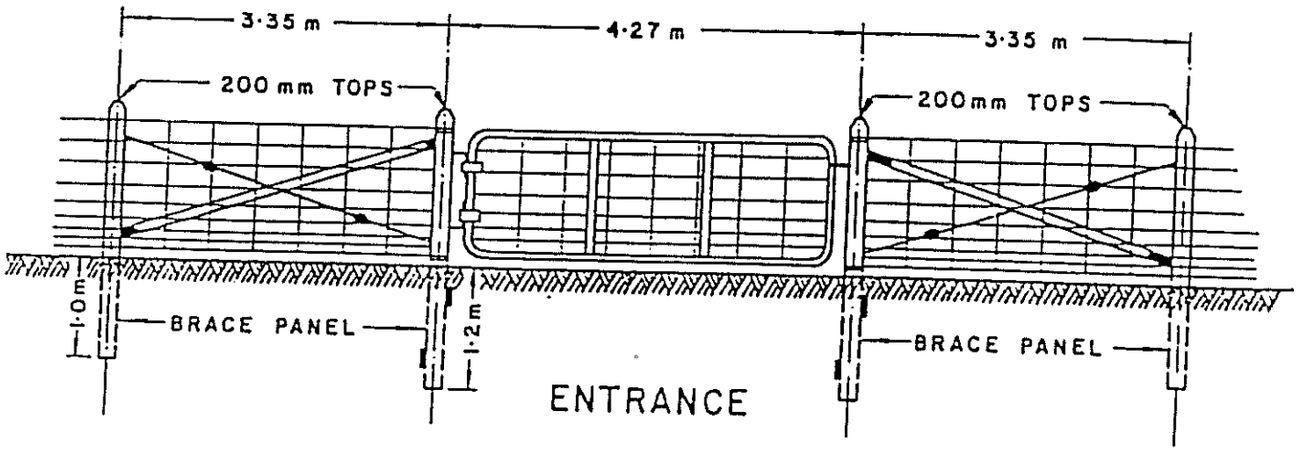
NOTES:

1. LENGTH OF POST

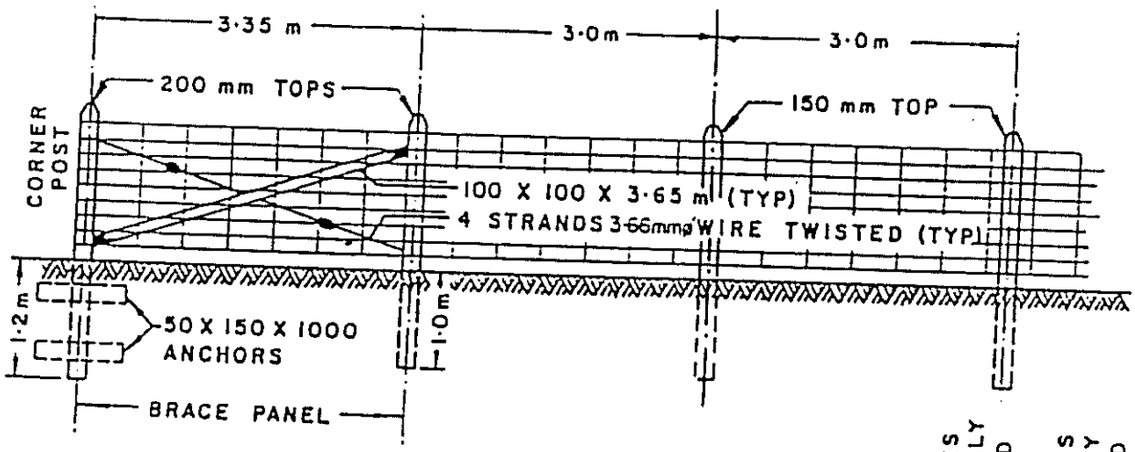
FENCE POST L		1.20m FENCE	1.20m FENCE	1.20m FENCE
END, CORNER O	STRAINING	1.20m FENCE	1.20m FENCE	1.20m FENCE
LINE POST		1.20m FENCE	1.20m FENCE	1.20m FENCE

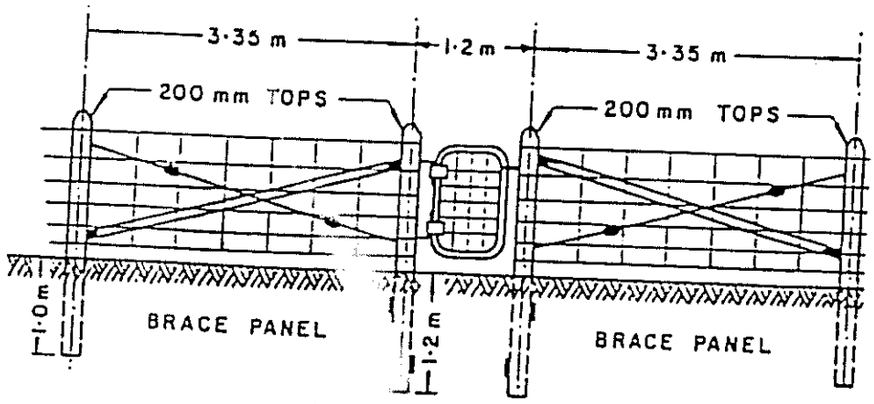
2. FASTENERS – 6 GALVANIZED STEEL OR ALUMINUM WIRE.
3. ALL POSTS, PIPE AND FASTENERS TO BE ELECTROSTATIC COATED–BLACK.
4. BRACE RAIL TO BE MINATED ON 1.20m HIGH FENCE.
5. ALL DIMENSIONS A IN MILLIMETRES OR METRES.
6. FENCE FABRIC SH UE TYPE 1 STEEL FABRIC 3.0mm DIA. STEEL WIRE, CLASS 'B', VINYL COATED, ST 3 LIGHT STEEL WIRE, GALVANIZED BEFORE WEAVING.
7. ALL FENCE COMPO TS SHALL BE VINYL COATED (CLASS 'B') AND BLACK IN COLOUR.
8. SONO TUBES REQU OVER TOTAL DEPTH OF FOOTINGS FOR ALL LINE AND END POSTS.

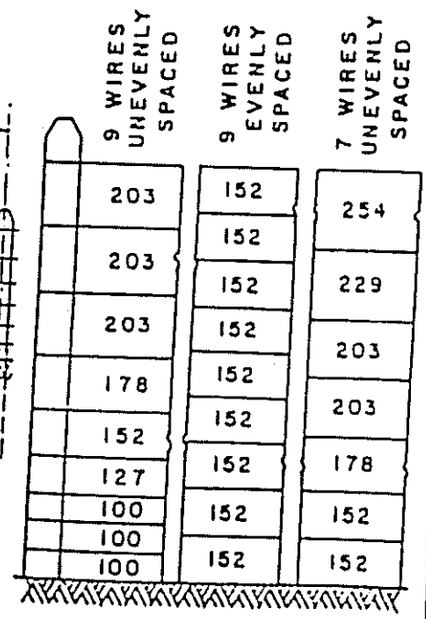
PROVED VISION 1 TE OF REVISION APRIL 1990	TOWNSHIP OF SCUGOG CHAIN LINK SECURITY FENCE	DATE OF ISSUE 1980 DRAWING No. SS-311



ENTRANCE





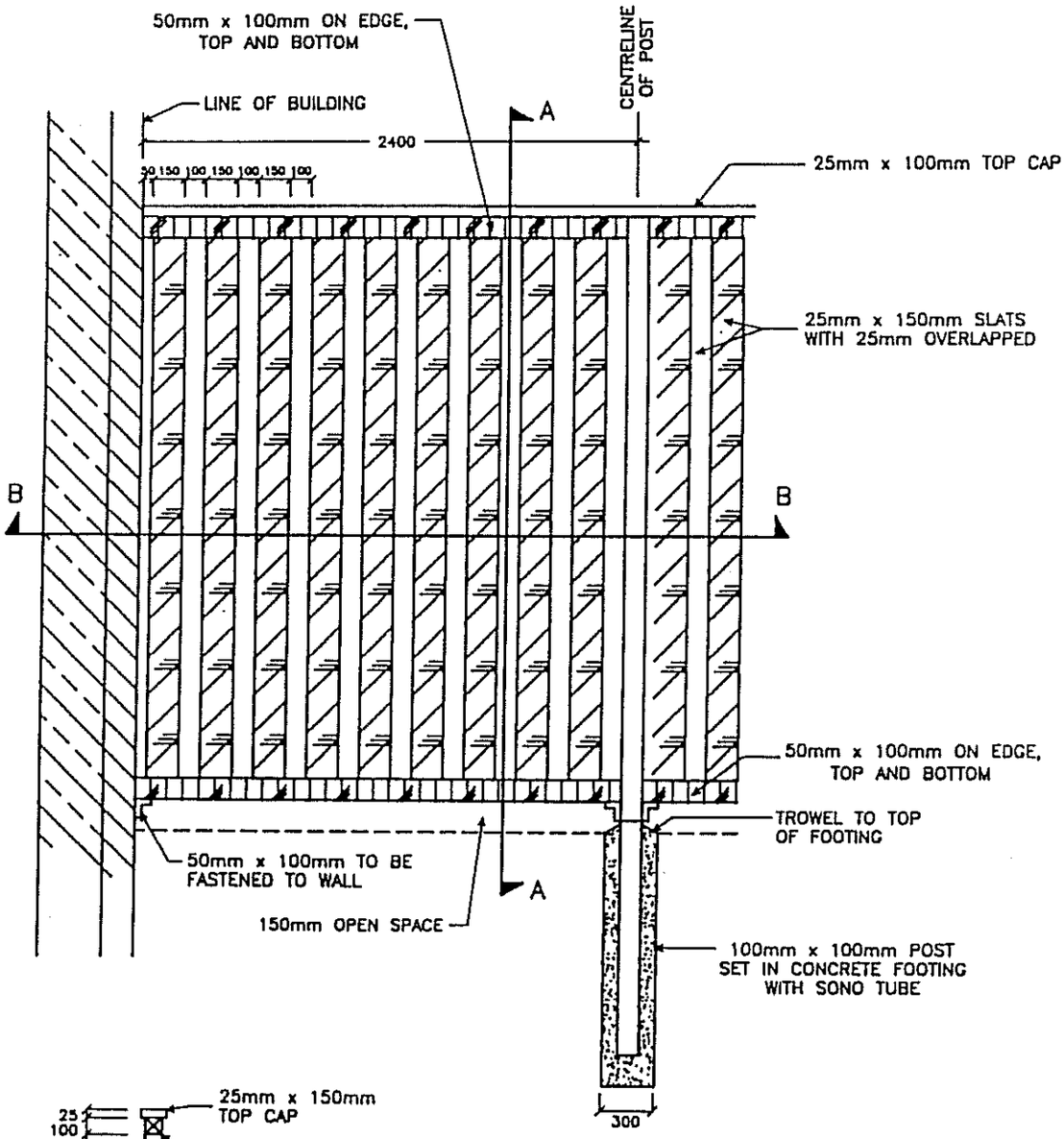


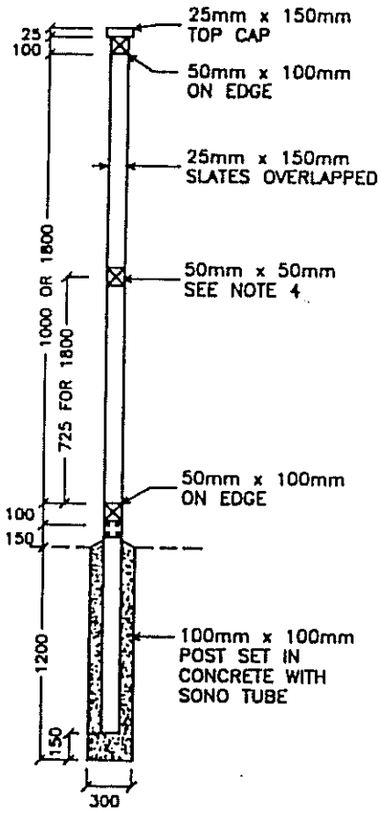
WIRE SPACING

NOTES:

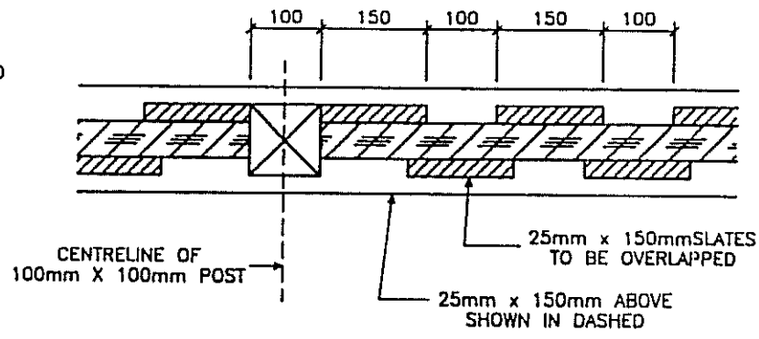
1. DIMENSIONS FOR BURIED PORTION OF POSTS ARE MINIMUM.
2. TOPS OF WOODEN POSTS TO BE SAWN OFF WITH 5mm PITCH. HIGH SIDE TO BE NEXT TO THE WIRE AND 50mm ABOVE IT.
3. LENGTH OF POSTS: LINE POSTS 2.45m MINIMUM, END, CORNER, ANCHOR AND GATE POSTS 2.65m GAUGE.
4. ALL STAPLES 45mm, ALL WIRE No. 9 GUAGE.
5. DIMENSIONS IN MILLIMETRES EXCEPT AS NOTED.
6. ALL POSTS TO BE 150mm MINIMUM DIAMETER CEDAR UNLESS OTHERWISE NOTED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	STANDARD FARM FENCE	DRAWING NO. SS-312
DATE OF REVISION		





SECTION A–A

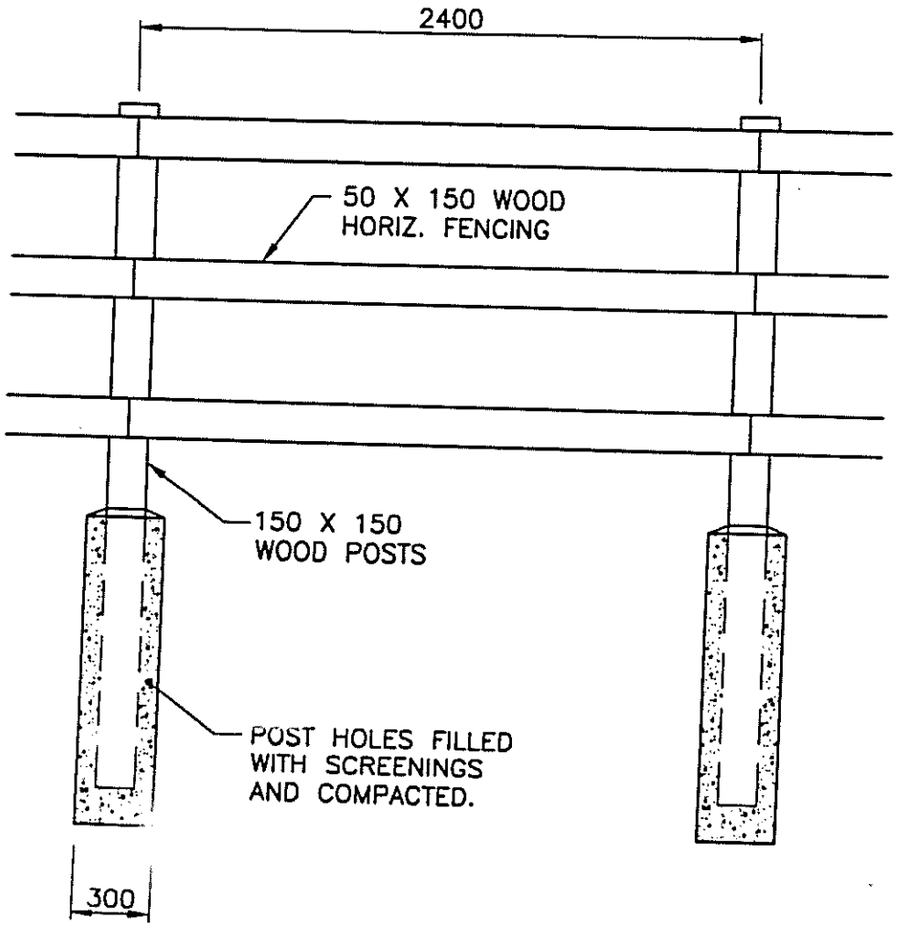


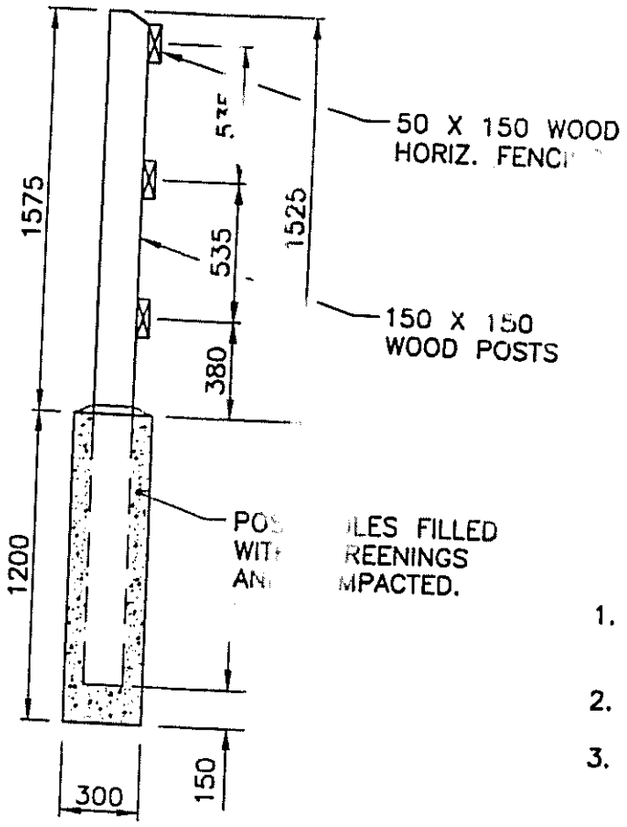
SECTION B–B

NOTES:

1. USE CONSTRUCTION GRADE CEDAR OR PRESSURE TREATED. DO NOT USE SPRUCE OR HEMLOCK.
2. USE OLYMPIC STAIN OR EQUAL.
3. USE STEEL ZINC COATED TWISTED NAILS No.11 GAUGE 64mm x 76mm.
4. FOR FENCE 1.8m OR HIGHER 50mm x 50MM MUST BE USED AS SHOWN IN SECTION A–A.
5. USE GALVANIZED FENCE BRACKETS.
6. FOR WALKWAYS, THE FENCE HEIGHT SHOULD BE 1.0m HIGH BETWEEN STREETLINE AND FRONT WALL OF DWELLINGS ON ADJACENT LOTS AND 1.8m FOR THE REMAINDER.
7. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
8. SONO TUBES REQUIRED OVER TOTAL LENGTH OF FOOTINGS FOR ALL LINE AND END POSTS.

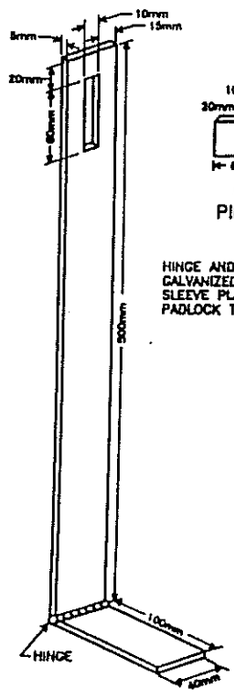
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
	WOOD PRIVACY FENCE	DRAWING NO. SS–313

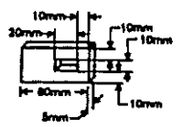




1. USE CONSTRUCTION GRADE CEDAR OR PRESSURE TREATED.
2. USE OLYMPIC STAIN OR EQUAL.
3. USE STEEL ZINC COATED TWISTED NAILS 11 GAUGE 100mm
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	N.T.S.
REVISION		DATE OF ISSUE FEB./2000
DATE OF REVISION	POST AND RAIL FENCE	DRAWING NO. SS–314

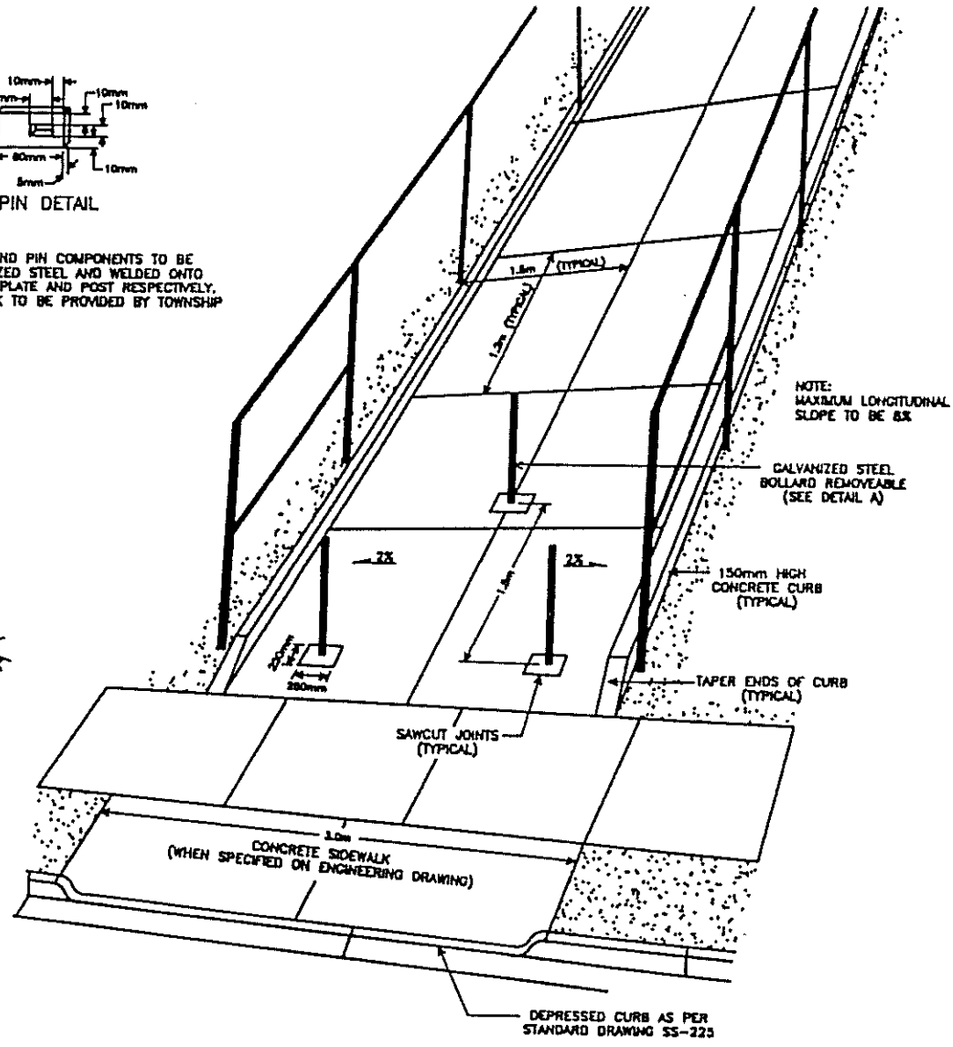


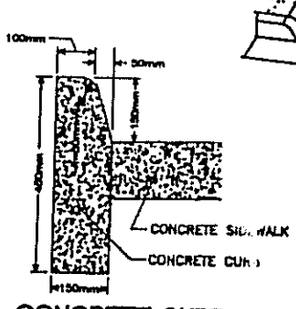


PIN DETAIL

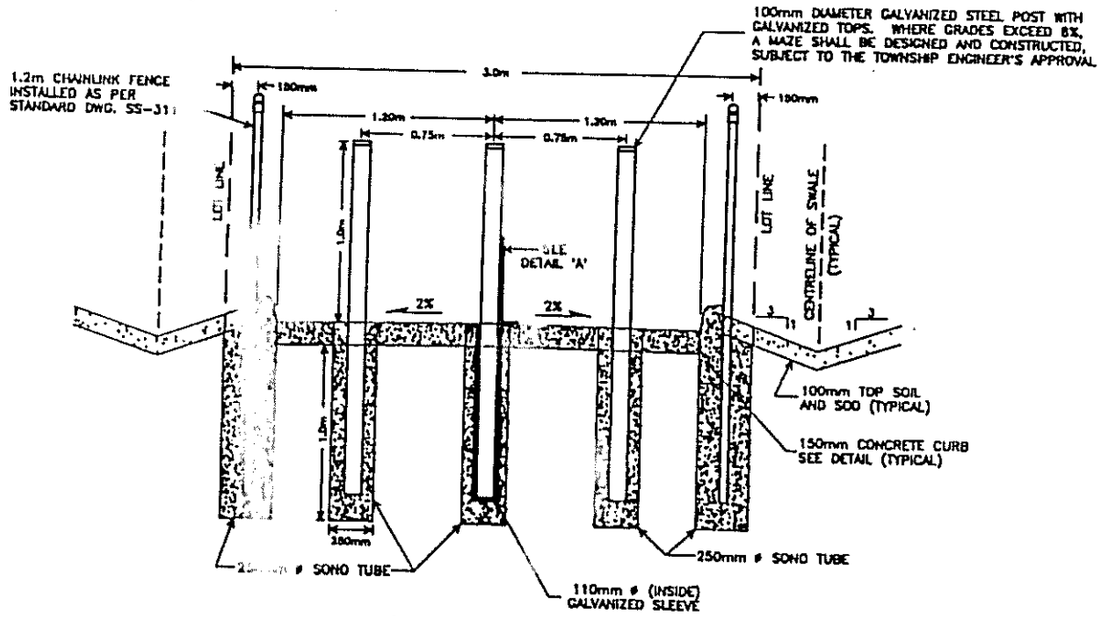
HINGE AND PIN COMPONENTS TO BE GALVANIZED STEEL AND WELDED ONTO SLEEVE PLATE AND POST RESPECTIVELY. PADLOCK TO BE PROVIDED BY TOWNSHIP

DETAIL 'A'





CONCRETE CURB DETAIL (TYPICAL)

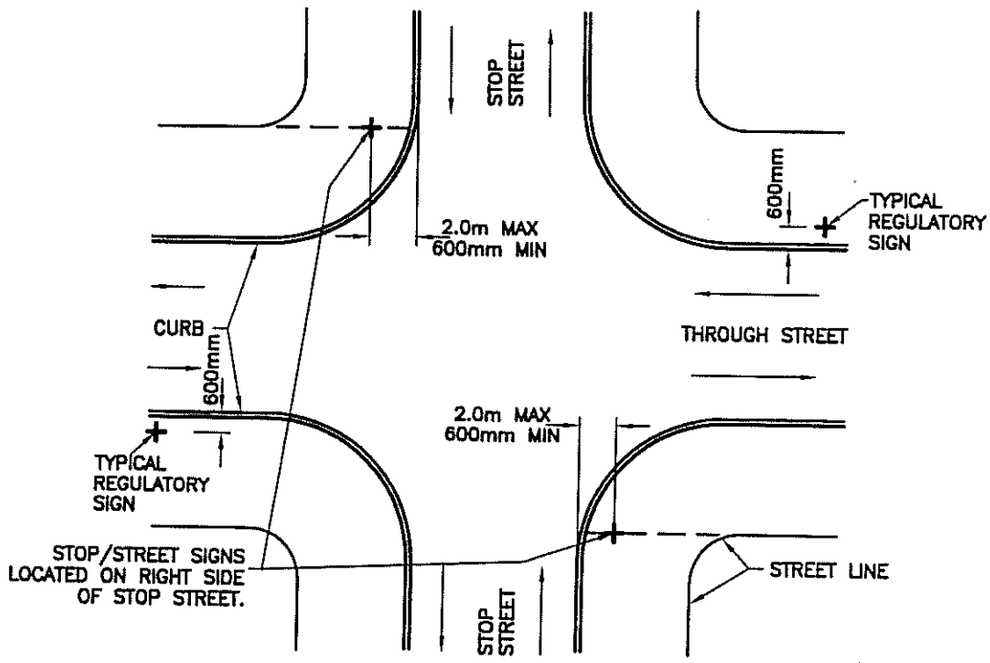


CROSS SECTION

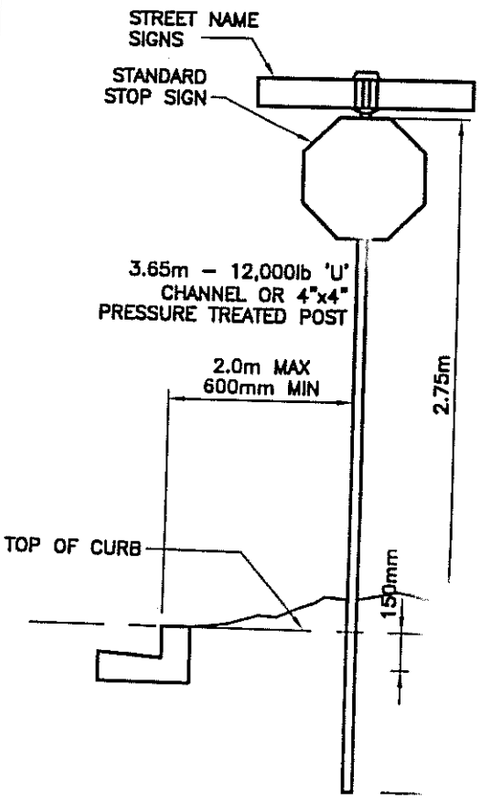
NOTES:

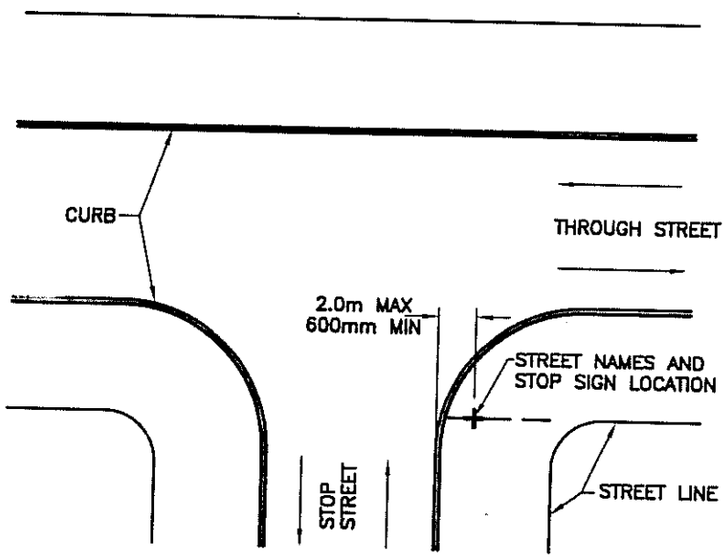
1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.
2. SECURITY LIGHTING OF WALKWAYS TO BE PROVIDED. DESIGN OF LIGHTING WILL BE SUBJECT TO APPROVAL BY THE TOWNSHIP OF SCUGOG.
3. ALL CONCRETE WORK TO CONFORM TO REQUIREMENT OF OPSD-1350. CLASS OF CONCRETE: 25MPa, 5-7% AIR ENTRAINMENT, 20mm MAXIMUM AGGREGATE SIZE.
4. MAXIMUM SAW CUT JOINT SPACING TO BE 4.5m.
5. CONCRETE POST FOOTINGS TO BE SEPARATE FROM CURB.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	PEDESTRIAN WALKWAY	DRAWING NO. SS-320
DATE OF REVISION APRIL 1990		



4 WAY INTERSECTION



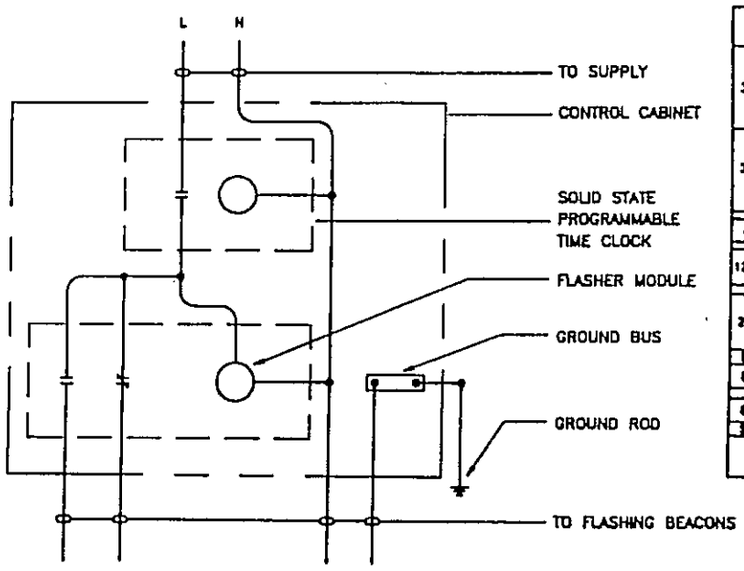


3 WAY INTERSECTION

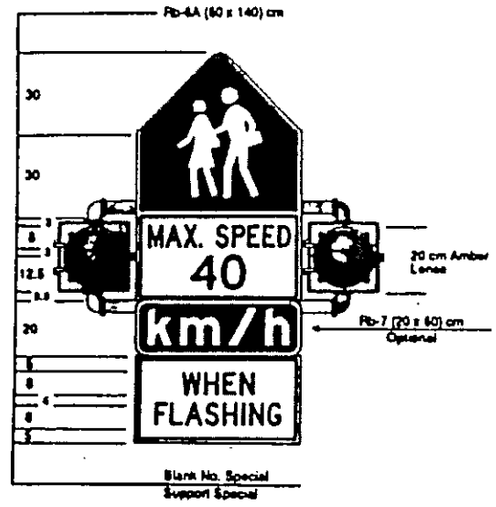
NOTES

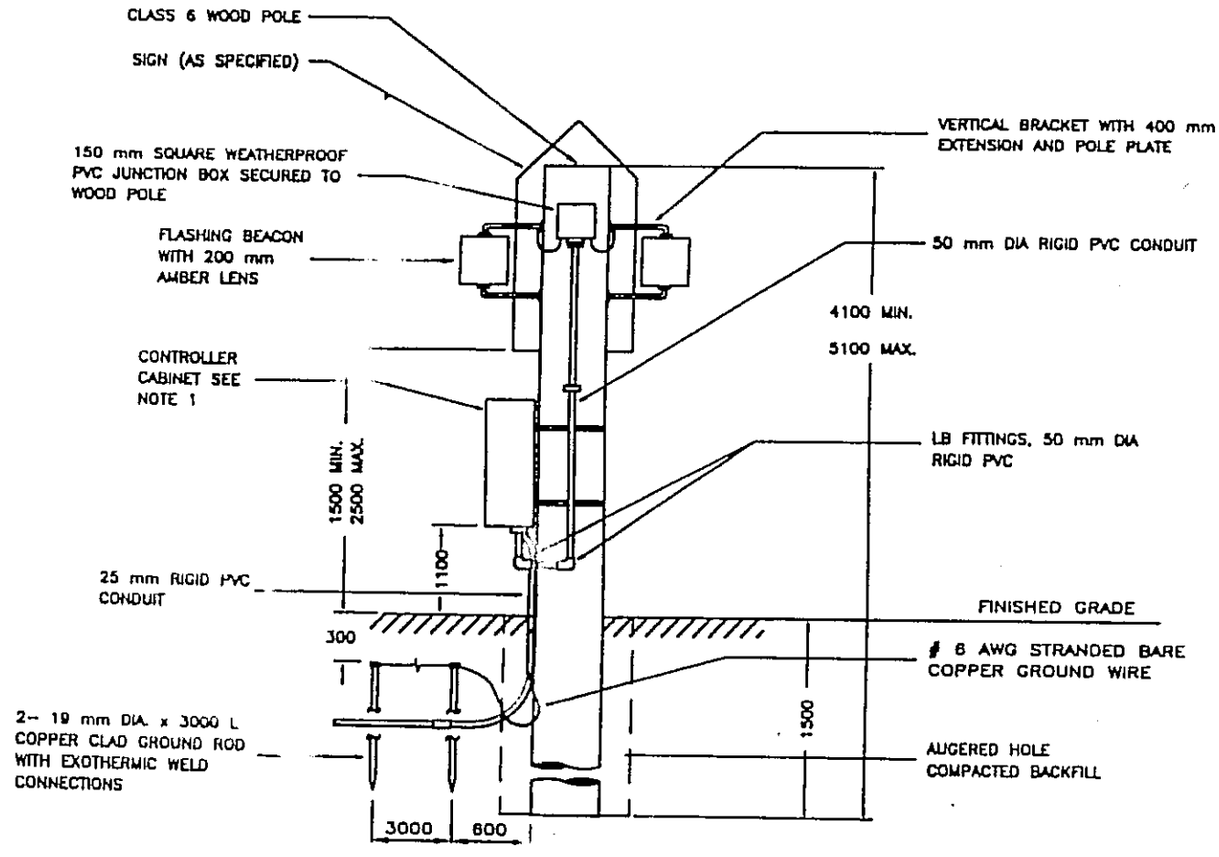
1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1990
REVISION 2	TRAFFIC SIGN DETAILS	DRAWING No. SS-331
DATE OF REVISION MAY 2003		



WIRING DIAGRAM



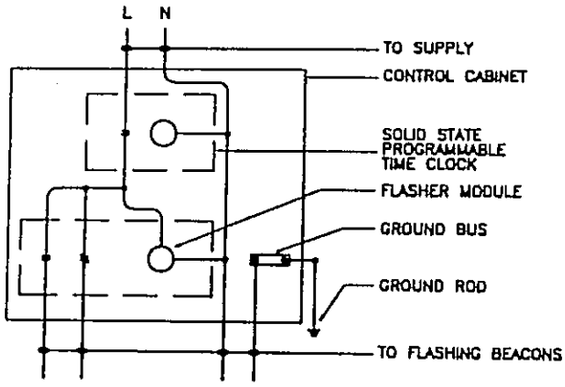


UNDERGROUND SUPPLY INSTALLATION
N. T. S.

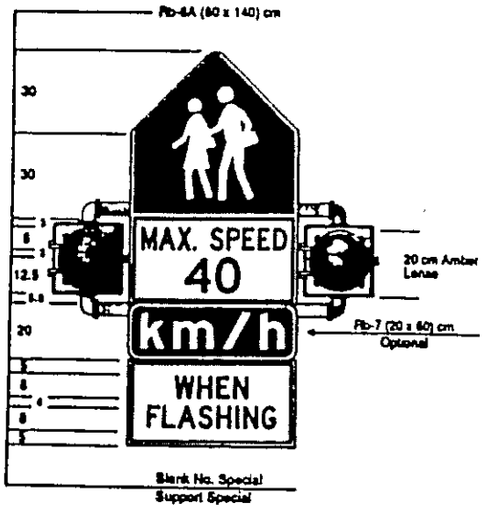
NOTES:

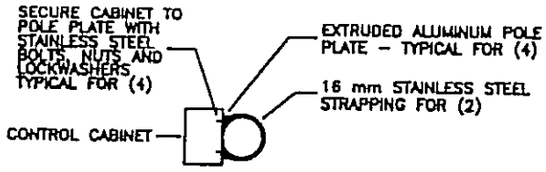
1. MINIMUM 300 mmH x 200 mmW x 150 mmD WEATHERPROOF CONTROL CABINET CONSTRUCTED OF FIBREGLASS WITH HINGED LOCKABLE DOOR COMPLETE WITH THE FOLLOWING:
   - 1– ASTRONOMIC TIME CLOCK– 7 DAY DIGITAL, LCD DISPLAY, SINGLE CHANNEL AND 365 DAY ADVANCE SCHEDULING TORK # DZS100
   - 1– SOLID STATE 21–FLASHER MODULE, FORTRAN # TF2–TL1851
2. ALL EQUIPMENT, CONDUIT STRAPS, FITTINGS ETC. SHALL BE SECURED TO WOOD POLE WITH GALVANIZED LAG SCREW UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1990
	SCHOOL ZONE SPEED LIMIT SIGN WITH FLASHING BEACONS UNDERGROUND SUPPLY INSTALLATION	DRAWING NO. SS–332

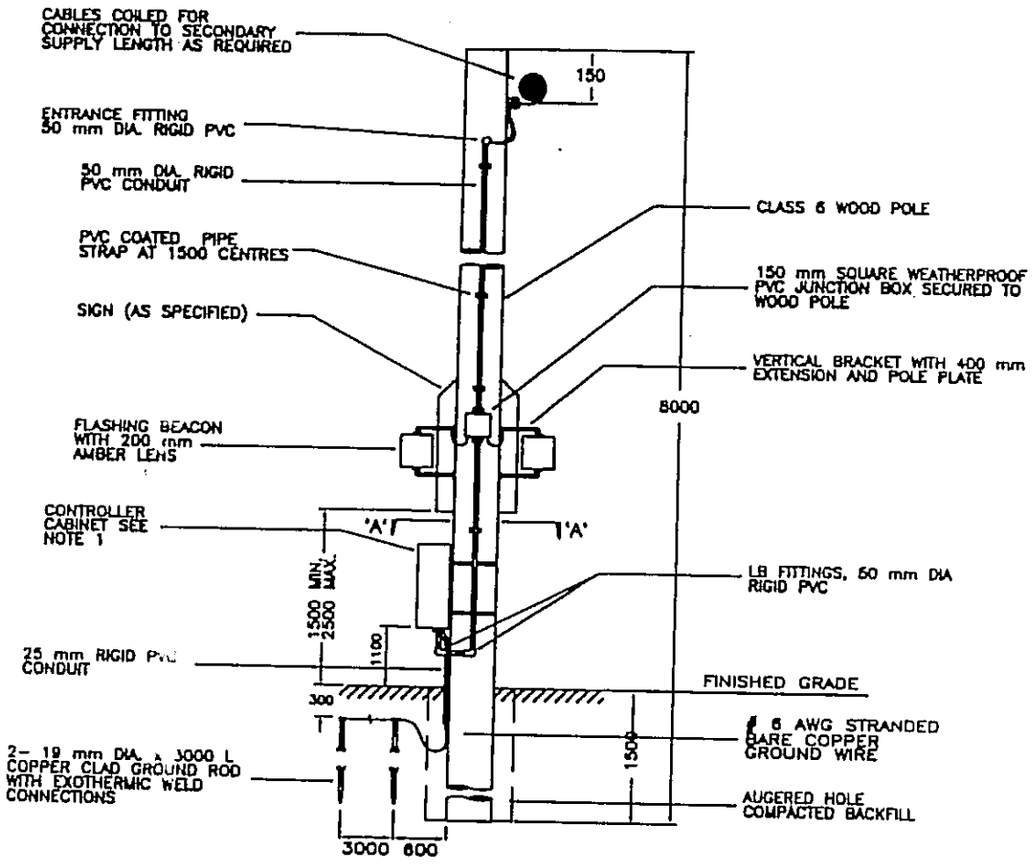


WIRING DIAGRAM





SECTION 'A' – 'A'



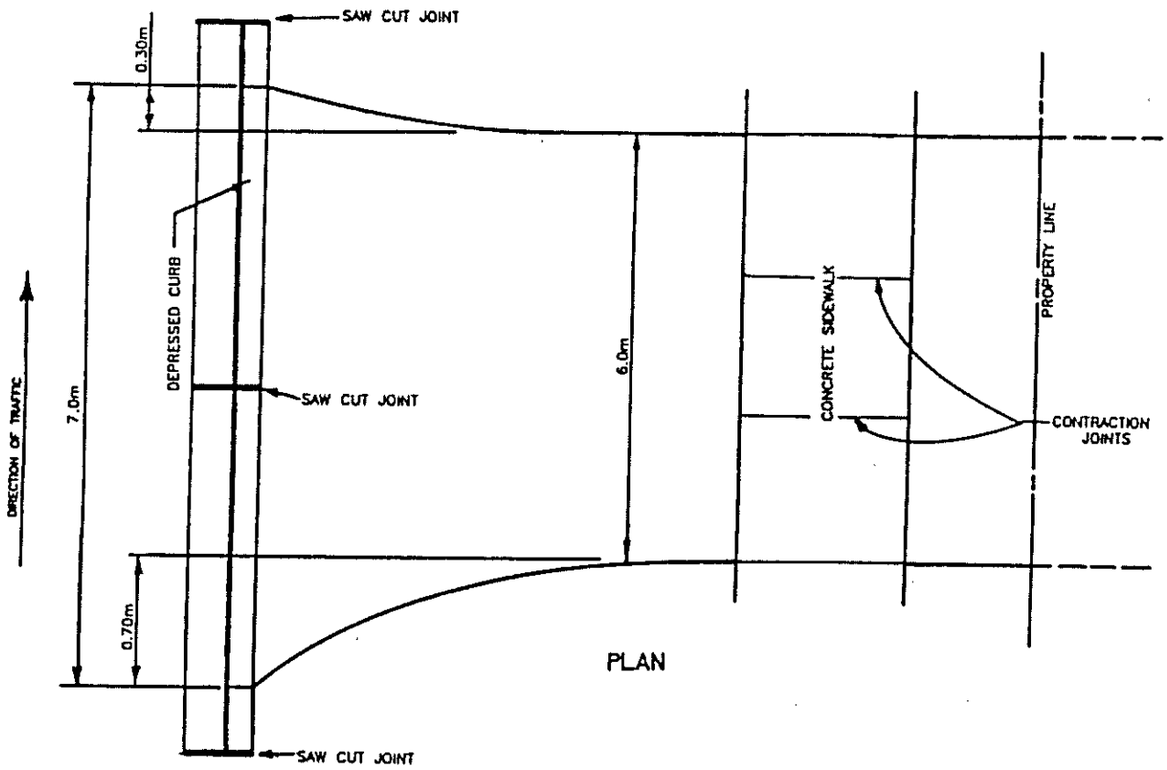
OVERHEAD SUPPLY INSTALLATION

N. T. S.

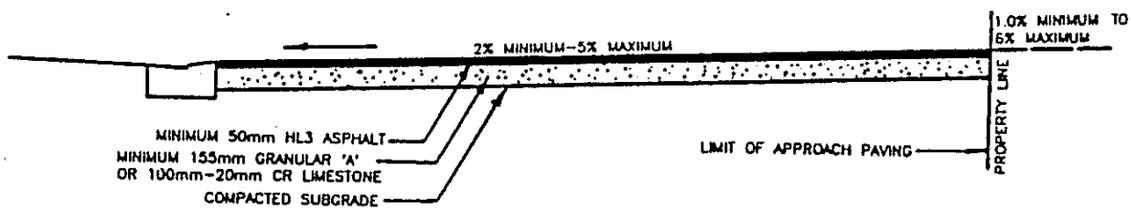
NOTES:

1. MINIMUM 300 mmH x 200 mmW x 150 mmD WEATHERPROOF CONTROL CABINET CONSTRUCTED OF FIBREGLASS WITH HINGED LOCKABLE DOOR COMPLETE WITH THE FOLLOWING:
   - 1– ASTRONOMIC TIME CLOCK–7 DAY DIGITAL, LCD DISPLAY, SINGLE CHANNEL AND 365 DAY ADVANCE SCHEDULING TORK # DZS100
   - 1– SOLID STATE 21–FLASHER MODULE, FORTRAN # TF2–TL1951
2. ALL EQUIPMENT, CONDUIT STRAPS, FITTINGS ETC. SHALL BE SECURED TO WOOD POLE WITH GALVANIZED LAG SCREW UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

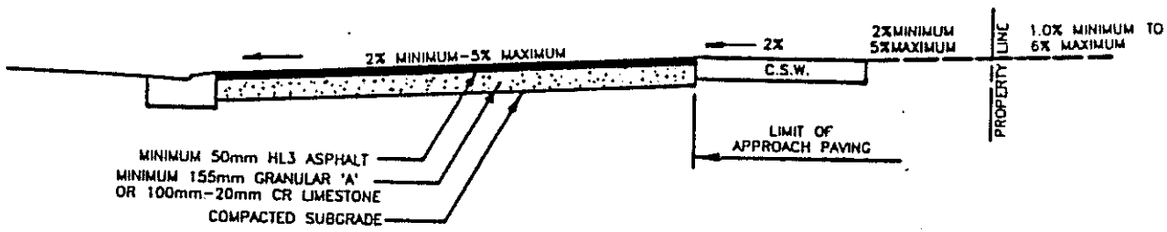
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG SCHOOL ZONE SPEED LIMIT SIGN WITH FLASHING BEACONS OVERHEAD SUPPLY INSTALLATION	DATE OF ISSUE 1990 DRAWING NO. SS–333



PLAN



TYPICAL SECTION
ON STREETS WITHOUT SIDEWALK

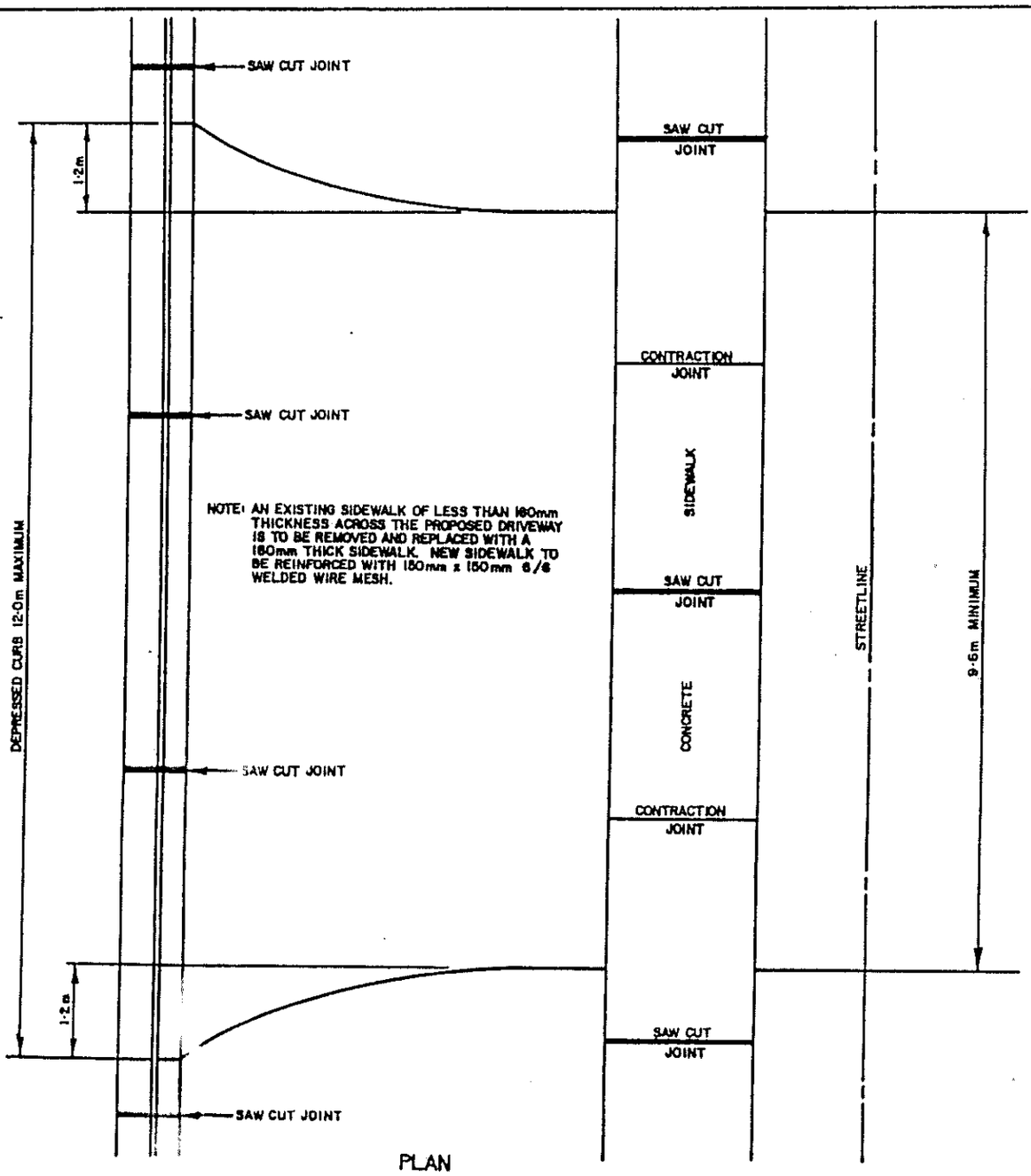


TYPICAL SECTION
ON STREETS WITH SIDEWALK

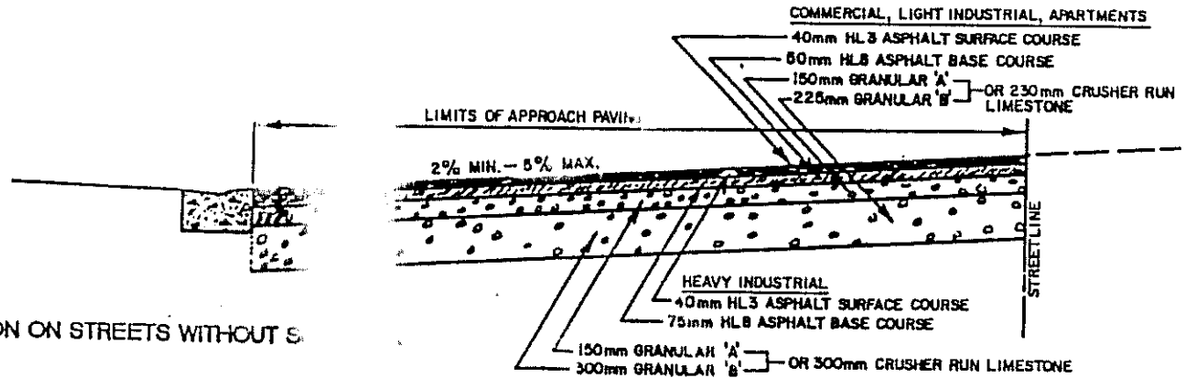
NOTE:

ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

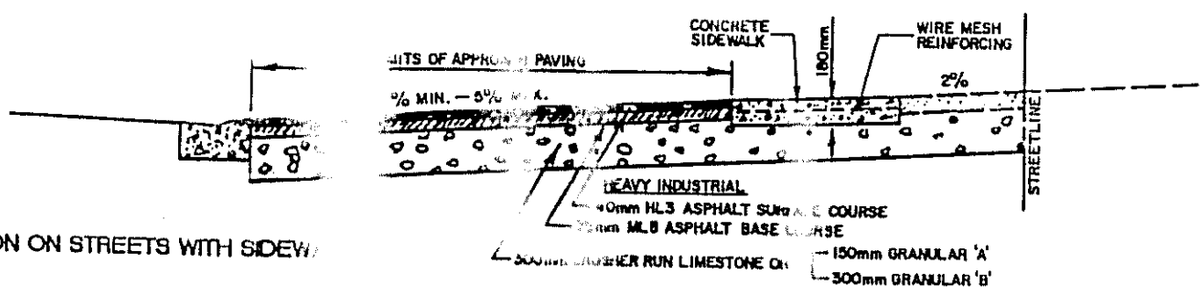
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	DRIVEWAY APPROACH PAVING FOR RESIDENTIAL DRIVEWAYS	DRAWING No SS-341
DATE OF REVISION APRIL 1990		



PLAN



SECTION ON STREETS WITHOUT S



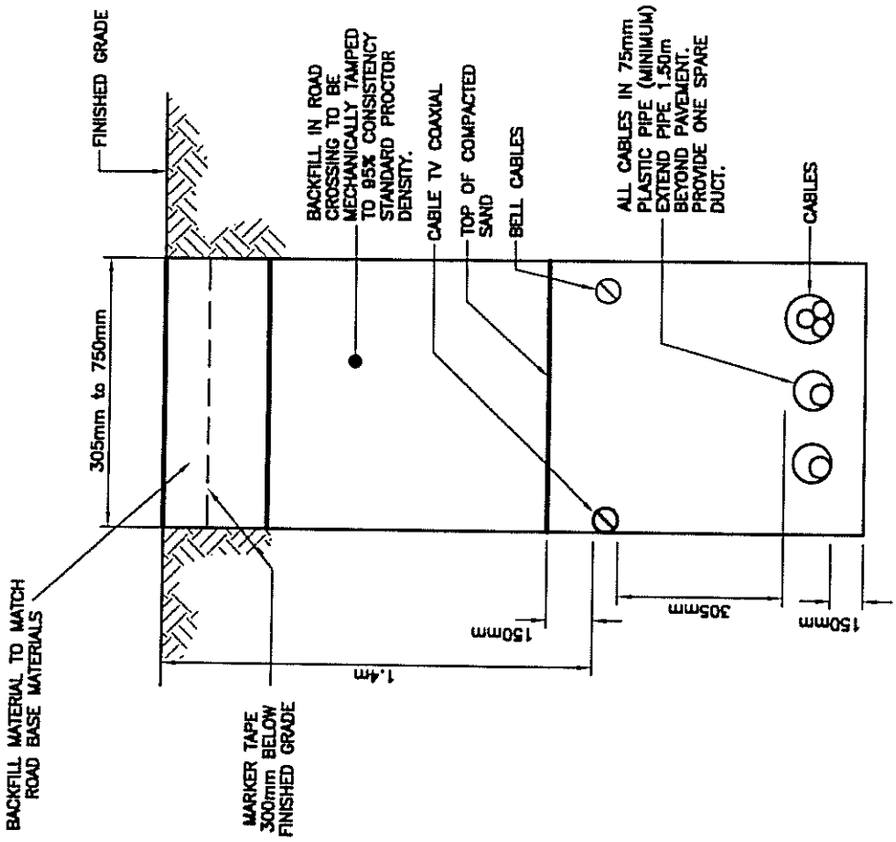
SECTION ON STREETS WITH SIDEW

COMMERCIAL, LIGHT INDUSTRIAL, APARTMENTS
SEE DRIVEWAY DESIGN ABOVE

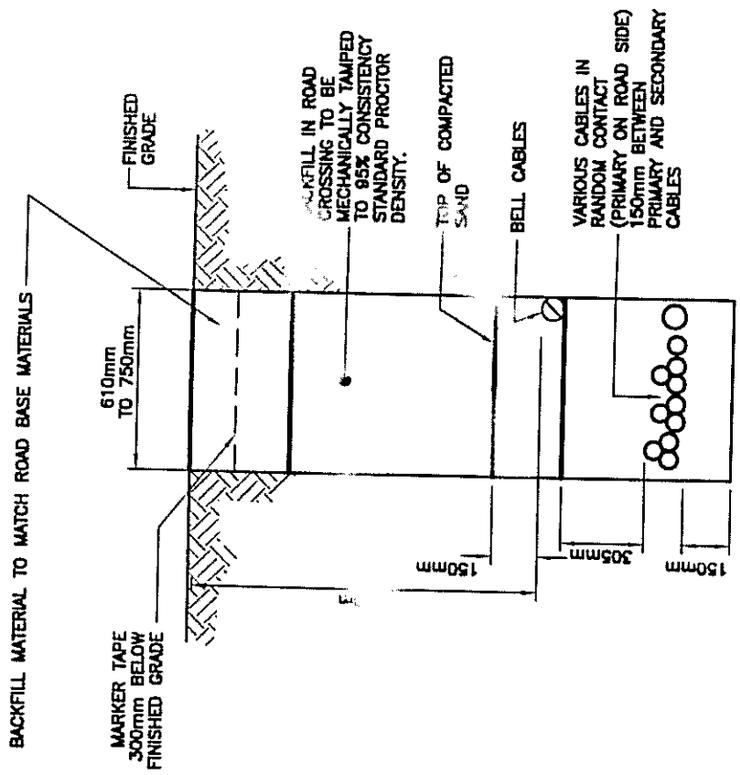
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

PPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
EVISION 1	DRIVEWAY APPROACH PAVING COMMERCIAL, INDUSTRIAL AND APARTMENTS	DRAWING No. SS-342
TE OF REVISION APRIL 1990		



TYPICAL ROAD CROSSING SECTION
NOT TO SCALE



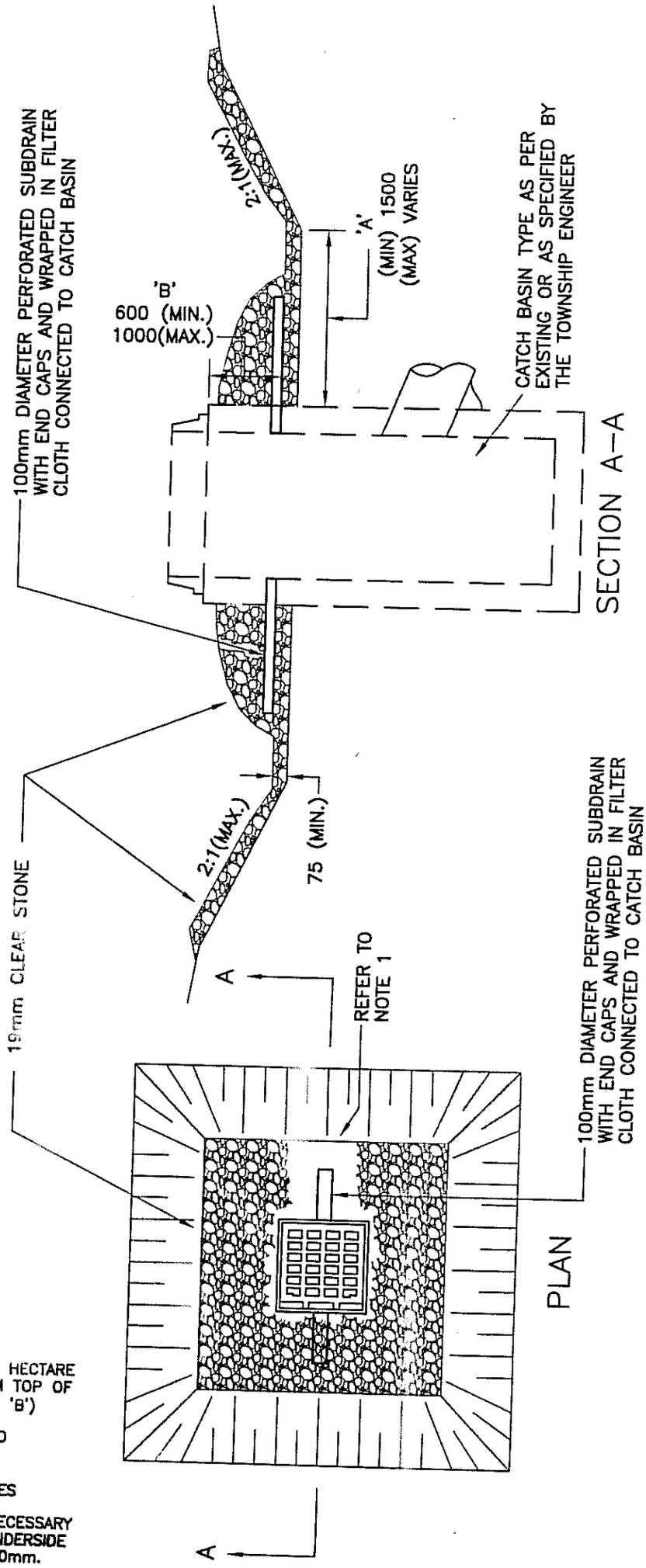
TYPICAL TRENCH SECTION

NOTES

1. THIS SECTION TO BE USED WHEN HYDRO AND BELL CABLES ARE INSTALLED ON THE SAME LEVEL.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.
2. FOR LOCATION IN ROW REFER TO SS-201, SS-202, SS-203, SS-204, SS-205, SS-206, SS-207, SS-210, SS-214, SS-215, SS-216, SS-242

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 2	TYPICAL JOINT BELL & HYDRO TRENCH & ROAD CROSSING SECTIONS	DRAWING No. SS-345
DATE OF REVISION MAY 2003		

METRIC
ALL DIMENSIONS IN MILLIMETRES

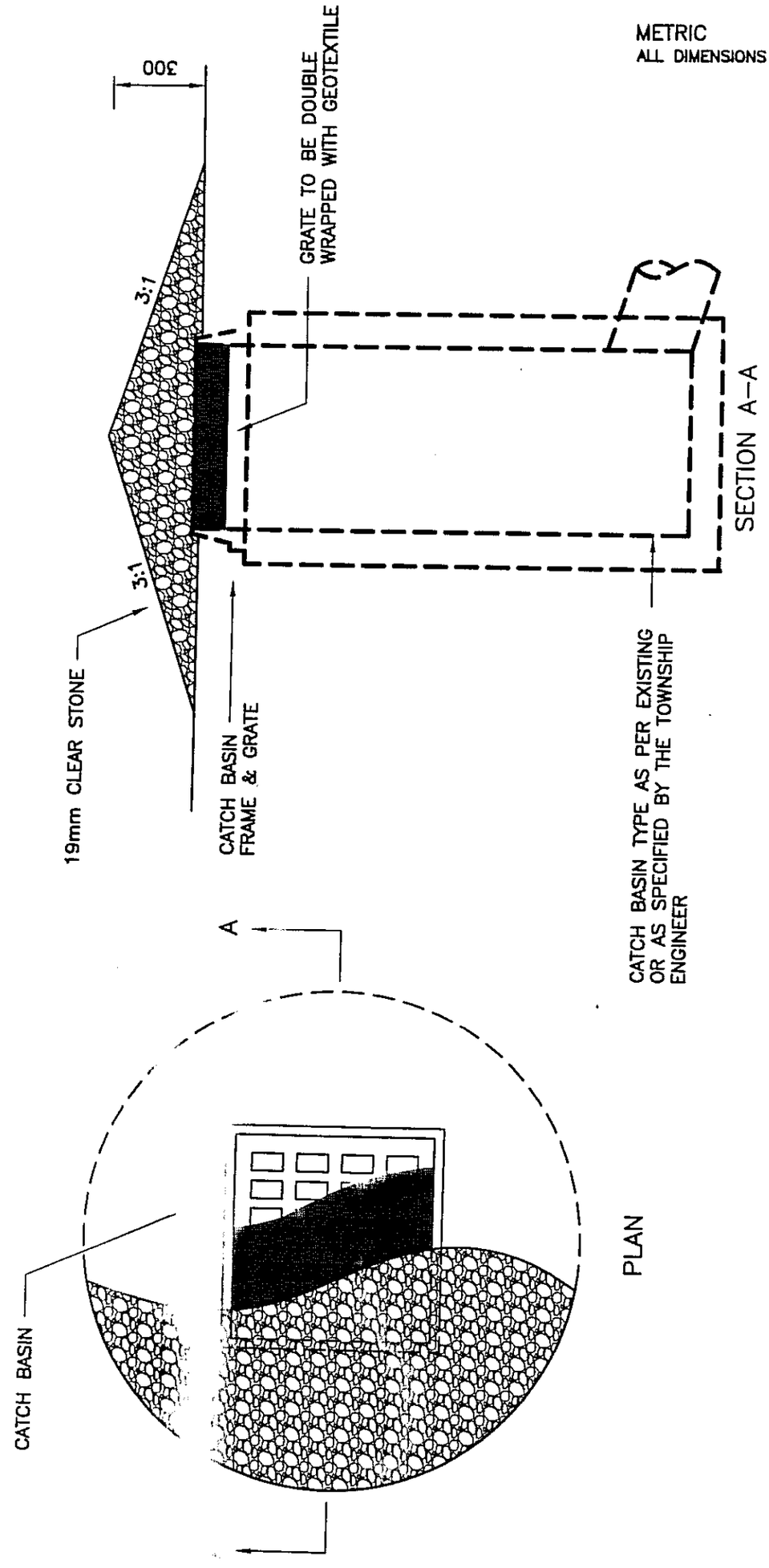


NOTES

1. VOLUME OF SEDIMENT TRAP TO BE 125m³ PER HECTARE OF DRAINAGE. DEPTH TO BE CALCULATED FROM TOP OF CATCH BASIN TO BOTTOM OF TRAP (DIMENSION 'B')
2. MINIMUM DEPTH FROM TOP OF CATCH BASIN TO BOTTOM OF TRAP SHALL BE 600mm, MAXIMUM DEPTH SHALL BE 1000mm. MINIMUM "A" DIMENSION 1500mm, MAXIMUM DIMENSION VARIES
3. SEDIMENT TRAP TO BE CLEANED AS DEEMED NECESSARY BUT AS A MINIMUM WHEN THE DEPTH FROM UNDERSIDE OF FRAME TO TOP OF SILT IS REDUCED TO 300mm.
4. UPON REMOVAL OF TRAP, CATCH BASIN CONNECTION HOLES TO BE PARGED WITH CONCRETE.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
REVISION	CATCH BASIN SEDIMENT TRAP UNPAVED AREAS DRAINING 2.0ha TO 4.0ha	DRAWING No. SS–346
DATE OF REVISION		

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES

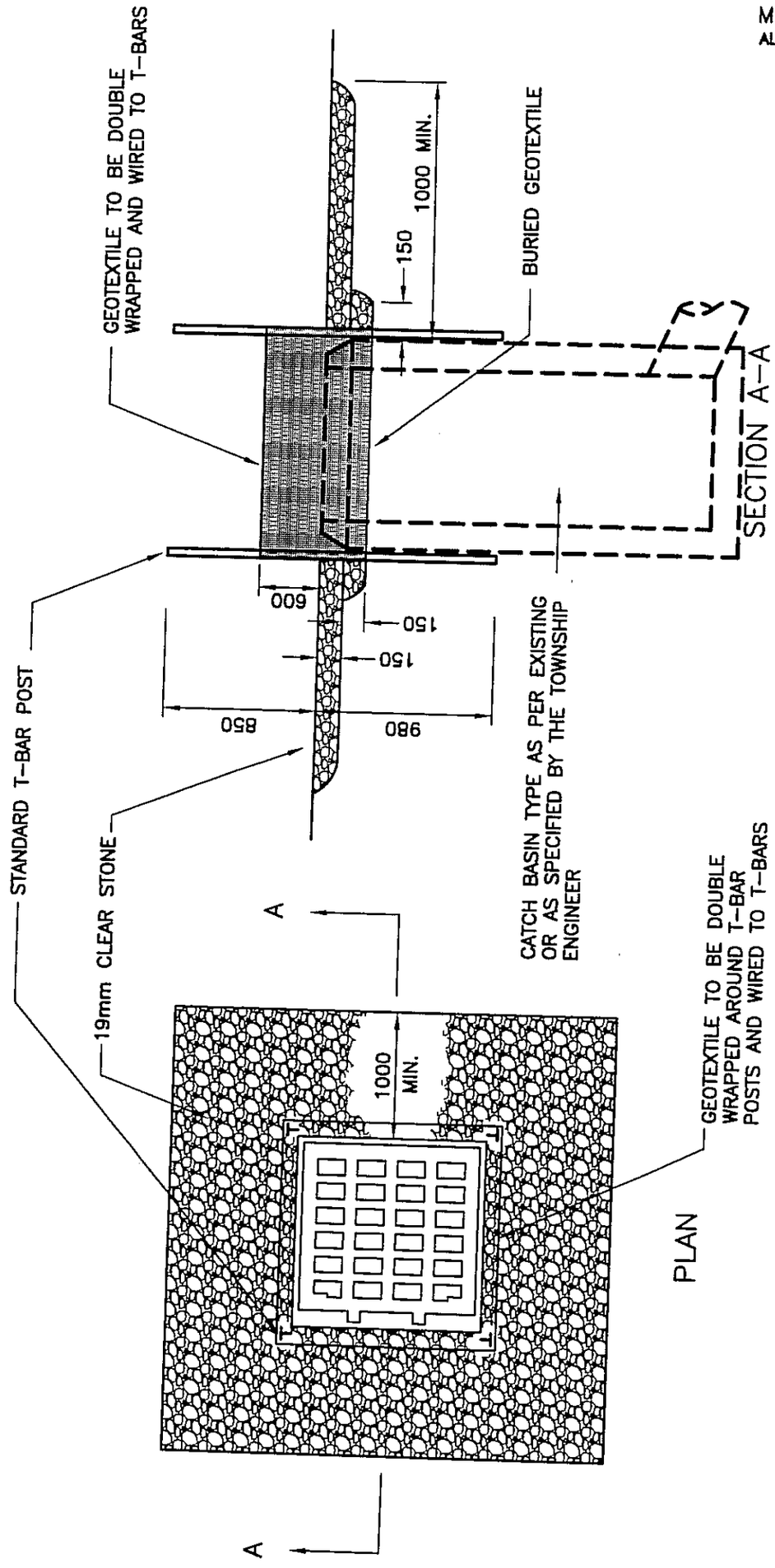


NOTES

1. CATCH BASIN LIFT HOLES TO BE PARGED WITH CONCRETE.
2. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm OR A NON WOVEN GEOTEXTILE TO BE CONSIDERED BASED ON SOIL PARAMETERS AND SITE CONDITIONS.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION	CATCH BASIN SEDIMENT BARRIER R.L.C.B. OR WITHIN UNPAVED AREAS TYPE "A"	DRAWING No. SS–347
TE OF REVISION		

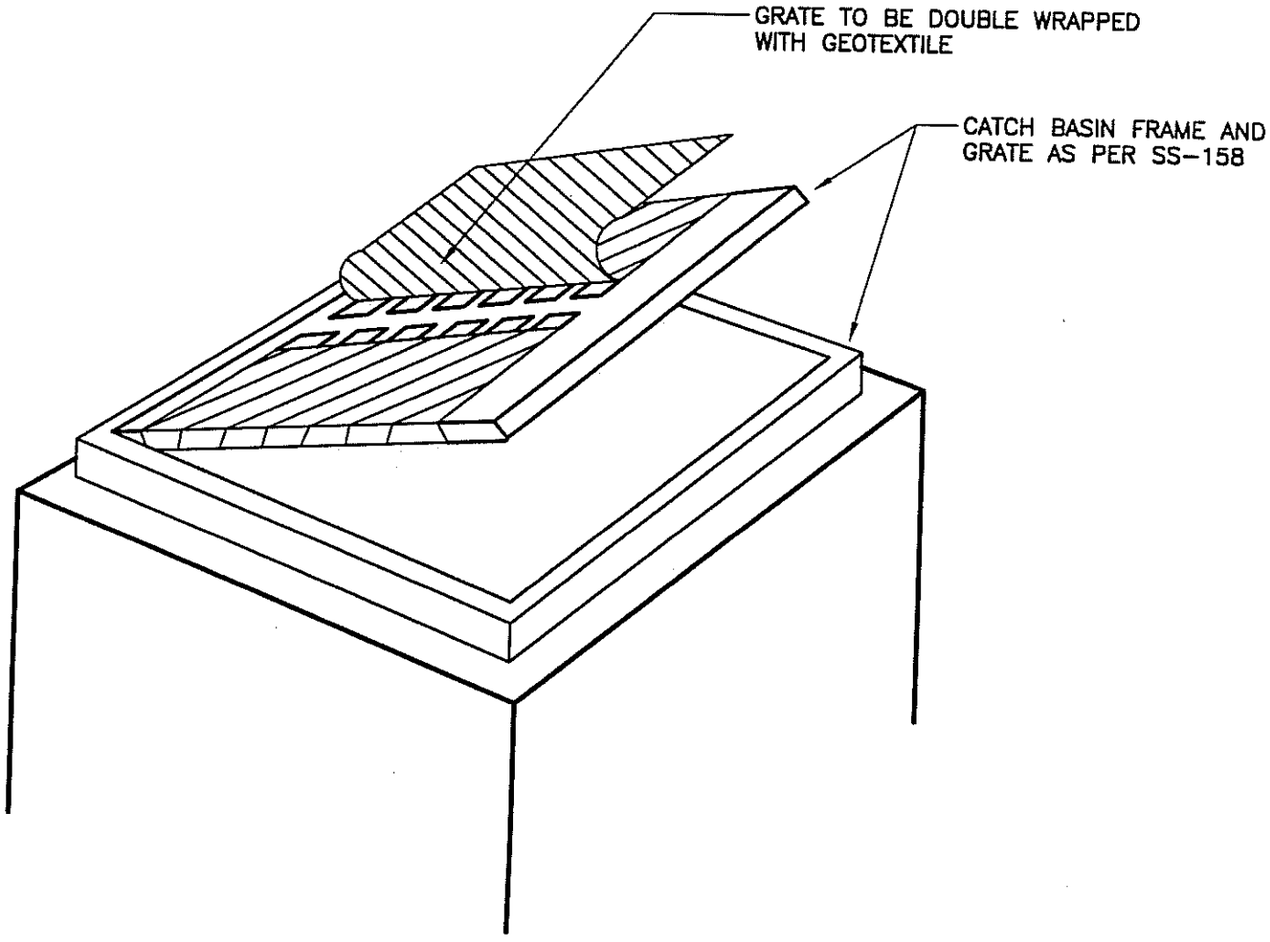
METRIC
ALL DIMENSIONS ARE IN MILLIMETRES



NOTES

1. CATCH BASIN LIFT HOLES TO BE PARGED WITH CONCRETE.
2. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm OR A NON WOVEN GEOTEXTILE TO BE CONSIDERED BASED ON SOIL PARAMETERS AND SITE CONDITIONS.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION	CATCH BASIN SEDIMENT BARRIER R.L.C.B. OR WITHIN UNPAVED AREAS TYPE "B"	DRAWING No. SS-348
TE OF REVISION		

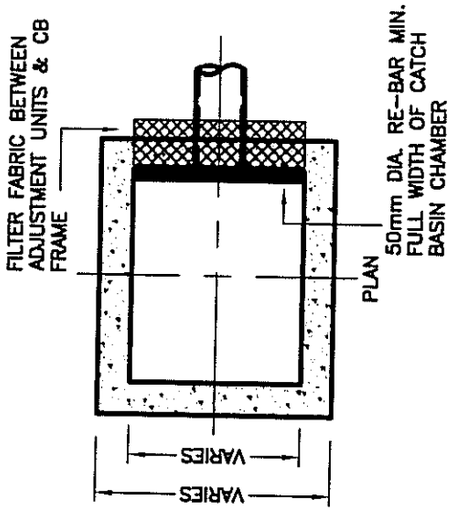


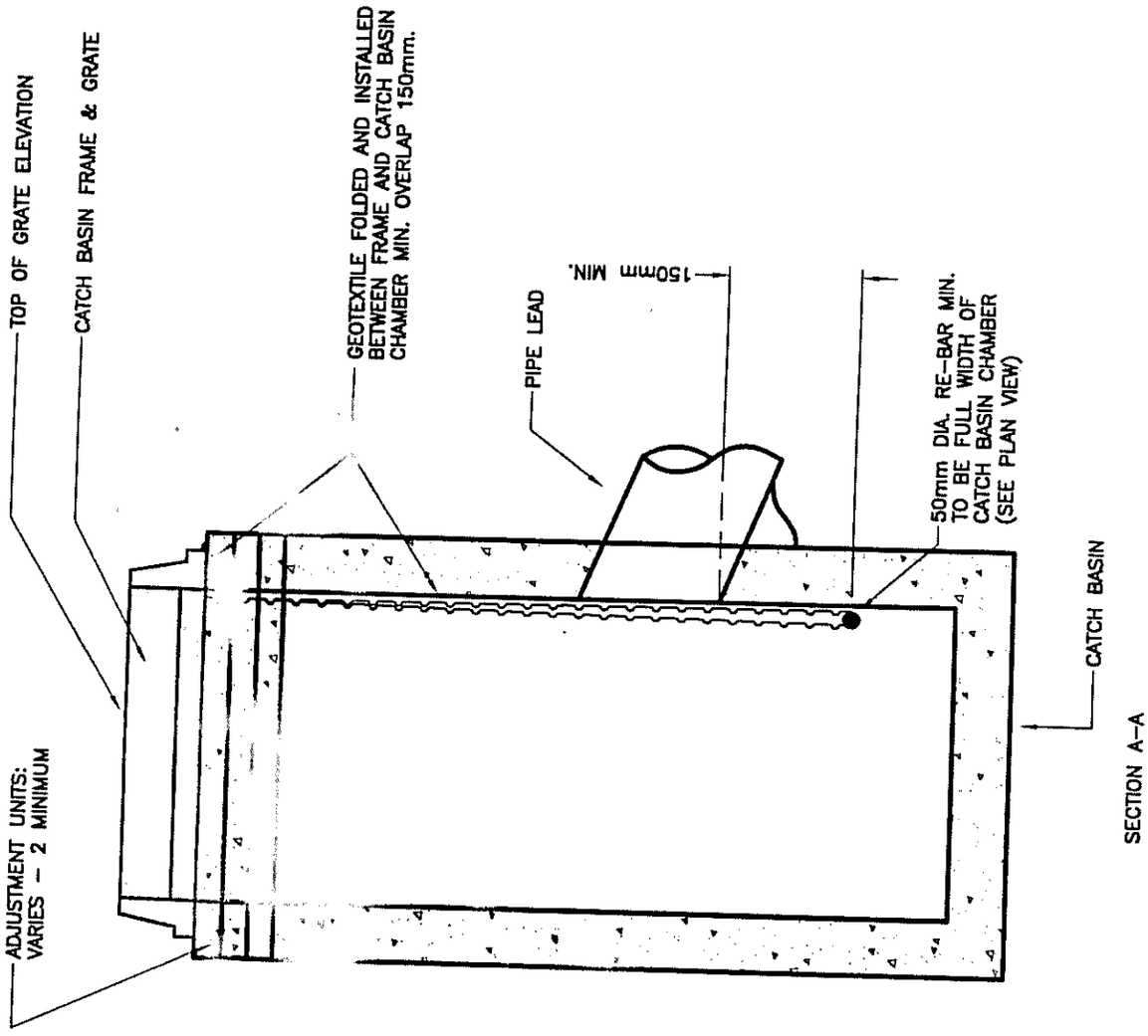
NOTES

1. TO BE USED UNDER APPROPRIATE DRAINAGE CIRCUMSTANCES, BETWEEN APRIL AND DECEMBER.
2. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm OR A NON WOVEN GEOTEXTILE TO BE CONSIDERED BASED ON SOIL PARAMETERS AND SITE CONDITIONS.
3. GEOTEXTILE TO BE REPLACED PERIODICALLY WHEN ACCUMULATED SEDIMENTS INTERFERE WITH DRAINAGE, OR AS DIRECTED BY THE TOWNSHIP ENGINEER.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION	ROADWAY CATCH BASIN SEDIMENT CONTROL DEVICE TYPE "A"	DRAWING No. SS-349
TE OF REVISION		

METRIC
ALL DIMENSIONS IN MILLIMETRES





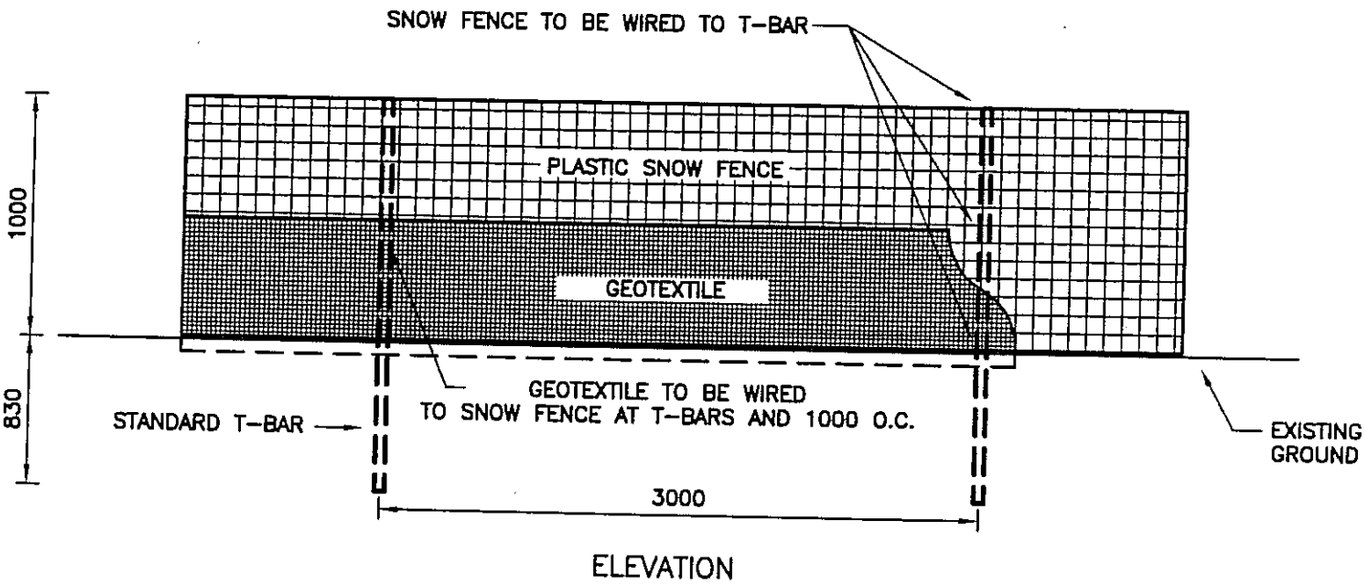
NOTES

1. TO BE USED UNDER APPROPRIATE D[illegible] CIRCUMS[illegible]ANCE[illegible]
2. WOVEN GEOTEXTILE TO HAVE A MINI[illegible] [illegible]IVALENT [illegible]PENI[illegible] SIZE OF 0.15mm AN[illegible] A MAXIMUM EQUIVALENT OPENING SIZ[illegible] .25mm [illegible] A [illegible] WOVEN GEOTEXTILE TO BE CONSIDERED BASED ON SOIL [illegible] [illegible]TERS AN[illegible] SITE [illegible]NDITIONS.
3. CATCH BASIN SUMP TO BE REGULARLY [illegible]NED AN[illegible] GEOTI[illegible]LE REPLACED WHEN ACCUMULATED SEDIMENT INTERFERES WITH DRAINAGE OR AS DIRECTED BY THE TOWNSHIP ENGINEER

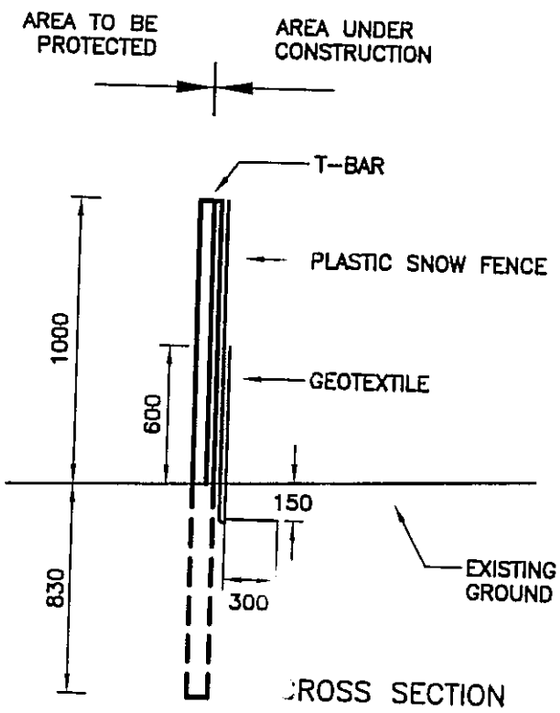
[illegible]PROVED [illegible]VISION [illegible]TE OF REVISION	TOWNSHIP OF SCUGOG ROADWAY CATCH BASIN SEDIMENT CONTROL DEVICE TYPE "B"	DATE OF ISSUE 2003 DRAWING No. SS-350

METRIC

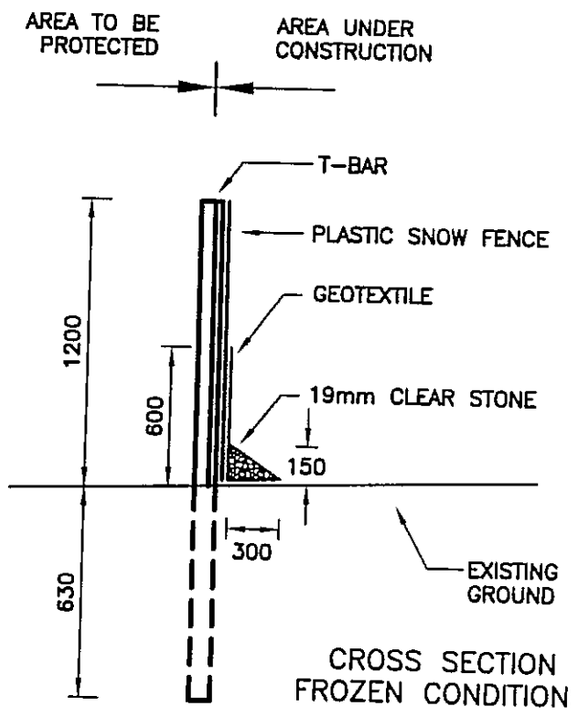
ALL DIMENSIONS IN MILLIMETRES



ELEVATION



CROSS SECTION



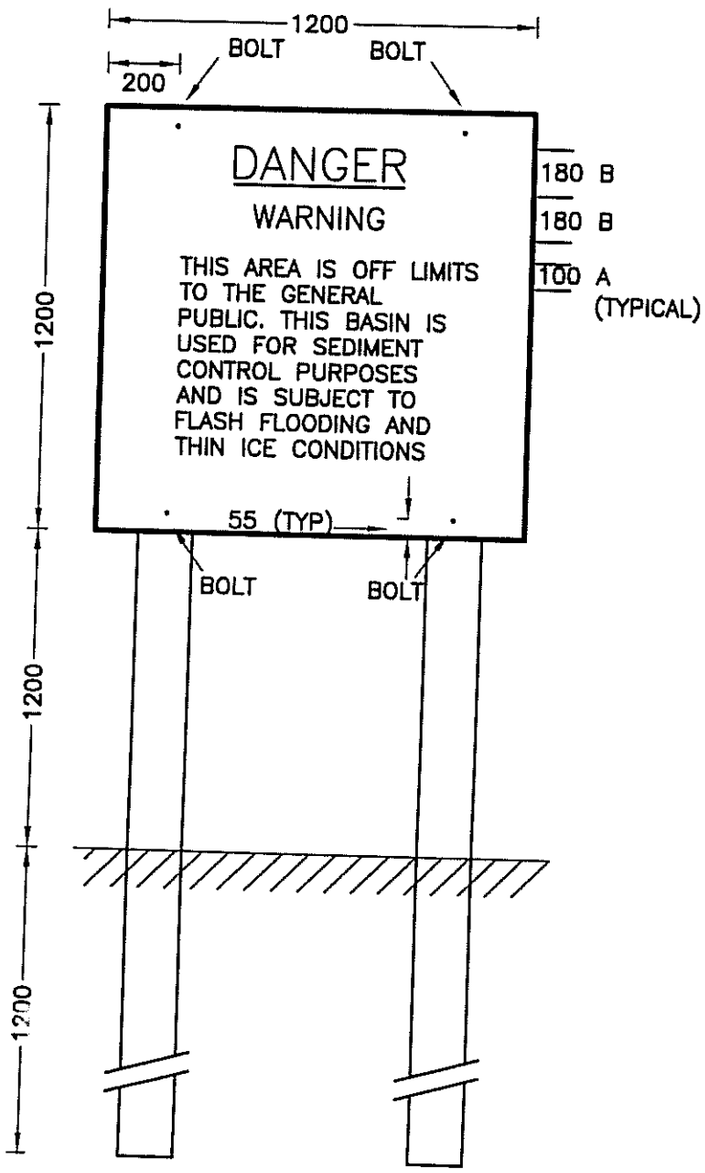
CROSS SECTION
FROZEN CONDITIONS

NOTES

1. NON WOVEN OR WOVEN GEOTEXTILE (MAY BE CONSIDERED BASED ON SOIL PARAMETERS AND SITE CONDITION) TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm.
2. GEOTEXTILE TO HAVE A HORIZONTAL OVERLAP OF 1000mm AT JOINTS.
3. SNOW FENCE TO BE UV STABILIZED HIGH DENSITY POLYETHYLENE OR APPROVED EQUIVALENT.

PPROVED EVISION TE OF REVISION	TOWNSHIP OF SCUGOG SEDIMENT CONTROL FENCE	DATE OF ISSUE 2003 DRAWING No. SS-351

METRIC
ALL DIMENSIONS IN MILLIMETRES

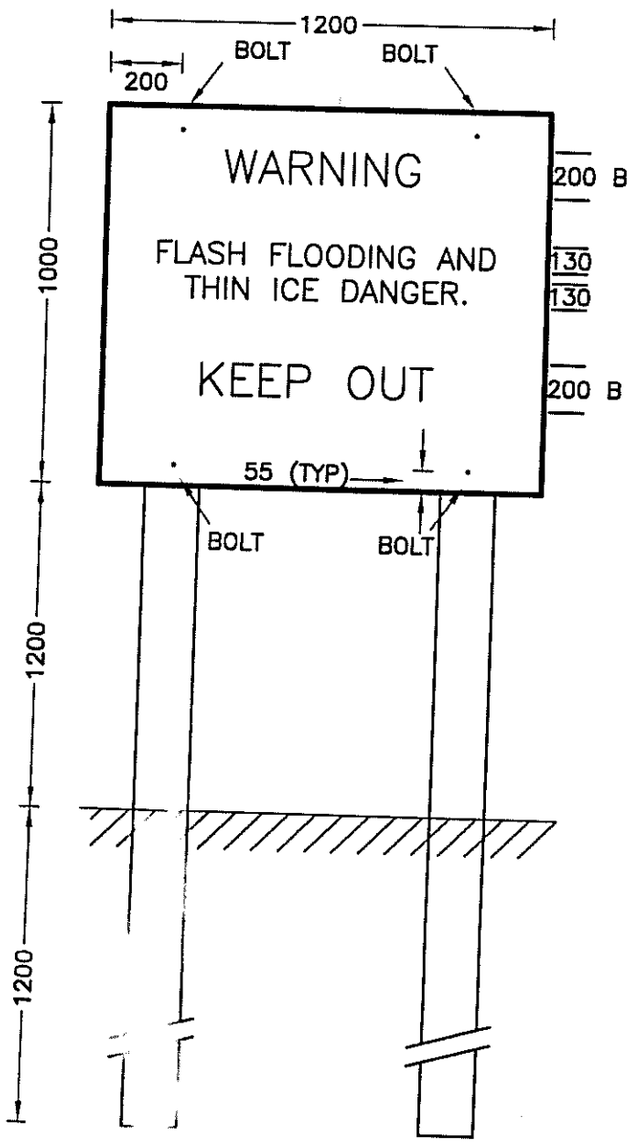


NOTES

1. SIGN TO BE ERECTED IMMEDIATELY AFTER CONSTRUCTION AND OPERATION OF THE TEMPORARY SEDIMENT POND.
2. SIGN TO BE MOUNTED TO SUPPORTS AT LOCATIONS INDICATED WITH 12mm HEX HEAD BOLTS & NUTS WITH FLAT WASHERS BOTH SIDES.
3. SIGNS MAY, AT THE DISCRETION OF THE TOWNSHIP OF SCUGOG, BE SURFACE MOUNTED IN A MANNER ENSURING STABILITY.
4. APPROVAL OF THE TOWNSHIP OF SCUGOG REGARDING THE WORDING OF THE MESSAGE REQUIRED PRIOR TO INSTALLATION.
5. TYPE FACE 'A' – FUTURA DEMI–BOLD
   TYPE FACE 'B' – FUTURA DEMI–BOLD CONDENSED
6. SIGN SPECIFICATIONS – 1200mm x 1200mm x 20mm EXTERIOR GRADE PLYWOOD, 100mm x 100mm WOOD SUPPORTS. MESSAGE AND BORDER COLOUR TO BE PANTONE 302C WITH A WHITE BACKGROUND.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION	TEMPORARY SEDIMENT POND WARNING SIGN	DRAWING No. SS–352
TE OF REVISION		

METRIC
ALL DIMENSIONS IN MILLIMETRES

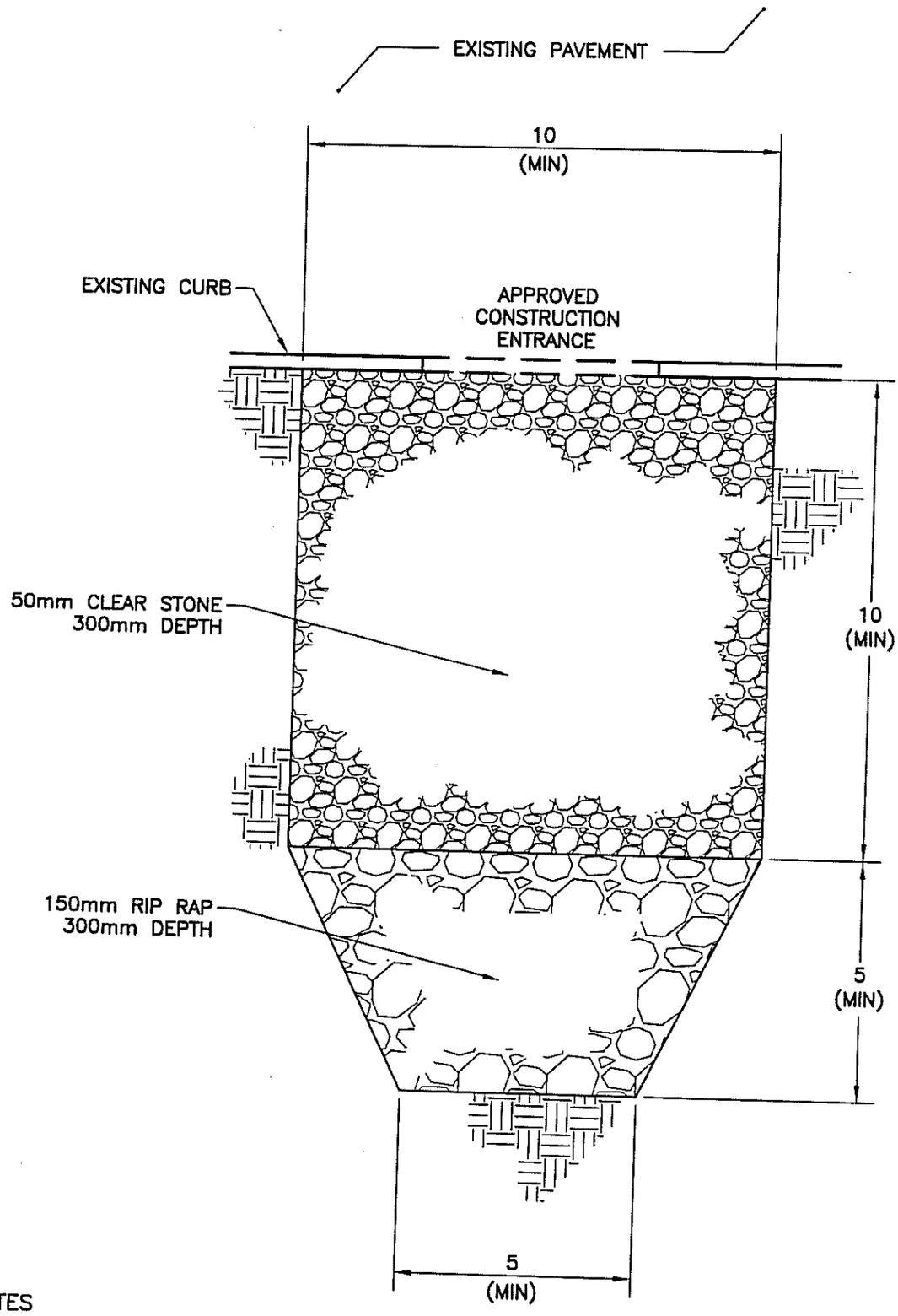


NOTES

1. SIGN TO BE ERECTED IMMEDIATELY AF CONSTRUCTION AND OPERATION OF TH STORMWATER MANAGEMENT FACILITY.
2. SIGN TO BE MOUNTED TO SUPPORTS A LOCATIONS INDICATED WITH 12mm HEX AD BOLTS & NUTS WITH FLAT WASHERS B SIDES.
3. SIGNS MAY, AT THE DISCRETION OF TH TOWNSHIP OF SCUGOG, BE SURFACE MOUNTED IN A MANNER ENSURING STA T.
4. APPROVAL OF THE TOWNSHIP OF SCUG REGARDING THE WORDING OF THE MESSAGE REQUI PRIOR TO INSTALLATION.
5. SIGN SPECIFICATIONS – 1200mm x 1200mm x 20mm EXTERIOR GRADE PLYWOOD, 100mm x 100mm WOOD SUPPORTS. MESSAGE AND BORDER COLOUR TO BE PANTONE 302C WITH A WHITE BACKGROUND.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
ISION	TEMPORARY STORM WATER MANAGEMENT FACILITY WARNING SIGN	DRAWING No. SS-353
E OF REVISION		

METRIC
ALL DIMENSIONS IN METRES

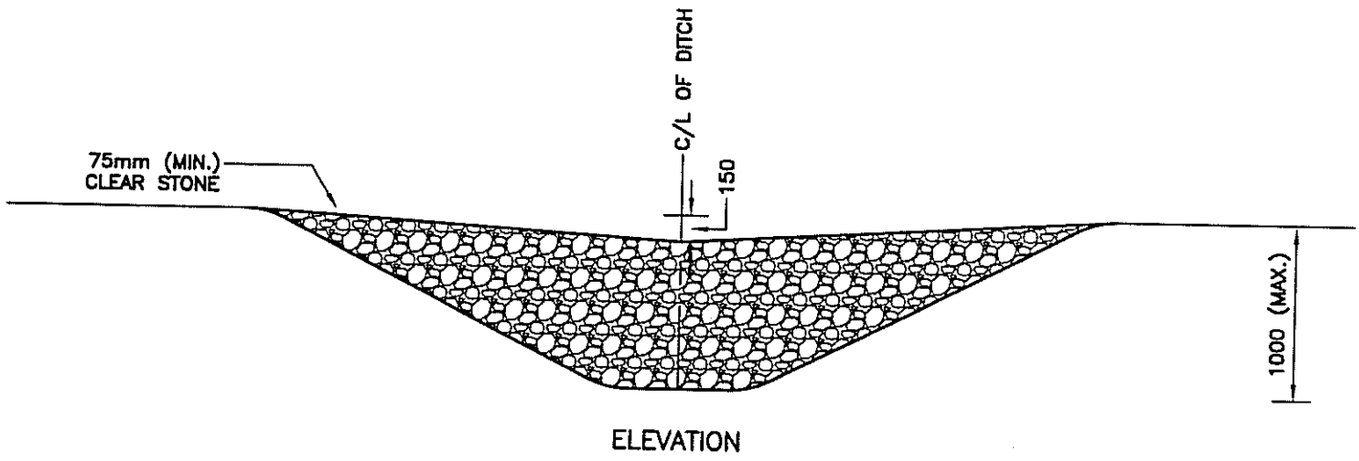


NOTES

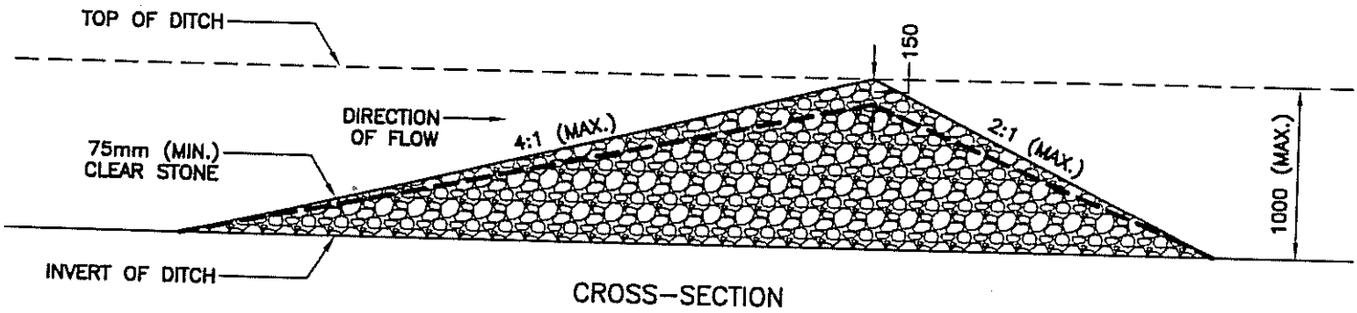
1. GRANULAR MATERIAL IS TO BE CLEAN APPROVED MATERIAL AND PLACED AT NOTED DIMENSIONS PRIOR TO LAND DISTURBANCE
2. GEOTEXTILE IS TO BE PLACED OVER THE ENTIRE AREA PRIOR TO STONE PLACEMENT
3. MAINTENANCE– THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL REDUCE TRACKING OR FLOWING OF SEDIMENT ONTO THE R.O.W. AND GRANULAR MATERIAL IS TO BE REPLACED AS WARRANTED OR DIRECTED BY THE TOWNSHIP ENGINEER.
4. FOR SITE DEVELOPMENTS GREATER THAN 4.0ha IN SIZE 20m (MIN) IS REQUIRED FOR 50mm CLEAR STONE AND 10m (MIN) IS REQUIRED FOR 150mm RIP RAP.

PPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
VISION		
TE OF REVISION	STONE PAD CONSTRUCTION ENTRANCE	DRAWING No. SS–354

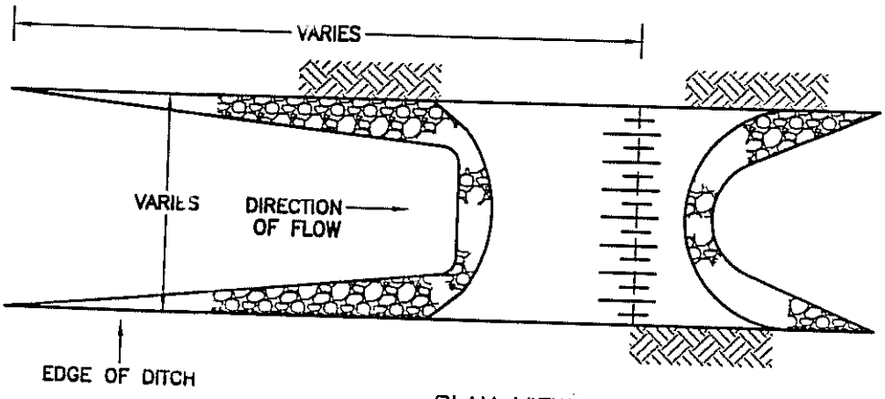
METRIC
ALL DIMENSIONS IN MILLIMETRES



ELEVATION



CROSS–SECTION



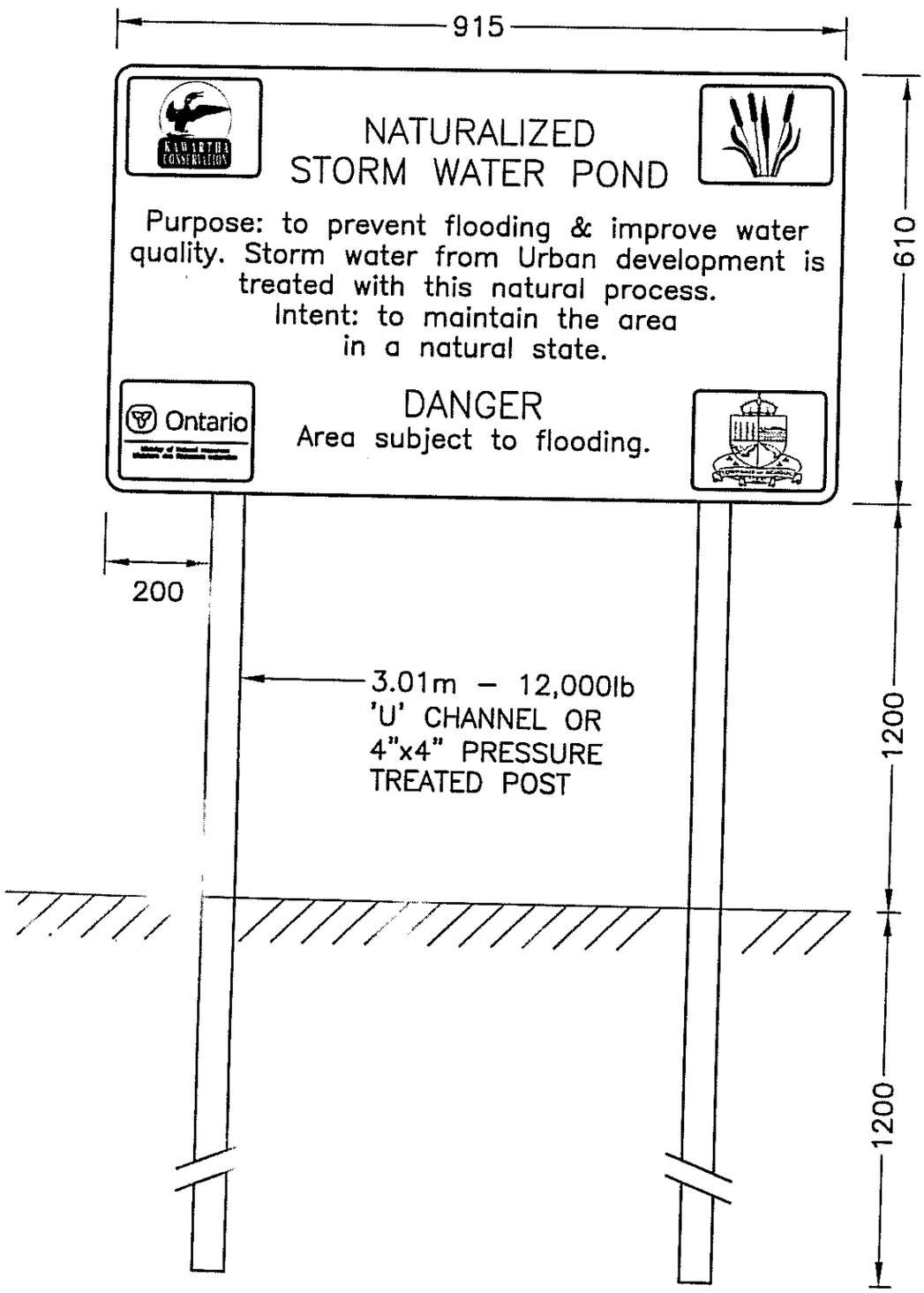
PLAN VIEW

NOTES

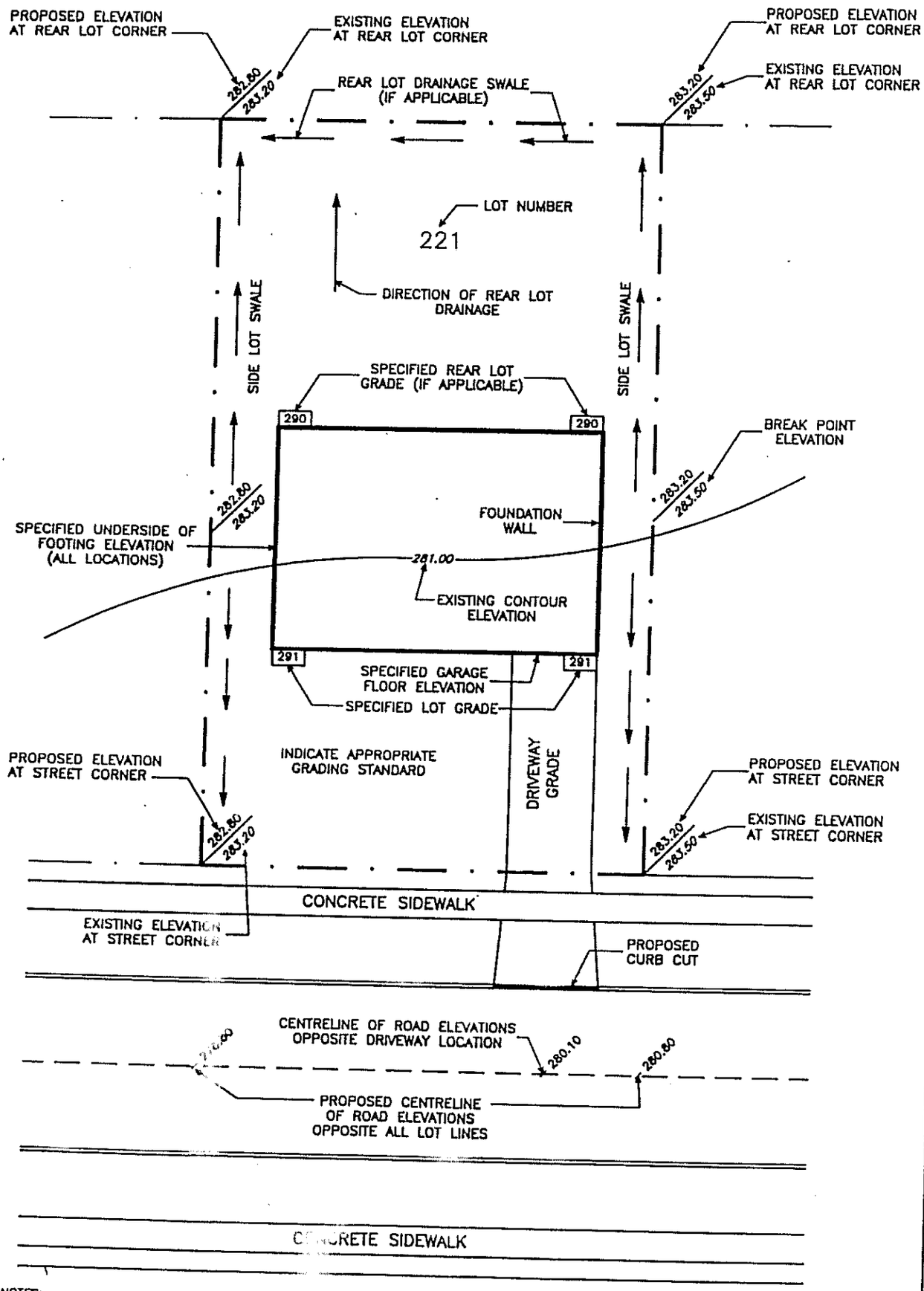
1. CLEAR STONE (75mm MIN) TO BE SIZED TO WITHSTAND MINIMUM DESIGN VELOCITY OF A 1:10 YEAR STORM EVENT.
2. SEDIMENT TO BE REMOVED WHEN IT ACCUMULATES TO ONE HALF OF THE ORIGINAL HEIGHT OF THE DAM.
3. SITE CONDITIONS MAY REQUIRE VARIATIONS OF DESIGN OR INSTALLATION OF GEOTEXTILE FABRIC AS DIRECTED BY THE TOWNSHIP ENGINEER.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 2003
ISION	ROCK CHECK DAM	DRAWING No. SS–355
E OF REVISION		

METRIC
ALL DIMENSIONS IN MILLIMETRES



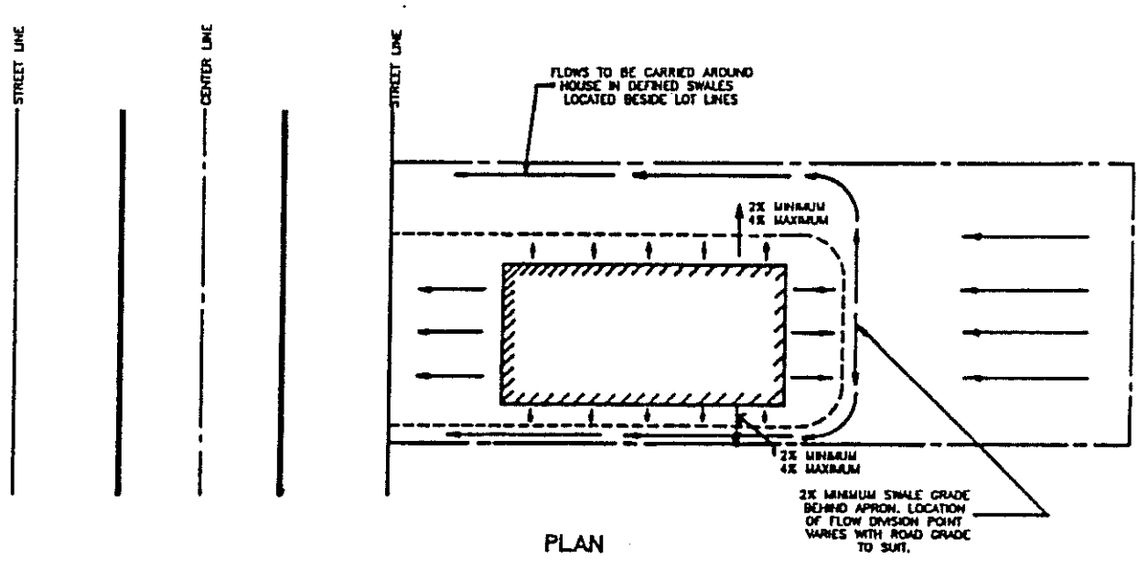
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG SWM POND SIGN IDENTIFYING NATURALIZED AREA	DATE OF ISSUE 2003 DRAWING No. SS–356



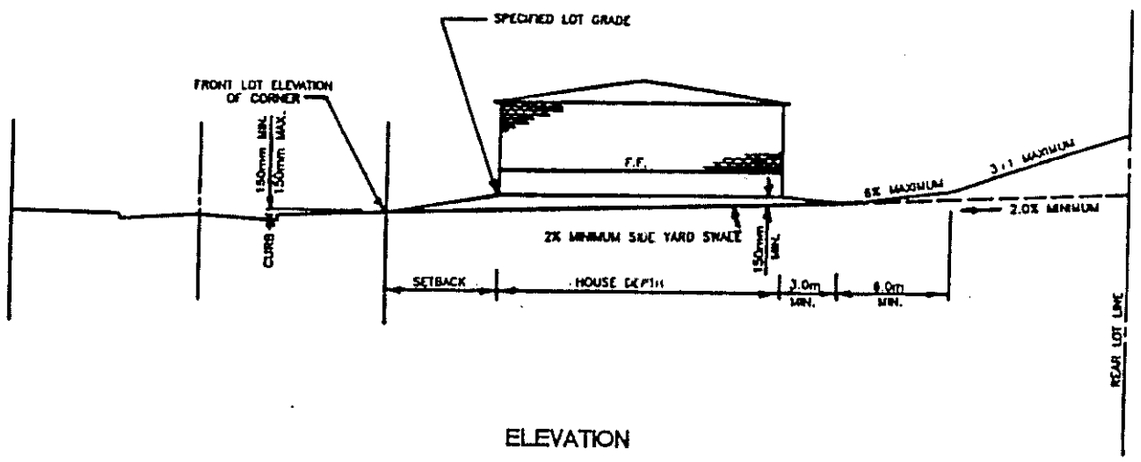
NOTES:

1. ALL CATCHBASIN LOCATIONS MUST BE [illegible] ON GRADING PLAN.
2. ALL EASEMENTS MUST BE SHOWN ON GRA[illegible] PLAN.
3. THE ABOVE LEGEND MUST APPEAR ON GR[illegible]G PLANS.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR [illegible]RES UNLESS OTHERWISE SPECIFIED.
5. PROVIDE LOT GRADING CERTIFICATE BY DEVELOPER'S ENGINEER IN ACCORDANCE WITH SUBDIVISION AGREEMENT REQUIREMENTS.
6. PROVIDE MAIN FLOOR AND BASEMENT ELEVATIONS.
7. SPECIFY PROPOSED GRADES ON ALL SWALES.
8. IDENTIFY PROPOSED LOCATION AND DIMENSIONS OF SEPTIC TILE BED AND APPROVAL CERTIFICATE OF DURHAM REGION HEALTH UNIT.
9. PROVIDE REGISTERED PLAN NUMBER ON GRADING PLAN.
10. REFER TO SECTION E 4.01 FOR ALL OTHER REQUIREMENTS.
11. MAXIMUM DESIGN DRIVEWAY GRADE TO BE 6%.
12. SITE BENCHMARK INFORMATION AS SHOWN ON APPROVED ENGINEERING DRAWINGS.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	TYPICAL LEGEND FOR LOT GRADING PLAN	DRAWING NO. SS-400
DATE OF REVISION APRIL 1990		



PLAN

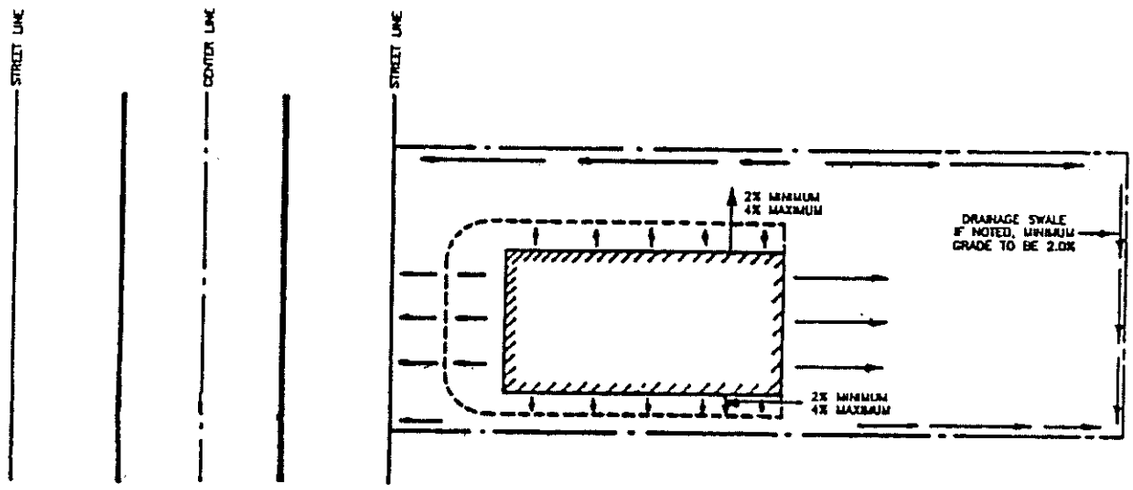


ELEVATION

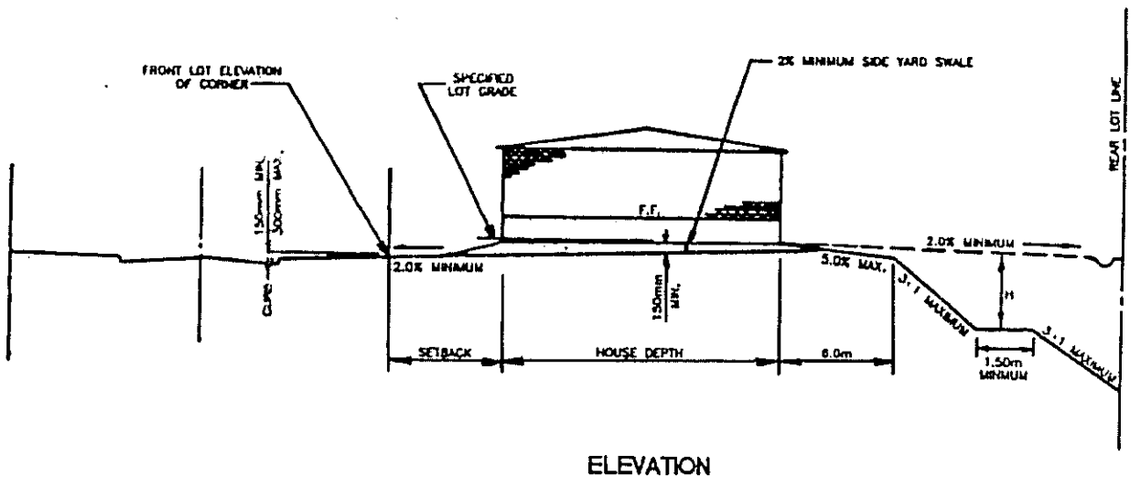
NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALE.
3. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	FRONT LOT DRAINAGE	DRAWING No. SS-401
DATE OF REVISION APRIL 1990		



PLAN



ELEVATION

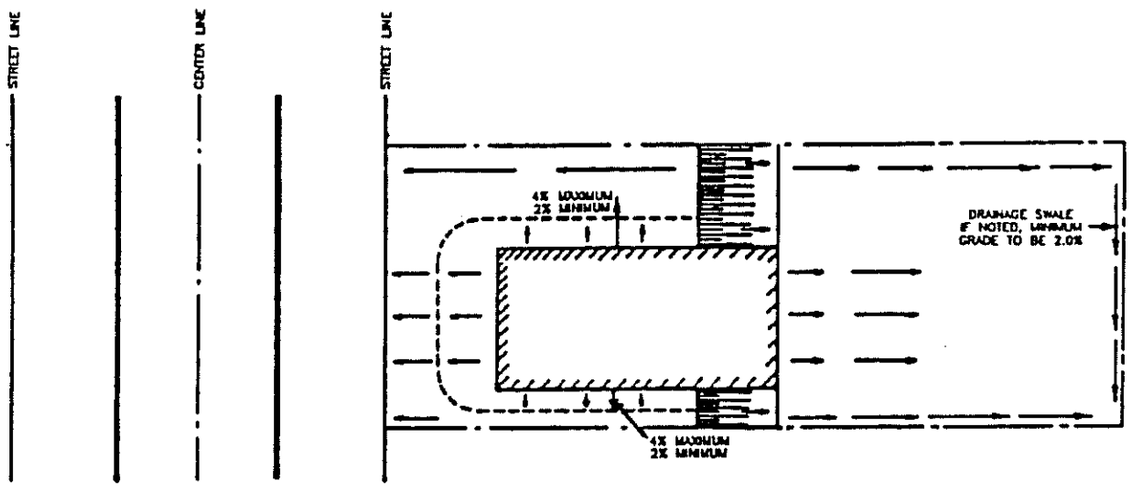
NOTE:

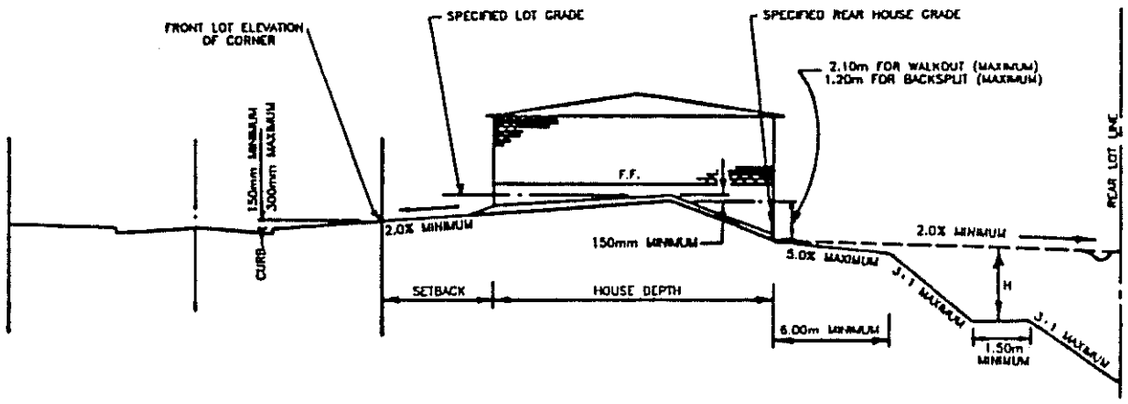
IF ATTACHED GARAGE IS CONSTRUCTED THAN REAR YARD SLOPE MAY COMMENCE AT REAR WALL OF GARAGE.

NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALES.
3. 'H' DIMENSION TO BE 1.80M MAXIMUM, UNLESS UNDISTURBED EXISTING SLOPE. TERRACE CAN BE ELIMINATED ON SLOPES OF 4:1 OR LESS.
4. ALL DIMENSIONS ARE IN MILLIMTRES OR METRES UNLESS OTHERWISE SPECIFIED.

PROVED VISION 1 E OF REVISION APRIL 1990	TOWNSHIP OF SCUGOG REAR LOT DRAINAGE	DATE OF ISSUE 1980 DRAWING No. SS-402

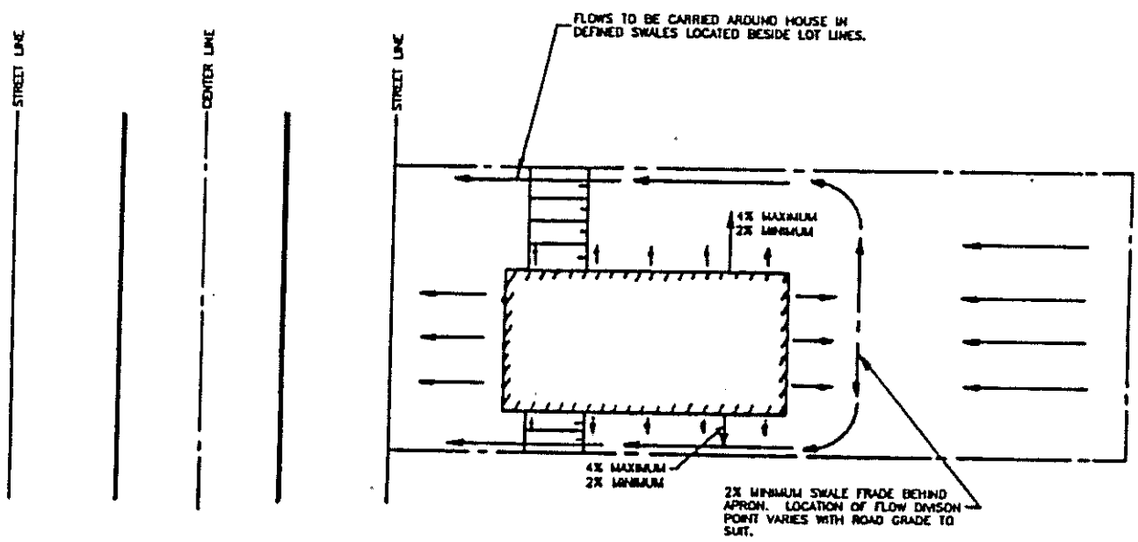




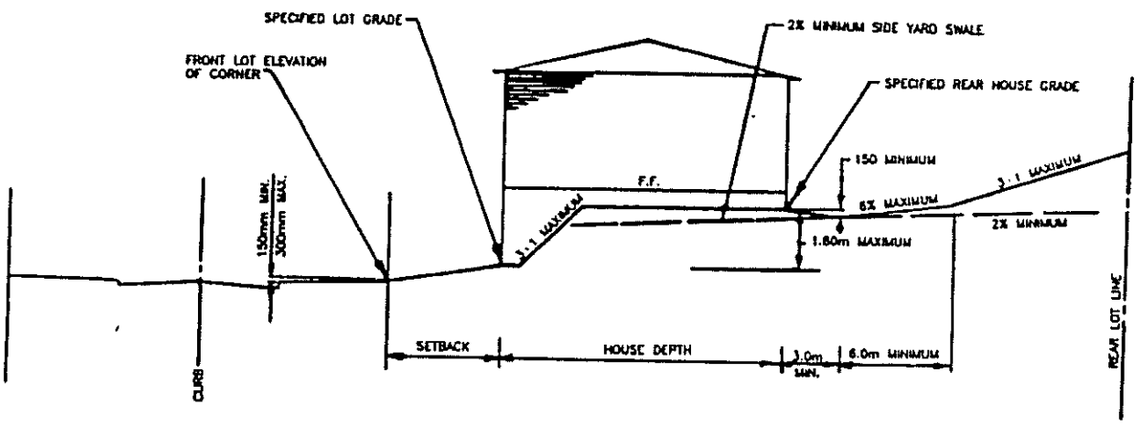
NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. 'H' DIMENSION TO BE 1.80m MAXIMUM UNLESS UNDISTURBED EXISTING SLOPE. TERRACE CAN BE ELIMINATED ON SLOPES OF 4:1 OR LESS.
3. REAR HOUSE GRADE MUST ALSO BE SPECIFIED ON LOT GRADING PLANS WHEN THIS HOUSE TYPE IS PROPOSED.
4. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SPECIFIED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	REAR LOT DRAINAGE FOR WALKOUT OR BACKSPLIT HOUSE	DRAWING No. SS-403
DATE OF REVISION APRIL 1990		



PLAN



ELEVATION

NOTES:

1. SPECIFIED LOT GRADE SHALL BE 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALE.
3. REAR HOUSE GRADE MUST ALSO BE SPECIFIED ON LOT GRADING PLANS WHEN THIS HOUSE TYPE IS PROPOSED.
4. ALL DIMENSIONS ARE IN MILLIMETRES ON METRES UNLESS OTHERWISE SPECIFIED.

PROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
VISION 1	FRONT LOT DRAINAGE	DRAWING No.
E OF REVISION APRIL 1990	FRONT SPLIT HOUSE TYPE	SS-404

ACCEPTED TO BE IN ACCORDANCE WITH THE TOWNSHIP OF SCUGOG STANDARDS. THIS ACCEPTANCE IS NOT TO BE CONSTRUED AS VERIFICATION OF ENGINEERING CONTENT TOWNSHIP ENGINEER DATE	APPROVED DEPARTMENT OF WORKS REGIONAL MUNICIPALITY OF DURHAM DATE

REVISIONS				
No.		DATE	BY	APPROVED

CORPORATION OF THE TOWNSHIP OF SCUGOG

SUBDIVISION NAME

STREET OR EASEMENT

LIMITS

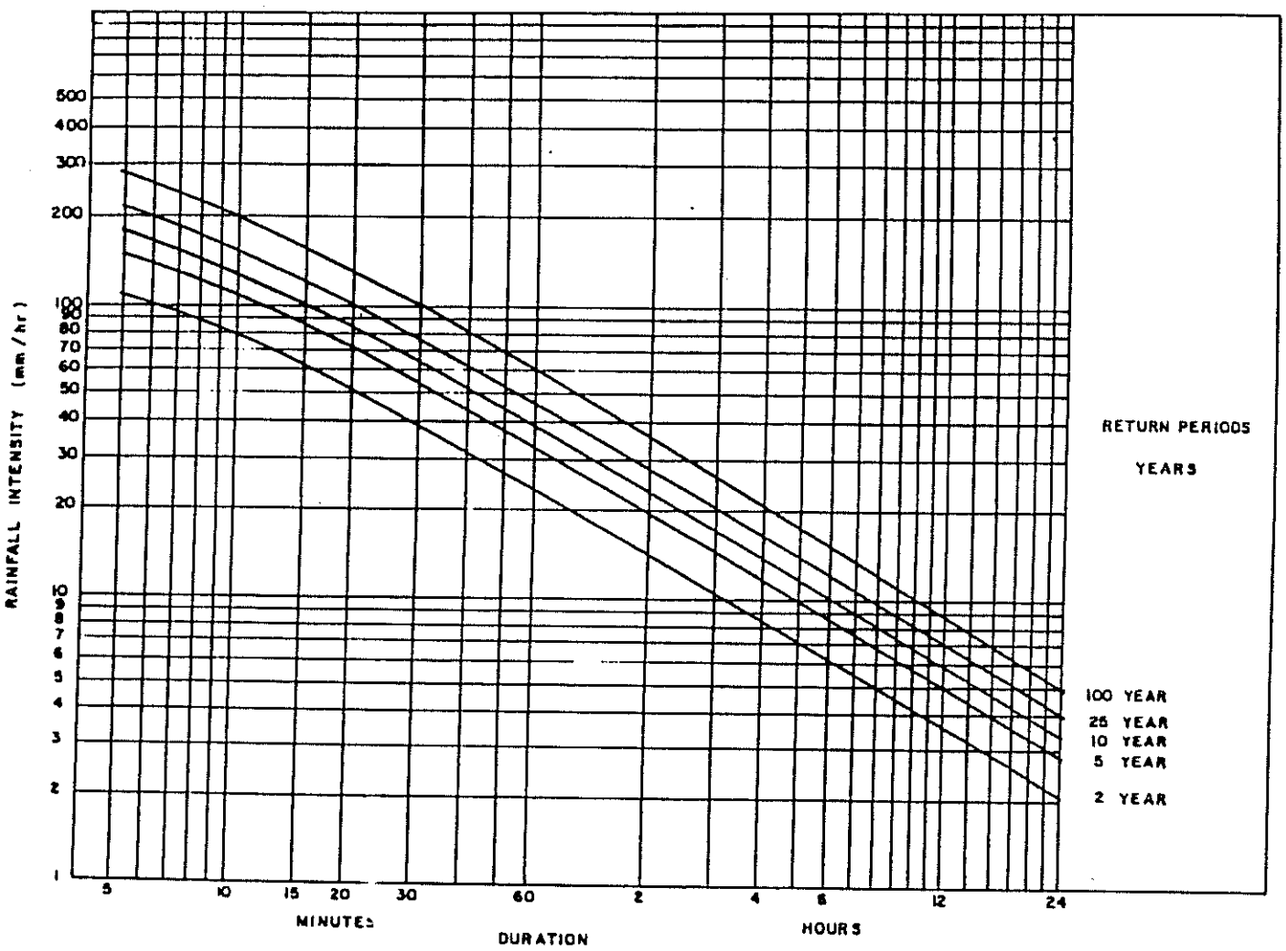
CONSULTANTS NAME

ENGINEER'S STAMP	SCALE	PROJECT No.
	DRAWN BY:	DRAWING No.
	DESIGNED BY:	
	CHECKED BY:	
	DATE:	

NOTES:

1. THE ABOVE TITLE BLOCK MUST APPEAR ON CONTRACT DRAWINGS.
2. "APPROVED" BLOCKS MUST APPEAR ON DRAWINGS IN A POSITION WHICH WILL NOT RESTRICT REVISION TABLE.
3. THE ENGINEER'S STAMP IS TO BE SIGNED AND DATED.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1980
REVISION 1	DRAWING TITLE BLOCK	DRAWING NO. SS-500
DATE OF REVISION APRIL 1990		

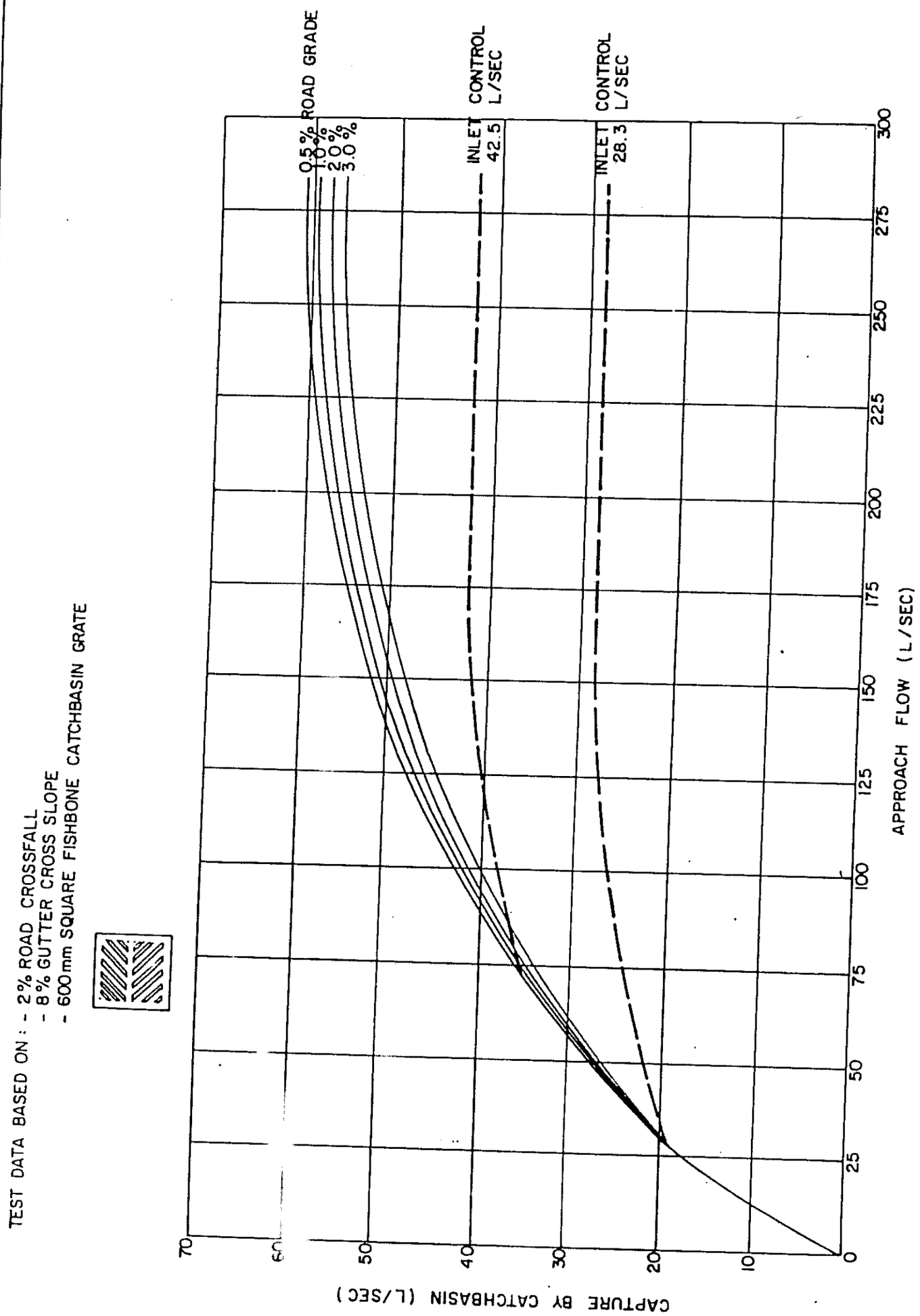


1. EQUATIONS FOR TYPICAL INTENSITY - DURATION - FREQUENCY CURVES T - TIME (MINUTES)
I - INTENSITY (mm/hr)

$$I_2 = \frac{645}{(T+5)^{0.786}} \quad , \quad I_5 = \frac{\quad}{(T+\quad)^{0.788}} \quad , \quad I_{10} = \frac{\quad}{(T+5)^{0.788}} \quad , \quad I_{25} = \frac{1243}{(T+4)^{0.787}} \quad , \quad I_{100} = \frac{1799}{(T+5)^{0.810}}$$

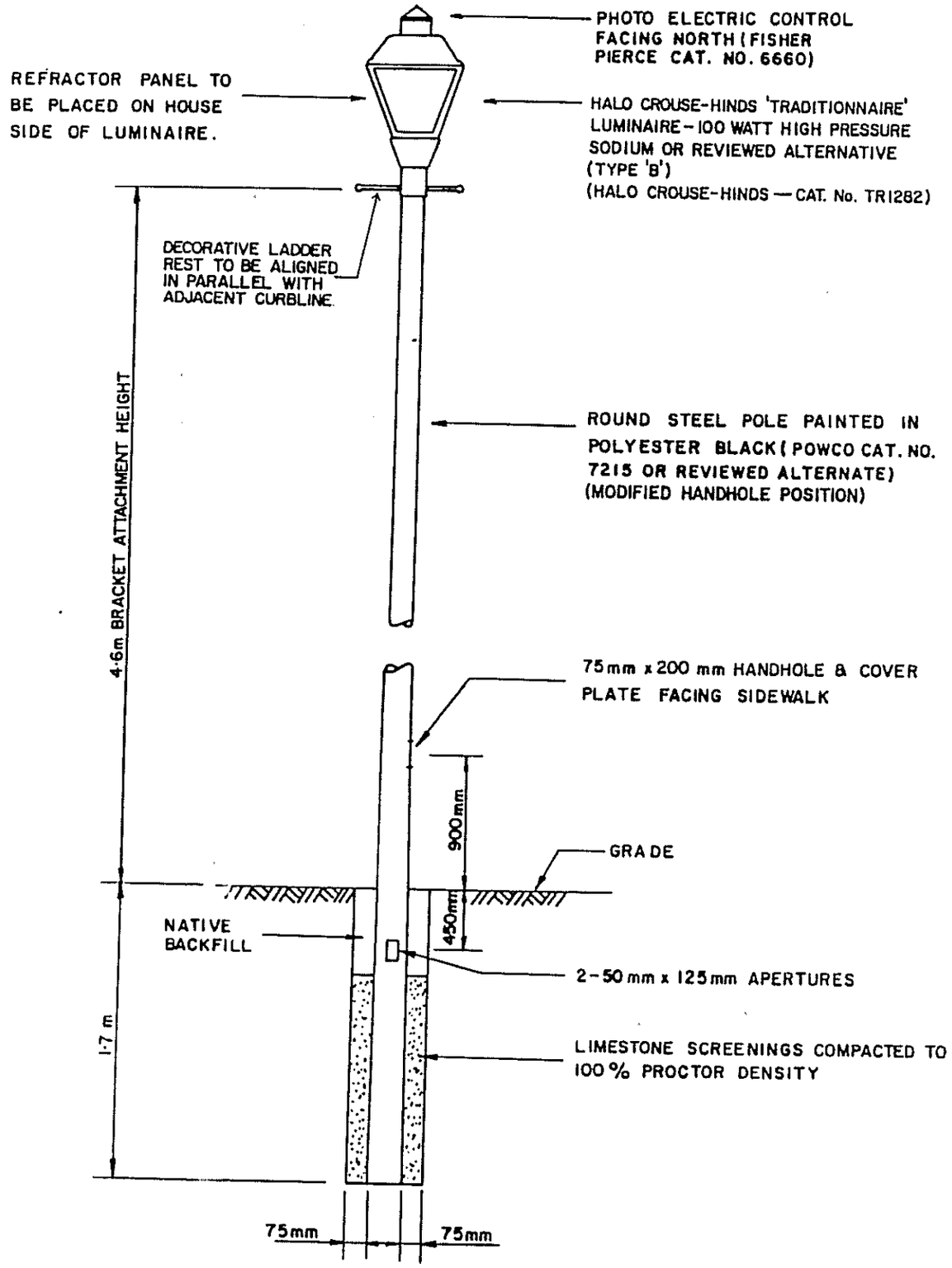
2. THE ABOVE EQUATIONS ARE ONLY VALID FOR T = 10 MINUTES TO 1440 MINUTES.

REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG RAINFALL INTENSITY DURATION CURVES	DATE OF ISSUE APRIL 1990 DRAWING No. SS-600



TEST DATA BASED ON : - 2% ROAD CROSSFALL
- 8% GUTTER CROSS SLOPE
- 600mm SQUARE FISHBONE CATCHBASIN GRATE

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
REVISION	HYDRAULIC PERFORMANCE OF CATCHBASIN GRATES LOCATED IN GUTTERS	DRAWING No. SS-601
DATE OF REVISION		

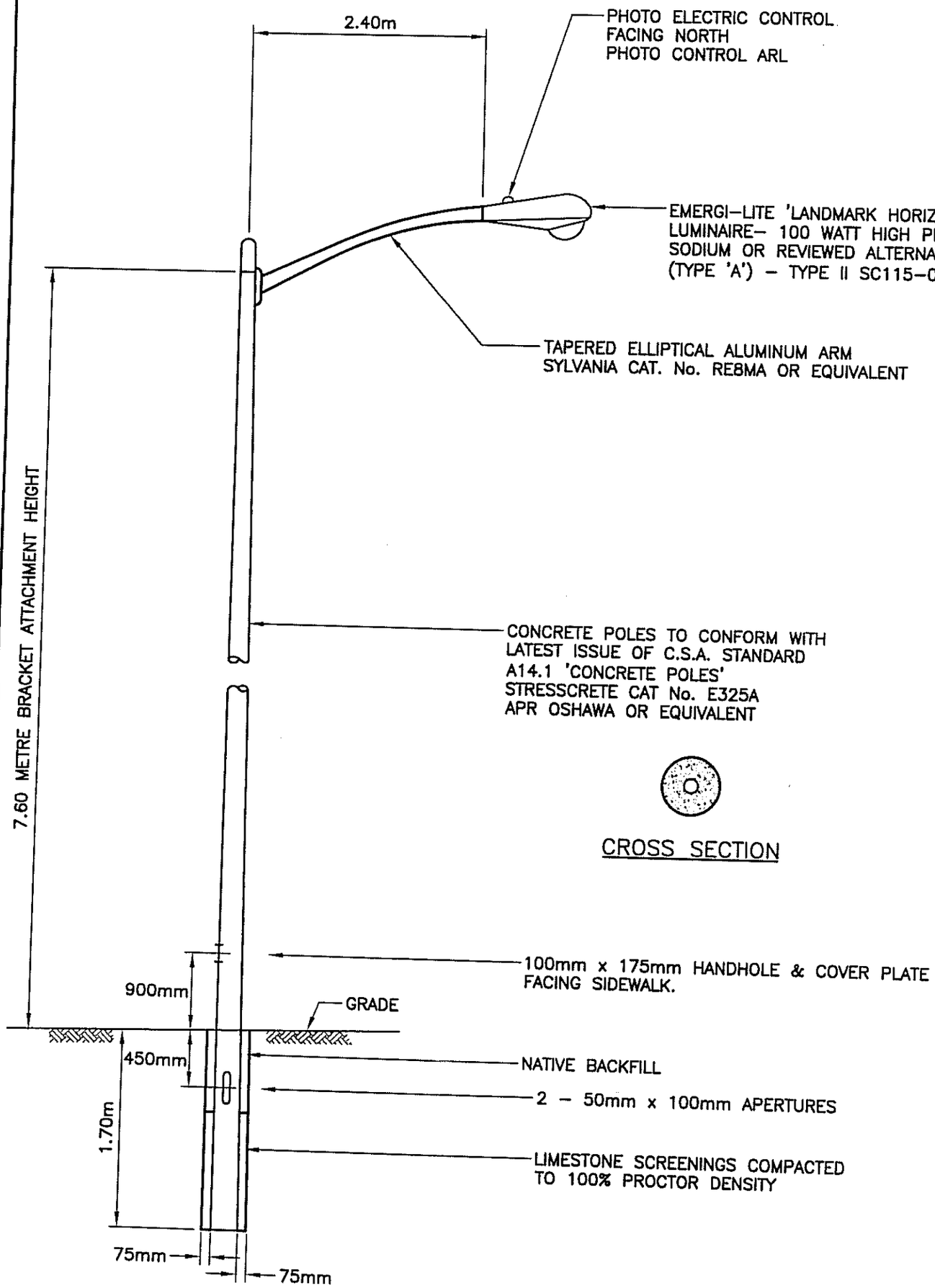


NOTE : S/L WIRING TO LOOP UP TO HANDHOLE CONNECTION TO LUMINAIRE WIRING BY MEANS OF ESNA FUSE & CABLE CONNECTOR

PPROVED EVISION TE OF REVISION	TOWNSHIP OF SCUGOG TOWN AND COUNTRY POST-TOP LUMINAIRE	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-700

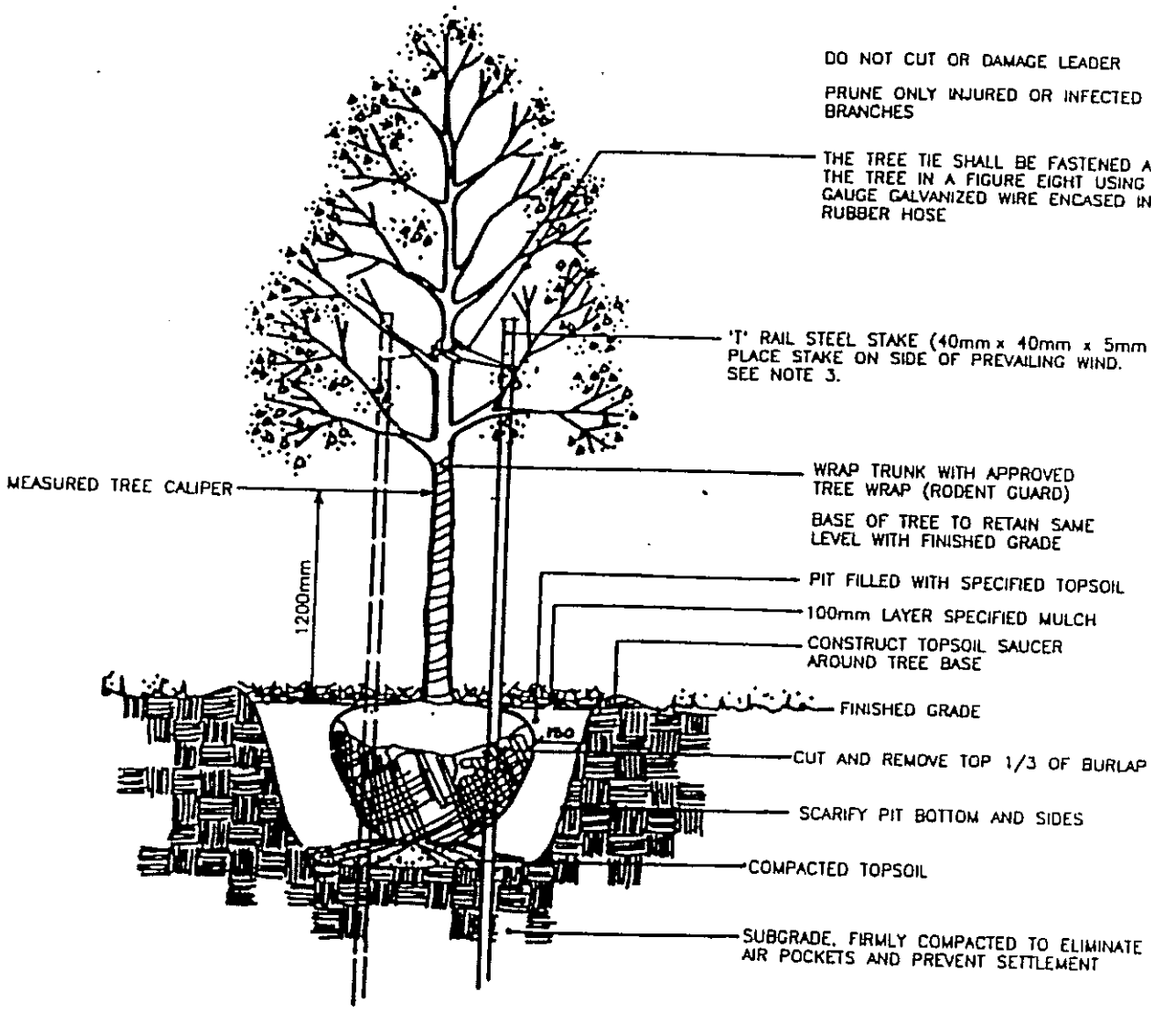
METRIC

ALL DIMENSIONS IN MILLIMETRES



NOTE: S/L WIRING TO LOOP UP TO HANDHOLE
CONNECTION TO LUMINAIRE WIRING BY MEANS
OF ESNA FUSE & CABLE CONNECTOR.

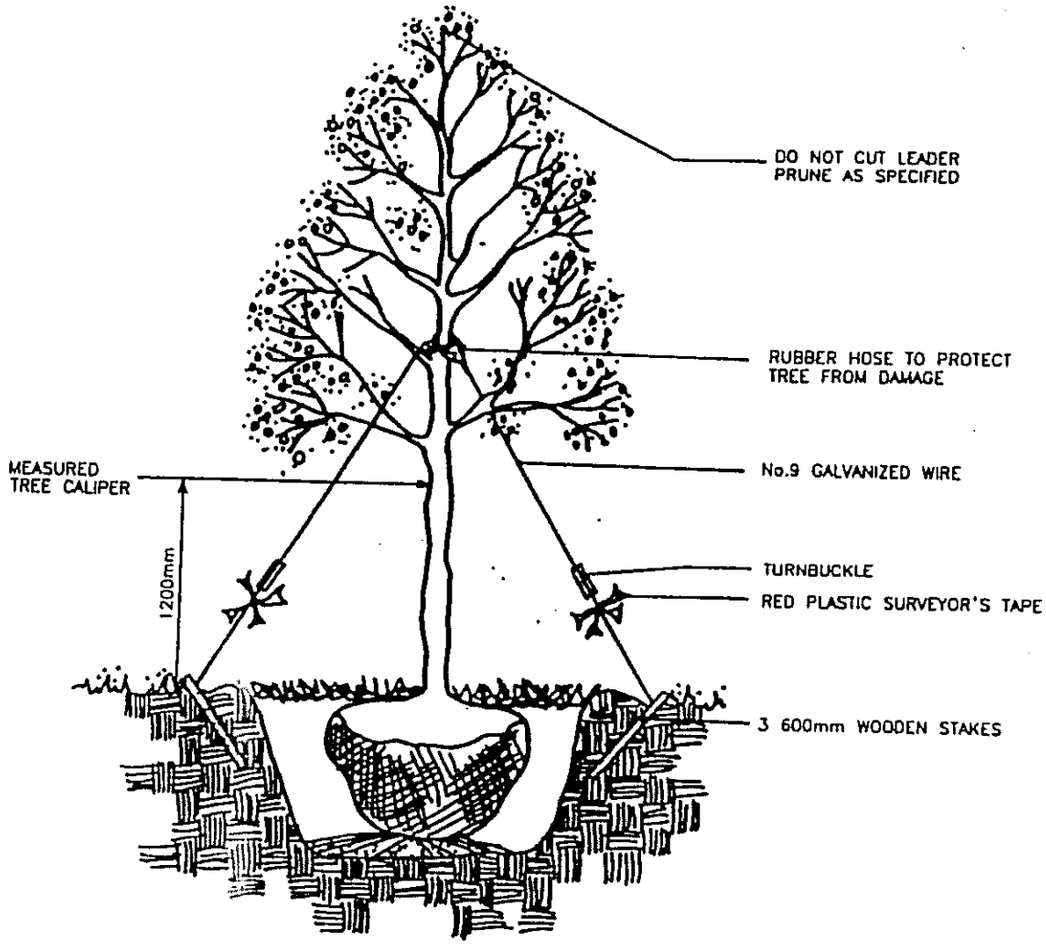
APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE 1990
REVISION 1	STANDARD HORIZONTAL TYPE LUMINAIRE	DRAWING No. SS–701
DATE OF REVISION MAY 2003		

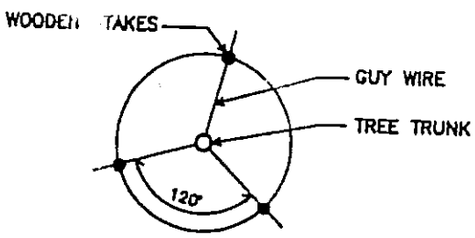


NOTES:

1. THE TOP OF ROOT BALL SHALL BE POSITIONED 50mm ABOVE GRADE.
2. SET TREE 50mm HIGHER THAN SURROUNDING GRADE TO ALLOW FOR SETTLEMENT.
3. TREES UNDER 70mm CALIPER REQUIRE 2 STAKES, TREES 70mm CALIPER AND OVER REQUIRE 3 STAKES.
4. THE ABOVE DETAIL DOES NOT REPRESENT ANY PARTICULAR SPECIES.
5. WHEN PLANT MATERIAL IS SUPPLIED IN A WIRE BASKET THE TOP 1/3 OF THE BASKET SHALL BE CUT AND REMOVED FROM THE PIT.
6. WATER THOROUGHLY AFTER PLANTING.
7. ALL DIMENSIONS ARE IN MILLIMETRES.

APPROVED	TOWNSHIP OF SCUGOG	DATE OF ISSUE
REVISION	DECIDUOUS TREE DETAIL LARGER THAN 50mm CALIPER	APRIL 1990
DATE OF REVISION		DRAWING NO. SS-801



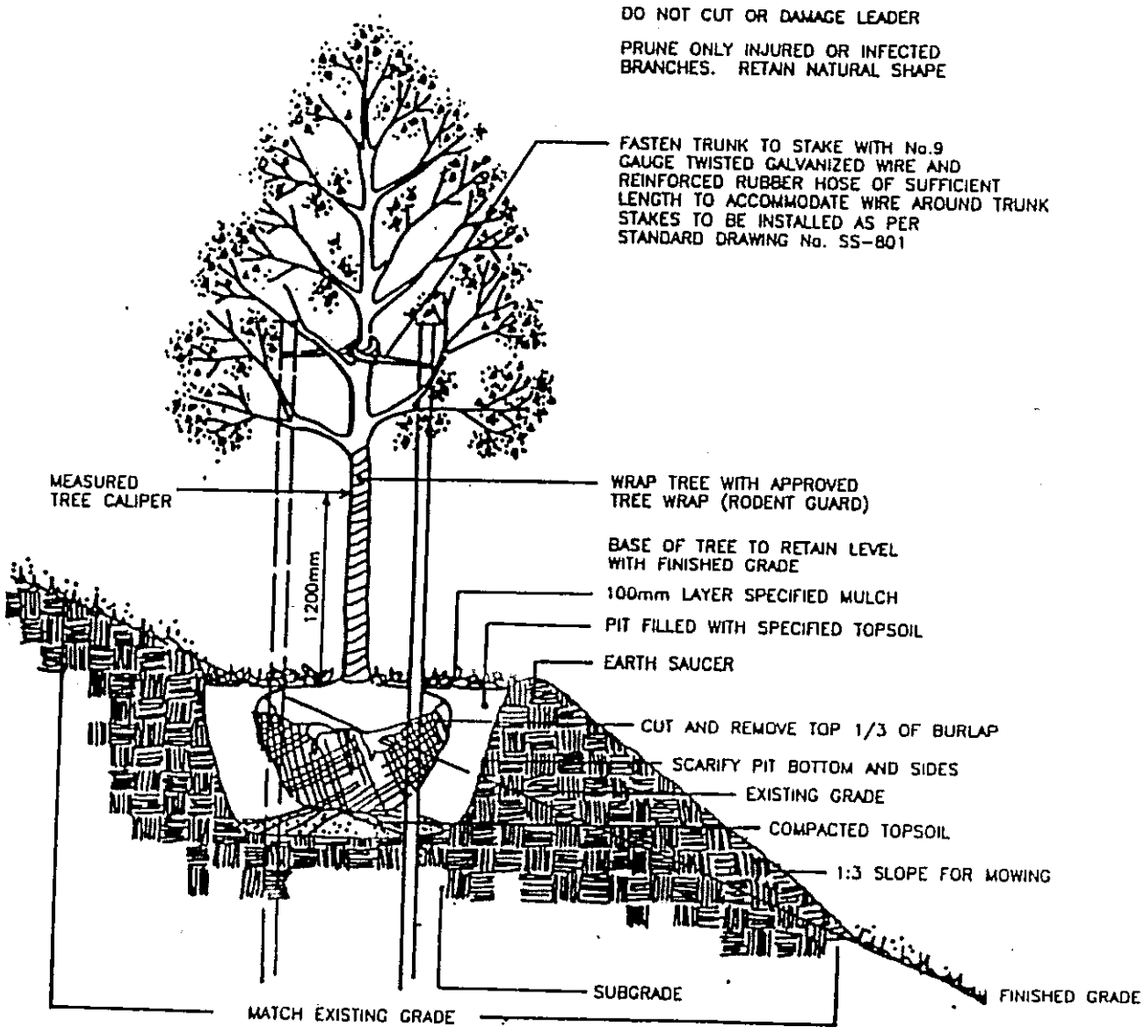


PLAN OF GUYING

NOTES:

1. SIMILAR GUYING USE FOR CONIFEROUS TREES GREATER THAN 2m IN HEIGHT.
2. FOR ADDITIONAL NOTES REFER TO TYPICAL DECIDUOUS TREE DETAIL (STANDARD DRAWING NO. SS-801).

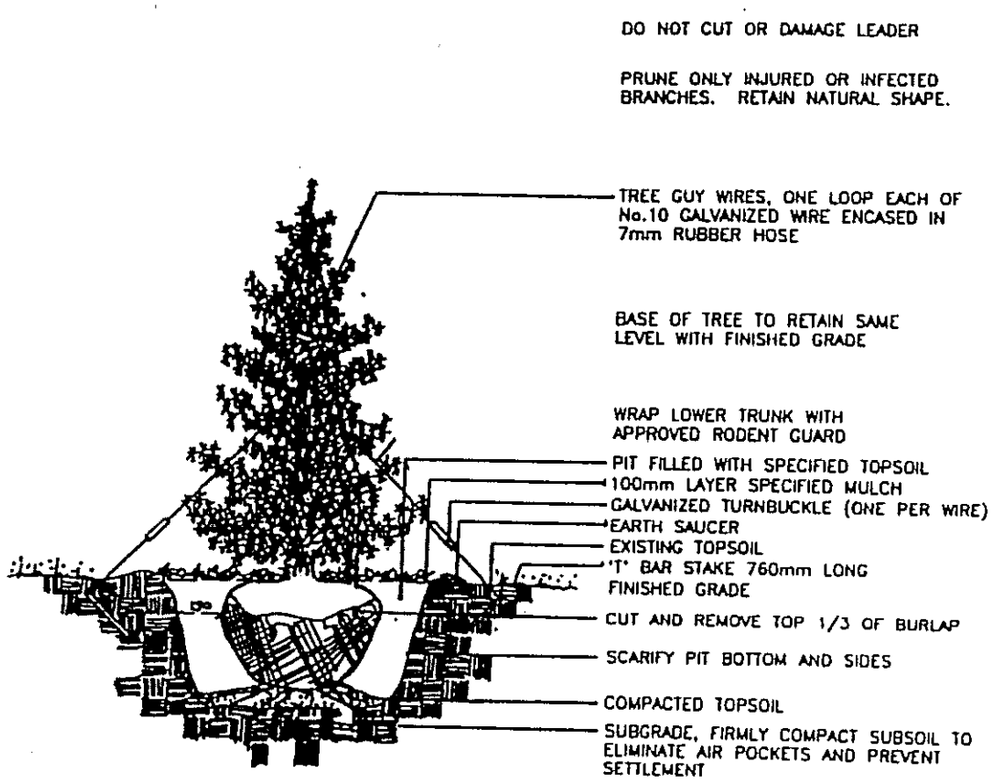
APPROVED REVISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
DATE OF REVISION	DECIDUOUS TREE DETAIL 300cm HEIGHT, 50mm TO 90mm CALIPER	DRAWING NO. SS-802



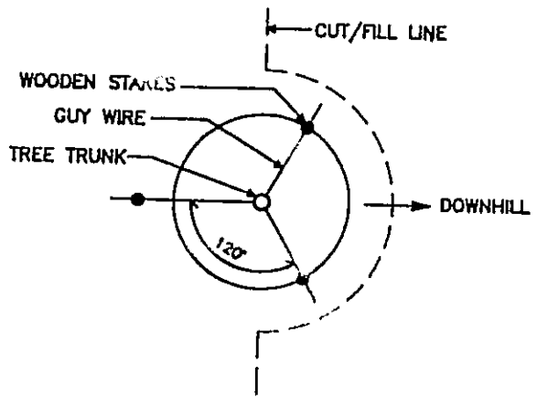
NOTES:

1. WATER THOROUGHLY AFTER PLANTING.

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG DECIDUOUS TREE PLANTING ON A SLOPE	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-803



CONIFEROUS TREE ON LEVEL GROUND

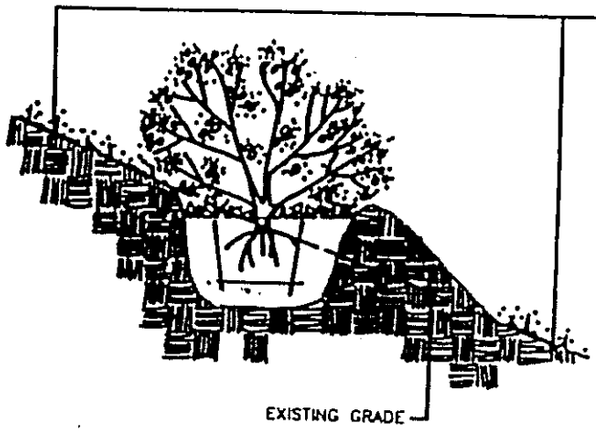


PLAN OF GUYING ON SLOPE

NOTES:

1. WATER THOROUGHLY AFTER PLANTING.
2. TOP OF ROOT BALL TO BE POSITIONED 50mm ABOVE GRADE.
3. ALL CONIFEROUS TREES 2m IN HEIGHT AND OVER TO BE TRIPLE GUYED.
4. ALL DIMENSIONS ARE IN MILLIMETRES.

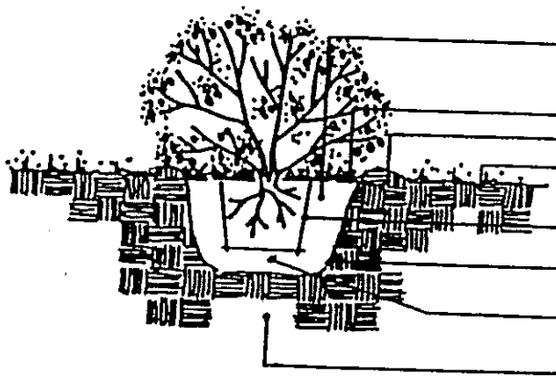
APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG TYPICAL CONIFEROUS TREE DETAIL LARGER THAN 200cm HEIGHT	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-810



SHRUB PLANTING ON A SLOPE

PRUNE ONLY INJURED OR INFECTED BRANCHES. RETAIN NATURAL SHAPE

BASE OF SHRUB TO RETAIN SAME LEVEL WITH FINISHED GRADE

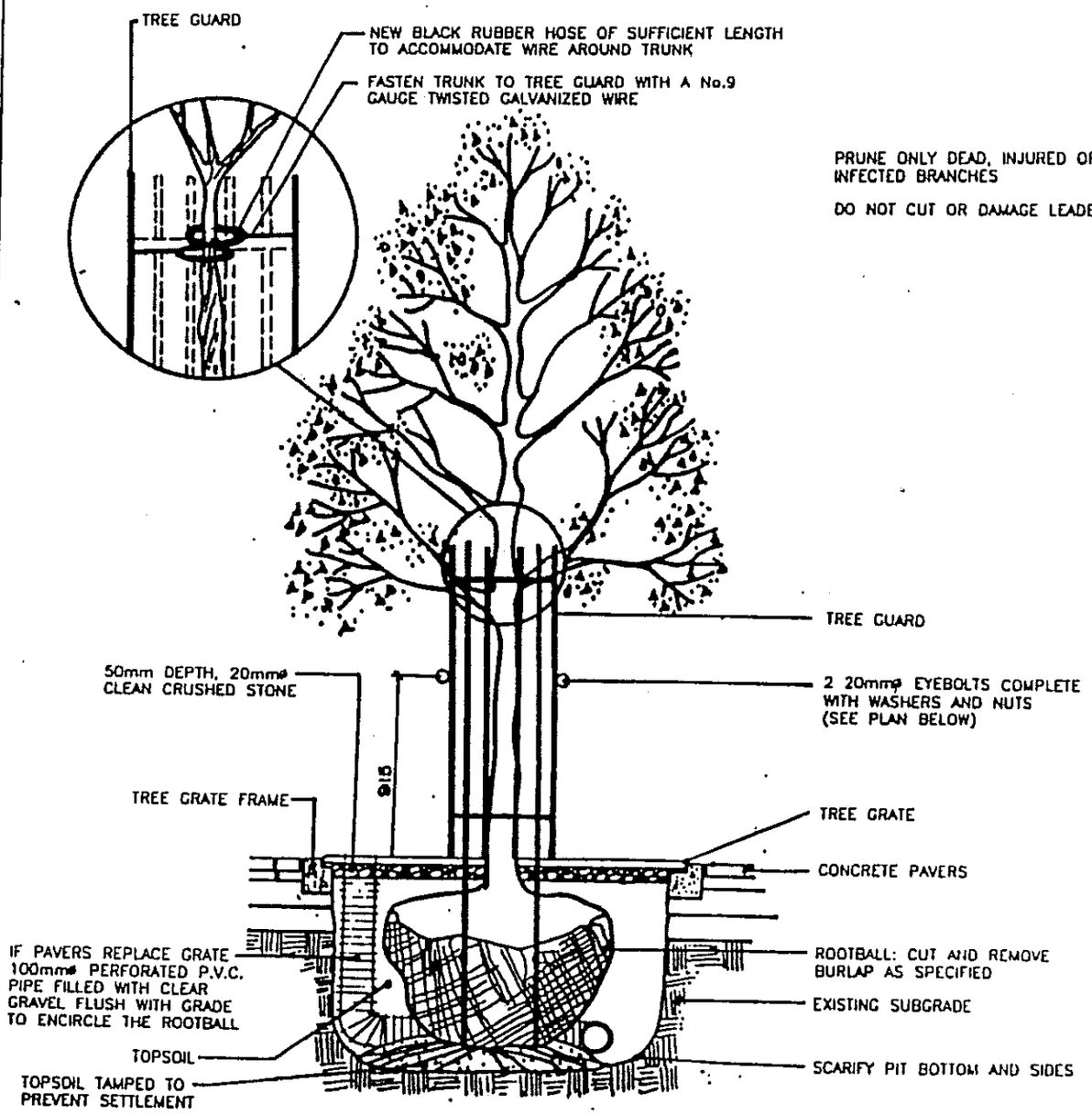


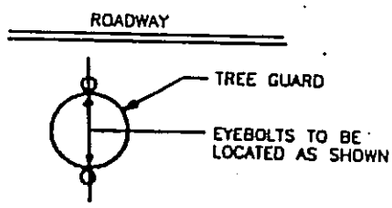
SHRUB PLANTING ON LEVEL GROUND

NOTES:

1. WATER THOROUGHLY AFTER PLANTING.

APPROVED REVISION	TOWNSHIP OF SCUGOG	DATE OF ISSUE APRIL 1990
DATE OF REVISION	SHRUB PLANTING DETAIL	DRAWING NO. SS-811



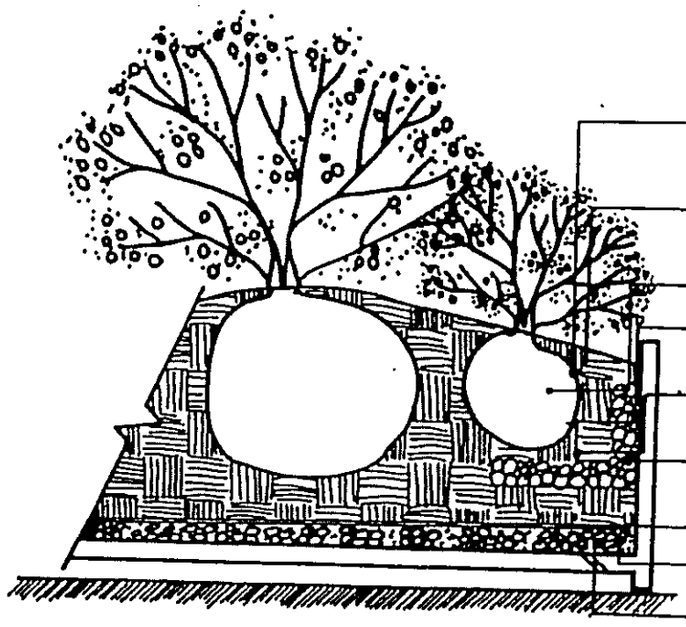


EYEBOLT LOCATION PLAN
N.T.S.

NOTES:

1. PAINT ALL EXPOSED HARDWARE WITH BLACK TREMCLAD PAINT OR EQUAL TO MATCH TREE GRATE AND GUARD.

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG STREET TREE DETAIL	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-815



PRUNE ONLY INJURED OR INFECTED BRANCHES. RETAIN NATURAL SHAPE.

BASE OF SHRUB TO REMAIN SAME LEVEL WITH TOP OF CONTAINER

PIT FILLED WITH SPECIFIED TOPSOIL

100mm LAYER SPECIFIED MULCH EARTH SAUCER

CUT AND REMOVE CONTAINER EDGES BELOW GRADE. SCARIFY POT SIDES.

SCARIFY PIT BOTTOM AND SIDES

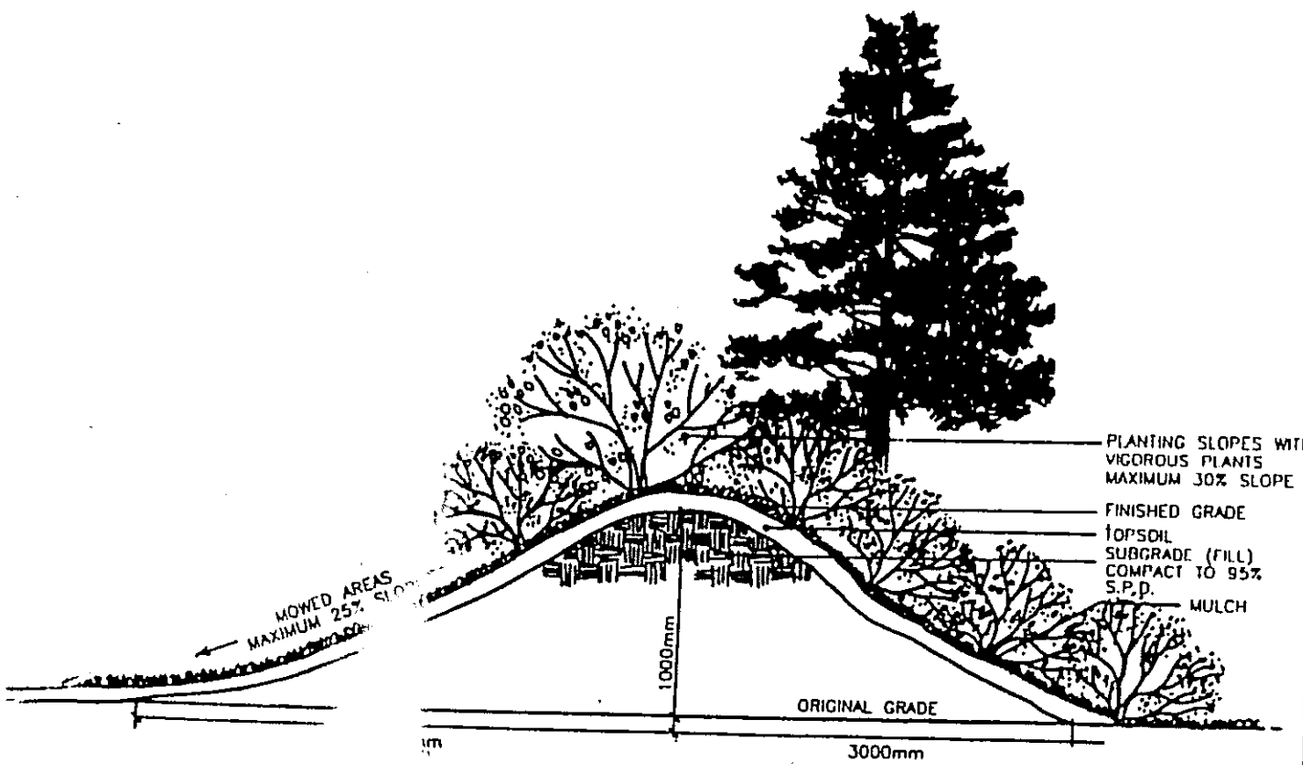
FIRMLY COMPACT BACKFILLED SOIL TO ELIMINATE AIR POCKETS AND SETTLEMENT

43ø WIDE BAND OF COARSE GRAVEL AROUND ENTIRE PERIMETER OF TUB FILTER CLOTH EXTEND 76 UP SIDE OF TUB WALL

100 COARSE GRAVEL

25ø WEEP HOLE. 6 PER PLANTER COVER WITH 6 COPPER MESH SCREEN

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG PLANTER DETAIL	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-816



NOTES:

1. BLEND SLOPES INTO SURROUNDING CAPED AREAS, USE ONLY APPROVED CLEAN FILL

APPROVED REVISION DATE OF REVISION	TOWNSHIP OF SCUGOG TYPICAL BERM PLANTING	DATE OF ISSUE APRIL 1990 DRAWING NO. SS-817