THE CORPORATION OF THE VILLAGE OF PORT CLEMENTS

BYLAW NO. 195

WHEREAS THE Council of the Corporation of the Village of Port Clements wishes to adopt a Bylaw to regulate and require the provision of services in respect of the subdivision of land pursuant to Section 989 of the Municipal Act;

NOW THEREFORE THE Council of the Corporation of the Village of Port Clements in open meeting, lawfully assembled ENACTS AS FOLLOWS:

1. TITLE

This Bylaw may be cited as "The Corporation of the Village of Port Clements Subdivision Servicing Bylaw No. 195, 1988".

2. DEFINITIONS

In this Bylaw, unless the context otherwise requires, the following words and expressions shall have the meaning hereinafter assigned to them:

"ACCEPT OR ACCEPTANCE" or any tense of these words when used with respect to Work or Works and Services shall mean the final acceptance of the Works and Services as certified by the Municipal Engineer in writing, when the maintenance period has been completed to the satisfaction of the Municipal Engineer.

"APPLICANT" means a person applying for the approval of a subdivision whether as an owner thereof or his duly authorized agent, or as a purchaser under an Agreement for Sale, or such purchaser's duly authorized agent.

"APPROVAL" means approval in writing from the authority having jurisdiction.

"APPROVING OFFICER" means a person appointed as an Approving Officer for the Corporation of the Village of Port Clements under the regulations of the "Land Title Act".

"BOND" means cash or an irrevocable Letter of Credit in favour of the Corporation.

"BOULEVARD" means all those portions of a highway not occupied by roadway and shall include the 'median' area between separated roadways.

"COMMUNITY SEWER SYSTEM" means a common sewer, or system of sewerage or sewage disposal, which serves two or more parcels.

"COMMUNITY WATER SYSTEM" means a system of waterworks which serves two or more parcels and which is owned, operated, and maintained by an improvement district under the Water Act or the Municipal Act, Council, or which is regulated under the Public Utilities Act.

"COMPLETE OR COMPLETION" or any tense of these words when used with respect to the work or works and services shall mean completion to the satisfaction of the Municipality when so certified by the Municipal Engineer in writing.

"CONNECTION" means the actual physical connection between a utility main and an individual parcel of land.

"CONTRACTOR" means a person or firm having a contract with an owner or the Corporation of the Village of Port Clements to construct roads or install municipal works or services or any other items required by this Bylaw.

"COUNCIL" means the Council of the Corporation of the Village of Port Clements.

"CUL-DE-SAC" means a length of local highway made for vehicular use, the end of which is designed to be permanently closed by the pattern of the subdivision; or which is terminated by a natural feature such as inaccessible terrain, so that there is no alternative vehicular route to another highway.

"ENGINEER" means the person employed by the Village of Port Clements as the Engineer.

"FRONTAGE" means that length of a parcel boundary which immediately adjoins a highway other than a lane or walkway.

"HIGHWAY" includes a street, road, lane, bridge, viaduct, and other way open to the use of the public, but does not include a private right-of-way on private property.

"IMPROVEMENT DISTRICT" means an improvement district pursuant to the Water Act or the Municipal Act.

"LANE" means a narrow highway which provides secondary vehicular access to any abutting parcel, so that the parcel may be serviced or reached by vehicles using that highway but a lane is not a half road.

"MEDICAL HEALTH OFFICER" means the Medical Health Officer (or his duly delegated employee or official so authorized) appointed under the Health Act who has jurisdiction over the area in which a subdivision is located.

"MUNICIPALITY" means the Corporation of the Village of Port Clements.

"OWNER" means a person who is entitled to subdivide land or his duly appointed representative.

"PARCEL" means any lot, block or other area in which land is held or into which land is subdivided, including strata lots created by strata plan, but does not mean a highway or portion thereof.

"POTABLE WATER" means water which is approved for drinking purposes by the Medical Health Officer in accordance with the Health Act.

"PRELIMINARY LAYOUT APPROVAL" means a document issued by the Approving Officer which sets out terms and conditions for final subdivision plans approval.

"PROFESSIONAL ENGINEER" means a person who is registered or duly licensed as such under the provisions of the Engineering Profession Act.

"PUBLIC UTILITY" means any system having facilities installed in a highway or in a right-of-way for the purpose of providing a service to property, and shall include, but not be limited to, water distribution, sewage and drainage collection, street lighting, electric power distribution, telephone, cable television, and gas distribution systems.

"ROAD-ARTERIAL" means a highway whose primary function is to carry through traffic from one area to another with as little interference as possible from adjacent land uses, but which may provide direct access to property as a secondary function.

"ROAD-COLLECTOR" means a highway whose primary function is to distribute traffic between arterial, other collector, and local roads within an area, but which also usually provides full direct access to properties. Collector roads are classified into two types:

(1) Through Collector Road means a collector road which connects, or is part of a route connecting two different arterial roads.

(2) Limited Collector Road means a collector road which, because of its location, geometric design or length, does not provide a shortcut between two arterial roads and, therefore, will carry only local area traffic.

"ROAD-LOCAL" means a highway whose primary function is to provide direct access to properties, and which usually connects to other local roads or to collector roads. Local roads are classified into two types:

(1) Through Local Road means a local road having access to two different collector or local roads which may, therefore, serve some traffic having neither origin nor destination along its length.

(2) Limited Local Road means a local road which, by virtue of its connections to the collector road system, is likely to be used by traffic having either an origin or a destination along its length. Three variations of the limited local road are:

(i) Cul-de-sac: a limited local road with only one access point.

(ii) P-loop: a variation of the cul-de-sac having a loop at one end; and

(iii) Crescent: a limited local road having access to the same local or collector road at two separate locations.

For the purpose of this Bylaw, a local road which serves more than 100 self contained dwelling units is a through local road regardless of configuration.

"ROADWAY" means the portion of a highway surfaced for the purpose of facilitating vehicular movement.

"SIDEWALK" means an improved area adjacent to the roadway for the use of pedestrian traffic.

"SITE AREA" means the area required to carry on a particular use.

"SUBDIVIDER" means the owner of the land proposed to be subdivided or his authorized agent.

"SUBDIVISION" means the division of land into two or more parcels, whether by plan or by metes and bounds description or otherwise, except that the words "subdivision plan" shall also be deemed to include a plan consolidating two or more parcels into a single parcel.

"VILLAGE" means the Corporation of the Village of Port Clements.

"WALKWAY" means a narrow highway for the use of the walking public only.

"WATER DISTRICT" means any Water Improvement District wholly or partially within the Village Boundaries.

"WORK" or any variation thereof means and includes all work required to be done for the setting out, the execution and the completion to the satisfaction of the Municipal Engineer.

"ZONE" means an area or district established under the Corporation of the Village of Port Clements Zoning Bylaw.

3. INTERPRETATION

3.1 In this Bylaw whenever words are used importing the subdividing or subdivision of land, those words shall be deemed to refer to the division of land into two or more parcels, whether by plan or by metes and bounds description or by replotting scheme or otherwise; except that the words "subdivision plan" shall also be deemed to include a plan consolidating two or more parcels into a single parcel, or several parcels into a smaller number of parcels, or as defined in the Land Title Act.

3.2 Words directing or empowering any officer of the Municipality to do any act or thing, or otherwise applying to him by his name of office, includes his successors in such office and his lawful deputy, and such person as the Council may from time to time by Bylaw or resolution designate to act in his place or stead.

3.3 Unless otherwise defined herein all words or expressions used shall have the same meaning assigned to them as like words or expressions contained in the Land Title Act and in the Municipal Act and amendments thereto.

4. HIGHWAY DEDICATION, SERVICING AND CONSTRUCTION STANDARDS

4.1 (a) The subdivider shall provide, without compensation:

(i) For the purpose of a highway within the subdivision, land not exceeding 20 metres in width.

(ii) For the purpose of widening a highway that borders or is within the subdivision, land not exceeding 10 metres in width.

(iii) Lanes shall be provided where the Approving Officer deems it necessary to provide secondary access in order that reasonable traffic flow can be assured on the main highway. A lane shall have a minimum width of six (6) metres.

(b) Where, in the opinion of the Approving Officer, terrain and soil conditions are such that a roadway having a width of 8.0 metres cannot be adequately supported, protected, and drained within the widths specified in subsection (a)(i), land sufficient to support, protect, and drain such a roadway may be required without compensation.

(c) Additional dedication may be required at intersections with arterial roads in order to provide traffic turn-lane channelization.

(d) Additional dedication may be required to accommodate utility Transformer Pads.

4.2 (a) Except as otherwise provided in this Bylaw, the subdivider shall provide vehicular and pedestrian highway systems such that each system:

(i) Serves and can be connected to all parcels created by the subdivision.

(ii) Extends along all highways within the subdivision.

(iii) Provides the standard of services in accordance with classification of highway as set out in Schedule 'A' of this Bylaw.

(iv) Provides for extension and connection of the highway system to lands and systems beyond the proposed subdivision.

(v) Provides for the temporary or interim conditions where services or facilities will be extended in the future.

(b) Without limiting the generality of subsection (a), the subdivider shall be required to provide vehicular highways to a minimum of 6 metres paved surface with adequate structural strength as per Schedule A of this Bylaw to both the existing parcels and those created by the subdivision where a system does not exist or exists at a standard less than that required by Schedule A.

(c) In any proposed subdivision, a highway which is cul-de-sac shall have a terminal area for a turn-around, the size of which shall be large enough to contain a circle with a radius of fifteen decimal three (15.3) metres (50 ft.).

4.3 (a) The subdivider shall provide sidewalks on highways within the lands being subdivided in accordance with the standards as set out in Schedule 'A' of this Bylaw for the various classifications of road.

(b) The minimum width of any walkway in any subdivision shall be three (3) metres. 1.2m

4.4 Maximum road lengths for cul-de-sacs, P-loops and future through roads shall be:

(a) Cul-de-sac roads shall not exceed 220 metres in length as measured from the intersecting highway, having more than one access, to the furthest limit of the road or to the beginning of the turnaround.

(b) P-Loops

(i) P-loops shall have a maximum total length of 500 metres. The entrance leg shall not exceed 220 metres in length and shall be a minimum of 6 metres wide.

(c) Future Through Roads

(i) The maximum length of the constructed portion of a future through road shall not exceed 400 metres.

(ii) There is no maximum length of the constructed portion of a future through road in the Agricultural zones.

(iii) "Future Through Road" for purposes of Section 4.4 (c) shall mean a highway having or planned to have two independent means of access to its length.

4.5 In a subdivision where the road layout is such that a highway or a portion thereof serves or will serve the adjoining properties outside the subdivision, the dedication and construction of new half-roads along the perimeter of the subdivision is permitted, provided however the following conditions are satisfied:

(i) There is sufficient highway dedication to provide for two-way traffic flow, sidewalk, sanitary sewer, water, street lights, and drainage collection system.

(ii) Such half-roads shall be constructed to the standards as set out in Schedule 'A' of this Bylaw.

4.6 (a) The subdivider shall clear, grade, surface and otherwise construct the required highways including roadways, emergency access and transit bays, in accordance with the standards contained in Schedule 'A' of this Bylaw.

(b) The subdivider shall grade and improve to grass or sodded standard all boulevards along highways within the subdivision.

5. WATER, SANITARY SEWER, STORM SEWER AND OTHER SERVICING STANDARDS

5.1 (a) Except as otherwise provided in this Bylaw, the subdivider shall provide water distribution, sanitary sewer and drainage works, underground wiring and street lighting systems such that each system:

(i) serves and is connected to all parcels created by the subdivision;
(ii) extends along all highways within the subdivision;
(iii) connects to the appropriate public utility;
(iv) provides the standard of service set out in Schedule 'A' of this Bylaw; and
(v) shall be constructed to allow for connection to lands and systems beyond the proposed subdivision.

5.2 Where a community water system is to be installed in a subdivision a supply of potable water adequate to serve the subdivision shall be proven before the subdivision is approved.

5.3 Where the owner is establishing a community water system and the use of a water source which comes under the terms of the Water Act, a licence to divert and use the amount of water required to serve the subdivision shall be held by the owner prior to the approval of the subdivision.

5.4 Each parcel not served by a community water system shall have on it a proven year round supply of potable ground water (wells) in accordance with the following:

(a) Where the Owner's stated intended use includes residential for each dwelling unit on a parcel not less than four (4) imperial gallons per minute over a one hour period to a minimum of five hundred (500) imperial gallons per day, and

(b) Where the intended use includes other than residential there shall be proven a supply adequate for the intended uses.

(c) Proof of potable water shall be provided for each lot to be created or intended use and this shall be presented to the Approving Officer in a report prepared by a Professional Engineer. The report must provide the well information, 24 hours test, chemical bacteriological test results, recovery tests, and a statement that the well or wells will provide enough potable water for the parcels to be created or intended use.

5.5 Where there is a community sewer system but no community water system no source of potable ground water shall be less than three metres (3 m) from any parcel boundary or less than seven point five metres (7.5 m) from any sewage carrying facility.

5.6 Where there is no community water system and no community sewer system, no source of potable ground water shall be less than fifteen metres (15 m) from any parcel boundary or from any septic tank disposal field.

5.7 Logs shall be kept for all holes drilled in search of potable ground water. Records shall be kept of all tests of such holes. Two copies of all logs and tests shall be submitted to the Approving Officer who will submit one copy to the Ground Water Section Hydrology Division, Water Resources Services of the British Columbia Environment Ministry.

5.8 (a) Each Parcel which is inside the Village of Port Clements shall be connected to a community sewer system.

(b) Where any parcel in a proposed subdivision is not served by a community sewer system the applicant shall have carried out the soil and percolation tests as required by the Medical Health Officer. The Medical Health Officer will supply written reasons to the Approving Officer why he would or would not recommend approval of a subdivision based on the waste disposal capabilities of the soil on that parcel to meet the requirements of this Bylaw.

6. SERVICING AGREEMENTS

6.1 All works and services to be constructed and installed to serve any proposed subdivision of any lands shall be constructed and installed to the standards prescribed in Schedule 'A' of this Bylaw to the satisfaction of the Municipal Engineer at the expense of the subdivider prior to the approval of such subdivision, unless the subdivider:

(a) Deposits with the Corporation, cash or a Bond for an amount equal to the cost of designing, installing and paying for all works and services required pursuant to this Bylaw; and

(b) Enters into a Servicing Agreement with the Corporation to construct and install the prescribed works and services by a specified date or forfeit the amount secured by the Municipality.

(c) Pays to the Corporation all fees in accordance with Section 8.3 of this Bylaw.

(d) Provides evidence that he will idemnify and save harmless the Municipality against:

(i) All actions and proceedings, costs, damages, expenses, claims and demands whatsoever and by whomsoever brought by reason of the construction and installation of all services herein described, and

(ii) All expenses and costs which may be incurred by reason of the execution of the said work resulting in damage to any property owned in whole or in part by the Municipality or which the Municipality by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, and

Can sell lots before approved by Vill. Engineer

Bond about 1½-2% of bond. Or can be bonded through letter of credit.

(iii) All expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, workmen's compensation assessments, unemployment insurance, Federal or Provincial Taxes, and for encroachments.

(e) Ensures that all works and services to be designed, constructed and installed at his expense are to the standards prescribed in Schedule 'A' of this Bylaw.

(f) Retains as his agent a Professional Engineer, competent in the field of municipal engineering and who is registered as a member in good standing with the Association of Professional Engineers of B.C. (A.P.E.B.C.), to prepare, sign and seal design (construction) drawings, and to provide "General and Resident Engineering Services" during construction both as defined in the current A.P.E.B.C. "Outline of Service and Scale of Recommended Fees for General Engineering Projects", including but not limited to, field inspection, preparing and certifying as-constructed drawings.

(g) Acknowledges that the Corporation does not confirm the completeness or accuracy of the design (construction) drawings and does not accept responsibility for any costs or damages resulting from errors, omissions or deficiencies in said drawings.

(h) Upon written notice that construction completion has been certified by the Municipal Engineer, maintains all of the said works and services for at least the period specified below:

Water Systems	One Year
Sanitary Sewer Systems	One Year
Storm Drainage Systems	One Year
Highway Paving, Asphalt, Walks and Curbs, Street Lights	One Year
Concrete Curbs and Sidewalks	One Year

The maintenance period may be extended beyond one year should the Municipal Engineer require further evidence that the works and services are satisfactory.

(i) Arranges and pays for the connection to the Corporation's existing works and services or utilities.

(j) Remedies any defects appearing within the maintenance period and reimburse (pay to) the Corporation for any damage to others works and services or properties resulting therefrom.

(k) Deposits with the Corporation for the maintenance period, on or before the date of issuance of the Certificate of Completion of said works and services, security in the form of a bond in an amount equal to at least five (5) percent of the estimated construction cost of the said works and services, as calculated by the Municipal Engineer, from which the Municipality may deduct the cost of maintaining the works, remedying any defects or damages should the owner fail to do so.

(l) Deposits with the Corporation prior to the issuance of the Certificate of Completion such inspection reports, test results or other documentation acceptable to the Municipal Engineer, to confirm compliance with plans and Schedule 'A', as prepared by and certified as correct by a Professional Engineer, and within two months of the date of the issuance of the Certificate of Completion for the works and services deposit with the Corporation one set of paper prints and one set of transparencies of the drawings showing the works and services as actually constructed as prepared by and certified as correct by a Professional Engineer.

(m) Assigns, transfers and conveys the works and services, upon issuance of a Certificate of Completion by the Municipality, together with all lands dedicated for roads upon or in which the works and services are located.

9. SCHEDULES

9.1 Schedule 'A' Village of Port Clements Design and Construction Specifications is hereby attached hereto and made part of this Bylaw.

10. SEVERABILITY

If any section, subsection, sentence, clause, or phrase of this Bylaw is for any reason held to be invalid by the decision of any court, such decision shall not affect the validity of the remaining portions of this Bylaw.

11. REPEAL

Bylaw No. 127 cited as "The Village of Port Clements Subdivision Bylaw No. 127-19__" and as amended is hereby repealed.

READ A FIRST TIME THIS 17th DAY OF October, 1988.

READ A SECOND TIME THIS 17th DAY OF October, 1988.

READ A THIRD TIME THIS 17th DAY OF October, 1988.

RECONSIDERED AND FINALLY PASSED AND ADOPTED THIS _____ DAY OF _____, 1988.

Certified to be a true and correct copy of Bylaw No. 195, 1988 being the Village of Port Clements "Bylaw to Regulate and Require the Provision of Services in Subdivisions.

_____
Susan E. Wood
Municipal Clerk

_____
Mayor

_____
Municipal Clerk

SCHEDULE "A"

As Referred to in Bylaw No. 195 of
the Village of Port Clements

"MINIMUM"

DESIGN STANDARDS

FOR DEVELOPMENT OF RESIDENTIAL SUBDIVISION

1.0 GENERAL

.1 Development of new areas requires the replot or subdivision of land in accordance with the procedures and requirements set out in the British Columbia Municipal Government Act and Regulations. The Village and its Engineers desire to be kept informed in regard to the proposed development prior to approving the subdivision. To this end the Developer is requested to present his preliminary proposal to the Village Council or Engineers at an early stage so that the proposal can be reviewed and commented on prior to giving approval in principle of the subdivision and development.

.2 The Developer shall engage a qualified engineer to undertake all the engineering for the municipal services to be installed as part of the proposed development. Such engineer shall design these services in accordance with accepted engineering practices and to the minimum standards as set out herein or established by government bodies. The Developer's engineer shall submit to the Village and their engineers, four complete sets of plans and specifications of all construction proposed a minimum of 30 days before construction is to commence for approval; supervise the construction of the municipal services; complete and submit within 90 days of completion of construction as-built plans (original or good quality transparencies) for all construction completed.

.3 The Developer will be responsible for all work carried out and the Village will take over operation of any services installed upon completion of the work and formal acceptance by the Village. After expiration of a one-year maintenance period and after final inspection indicating no further deficiencies, the Village will undertake normal maintenance caused by the Developer or by the Builder's operations. However, any work required under the Maintenance bond will be referred to the Developer's Engineer for proper action by the Contractor.

.4 No construction shall be undertaken until a Development agreement between the Village and the Developer has been signed and the Plans and Specifications of proposed construction are "Approved" by the Village Council or Village Engineers.

.5 Any of the services to be installed by the Developer shall be installed in such manner as to least interfere with existing services.

2.0 OVERALL LAYOUT

.1 The proposed development shall be laid out and designed having regard to the overall development of the Village and possible future expansions of abutting areas. Tie-ins into existing developments shall not create overloads on existing services. The inclusion of oversize services to provide sufficient capacity for future developments shall be carried out at the expense of the Developer or as specifically agreed to.

.2 The concepts of layout such as size of lots, back lanes or laneless subdivision, widths of rights-of-way for traffic and other services, park reserves and school sites, densities and zoning, should be approved in principle by the Village and the Planning Authorities prior to submission of detailed plans, so that any necessary or desirable revisions can be incorporated without requiring major changes.

.3 Rights-of-way shall be provided for all utilities not located on streets, lanes, or utility lots, including rights-of-way for ditches or watercourses accommodating surface run-off.

3.0 LOCAL IMPROVEMENTS

.1 Local Improvements shall be interpreted to include the following:

- .1 Water mains; including all fittings, valves, hydrants
- .2 Water service connections (to the property line)
- .3 Sanitary sewer mains
- .4 Sanitary sewer connections (to the property line)
- .5 Storm drainage system
- .6 Paved roads; base course and asphaltic concrete surface course.
- .7 Curb and gutters
- .8 Sidewalks
- .9 Lane grading and graveling
- .10 Street lighting and underground services
- .11 Overhead electric power distribution (minimum standard)
- .12 Landscaped boulevards, parks, buffer strips and other dedicated lands
- .13 Traffic signs and street signs

.2 The type and extent of servicing shall be in accordance with this development agreement.

.3 The standards outlined herein are intended to be the minimum standards. Where conditions dictate and good engineering practice requires, higher standards then those indicated shall be incorporated into the design. It shall be the Developer's responsibility to develop the subdivision in accordance with standards which are acceptable to the Village and which conform to good engineering and construction practices (20 year design).

(n) Provides all rights-of-way, easements, restrictive covenants or other documentation pursuant to plan registration necessary for construction or ultimate access required by the Approving Officer for the subdivision.

(o) Arranges for B.C. Hydro, B.C. Telephone and Cablevision companies to perform all work required to allow the provision of these services to the affected subdivision within alignments approved by the Municipal Engineer.

6.2 (a) Where the subdivider has failed to construct the work and services within the period as prescribed in the "Servicing Agreement" the Corporation may elect to:

(i) at the request of the subdivider, extend the period of the Servicing Agreement on such terms and conditions, including security that it may deem reasonable, or

(ii) may enter onto the site to complete the works and services and to use such security as it deems necessary, and, should such security be insufficient, to recover such additional amount from the subdivider.

6.3 Where, in the opinion of the Approving Officer, the works and services to be constructed and installed to serve a proposed subdivision consist only of all or some of the following; water connections, sanitary sewer connections, storm sewer connections, and driveways off of existing municipal services or roadways; the subdivider may only be required to pay for the necessary works and services and any municipal connection fees without entering into a servicing agreement or payment of the processing and engineering administration fee.

7. PAYMENT OF TAXES AND CHARGES

7.1. (a) The subdivider shall pay all school taxes and all municipal taxes, rates and charges including charges established under Section 286 of the Municipal Act, assessed and levied against the lands to be subdivided, and where such taxes, rates and charges for the current year have not been assessed, levied and imposed on the said lands at the date on which the approval of the subdivision is signed by the Approving Officer, pay the amount estimated by the Collector to be the total of the school taxes, levied and imposed on the said lands for the current year.

8. APPLICATION FEES

8.1 Pursuant to Section 988 (4) of the Municipal Act every subdivider shall submit with his application for subdivision a fee which shall be $25.00 for the first parcel to be created by the proposed subdivision and $10.00 for each additional parcel.

8.2 The fee prescribed by this Section shall be in addition to any fee prescribed under the Land Title Act.

8.3 Every subdivider shall pay the Servicing Agreement Processing and Engineering Administration Fees in the amount as set out below:

(a) Processing Fee: payable prior to the submission of engineering drawings; $400.00.

(b) Engineering Administration Fee: payable prior to the project proceeding to construction.

Estimated construction cost of engineering works as approved by Municipal Engineer	Percentage of construction cost to be paid as fee
up to $200,001.00 - $200,000.00	5%
$450,000.00	4%
$450,000.00 +	3%

for plan reviews & applications
- sporadic inspections underground work
- final inspection & stamp & approval

(pressure tests water/sewer lines)

4.0 EXISTING IMPROVEMENTS

.1 Closing of Roads or Existing Facilities

.1 Approval shall be obtained from the Village 48 hours prior to closing of developed streets or shutting off existing utility service when required for construction.

.2 Road Crossings

.1 Developed roads shall be returned to their original standard. Where it is necessary to excavate an existing road or lane for the purpose of providing an open trench crossing (for water or sewer main, gas main, telephone cable, etc.) such excavations must be backfilled with compacted sand and/or gravel material to the satisfaction of the Village Engineer.

5.0 Water System

.1 Design

.1 Water works system shall be designed in accordance with recommended standards and design manual of the American Water Works Association (AWWA). The system shall be designed as part of the overall or ultimate Village system for peak hour consumption plus fire flows. Velocities at maximum flows shall be under 5 feet per second.

.2 The waterworks system shall be designed to meet Canadian Underwriter Association recommended standards. Generally these are 840 igpm fire flow for residential and 1500-2500 igpm for commercial fire flows with a residual pressure of 40 psi for sprinklered systems and 20 psi at hydrants in residential areas.

.2 Water Main:

.1 Minimum size of 6-inch diameter unless otherwise approved.

.2 Main sizes may be increased as considered necessary by the Village Engineer to accommodate future development.

.3 Pipe shall be PVC pressure pipe C900 or approved equal.

.4 All mains shall be installed to aluminum depth of four (4) feet of cover below finished grade.

.3 Hydrants:
- .1 Maximum spacing 500 feet in any direction.
- .2 Hydrants shall be so located to conform with sidewalk design. When hydrants installed by the Developer are required to be relocated, the Developer will assume full responsibility.
- .3 Hydrants are to be two (2) feet clear of curblines.
- .4 Hydrants shall be of a type meeting Village Fire Department standard complete with:
  - .1 Two (2) 2.1/2 inch hose nozzles.
  - .2 Threads on hose and pumper connections to be of the same standard as presently in use in the Village.

.4 Valves:
- .1 Valves on mains are to be located at the extended property lines of street intersections.
- .2 A sufficient number of valves shall be provided so that no more than three (3) valves must be closed to isolate any one section of water main.
- .3 Valves shall be iron body , bronze mounted gate valves with a non-rising spindle, to open by turning in a counter-clockwise direction.
- .4 Valve boxes with operating stem and nuts are required on all valves.
- .5 An isolating valve to be provided on each hydrant lead.

.5 Service Connections:
- .1 Minimum size 3/4 inch diameter
- .2 Corporation stop to be provided at the mains.
- .3 The curb stop on each service connection shall be placed at the centreline of each lot 1-foot off the property line or as otherwise approved by the Village.
- .4 Pipe shall be type K copper.
- .5 All service lines shall be installed to a minimum depth of three (3) feet of cover (including "goose neck" or bend off the main).

.6 Testing and Disinfection:
- .1 Leakage testing and disinfection shall be carried out in accordance with AWWA standards.

6.0 SANITARY SEWER SYSTEM

.1 Design Loading:
- .1 Sewage loadings are to be determined on the basis of a minimum population density of 22 persons per acre and a per capita sewage flow of 80 igpd.
- .2 Mains shall be sized to carry peak hourly flows plus an allowance for infiltration.

.2 Infiltration:
- .1 In areas where the ground water rises up to or higher than the sanitary sewer pipe invert the sewer mains shall be designed and installed to be water tight. The main shall be be tested for water tightness by either an infiltration or exfiltration test and witnessed by the Village or Village Engineer.
- .2 Maximum allowable leakage is 100 imperial gallons per day per inch of diameter per mile of main with a two foot hydrostatic head of water.

.3 Manholes:
- .1 Concrete manholes shall be minimum of 48 inch inside diameter in the main portion of the structure.
- .2 Frames and covers shall be of cast iron, asphalt dipped and of construction equal to the City of Prince Rupert standard.
- .3 Spacing of manholes should not exceed 400 feet.
- .4 All joints shall be designed and constructed to be water tight.

.4 Pipe:
- .1 Minimum size of 8 inch diameter.
- .2 Minimum depth to invert is five (5) feet unless otherwise approved.
- .3 Minimum grades for pipe shall be as recommended by the Department of the Environment.
- .4 Type of pipe subject to approval of the Village or Village Engineer.

.5 Service Connections:
- .1 Minimum size 4 inch.
- .2 Under no circumstances will roof or surface drainage from buildings be permitted into the service or the sanitary sewer system.

7.0 STORM SEWER SYSTEM

.1 General:

.1 The requirement of storm sewers shall be dependent upon the type of development, the drainage area and the length of surface drainage runs. Open ditches along the streets and lanes within the subdivision will not be accepted.

.2 Design Formula:

.1 Storm sewer mains shall be designed in accordance with the Rational Method of Storm Sewer Design and according to the formula of:

$Q = CIA$ where Q = discharge in cfs

A = area in acres

I = rainfall intensity

C = runoff coefficient
The runoff coefficient for residential areas shall be 0.35.

.3 Pipe Sizes:

.1 Minimum 10 inch diameter

.4 Manholes

.1 Same as for sanitary sewers

.5 Catch Basins

.1 Surface water shall not be permitted to run a distance greater than 1,200 feet along roadways providing the flow along the street is less than 2.5 cfs. For flows greater than 2.5 cfs, limit runoff distance along curbs to 800 feet.

8.0 ROADWAYS

.1 Design:

.1 Paved roadways shall be designed in accordance with the Asphalt Institute method of pavement design using maximum of 18,000 pound axle loads. The design parameters such as traffic count, percentage of trucks, California Bearing Ratio (CBR) etc, are to be outlined to the Village Engineer.

.2 The Village reserves the right to request the Developer to engage a soils testing firm to carry out CBR tests on the subgrade prior to paving to confirm adequacy of design.

.2 Road Widths:

.1 Roadway widths shall be designed in conjunction with curb and gutter to satisfy traffic requirements. Minimum requirements are as follows:

.1 Along ornamental parks or undevelopable land and utilizing parking on one side only - 28 feet.

.2 Local residential streets (cul-de-sacs, short crescents) - 32 feet.

.3 Basic residential streets - 36 feet.

.4 Collector streets - 40 feet.

.5 Arterial streets - 48 feet

.2 Roadway width is curb to curb (measured at bottom of curb face).

.3 Grades

.1 Minimum grade on paved roadways shall not be less than 0 4% for straight tangents and 0.6% along curves.

.2 Maximum grade on residential roads shall not exceed 6.0% unless otherwise approved.

.3 All roads shall be crowned at a slope of 1/4 to 1/3 inch to 1 foot.

.4 Vertical transition grade changes are to be not greater than 1.0% change in 40 feet. A vertical curve design to suit this requirement is acceptable.

.4 Design Speed

.1 All roads classified as collector streets shall be designed for 30 miles per hour.

.2 Arterial streets shall be designed for 40 miles per hour or as required by the Village.

.5 Clearing and Grubbing:

.1 All trees, stumps, shrubs, debris, etc. shall be removed for the full width of the right-of-way and disposed of.

.6 Right-of-way Grading:

.1 The area between back of each curb or sidewalk and property shall be graded to provide a uniform slope from top of concrete to finished grade at the property line as established on the subdivision plan.

.7 Sub-base Construction

.1 The subgrade shall be excavated or filled to the required grade over the full width of the roadway.

.2 Where earth fill is required it shall be placed in lifts not exceeding 6 inches in depth and each lift shall be thoroughly compacted to a minimum of 95% of Standard Proctor Density.

.3 The subgrade shall be graded to conform to the required longitudinal grade and crown of the roadway and the top 6 inch depth shall be compacted to 100% of Standard Proctor Density.

.8 Base Course Construction:

.1 The base course shall not be less than the equivalent of 6 inches of soil cement or an alternative design as approved by the Village Engineer to meet sub-base and traffic requirements. Refer to design of pavement.

.9 Asphalt Surface:

.1 Asphalt surface shall not be laid until the base course has been inspected and approved by the Village.

.2 Asphalt materials, mixing, spreading and rolling shall conform to good practice.

.3 The asphalt hot mix concrete pavement shall meet the following test requirements:

Test	Limits
Marshall Stability	Minimum 750
Flow	Min. 8 - Max. 16
% Voids Total Mix	3 - 5
% Voids in Mineral Agg.	14+

.4 A minimum compacted thickness of 2 inches of hot mix asphaltic concrete shall be placed on all residential streets.

.10 Lanes:

.1 Lanes shall be graded as outlined for sub-base construction.

.2 Lanes shall be graveled with a minimum 3 inches of 1 inch minus well graded crushed gravel, spread over prepared subgrade, 14 feet wide.

9.0 CURBS AND GUTTERS

.1 Standard curb and gutters shall be constructed in accordance with the Village's standards for these structures or as approved, and as follows:
- .1 Concrete shall be 3500 psi; 5% to 8% air entrained.
- .2 At street intersections, curb and gutter shall be constructed to a radius of 25 feet minimum. Minimum curb radius within cul-de-sacs shall be 40 feet.
- .3 Curbs and gutters all be constructed before placing the base course. Expansion joints are to be placed at a maximum of 150 feet and at every point of tangency.

10.0 SIDEWALKS

.1 Requirement:
- .1 Sidewalks shall be provided along both sides of streets.

.2 Dimensions:
- .1 Sidewalks shall be a minimum width of 48 inches.
- .2 Sidewalks may be either separate or of monolithic design together with the curb and gutter or as required by the Village.
- .3 Normal thickness shall be 4 1/2 inches, minimum.
- .4 At all private driveways, thickness shall be a minimum of 6 inches.
- .5 All lanes and commercial crossings shall be a minimum of 7 inches thick and reinforced.
- .6 Construction joints shall be marked at intervals of 5 feet.

.3 Finishing:
- .1 Sidewalks shall be edged and brush finished.
- .2 Expansion joints, using remoulded non-extrusive material, 1/2 inch by 4 inches shall be constructed every 150 feet, on either side of driveways and at every point of change in direction.

.4 Concrete:
- .1 Concrete shall be 3500 psi 5% to 8% air entrained.

.5 Grades:
- .1 Grades shall be provided by the Developer's Engineer.
- .2 Minimum sidewalk cross-slope of 1/4 to 3/8 inch per foot of width down toward the roadway.

.6 Base:
- .1 Subgrade shall be graded or filled to the required grade and cross section of sidewalk.
- .2 Where fill is required it shall consist of approved material compacted to minimum of 95% Standard Proctor Density.
- .3 The sidewalks shall be constructed on 2 inches of approved compacted granular base material.

11.0 LOT DRAINAGE

.1 Plan:
- .1 The Developer shall submit to the Village an overall plan of the area to be developed on which shall be indicated the following information:
  - .1 Proposed top of curb elevation at centre of lot.
  - .2 Proposed lot corner grades.
  - .3 Proposed ground at house.
  - .4 Invert of sanitary sewer.
  - .5 Direction of drainage.

.2 Retaining Walls:
- .1 Where extremes in elevation of abutting lots require the construction of a retaining wall, such shall be indicated on the plan and no building permit will be issued without a commitment by either owner of the two lots involved to construct such retaining wall at the time of construction of the proposed home.

.3 Design:
- .1 In general, the lot layouts shall be such that the minimum slope in the front yard from the grade at the house to the sidewalk shall not be less than 2%. The minimum slope in back yards shall be 2% while in cases where the back yard slope is towards the house, provisions are required to keep runoff at least 10 feet away from the house with the possibility of draining some along the driveway side of the house across the driveway onto the road.

12.0 BOULEVARDS AND BUFFER STRIPS

.1 Grading:
- .1 All boulevard areas (between sidewalk and curb and gutter or between curbs) and buffer strips, shall be filled to final grade with a minimum of 4 inches of topsoil.

.2 Grades:
- .1 The cross slope across boulevards shall be a minimum of 3/8 inch per foot.
- .2 Terms or elevated contours shall be utilized for sound abatement as required by the Village.

.3 Trees:
- .1 Trees shall be planted along the buffer strip. They shall be a minimum of 6 feet high and spaced at a maximum of 40 feet or 1 tree per 1000 square feet, whichever is greater.

13.0 PARKS AND RESERVES

.1 Grading
- .1 Areas designated as parks and reserves within the subdivision area shall be shaped and filled to final grade with 4 inches of topsoil and seeded to a variety of grass approved by the Village.

.2 Landscaping:
- .1 Shrubs and 6 foot high trees shall be planted at minimum density of one tree or shrub per 1000 square feet of grass area.

.3 Utility Service:
- .1 One sanitary sewer and water service complete with surface connection shall be installed at an approved location to each designated park area involving playground or public use.
- .2 One water service complete with surface connection only required for ornamental parks.
- .3 Water service to be minimum of 1 inch diameter.

14.0 TRAFFIC CONTROL DEVICES AND STREET NAME SIGN

.1 Traffic Signs:

.1 Standard traffic signs and traffic control devices shall be installed by the Developer and shall be in accordance with the Manual of Uniform Traffic Control Devices of the Canadian Good Road Association.

.2 Street Signs:

.1 Reflectorized street name signs, of the type and colour satisfactory to the Village, mounted on 2 inch diameter posts shall be installed by the Developer in the area to be developed.

15.0 GAS, POWER AND TELEPHONE SERVICES

.1 Installation:

.1 The gas, power and telephone services to be installed shall be arranged between the Developer and the respective utility companies.

.2 These services shall be underground except for power distribution.

.3 Any cost for these services charged by the respective utility companies, shall be paid by the Developer.

.2 Right-of-way:

.1 The Developer shall provide rights-of-way in each subdivision or register easements in the name of the Village for the purpose of the utility services of sufficient size and location to the satisfaction of the utility companies.

.2 Easements shall be registered on each individual lot prior to the sale of any lot in the development area.

16.0 STREET LIGHTING

.1 Installation:
- .1 Street lighting shall be arranged by the Developer.
- .2 Street light cables shall be installed underground and connected with acceptable type of steel post street lights complete with fixture.
- .3 The location and density of street lights shall provide a minimum of 0.1 foot candle of light at the street surface.
- .4 The street lighting layout and location of the buried lines shall be approved by the Village Engineer.

.2 Costs:
- .1 Any capital contribution that the utility company may charge for installation of underground street lighting, shall be paid for by the Developer.
- .2 The Village will pay rental charges to the utility company providing street lighting, for the operation of street lights thus installed.

.3 Location:
- .1 Street lights shall be placed at locations not interfering with proposed driveways and in general shall be located in line with the extension of common property lines between two lots.
- .2 The face of the posts shall be at least 2 feet away from the face of the curb or of the sidewalk.

CERTIFIED TO BE A TRUE AND CORRECT COPY
OF SCHEDULE A OF BYLAW NO. 195, 1988,
BEING THE VILLAGE OF PORT CLEMENTS "BYLAW
TO REGULATE AND REQUIRE THE PROVISION
OF SERVICES IN SUBDIVISIONS".

Municipal Clerk

THE VILLAGE OF PORT CLEMENTS
SUBDIVISION SERVICING
BYLAW NO. 195, 1991

Prepared By
Stanley Associates Engineering Ltd.

June 1991

THE VILLAGE OF PORT CLEMENTS
SUBDIVISION SERVICING BYLAW NO. 195, 1990

WHEREAS the Council of The Village of Port Clements wishes to adopt a Bylaw to regulate and require the provision of services in respect to subdivision of land pursuant to Section 625, 998, 989, 990, 991 and 995 of the Municipal Act;

AND WHEREAS the Council of The Village of Port Clements wishes to consider requiring the provision of works and services under Section 989 of the Municipal Act as a condition of the issue of a Building Permit;

NOW THEREFORE, the Council of The Village of Port Clements, in open meeting duly assembled, **ENACTS AS FOLLOWS:**

1.0 TITLE

This Bylaw may be cited as "The Village of Port Clements Subdivision Servicing Bylaw No. 195, 1991". Text and figures enclosed by brackets (---) are included for information only and do not form part of this Bylaw.

2.0 REPEAL

The "Subdivision Bylaw of The Village of Port Clements No. 127", and all amendments thereto, is hereby repealed.

3.0 DEFINITIONS

In this Bylaw, unless the context otherwise requires:

"APPROVAL" means written approval of a subdivision by the Approving Officer or issuance of building permit by the Building Inspector.

"APPROVING OFFICER" means a person appointed under Section 77 of the Land Titles Act as an Approving Officer for The Village of Port Clements.

"BUILDING INSPECTOR" means a person appointed as a Building Inspector for The Village of Port Clements.

"COMMUNITY DRAINAGE SYSTEM" means a system of works owned, operated and maintained by the Municipality, designed and constructed to control the collection, conveyance and disposal of surface and other water.

"COMMUNITY SANITARY SEWAGE SYSTEM" means a system owned, operated and maintained by the Municipality for the collection and disposal of sanitary sewage.

"COMMUNITY WATER SYSTEM" means a system of waterworks, within the meaning of the "Health Act", which is owned, operated and maintained by the Municipality.

"HIGHWAY" means and includes any street, road, lane, walkway, bridge, viaduct and any other way open to the use of the public, but does not include a private right-of-way on private property.

"LANE" means a narrow highway which provides vehicular access to any abutting parcel, so that the parcel may be serviced or accessed by vehicles using that highway.

"MEDICAL HEALTH OFFICER" means the official appointed under the Health Act who has jurisdiction over the area in which the subdivision is located.

"MUNICIPALITY" means The Village of Port Clements.

"OWNER" means a person, registered in the Land Titles Office as owner of land or a charge on land whether entitled to it in his own right or in a representative capacity or otherwise, and includes "registered owner".

"PARCEL" means any lot, block or other area in which land is held or into which land is subdivided, but does not include a highway or portion thereof.

"POTABLE WATER" means water which is accepted for drinking purposes by the Medical Health Officer.

"PROFESSIONAL ENGINEER" means a person who is registered or duly licensed as such, under the provisions of the "Engineering Profession Act" of the Province of British Columbia.

"SUBDIVISION" means the division of land into two or more parcels, whether by plan, apt descriptive words, or otherwise.

"WALKWAY" means a narrow highway for the predominant use of pedestrian traffic.

"WORKS AND SERVICES" means any public service, facility or utility which is required or regulated by this Bylaw and without restricting the generality of the foregoing includes: the supply and distribution of water; collection and disposal of sanitary sewage and drainage water; street lighting; access roadways, curbs, gutters, and sidewalks; and natural gas, power, telephone and cablevision services.

"ZONE" means a zone as provided for in the Zoning Bylaw of the Village of Port Clements, and amendments thereto.

All words or expressions used in the Bylaw shall have the same meaning assigned to them as like words or expressions contained in the "Land Title Act" and the "Municipal Act".

4.0 GENERAL PROVISIONS

4.1 Severability

The provisions of this Bylaw are severable. If any provision is for any reason held to be invalid by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining provisions of this Bylaw.

4.2 Administration

This Bylaw shall be administered by:

a) The Approving Officer of The Village of Port Clements where works and services are to be provided because of subdivision of land; or

b) The Building Inspector of The Village of Port Clements where works and services are to be provided pursuant to Section 989(4), (5), or (6) because of an application for a building permit; or

c) Some other officer appointed by Council.

4.3 Record Kept

1. The Approving Officer shall maintain a record of all applications submitted under this Bylaw with respect to subdivisions, which record shall indicate the final disposition of all such applications thereon.

2. The Building Inspector shall maintain a record of all occasions when the provisions of this Bylaw are used under Section 989(4), (5), or (6) of the Municipal Act to require the provision of works and services in accordance with the standards of this Bylaw and this record will show what works and services were provided and where.

4.4 Authorization for Entry

Employees of the Municipality are hereby authorized to enter at all reasonable times upon such any property or premises to inspect the same in connection with their duties under this Bylaw and to ascertain whether the provisions of this Bylaw are being complied with.

4.5 Measurements

All measurements in this Bylaw are expressed in the Metric System.

4.6 Compliance with Other Regulations

.1 (Applications for subdivision will be reviewed for compliance with the requirements of this Bylaw and other Municipal and Provincial legislation. Nothing contained in this Bylaw shall relieve the owner of a subdivision from the responsibility to seek out and comply with legislation applicable to his undertaking.)

.2 (Except where a setback of a building or structure in respect to a highway is concerned, no subdivision shall be approved which would cause any existing building or structure, sewage disposal installation or used source of potable water to contravene any zoning, building or other regulation in force.)

5.0 REQUIRED WORKS AND SERVICES

5.1 Works and Services

(To provide certainty and equity for all, whether subdivider, council, administration or the public, the areas where specified works and services are required to be provided at subdivision or development should be made very clear. In determining which approach to use, the location of zoning zones, the current extent and capacity of various services, the most cost effective extensions of services, etc. should be considered. The areas where various services are required can be shown:-

a) in tabular form (a part of text) based on the zones in the Zoning Bylaw; or

b) on a map(s) scheduled to the Bylaw and which shows the areas where specific works and services are to be provided.)

5.2 Highway Width

Throughout the Municipality and in accordance with the following uses of highways, the subdivider or developer shall provide land for highways without compensation:

a) for motor vehicle use, land not exceeding 20 metres in width; or

b) to widen an existing local highway that borders on or is within the subdivision or development no more than the lesser of:-

   i) 10 metres in width; or

   ii) the difference between the current width of a local highway and 20 metres; but

c) notwithstanding subsection (a) of this section additional width may be required pursuant to Section 995(2) of the Municipal Act; and

d) for motor vehicle use, lanes where deemed necessary pursuant to Section 75(1)(d) of the Land Title Act which shall have a minimum width of six (6) metres; but

e) for pedestrian use only, walkways shall have a minimum width of three (3) metres.

5.3 Roads

Highways, sidewalks and boulevards shall be provided in all subdivisions and developments in accordance with Schedules "B" and "C" which are attached to and form part of this bylaw; and all highways, sidewalks and boulevards shall be located, constructed and otherwise meet the standards found in Schedule "A" which is attached and forms part of this bylaw.

5.4 Water

In all subdivisions and developments where a water distribution system and fire hydrant system is required or, where no community water system is required and each newly created parcel is to be provided with a source of potable water, each shall be located, constructed and otherwise meet the standards found in Schedules "A" and "B" which are attached to and form part of this Bylaw.

5.5 Effluent Disposal

In all subdivisions and developments where a sewage collection system is required or where no community sewage collection system is required and each newly created parcel is to be provided with an area of soil capable of disposing of a specified amount of effluent, each shall be located, constructed and otherwise meet the standards found in Schedules "A" and "B" which are attached to and form part of this Bylaw.

5.6 Drainage

In all subdivisions and developments where a drainage collection system or a drainage disposal system is required, each shall be located, constructed and otherwise meet the standards found in Schedules "A" and "B" which are attached to and form part of this Bylaw.

5.7 Streetlighting

In all subdivisions and developments where a streetlighting system is required, each shall be located, constructed and otherwise meet the standards found in Schedules "A" and "B" which are attached to and form part of this Bylaw.

5.8 Underground Wiring

In all subdivisions and developments where underground wiring is required, each shall be located, constructed and otherwise meet the standards found in Schedules "A" and "B" which are attached to and forms part of this Bylaw.

5.9 Overhead Wiring and Natural Gas

1. Overhead wiring may be considered at the discretion of the Approving Officer for some subdivisions; and, where such overhead wiring is to be provided, it shall be located, constructed and otherwise meet the standards found in Schedule "A" which is attached to and form part of this Bylaw.

2. Natural gas services may, at the owner's option, be provided for some subdivisions; and, where such natural gas services are to be provided, they shall be located, constructed and otherwise meet the standards found in Schedule "A" which is attached to and forms part of this Bylaw.

6.0 SECURITY

Where:

a) all works and services required to be constructed or installed at the expense of the subdivider are not constructed or installed, before the Approving Officer approves the subdivision, security in the form of a cash deposit, or an irrevocable letter of credit from a financial institution acceptable to the Municipality, in the amount of 120% of the estimated construction cost as estimated by the Approving Officer and satisfactory to the Approving Officer, shall be deposited with the Municipality; and

b) where all works and services required to be constructed and installed at the expense of the developer pursuant to Section 989(4), (5), or (6) of the Municipal Act are not constructed or installed, before the Building Inspector issues the building permit, security in the form of a cash deposit, or an irrevocable letter of credit from a financial institution acceptable to the Municipality, in the amount of 120% of the estimated construction cost as estimated by the Building Inspector and satisfactory to the Building Inspector, shall be deposited with the Municipality.

7.0 FEES

7.1 Application Fees

Pursuant to Section 988(4) of the Municipal Act a fee of Twenty-five ($25.00) Dollars for the first parcel created by subdivision and Ten ($10.00) Dollars for each additional parcel is payable to the Municipality.

7.2 Examination Fee

An examination fee as required under Section 83(2)(a) of the Land Title Act and set out in regulations thereto is payable to the Municipality.

(No other fees may be levied.)

8.0 OVERSIZING OF WORKS

8.1 Where an owner in accordance with this Bylaw provides a highway or water, sewage or drainage facilities that serve land other than the land being subdivided or developed, and

a) The Municipality has required that the owner provide excess or extended highway, water, sewage or drainage facilities; and

b) The Municipality has considered the cost of it providing such facilities in whole or in part would be excessive; and

c) The Municipality has

i) determined the portion of the cost of providing excess or extended services,

ii) determined which part of excess or extended services will benefit each parcel served; and

iii) Imposed, as a condition of an owner connecting to or using the excess or extended service, a charge related to the benefit under (ii)

all in accordance with Section 990 of the Municipal Act; the interest rate on the charge payable under c(iii) shall be Ten (10%) Percent calculated annually.

9.0 BYLAW SCHEDULES

9.1 The following is a list of schedules attached hereto and which form a part of this Bylaw:-

Schedule "A" - Design Criteria, Specifications, and Standard Drawings

Schedule "B" - Level of Works and Services

Schedule "C" - Level of Highway Works and Services

9.2 The following is a list of appendices attached hereto for the purpose of providing information only and which do not form a part of this Bylaw.

Appendix "A" - Drawing Submissions - Acceptable Standards

Appendix "B" - Typical Forms and Agreements

Appendix "C" - Administrative Provisions

10.0 ADOPTION

READ A FIRST TIME this 16th day of March, 1992.

READ A SECOND TIME this 16th day of March, 1992.

READ A THIRD TIME this 16th day of March, 1992.

RECONSIDERED, FINALLY PASSED AND ADOPTED BY COUNCIL this 11th day May, 1992.

Mayor Brian Hornidge

Clerk Jukka Efraimsson

CERTIFIED TO BE A TRUE COPY OF
By-Law # 195 1991
DATE: June 24, 1992
JUKKA EFRAIMSSON
CLERK TREASURER

A true copy of By-Law No. 195
registered in the office of the Inspector of Municipalities this 16th *day of* July *19* 92.

Deputy Inspector of Municipalities

SCHEDULE "A"

THE VILLAGE OF PORT CLEMENTS

SUBDIVISION SERVICING BYLAW NO. 195

SCHEDULE A

Design Criteria, Specifications and Standard Drawings

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VILLAGE OF PORT CLEMENTS

SUBDIVISION SERVICING BYLAW NO. 195

SCHEDULE "A"

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

Schedule 'A' to the Subdivision Servicing Bylaw identifies the Design Criteria, Specifications. and Standard Drawings acceptable to the Municipality.

This Schedule is to be referred to in the design, construction and acceptance of Engineering Works within the Municipality. Additional information, clarification and suggestions for changes and amendments should be directed to:

Village of Port Clements
P.O. Box 198
Port Clements, BC
V0T 1R0

1.2 DEFINITIONS

In this Schedule, unless the context otherwise specifies:

"ACCEPTED" means as accepted by the Approving Officer or Building Inspector employed by the Municipality.

"CONSIDERED" means considered for acceptance by the Approving Officer or Building Inspector.

"CONTRACTOR" means the person or persons or the company undertaking the construction of works in a subdivision development, and/or on municipal property, or their employees, subcontractors or other duly authorized representative.

"DEVELOPER" means the owner of land or the holder of a bona-fide interim agreement or option to purchase land, who has made application to the Municipality for or is engaged in undertaking the development or subdivision of such land and shall include his duly authorized representative.

"DEVELOPER'S ENGINEER" means the Professional Engineer engaged by the Developer to design and/or prepare drawings for the construction of works in a subdivision, development, and/or on municipal property, or his duly authorized representative.

"ENGINEER" means the Municipal Engineer of the Village of Port Clements or a duly authorized representative of the Municipality.

"MUNICIPALITY" means the Village of Port Clements.

"PROFESSIONAL ENGINEER" means a person who is registered or duly licensed as such in British Columbia under the provision of the Engineer's Professional Act.

"THIS SCHEDULE" means the "Design Criteria, Specifications and Standard Drawings" prepared by the Village of Port Clements.

"THE WOI :" means and includes anything and everything to be done for the setting out, the execution and fulfillment of the requirements in this Schedule.

1.3 SCOPE AND USE

This schedule shall be taken to mean the Design Criteria, Specifications and Standard Drawings to be referred to, and incorporated in, subdivisions, developments, and on municipal properties or rights-of-way, in the Village of Port Clements.

1.4 NON-MUNICIPAL CODES AND STANDARDS

Where non-Municipal codes and standards, such as A.S.T.M., C.S.A., A.W.W.A., etc., are referred to in this Schedule, the latest adopted revision, including amendments, of these codes and standards at the date of commencement of construction shall apply, except that the Approving Officer may vary requirements under certain circumstances in the interest of public health or safety.

When references to the following capitalized abbreviations are made, they refer to Specifications, Standards, or Methods of the respective Association.

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWS	American Welding Society
BCBC	British Columbia Building Code
CEC	Canadian Electrical Code
CEMA	Canadian Electrical Manufacturers Association
CGSB	Canadian General Standards Board
CSA	Canadian Standards Association
CSPI	Corrugated Steel Pipe Institute
IES	Illumination Engineering Society
LEMA	Lighting Equipment Manufacturers Association
NBC	National Building Code of Canada
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
RTAC	Road and Transportation Association of Canada
WCB	Workers' Compensation Board

2.0 ROAD AND WALKWAYS

2.1 INTRODUCTION

All roads in the Municipality shall be designed in accordance with the recommended practice as outlined in "Geometric Design Standards for Canadian Roads and Streets", as published by the Canadian Roads and Transportation Association (R.T.A.C.) or as stated elsewhere in this Schedule or as accepted.

2.2 BASIC ROAD AND WALKWAYS CLASSIFICATIONS

Roadway classification throughout the Municipality shall be as indicated in this Bylaw. All roads built within the village shall be either to an arterial, local or collector standard as defined in this section. The local and collector roads are minor roads built to a rural standard. The distinction between arterial, local and collector roads shall be at the discretion of the Approving Officer.

Arterial Street (standard drawing R-6)

Arterials are intended to carry large volumes of all types of traffic moving at medium, to high speeds. Controlled access to adjacent properties will be permitted, however direct access to single family development will not generally be allowed. Average daily traffic (ADT) volumes generally range from 5,000 - 30,000 vehicles. Arterial streets are normally characterized by trip lengths exceeding 1.5 km.

Local Road (standard drawing R-7)

The main function of a minor local street is to provide land access. Direct access is allowed to all abutting properties. Local streets are not intended to move large volumes of traffic. Minor local streets shall not exceed 150 m in length unless accepted.

Collector Street (standard drawing R-8)

Collector streets provide both traffic service and land service functions. The traffic service function of this type of street is to carry traffic between local and arterial streets. Controlled access to adjacent properties will be allowed on collectors. Trip lengths are commonly in the range of 0.75 - 1.5 km. Average daily traffic (ADT) volumes generally range from 1,000 - 12,000 vehicles.

Cul-de-Sacs and P-Loops (standard drawing R-1-A)

Cul-de-sacs and P-Loops shall be classified as minor local streets and shall not exceed a length of 120 m unless accepted.

Lanes (standard drawing R-12)

Lanes provide service access to commercial areas or as an extension of any existing system of lanes. Lanes shall not exceed a length of 150 m unless accepted. Dead-end lanes shall not be encouraged, but, when accepted, shall include a turn-around area.

Walkways (standard drawing R-10)

Functional walkways provide pedestrian access to transit, shopping and school sites. Leisure walkways provide pedestrian access to parks and open public areas.

2.2.1 OPTIONAL ROAD CLASSIFICATIONS

Upon agreement between the developer and the Approving Officer, the developer shall be allowed to build roads to the following standards.

Minor Local Road - Urban (standard drawing R-1)

The definition of a minor local road - urban is the same as for a local road in section 2.2. For construction purposes, a minor local road - urban does not require 2 m shoulders.

Major Local Road - Urban (standard drawing R-2)

The main function of a major local road - urban is to provide land access. Direct access is allowed to all abutting properties. Local streets are not intended to move large volumes of traffic. Trip lengths are short, generally under 0.75 km in length.

A major local road -urban requires construction of a 1.2 m sidewalk.

Collector Road, Urban (standard drawing R-3)

The definition of a collector road - urban is the same as for a collector road in section 2.2. For construction purposes, a collector road - urban does not require 2 m shoulders but does contain the requirement for a 1.7 m sidewalk.

Minor Commercial Road (standard drawing R-4)

Commercial streets provide vehicle and pedestrian access to and through commercial shopping areas. Pedestrian volume and vehicle parking volume are greater than on residential streets.

Major Commercial Road (standard drawing R-5)

The definition of a major commercial road is the same as for a minor commercial road. For construction purposes, the difference is that a the paved portion of a major commercial road must be 16 m wide, as compared to 13.5 m of pavement for a minor commercial road.

2.3 DESIGN PARAMETERS

2.3.1 Design Speed

Unless otherwise specified, roadways shall be designed to the following minimum standards as specified in the Roads and Transportation Association of Canada Geometric Design Standards for Canadian Roads and Streets Manual:

Arterials	70 km/hr.
Locals	50 km/hr.
Collectors	60 km/hr.

2.3.2 Cross Section Elements

All right-of-way and roadway widths shall be as outlined in Table 2.3.2 Right-of-way and Roadway Widths.

Table 2.3.2 - Right-of-Way and Roadway Widths

Road Classification	Minimum Right-of-Way Width	Minimum Roadway
Arterial:		
Controlled by the BC Ministry of Transportation and Highways	As per BC M.O.T.H. Requirements	As per BC M.O.T.H. Requirements
Local Street (standard drawing R-7):	20.0 m	6.0 m, 2 m shoulders
Collector (standard drawing R-6):	20.0 m	7.5 m, 2 m shoulders
Cul-de-Sac (standard drawing R-1-A)	20.0 m (15.0 m bulb)	6.0 m paved c/c (8.5 m bulb)
Lane (standard drawing R-12):	4.88m	4.4 m granular
Walkways (standard drawing R-10):		
Leisure	3.0 m	1.5 m granular
Functional	3.0 m	1.5 m paved

Where an 8 metre roadway width cannot be adequately supported, protected or drained within a 20 metre highway right-of-way width because of terrain and soil conditions, land of a greater width may be required to be provided so an 8 metre roadway may be adequately supported, protected or drained. In accordance with the bylaw, all work on highway right-of-way is to be completed before the subdivision is approved unless an arrangement pursuant to Section 6.0 of the bylaw is made.

For details of cross-sectional elements refer to the standard drawings.

Roll-over curbs will be permitted only on local roads and only where the adjoining land use is designated as single family residential.

2.3.3 Horizontal Alignment

Curvature

Table 2.3.3.1 illustrates the minimum required centreline radius for various superelevation rates for each classification of roadway. All designs to be in accordance with RTAC Standards.

Table 2.3.3.1 - Minimum Horizontal curve Radii (Metres)

Roadway Classification	Horizontal Curve Radii No Superelevation (m/m)	Superelevation 0.02	0.04	0.06
Arterial				
MOTH	MOTH Standards	MOTH Standards		
Municipal	RTAC Standards	1500	500	130
Collector	120	110	100	-
Local	65	-	-	-

Spiral transition curves and superelevation will be required for arterial roadway designs while collector and local streets may be designed using simple curves.

The maximum superelevation rate for arterials shall be 0.06 m/m and for collectors shall be 0.04 m/m. No superelevation will be permitted on local streets.

Table 2.3.3.2 illustrates the minimum curb or pavement return radius for various roadway classifications.

Table 2.3.3.2 - Curb Return Radii

Road Classification	Return Radii (metres)
Arterial	9
Collector	8
Local	8
Cul-de-Sac	6

Cul-de-sac bulb radius for paved or gravelled surface shall be a minimum of 8.5 m.

All roadways shall be constructed using a 2% centreline crown except under adverse topographic conditions, offset crowns may be permitted for local or collector streets at the discretion of the Approving Officer, in which case the location of the crown shall be approximately 2.5 metres from high side curb with a minimum cross slope of 2% and a maximum of 4%.

Overall curb-to-curb crossfalls will not be permitted except in cases where superelevation is required.

Lanes shall be constructed using an inverted 2% crown.

2.3.4 Vertical Alignment

Roadway Grades

Minimum grades for urban and rural roadways shall be 0.50 percent with 2% crossfall or 0.30% with 3% crossfall*.

* Special approval required.

Curb return grades shall be minimum 1.0%

Table 2.3.4.1 - Maximum Roadway Grades

The maximum roadway grade for all designations shall be 8%. Consideration may be given to allowing increased grades where short sections of steeper grades can be utilized to improve the geometric design of intersections for increased safety.

Vertical Curvature

Vertical curves shall be designed to provide safe stopping sight distances and shall be provided where centreline grades change is in excess of 1%. Stopping sight distance is the distance separating a vehicle from an object, measured the instant that an object (for which the driver decides to stop) comes into view. Minimum stopping sight distance is the least distance required to bring the vehicle to a stop, under prevailing vehicle and climatic conditions. Vertical curve length is calculated by the equation L = KA:

Where: L = length of the vertical curve
K = a constant related to lines and geometry of a parabolic curve
A = algebraic difference in grades in percent

Table 2.3.4.2. shows the minimum K values to be used for vertical curve design.

All vertical curves are to be symmetrical.

Table 2.3.4.2. - Minimum K Values (metres) for Vertical Curve Design

Roadway	Crest Curve		Sag Curve	
			With Street	Without Street
Classification	Minimum	Desirable	Lighting	Lighting
Arterial - RTAC - M.O.T.H. Requirements				
Local	7	10	6	9
Collector	10	15	9	20

Vertical Alignment

The vertical alignment of roads shall be such that an access driveway having a maximum 10% grade can be achieved from the property line to the proposed building area.

2.3.5 Intersections

Unless indicated elsewhere herein, all intersection design standards shall conform to those outlined in the "Geometric Design Standards for Canadian Roads and Streets" as published by Roads and Transportation Association of Canada.

Intersection Grades

Approach grades of minor roads at intersections to major streets shall not exceed 75% of the maximum allowable road grade for that street classification.

Consideration may be given to increased approach grades where topographic or other conditions dictate the use of maximum or near maximum grades.

Intersection Vertical Curves

The minimum K values for vertical curves on minor roads at intersection shall be as shown in Table 2.3.5.

Table 2.3.5 - Minimum Intersection K Values

Minor Intersecting Street	Minimum K Value, Metres	
	Crest Curb	Sag Curve
Local	4	4
Collector	7	6

Grades of major roads through intersecting minor approaches shall be constant and shall not exceed 75% of the maximum allowable grade for that street classification. Consideration may be given to allowing increased grades where topographic or other conditions dictate the use of maximum or near maximum grades.

2.3.6 Road Base

Minimum road base requirements shall be as outlined in Table 2.3.6.1.

Table 2.3.6.1 - Pavement Structure Requirements

Road Classification	Sub-base Thickness	Base Thickness	Surface Material and Thickness
Arterial	+ 400 mm	75 mm	100 mm asphalt
Local:			
Residential	+ 300 mm	75 mm	50 mm asphalt
Commercial	+ 300 mm	75 mm	50 mm asphalt
Industrial	+ 400 mm	75 mm	75 mm asphalt
Collector (All zones)	+ 400 mm	75 mm	75 mm asphalt
Cul-de-sac	+ 300 mm	75 mm	50 mm asphalt
Lane	+ 300 mm	75 mm	50 mm granular

Pavement structure requirements refer to both rural and urban road classifications.

* Increases in sub-base thickness where poor soil conditions exist shall be at the discretion of the Approving Officer. Pavement structure requirements shall be confirmed by the Developer's Engineer following completion of a geotechnical investigation.

Where a "half-road" is to be installed, the asphalt thickness for all road classifications shall be a minimum of 75 mm with 45 mm to be installed during initial construction and the 30 mm remaining thickness to be installed when the roadway is completed.

2.3.7 Sidewalks and Walkways

Sidewalks shall be installed in accordance with the minimum requirements outlined in Table 2.3.7.

Table 2.3.7 - Minimum Sidewalk Requirements and Widths and Curb Types

Road Classification	Requirement	Width	Curb Type
Arterial	Both Sides	1.5 m	non-mountable
Local	* One Side	1.5 m	varies
Collector	* One Side	1.5 m	non-mountable
Cul-de-sac	N/A	N/A	varies

* Additional sidewalk shall be installed in areas deemed necessary by the Approving Officer. Such cases shall include areas with multi-family, institutional and commercial development and proposed bus routes.

Where a walkway exists on a cul-de-sac, a sidewalk, 1.5 m wide, shall be extended to the walkway entrance.

Sidewalks shall not be required for rural roads.

Sidewalks shall at all times drain towards the gutter with a cross slope of 2%.

Wheelchair ramps shall be installed at all intersections and at cross-walks.

Where non-mountable curbing is used, access to properties shall be in the form of sidewalk crossings and shall conform to municipal standards. Breaks in a sidewalk and use of curb returns for access will not be permitted. Widths for crossings may vary depending on the development's requirements. Minimum crossing width for residential driveways shall be 6.0 m. Maximum crossing width for industrial and commercial driveways shall be 10.0 m.

Where mountable curbing is used, sidewalk crossings will not be required and access shall be directly over the sidewalk. Transition from mountable to non-mountable curbing shall in all cases be made at the nearest wheelchair ramp.

Where a barrier curb leads to a roll over curb, the construction of a transition curb will be required.

Sidewalk crossings for private residential driveways shall be 150 mm thick. Sidewalk crossings for lanes, industrial, commercial or multiple dwelling developments shall be 180 mm thick. Curing compound and sealing compound shall be applied according to the manufacturer's recommendations.

Sidewalks and walkways shall be designed to provide an overall pedestrian traffic system throughout the areas and locations shall be subject to the acceptance of the Approving Officer.

Pedestrian walkway patterns in newly developed areas shall be designed on the basis of functional and leisure usage and shall be subject to the acceptance of the Approving Officer.

Functional walkways for pedestrian access to transit, shopping and school sites shall be constructed to Municipal specifications to a full 1.5 m width with a minimum of 100 mm pit-run gravel base and surfaced with a minimum of 50 mm asphaltic concrete or a minimum of 100 mm of concrete.

Leisure walkways for pedestrian access to and in parks and open public areas shall be constructed to Municipal specifications to a full 1.5 m width with a minimum of 100 mm pit-run gravel base and surfaced with a minimum of 50 mm compacted crushed shale or gravel.

(Fencing of walkways shall be the responsibility of the adjacent property owners who will ensure that construction of such is carried out in accordance with Municipal standards.)

Where walkway grades exceed 9% but are less than 12%, an accepted stepped walkway shall be constructed.

Where walkway grades exceed 12%, accepted steps shall be constructed. All walkways concrete with steeper than 10% grades shall be provided with an accepted handrail.

Walkways shall be graded and constructed to the full width between property lines to provide proper access and drainage.

2.3.8 Boulevards and Restoration

Unless otherwise accepted, all boulevards shall be graded to drain to the curb or ditch, as applicable, at a minimum slope of 2% and a maximum slope of 10 %.

The top 100 mm of soil shall be good quality topsoil raked free of any debris which is not conducive to the growing of grass and shall be seeded. Hydroseeding may be required.

Quantities and combinations of landscaping materials shall be submitted to and accepted by the Approving Officer prior to installing such materials.

Driveway gradients shall have a maximum slope of 10% from the back of curb, back of sidewalk, or edge of shoulder, as applicable.

2.3.9 Geotechnical Requirements

The developer's engineer shall in all cases ensure that the structural integrity of the on-site soils are adequate to accommodate the expected loading, by providing a geotechnical evaluation prepared by a qualified geotechnical engineer.

Modifications to the Municipality's minimum pavement structure requirements shall be as outlined in Section 2.3.6, "Road Base".

2.3.10 Street Names

Street names for new streets must be accepted by the Approving Officer who shall have absolute discretion in this regard.

2.3.11 List of Standard Drawings

The following drawings are for road classifications defined in Section 2. Group 1 drawing include the basic road classifications identified in sections 2.2.

Group 2 drawings are options available to the developer upon agreement between the developer and the Approving Officer. Group 2 roads are defined in section 2.2.1.

Group 3 drawings provide construction designs for improvements which may be required depending on the classification of the road being built.

Group 1 - Basic Road Classifications

Title	No.	Section
Arterial 4 Land Undivided	R-6	2.2
Local Road	R-7	2.2
Collector Road	R-8	2.2
Cul-de-sac Road	R-1A	2.2
Paved Lane	R-12	2.2
Paved Walkway	R-10	2.2

Group 2 - Optional Road Classifications

Title	No.	Section
Minor Local Road, Urban	R-1	2.2.1
Major Local Road, Urban	R-2	2.2.1
Collector Road, Urban	R-3	2.2.1
Minor Commercial Road	R-4	2.2.1
Major Commercial Road	R-5	2.2.1

Group 3 - Optional/Required Depending on Road Classification

Title	No.	Section
Curb & Gutter	R-9	2.5.8
Culvert Installation	R-11	2.5.6
Hydrant Access path	R-13	3.2.5
Separate Sidewalk	R-14	2.3.7
Sidewalk Crossing	R-15	2.3.7
Transition Curb	R-16	2.3.7
Wheelchair Ramp	R-17	2.3.7
Typical Culvert Installations	R-18	2.5.6
Sandbag Bulkhead	R-19	2.5.6

2.4 MATERIALS

2.4.1. Roadway Embankment Materials

Earthfill for roadway embankment shall be native material with the exception of overburden, topsoil and rockfill. Earthfill shall be capable of being compacted to form a stable embankment, and shall be free of organic or deleterious material.

2.4.2. Select Granular Sub-Base Material

Select granular sub-base material shall be a pit-run gravel, or crushed gravel, screened if necessary, composed of inert, durable aggregate, uniform in quality and free from soft or disintegrating particles, clay or silt balls, organic material or other deleterious material, and shall be well graded from coarse to fine particles within the following gradation limits:

Sieve Size	Percent Passing
75 mm	100
25 mm	60 - 85
No. 4	30 - 60
No. 200	2 - 10

That portion of the aggregate which passes the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity limit of not more than 6.

Shot rock may be accepted for use as granular sub-base material at the discretion of the Approving Officer. If shot rock is proposed, the proposed gradation of the shot rock material shall be submitted to the Approving Officer for acceptance prior to commencement of construction.

2.4.3. Crushed Granular Base Material

Crushed granular base material shall consist of inert, durable crushed aggregate, screened if necessary, uniform in quality and free from soft or disintegrating particles, clay or silt balls, organic material or other deleterious materials, and shall be well graded from coarse to fine particles within the following gradation limits:

Sieve Size	Percent Passing
19 mm	100
12.5 mm	70 - 100
No. 4	40 - 80
No. 8	30 - 60
No. 16	20 - 45
No. 50	8 - 20
No. 200	2 - 8

Not less than 60 percent (60%) of the material retained on the No. 4 sieve shall be crushed particles with at least one fractured face. That portion of the material which passes the No. 40 sieve shall have a liquid limit of not more than 25 and plasticity limit of not more than 6.

2.4.4. Hot Mix Asphaltic Concrete

Hot mix asphaltic concrete mix design shall be prepared by a Professional Engineer and satisfy the following criteria, in accordance with ASTM D-1559, Marshall Test Procedure:

- Blows per face 50
- Marshall stability, kg at 60°C 450
- Flow index, mm 8 - 14
- % voids in mineral aggregate
  - 20 mm max. 14 min.
  - 12.5 mm max. 14 min.
- % voids in total mix 3 - 5
- % voids filled with asphalt 75 - 85

Prime coat shall be MC-0 (MC-30) or as accepted.

Asphalt cement shall be prepared by refining petroleum, uniform in character, shall not foam if heated to 177 ° Celsius, and shall conform to grade 120 - 150 penetration when tested in accordance with ASTM-D5.

Tack coat shall be RC-0 (RC-30) or as accepted.

Coarse mineral aggregate shall consist of hard, clean, durable, crushed aggregate, in conformance with ASTM D692.

Fine mineral aggregate shall consist of natural sand or hard, clean, durable crushed aggregate.

Gradation of mineral aggregate, graded in accordance with ASTM C136 shall conform to the following, and shall form a smooth concave shaped curve when plotted on a semi-log chart:

	% Passing	
Sieve Size	Base Course	Surface Course
19.0 mm	100	-
12.5 mm	75 - 90	100
9.5 mm	68 - 82	78 - 94
No. 4	44 - 63	58 - 80
No. 8	-	52 - 74
No. 10	31 - 50	42 - 64
No. 20	23 - 41	28 - 48
No. 40	17 - 34	19 - 38
No. 100	10 - 20	10 - 24
No. 200	3 - 10	3 - 14

A minimum of 60% of the particles by weight retained on the No. 40 sieve shall have two or more fractured faces.

2.4.5 Concrete

The design of concrete mixes shall be prepared by a Professional Engineer and shall suit the local site conditions.

Cement shall be normal Portland Cement Type 10 or sulphate resistant Portland Cement Type 50, conforming to CSA A.5.
Water and aggregates shall conform to CSA A.23.1. Air entraining admixtures shall conform to CSA A.266.1. Chemical admixtures shall conform to CSA A.266.2 and shall be used only if accepted.

Concrete for curb and gutter and sidewalks shall be ready mix concrete designed to achieve a 28 day compressive strength of 25 kPa, with a maximum aggregate size of 25 mm, air entrainment 5 - 7%, water-cement ratio 0.50 maximum and slump of 25 - 75 mm. Premoulded expansion joint filler material shall be minimum 13 mm thick, cut to suit.

2.4.6 Grass Seed Mixture

Grass seed shall be premium quality with a purity of 95% or better and a germination rate of 85% or better. The species and percentages of the seed mixture shall be

Species	% By Weight	% Live Pure Seed
Perennial Rye Grass	30	8.1
Creeping Red Fescue	25	16.2
Red Top	5	28.1
Kentucky Blue Grass	10	21.6
Red Clover	20	17.3
Alsike Clover	10	8.6

Dry seeding application rates shall be 30 kg dry seed mix per hectare and 250 kg fertilizer per hectare, type 13-16-10.

Hydroseeding application rates shall be:

Seed Mix	70 kg per hectare
Fall Rye Grass	20 kg per hectare
Binder	40 kg per hectare (polymer, seaweed extract, vegetable gum)
Fertilizer	250 kg per hectare (13-16-10)

For playgrounds and lawns, Buckerfield playground mix or as accepted by the Approving Officer.

2.5 INSTALLATION

2.5.1 General

Copies of compaction test results, granular materials, sieve analyses, asphaltic concrete and concrete design mixes, asphaltic concrete and concrete test results shall be submitted to the Municipality.

The working area and haul roads shall be maintained in an orderly fashion and shall not be encumbered with equipment, materials or debris.

Dust control shall be maintained at all times by watering or other approved means.

The work shall be scheduled such that disruption of normal traffic and inconvenience to residents shall be kept to a minimum.

Proof rolling of the subgrade, subbase or base course may be required by the Approving Officer.

2.5.2. Clearing and Grubbing

The roadway right-of-way shall be cleared and grubbed of all standing or fallen trees, brush, timber, stumps or other debris and organic materials and these materials shall be disposed of by burning or other approved means. Burning shall be done in accordance with B.C. Forest Act and Municipal By-laws. Topsoil and overburden shall be stripped to a minimum depth of 300 mm.

2.5.3. Grading

The entire roadway right-of-way width shall be graded to the approved profile and cross-section, and uniformly compacted to a minimum 98%
Standard Proctor. The completed profile and cross-section shall be accurate to a tolerance of 30 mm, with no soft, spongy or unstable areas, and free from ruts, waves and undulations.

2.5.4 Select Granular Sub-Base

Select granular sub-base material shall be placed on dry, firm sub-grade, and compacted in uniform layers not exceeding 150 mm in uncompacted thickness, to a minimum 100% Standard Proctor Density. The completed profile and cross-section shall be accurate to a tolerance of 15 mm, free from ruts, waves and undulations.

2.5.5 Crushed Granular Base

Crushed granular base course material shall be placed on dry, firm sub-base, and compacted in uniform layers to a minimum 100% Standard Proctor Density. The completed profile and cross-section shall be accurate to a tolerance of 12 mm, free from ruts, waves and undulations.

2.5.6 Culverts

Culverts shall be concrete, corrugated polyvinyl chloride (PVC), or galvanized corrugated steel (CMP) pipe designed for H20 loading for local roads and HS25 loading for arterial and collector roads in accordance with A.A.S.H.O.

Culvert sizes shall be designed for the anticipated runoff, 25 year return period, and shall be minimum 375 mm diameter. Driveway culverts shall be a minimum 7.0 m long.

In areas where culverts cross under major roadways or are located in critical or sensitive areas, culverts shall be sized for 1 in 100 year return period.

Culverts shall be installed to true line and grade, with a minimum 300 mm bury. End walls shall be rip-rapped or concrete-sandbagged.

2.5.7 Boulevards

Boulevard areas lying between the curb and property line of the road right-of-way shall be graded to drain to the curb and fill sections shall be compacted. The topsoil shall be raked free of roots and other debris and the boulevard shall be seeded.

2.5.8 Curb and Gutter, Sidewalk

All concrete work shall conform to the applicable CSA Standards. All curb and gutter and sidewalk shall be plant mixed Portland Cement concrete installed to true line and grade, placed on dry, firm granular base course. Alternative materials and methods of construction such as extruded curb and gutter may be considered and in some instances will be requested by the Approving Authority.

Concrete placed in forms shall be consolidated using mechanical vibration to achieve the required strength.

Expansion joint material shall be placed at each expansion joint, construction joint, beginning and end of curb with radius less than 15 m, around all structures such as poles, valve boxes, and hydrants and adjacent to any building or structure. Contraction joints shall be provided at intervals of 3 m in curb and gutter and 1.5 m in sidewalks. Finish shall be broom-finish with tooled, rounded edges.

Cold weather installation of concrete shall conform to CSA A23.1.19. Hot weather installation of concrete shall conform to CSA A23.1.20.

2.5.9 Hot-Mix Asphaltic Concrete

Priming and paving shall be carried out only on dry, smooth, compacted base course. Granular base courses and asphaltic concrete base courses shall be kept clean and uncontaminated until covered. Priming shall include granular and asphaltic base courses, edges of buildings, structures, gutters and pavement and shall not be carried out when the ambient temperature is less than 10 degrees Celsius.

Hot-mix asphaltic concrete shall be produced in a batch plant capable of drying and heating the mineral aggregate, heating the asphalt cement and accurately proportioning all materials to produce an asphaltic concrete possessing the required characteristics and within designated tolerances in accordance with ASTM D-99.

Hauling of asphaltic concrete shall be done in a manner such that the hot-mix is delivered to the site at the specified temperature and that no damage to surfaces of roadway occurs.

Hot-mix asphaltic concrete shall be placed, spread and compacted to produce a true profile and cross-section, of the specified thickness and density and with a uniform textured surface, free from roller marks. Minimum final densities shall be:

Prior to October 1	- 97% of laboratory design density
After October 1	- 98% of laboratory design density

Test results indicating conformance with the approved detailed design drawings and specifications shall be submitted.

3.0 WATER SUPPLY

3.1 INTRODUCTION

Water distribution design and construction shall conform to the requirements of the Provincial Ministry of Health and this schedule.

The system shall be designed to provide day-to-day requirements and also shall provide adequate flows for fire protection. The required flow shall be the sum of the maximum daily flow plus the required fire flow.

When a private water source is required for land development, the water must be tested and proven safe for human consumption. The Building Inspector will require a copy of the Medical Health Officer certificate prior to final inspection of any residence or commercial food, beverage or accommodation building built within the development.

3.2 DESIGN PARAMETERS

3.2.1 Per Capita Flows, Fire Flow Demands

Minimum design flows for domestic demand shall be:

Average daily domestic flow	455 litres/capita/day
Maximum domestic flow	1,010 litres/capita/day
Peak hour domestic flow	1,365 litres/capita/day

Additional design flows may be required for industrial, institutional or commercial development.

Fire flow shall be in accordance with the criteria outlined in "Water Supply for Public Fire Protection - A Guide to Recommended Practise", published by Public Fire Protection Survey Services.

The following minimum fire flows shall be met for the noted development types:

Zone	Required Fire Flow
Single Family Residential	60 litres/sec
Apartments, Townhouses	90 litres/sec
Commercial	150 litres/sec
Institutional	150 litres/sec
Industrial	225 litres/sec

Design populations used in calculating water demand shall be computed to accordance with the Municipality's population predictions or with the planned development in the area to be served, whichever is larger.

3.2.2 Pressure and Hydraulic Network Considerations

Water Pressure: Unless otherwise accepted, the following standards shall be used:

Minimum pressure at peak hour demand	265 kPa
Maximum allowable pressure	690 kPa (865 kPa with individual PRV'S)
Minimum fire protection residual (at hydrant, maximum day demand)	140 kPa

As a basic guideline, the following criteria may be used:

Design for maximum of (a) fire flows, plus maximum day demand or (b) peak hour demand, whichever is greater.

Hazen-Williams formula to be used.

Demand requirements shall be based on the Municipality's present water consumption records and the projected trends. Demand may vary for different locations within the Municipality.

Where there is an existing hydraulic network in place, the Municipality may provide information for design calculations.

Depending on the complexity and extent of the proposed distribution system, the Approving Officer may require a hydraulic analysis design showing minimum flows and pressures.

The maximum desirable length of any permanent non-interconnected watermain shall be 150 m. All mains exceeding 150 m, unless it is a temporary situation, shall be looped unless otherwise accepted. Dead-end mains shall not be promoted.

In residential areas, watermains servicing fire hydrants shall be 150 mm diameter or larger. Watermains 100 mm in diameter may be permitted for domestic service on dead end roads where no further extension is planned, no fire hydrant is required and the dead end main is less than 75 m long. Where a dead-end main is longer than 200 m or services more than one hydrant, watermain shall be 200 mm diameter or larger. In commercial/ industrial/institutional areas, the minimum watermain size shall be 200 mm diameter. However, should the hydraulic analysis indicate a need for larger size watermains, the larger size watermain shall be used.

Watermains shall generally be located in the road right of way. When watermains must cross private property, a registered utility right-of-way, minimum 6.0 m wide, shall be provided.

Design of pumping stations and control valving such as pressure reducing valves require the acceptance of the Approving Officer. Good engineering practice and consideration of operation and maintenance requirements should be considered in the design of these facilities.

3.2.3 Cover, Grades, Clearance

The minimum cover over any watermain shall be 1.0 metres.

The minimum grade for a main shall be 0.1%. The maximum grade shall be 20.0% unless provisions are made to anchor the pipe to the bottom of the trench with concrete poured in place. Watermain grades shall generally be consistent with the roadway grade.

The minimum vertical clearance between a watermain and any sanitary sewer shall be 450 mm unless the watermain is adequately encased with concrete encasement. The minimum vertical clearance to piping other than sanitary sewer shall be 300 mm unless the watermain is adequately encased in concrete.

The minimum horizontal clearance between a watermain and any sewer shall be 3.0 m unless the watermain is concrete encased or installed in a carrier pipe.

3.2.4 Valving

In general, valves shall be located as follows:

a) In intersections, in a cluster at the pipe intersection or at the project property lines, to avoid conflicts with curbs and sidewalks:

   i) 3 valves at "X" intersection
   ii) 2 valves at "T" intersection

   so that specific sections of mains may be isolated.

b) Not more than 240 m apart, or 20 services, whichever is less, for single family residential. All other zones shall require special designs.

c) Not more than 1 hydrant isolated.

d) In gravel surfaced roads, outside the travelled portion of the roadway.

Valves shall be the same diameter as the main up to 300 mm diameter. Gate valves may be used up to and including 300 mm diameter. Butterfly valves shall be required in mains larger than 300 mm. Butterfly valves shall be installed in insulated chambers, with provision for positive drainage to storm sewer or other drainage facilities.

3.2.5 Hydrants

Fire hydrants shall generally be located at street intersections and shall be installed at a 850 mm offset from the centre of corner cuts. Where hydrants are required at mid-block locations, they shall be installed opposite property pins at a 850 mm offset. In no case shall fire hydrant spacing exceed a distance of 200 m nor should any residence be more than 90 m from a hydrant.

In high density residential, commercial, and industrial areas, hydrants shall be located at a maximum spacing of 75 m or as accepted. Additional hydrants may be required in high risk areas.

It shall be the Developer's responsibility to ensure the design and proposed locations of the fire hydrants will not conflict with existing or proposed street lights, power poles, etc.

All hydrants shall be installed with the pumper port facing the street and in no case shall the port be less than 450 mm above ground level.

Gate valves shall be installed with a flanged connection at the main to isolate all hydrants.

Hydrant access paths shall be installed as shown on the standard drawings on all roads with ditches.

3.2.6 Air Valves, Blow-Offs, Chamber Drainage

Air release valves shall be installed at the summit of all mains of 200 mm diameter and larger except where the difference in grade between the summit and valley is less than 600 mm. Chamber insulation and drainage shall conform to that specified for butterfly valve chambers.

A 50 mm diameter standpipe shall be installed on all dead-end mains. Standpipes shall be installed at a height of 750 mm above ground or in a box below grade as shown on the standard drawings.

3.2.7 Thrust Blocking

Concrete thrust blocking shall be provided at bends, tees, wyes, reducers, plugs, caps, and blow-offs. The area of thrust block bearing on pipe and ground shall be as shown on the standard drawings or as accepted. For mains 300 mm diameter and larger or in areas of poor soils, special designs may be required.

3.2.8 Service Connections

In addition to the Municipal requirements, service connection shall be subject to the requirements of the BC and National Plumbing Codes. Service connections 50 mm and larger diameter may be installed using a gate valve flanged to the tee at the main and a gate valve, temporary cap and thrust block at property line. Service connection 19 mm to 50 mm diameter shall include a corporation stop at the main, a saddle as accepted, and a curb stop and box.

The minimum size water service connections shall be as follows:

Residential	20 mm diameter
Other	50 mm diameter.

Whenever possible all water service connections shall be located at the centreline of the lot.

Connections shall be installed up to the property line at a minimum depth of 1.0 m. All services shall be marked with a 40 mm x 90 mm stake at the property line with the top 150 mm painted blue and marked with the length of the stake in meters. Curb stops shall be located at a 300 mm offset from property line and shall be extended to ground level.

3.2.9 List of Standard Drawings

The following drawings form part of Seciton 3:

Title	No.
Thrust Blocks	W-1
Fire Hydrant Assembly	W-2
Sewer and Water Services	W-3
Water Service Connection	W-4
Extension Service Box	W-5
Standpipe Detail	W-6
Watermain Relocation	W-7
Butterfly Valve Chamber	W-8
Air Release Valve Chamber	W-9
Encasement Pipe Detail	S-5
Trench Details in Paved Areas	S-6
Trench Details in Gravelled Areas	S-7
Trench Bedding Details	S-8
Trench Anchor Blocks	S-12

3.2.10 Private Water Source

Where a parcel is not required to be serviced by a community water system as a condition of approval and is to be used for residential development, there shall be proof, acceptable to the Approving Officer, of a source of potable water which produces not less than 2,300 litres per day and where there is to be more than one dwelling units on a parcel, there shall be an additional 2,300 litres per day for each such dwelling unit.

Where a parcel is not required to be served by a community water system and is to be used for a purpose other than residential development, the volume of potable water to be provided shall be determined in accordance with the proposed usage, but shall, in any case, not be less than 2,300 litres per day.

Where a private water source is required, the water provided must be potable water certified for drinking purposes by the Medical Health Officer. Certification must clearly state whether or not the water tested meets the Provincial standards on both chemical analysis and coliform count.

3.3. MATERIALS

3.3.1 Pipe

The materials outlined in Table 3.3.1 shall be considered acceptable for installation throughout the Municipality.

Table 3.3.1 - Pipe Materials and Specifications

MATERIAL	SIZE RANGE (mm)	SPECIFICATION	USE
polyethylene	19 - 50	CSA 8137-1-M1983 PE Series 160	Service connection
polyvinyl chloride	100 - 300	AWWA C900, Class 150 (bell & spigot joints)	distribution mains and service connections

Consideration may be given to use of alternate materials for major trunk mains.

3.3.2 Pipe Joints

Jointing of pipe shall be in accordance with manufacturer's recommendations.

A flexible joint shall be provided at locations where pipe is held in a fixed position by a rigid structure or support.

Unless otherwise approved, the amount of pipe deflection at joints and couplings shall not exceed 3 degrees, or one half the limit specified by the manufacturer, whichever is less.

3.3.3 Valves, Valve Boxes and Fittings

Solid wedge or double disc gate valves, iron body, bronze mounted, clockwise closure, manufactured in Canada, with non-rising stems, conforming to A.W.W.A. C500 specifications and combined with extension spindles and valve boxes shall be installed on all watermains up to and including 250 mm diameter. Valve manufacturer must be acceptable to the Approving Officer.

On mains larger than 300 mm in diameter, butterfly valves, flanged type conforming to A.W.W.A. C504 specifications along with an insulated valve chamber shall be installed. Valves larger than 300 mm shall have a 100 mm diameter bypass line.

Where air release valves are required they shall be double acting, vacuum type, with cast iron bodies and 860 kPa flanges. A ball valve or gate valve with activator shall be installed beneath each air valve assembly. All air release valves shall be protected from frost by insulating the valve chambers.

Valve boxes shall be Terminal City NT Type 1, or as approved, and shall be locking unless otherwise accepted. Valve box risers shall be PVC pipe or as approved, suitable for the valve and valve box.

Fittings for PVC pipe shall be:

a) Cast iron fittings manufactured to AWWA C110 designed for a working pressure of 1035 kPa.

b) Asphalt coated ductile iron compact fittings manufactured to ANSI/AWWA C153/A21.53-84.

c) PVC bends to CSA Spec. B137;.37 rubber gasket joints to ASTM D1869, Type 1, Grade 1, PVC to ASTM D1784, Class 12454-B.

Mechanical seal joints on fittings to pipe shall be formed by a bell and preformed rubber gasket suitable for the pipe to which the joint is made.

Flanged joints on fittings shall be flat faced conforming in dimension and drilling to ANSI B16.1.

Ends shall be flanged or belled to suit pipe ends.

3.3.4 Hydrants

Hydrants shall be compression type Terminal City Type 1 or approved equal and shall conform with A.W.W.A. Specification C502 and shall be flanged at 50 mm above the ground line. Hydrants shall have two hose nozzles and one pumper nozzle complete with caps. Hose nozzles shall be 63 mm in diameter and pumper nozzles 114 mm in diameter. Nozzle threads shall conform with British Columbia Fire Hose Thread Specification, 6 threads per inch.

Hydrant stems shall be turned counterclockwise to open. Stem seals shall be resilient "O-Ring".

Hydrant extensions shall be supplied complete with nuts, bolts, flange gaskets, operator extension and coupling.

Hydrants shall be supplied complete with nuts, bolts, flange gaskets, operator extension and coupling.

Hydrants shall be installed using flanged joints and shall be held in place by thrust blocks. Tie rods may be permitted for thrust restraint in situations where existing utilities limit the available space for concrete thrust blocks.

3.3.5 Service Connections

Corporation stops shall be in accordance with AWWA C800, with fittings ends suitable for use with compression fittings Mueller A-225 unless otherwise approved. Service saddles for connections to PVC and existing A.C. shall be double strap type.

Corporation couplings shall be in accordance with AWWA C800.

Polyethylene pipe with compression type fittings with stainless steel inserts shall be used for all connections up to 50 mm diameter and polyvinyl chloride with fittings in accordance with Section 3.3.3 for connections 100 mm diameter and larger. Service connections between 50 mm and 100 mm in diameter shall not be permitted.

Curb stops shall be Mueller A-617 or as approved, with drain. Curb boxes shall be adjustable type and have a sidewalk pattern top casting. Stationary rods shall be provided.

3.3.6 Pipe Bedding

Pipe bedding specifications shall conform to Municipal standards for Class "A", Class "B" and Class "C" bedding. Pipe bedding selection may vary for different material installed and for different locations within the Municipality.

3.4 INSTALLATION

3.4.1 Excavation, Bedding, Backfill, Restoration

The trench shall be excavated so that pipe can be laid to the specified alignment and depth with allowance for the specified trench wall clearances and bedding. Wall clearances shall be minimum 150 mm, maximum 400 mm, from the bottom of the trench to 100 mm above the top of the pipe.

Bracing, sheeting and trench side slopes shall be in accordance with Worker's Compensation Board safety requirements. Dewatering may be required to control trench water.

Bedding material shall be crushed gravel, sand, select native material or concrete. Bedding shall be compacted to 95% Standard Proctor Density.

Backfill material shall be approved select native material or pitrun gravel and shall be placed in such a manner to prevent damage to the pipe.

Backfill materials in travelled surfaces shall be compacted to 95% Standard Proctor Density, except for the upper 750 mm which shall be compacted in accordance with the adjacent travelled surface design requirements.

Surface restoration shall conform to the original condition or as accepted.

3.4.2 Pipe Laying

Pipe shall be installed in accordance with the applicable AWWA specifications, the manufacturer's recommendations and requirements of this Schedule.

Pipes shall be handled with the greatest care and with equipment designed so that no damage occurs to pipe or fittings.

Batter boards shall be erected over the trench or trench line at intervals of not more than 20m. The centre line of the required pipe line shall be marked on these boards and string or wire stretched between the boards and on this centre line. The pipe shall be kept to proper line by plumbing down from this string line. Each pipe shall be laid to grade by means of batter boards and a boning rod with a shoe which will enter the pipe and stand on the invert. A minimum of three (3) batter boards shall be in place at all times during excavation and pipe laying. Sufficient batter boards shall be placed so that sighting is possible along these boards from one manhole to the next. Alternate methods of grading and aligning the pipe may be considered.

All pipes shall be laid to horizontal line, with a tolerance of plus or minus 10 mm of the design line; and grade, with a tolerance of plus or minus 25 mm for water mains and services; with the spigot end pointed in the direction of the flow. The pipes shall be jointed in accordance with the manufacturer's recommendations except that joint deflections shall be allowed only up to one-half of the manufacturer's recommended tolerances. Particular care must be taken to see that the ends of the pipes are kept clean. Care shall be taken to properly align the pipe once the joints are forced home. Movement of the pipe once the joints is made shall be kept to an absolute minimum. Jumping on or dropping of pipe to obtain grade shall not be permitted.

Care shall be taken to prevent the entrance of trench water or other material into the pipe during installation.

3.4.3 Valves, Hydrants and Appurtenances

Valves shall be installed at the specified locations, in the vertical position. Valve boxes shall be installed plumb, centered over the valve, and such that traffic loads are not transmitted to the valve.

Hydrants shall be installed at the specified locations, set plumb and such that the pumper port faces, and is at right angles to, the road centreline, unless otherwise accepted. Drain outlets with drain rock shall be provided and kept free of obstructions. The ground flange shall be 50 mm above finished ground or sidewalk grade unless otherwise accepted.

Fittings shall be installed at the specified locations in accordance with the manufacturer's recommendations.

3.4.4 Thrust Blocking

Thrust block bearing areas shall be to Municipal standards. Concrete shall be 25 MPa minimum at 28 days.

Care shall be taken to ensure that concrete does not interfere with the operation of flange bolts and nuts or prevent proper operation of hydrant drains.

3.4.5 Service Connections

Service connections shall be installed at the specified locations and depths with the same tolerances as specified for pipe laying.

Curb stop boxes shall be set plumb and adjusted to finish grade.

3.4.6 Testing

Prior to testing, all new water mains are to be cleaned of debris by passing a line sized "pig" through the main or alternatively the main shall be video inspected and immediately afterwards the pipe ends shall be capped in preparation for testing and disinfection.

All water mains shall be tested in accordance with the appropriate AWWA specifications and the following criteria:

a) The test pressure shall be 1035 kPa or 1.5 times the operating pressure, whichever is greater. The pressure test shall be maintained for a minimum of two hours.

b) The allowable leakage shall be determined by AWWA formula:

$$L = \frac{N\ D\ P^{0.5}}{131{,}000}$$

L = allowable leakage in litres per hour

N = number of joints in test section

D = inside diameter of pipe in millimetres

P = test pressure in kPa

Service connections shall be tested with the watermain.

The Approving Officer shall be notified 24 hours in advance of the leakage testing and may elect to witness the test. All test data and leakage calculations are to be submitted to the Approving Officer.

3.4.7 Flushing and Disinfection

All water mains shall be disinfected by chlorination, after the system has been flushed of dirt and other debris. Chlorination methods shall conform A.W.W.A. C601 and all disinfection shall be acceptable to the Approving Officer and Public Health Inspector.

Upon completion of disinfection, the entire piping system shall be thoroughly flushed, filled with water and left in a condition ready for use.

Care shall be taken to ensure chlorinated water from the testing procedure is not discharged into fish bearing streams. Dechlorination may be required prior to discharge.

4.0 SANITARY SEWERS

4.1 INTRODUCTION

Sanitary sewer systems shall be designed and installed in accordance with the requirements of the Ministry of Environment, Waste Management Branch, "Guidelines for Assessing Sewage Collection Facilities", and the requirements noted in this Schedule.

4.2 DESIGN PARAMETERS

4.2.1 Design Flows

The sanitary sewer system shall be designed using the following minimum average daily flows for the zone noted:

Residential/institutional	=	360 litres/capita/day
Industrial/commercial	=	22,500 litres/day/hectare

An infiltration rate of 0.6 litres/sec/hectare shall be added to the above flows.

The design flows shall be calculated using the average daily flows plus the infiltration rate.

Peak flows shall be 4 times the average daily flow for contributing areas with populations less than 1,000; and 3.5 times the average daily flow for contributing areas with populations between 1,000 and 3,000. For populations of more than 3,000 persons, following the formula

$$M = \frac{1 + 14}{4 + P^{0.5}}$$ shall be used.

Where: M = ratio of peak to average flow
P = population in thousands

Design populations used in calculating average daily flows shall be computed in accordance with the Municipality's population predictions or with the planned development in the area to be served, whichever is larger.

4.2.2 Pipe Flow Formulas

Capacities of gravity sanitary sewer mains shall be determined using Manning's Formula:

$$Q = \frac{A\,R^{0.667}\,S^{0.5}}{N}$$

Where: Q = Design Flow in m^3/sec
A = Cross Sectional Area in m^2
R = Hydraulic Radius in m
S = Slope of hydraulic grade line in m/m
N = Roughness coefficient
= 0.013 for A.C., Conc. and P.V.C. Pipe

Calculations for capacities of sanitary sewer forcemains shall use the Hazen - Williams Formula:

$$Q = 0.278\ CD^{2.63}\ S^{0.54}$$

Where:
- Q = Rate of flow in m^3/sec
- D = Internal pipe diameter in mm
- S = Slope of hydraulic grade line in m/m
- C = Friction coefficient
- = 120 for all pipe

4.2.3 Manholes and Hydraulic Losses

Manholes shall be required at:

- all changes in grade
- all changes in direction
- all changes in pipe sizes
- all intersecting sewers
- all terminal sections
- downstream end of curvilinear sewers

Manholes shall be placed where future extensions are anticipated and shall be spaced no greater than 150 m apart.

Pipe intersections in manholes shall utilize smooth hand formed concrete channels to maintain uniform flows.

The invert of the downstream pipe shall not be higher than that of the upstream pipe. However, both pipes may be placed at the same elevation.

The springline of the downstream pipe shall not be higher than that of the upstream pipe.

Minimum drop in invert levels across manholes:

i) Straight run - no drop required
ii) Deflections up to 45° - 25 mm drop
iii) Deflections 45° to 90° - 30 mm drop

A drop pipe shall be installed when the drop between inverts exceeds 0.6 m.

Inside ramps will be permitted up to 450 mm from invert to channel bed.

Where a small pipe joins a larger pipe, the energy gradient shall be maintained through the transition.

Manholes deeper than 4.25 m shall be provided with safety platforms in accordance with the Worker's Compensation Board requirements.

4.2.4 Temporary Cleanouts

Temporary clean-outs may be provided at terminal sections of a main provided that:

a) Future extension of the main is proposed or anticipated.

b) The length of sewer to the downstream manhole does not exceed 45.0 m.

c) The depth of the pipe does not exceed 2.0 m at the terminal point, and

d) No more than two (2) service connections are to be installed between the cleanout and the downstream manhole.

Clean-outs shall not be considered a permanent structure.

4.2.5 Minimum Pipe Diameter, Velocity, Grades and Cover

The minimum diameter for sanitary sewer installations shall be as follows:

a) Sanitary Sewer Mains = 200 mm
(except last upstream portion which cannot be extended in the future, may be 150 mm diameter if less than 45 m long.)

b) Sanitary Sewer Connections = 100 mm
(a minimum 150 mm diameter service shall be used for all commercial and industrial services)

c) Sanitary Sewer Forcemains = 100 mm

The minimum velocity shall be 0.6 m/sec. There is no maximum velocity, however, consideration must be given to scour problems where flow exceed 2.5 m/sec., and anchoring must be incorporated where the grade(s) of the sewer are 15% or greater.

The grade of any sewer shall be governed by the minimum velocity required. However, the last section of a main that will not be extended in the future, shall have a minimum grade of 1.0% where 150 mm diameter pipe is proposed.

The minimum cover over any main shall be 1.0 m. The desired cover over any sewer forcemain is 1.2 m. Consideration must be given to both dead and live loads for pipe material being utilized.

The depth of the sewer must be sufficient to provide 'gravity flow service connections to both sides of the roadway and must allow for future extension(s) to properly service all of the upstream tributary lands for ultimate development.

Where it is not feasible to service by gravity connection to a sewer in the frontage street, a rear yard sewer may be required.

Where permitted, horizontal curves will require a constant offset and/or shall be uniform throughout the curve. The radius of the curve shall not be less than 60 m. The design velocity must exceed 0.91 m/sec., the minimum grade shall be 1.0% and each joint is to be located by survey.

Sanitary sewers shall generally be located in the road right-of-way, with offsets from property line as shown on the standard drawings. When sanitary sewers must cross private property, a registered utility right-of-way, minimum 6.0 m wide, shall be provided.

4.2.6 Service Connections

In addition to the Municipal requirements, service connections shall be subject to the requirements of the BC and National Plumbing Codes. A backflow preventor valve shall be installed on all sanitary sewer service connections.

Service connections shall be provided to each lot fronting the main. All services shall enter the main at a point just above the springline.

Separate service connections shall be installed for each dwelling unit of a duplex, townhouse or row housing development for individual ownership.

Connections to new mains shall be made using wye fittings; connections to existing mains shall be made using saddles.

The minimum size for sanitary sewer service connections shall be 100 mm.

The minimum grade of 100 mm diameter service connection from the main to the property line shall be 2.0%. Where this grade cannot be met, a 150 mm diameter service connection at a minimum grade of 1.0% may be installed.

Desirable depth shall be 1.2 m at the property line or as accepted.

Service connections may be permitted into manholes provided that:

i) The connection is not in an adverse direction to the flow in the sewer main.

ii) The provisions noted in 4.2.3 are met.

All services shall be marked with a 40 mm x 90 mm stake at the property line. The top 150 mm of the stake shall be painted red, and the depth from the top of the stake to the invert of the service piping shall be noted in metres.

4.2.7 Pumping Stations and Force Mains

If at all possible, the use of sanitary pump stations is to be discouraged. Any proposed use of pump stations must receive prior approval from the Municipality. Any sanitary pump station, must be located within a right-of-way outside of the road dedication.

The size, capacity and type of these stations will be dependent upon the development and catchment area involved.

All pumping station and force main design and installation shall be as accepted for the specific installation.

In conjunction with sanitary pumping facilities, the following criteria shall be noted in the design of force main systems.

a) **Velocity**

At the lowest pump delivery rate anticipated to occur at least once per day, a cleansing velocity of at least 0.9 m/sec should be maintained. Maximum velocity should not exceed 3.5 m/s.

b) **Air Relief Valve**

An automatic air relief valve suitable for sewerage applications, installed in an insulated manhole, shall be placed at high points in the force main to prevent air locking. If requested by the Municipality and within reasonable depths, the sewer shall be graded to eliminate air relief valves.

c) **Termination**

Force mains should enter the gravity sewer system at a point not more than 600 mm above the flow line of the receiving manhole. An inside drop pipe shall be incorporated.

d) **Size**

The minimum size for force mains shall be 100 mm diameter. All force mains shall be designed to prevent damage from superimposed loads, or from water hammer or column separation phenomena.

Consideration must be given to maintenance requirements in the design of all sewage pumping stations. Pump selection, wetwell volumes, control system, etc., shall be reviewed with the Approving Officer on a project by project basis.

4.2.8 List of Standard Drawings

The following drawings form part of Section 4:

Title	No.	Title	No.
Standard Manhole	S-1	Trench Bedding Details	S-8
Exterior Drop Manhole	S-2	Manhole Cover Insulation Detail	S-10
Manhole Benching	S-3	Anchor Block	S-12
Standard Sewer Connections	S-4	Location of Service Connections	S-13
Encasement Pipe Detail	S-5	Typical Residential Sewer Connection	S-14
Trench Details in Paved Areas	S-6	Manhole Cover and frame	S-15
Trench Details in Gravelled Areas	S-7		

4.2.9 On Site Sewage Disposal

Where a parcel is not required to be served by a community sewer system, such parcel shall be served by individual on-site sewage disposal.
An area, suitable for construction of on-site sewage disposal facilities and certified by the Medical Health Officer, shall be located on each parcel, and not smaller than the following as determined by the percolation rate of the soil in that area:

Percolation Rate (min/2.5 cm)	Min. Size of Area of Soil (Square Metres)
less than 13	300
13 or more, but less than 25	450
25 or more, but less than 30	600

The longest acceptable percolation rate is 30 minutes/2.5 cm.

There shall be a minimum of 120 cm of natural porous topsoil above the ground water table or any impervious layer in such area of soil and a representative number of test holes shall be dug in that area to a minimum depth of 120 cm to demonstrate this.

The area of soil required for sewage disposal shall be capable of meeting the siting and setback requirements for absorption fields in the Sewage Disposal Regulations, B.C. Reg. 411/85.

Percolation tests are subject to the certification of the Medical Health Officer, B.C. Ministry of Health, who will make a recommendation to the Approving Officer.

Percolation tests to test the area of soil are to be undertaken as follows:

a) Percolation testholes shall be dug at points and elevations selected as typical in the area of proposed disposal field;

b) One of these testholes shall be dug at each end of the area of the disposal field. Further holes may be required depending on the nature of the ground and the result of the first test and the size of the proposed field;

c) Testholes shall be 300 mm square and excavated to the depth of the proposed absorption trench;

d) To make the percolation test more accurate, any smeared solid should be removed from the walls of the testhole;

e) If the soil contains considerable amounts of silt and/or clay, the testhole shall be presoaked before proceeding with the test. To do this, keep the hole as fully filled with water as possible for four (4) hours. Proceed with the test immediately after presoaking.

f) To undertake the test, fill the testhole with water. When the water level is thirteen (13) centimetres or less from the bottom of the hole, refill the hole to the top. No recording of time need be done for these two fillings.

g) When the water level after the second filling (step (f)) is thirteen (13) centimetres or less from the bottom of the hole, add enough water to bring the depth of water to fifteen (15) centimetres or more;

h) Observe the water level until it drops to the fifteen (15) centimetre depth. At precisely fifteen (15) centimetres commence timing. When the water level reaches precisely twelve and one-half (12.5) centimetres depth, stop timing;

i) repeat procedures (g) and (h) until the last 2 rates of fall do not vary more than 2 minutes per 2.5 cm;

j) The time in minutes for the water level to drop 2.5 centimetres is the percolation rate for that hole and is recorded in minutes per 2.5 centimetres. The percolation rate of the absorption field is the average of the slowest rates of the percolation tests made for that field;

k) Cover the holes, flag their location and repeat the test in other locations. Record the results and submit to the local authorities.

4.3 MATERIALS

4.3.1 Gravity Main Pipe

The materials outlined in Table 4.3.1 shall be considered acceptable for installation throughout the Municipality.

Table 4.3.1 - Gravity Sewer Pipe Materials and Specifications

Material for Gravity Sewers	Size Range (mm)	Minimum Specification	Use
Polyvinyl Chloride	100 - 150 200 - 375	CSA B182.1, SDR 28 ASTM, D3034, SDR 3	minor collection mains service connections
*Non-Reinforced Concrete	300 - 900	ASTM C14, Class III	major trunk mains
Reinforced Concrete	300 & Larger	ASTM C76, Class III	major trunk mains

* Use of non-reinforced concrete pipe shall be at the sole discretion of the Approving Officer. Consideration must be given to dead and live loads when selecting pipe classes.

4.3.2 Force Main Pipe

The materials outlined in Table 4.3.2 shall be considered acceptable for installation throughout the Municipality.

Table 4.3.2 - Force Main Sewer Pipe Materials and Specifications

Material for Gravity Sewers	Size Range (mm)	Minimum Specification	Use
Polyvinyl Chloride	100 & Larger	AWWA C900	minor forcemain

4.3.3 Pipe Joints

All gravity sewer pipe shall be jointed using rubber gaskets or gasket fittings and couplings. All sewer force main piping shall be jointed as specified for water main piping.

4.3.4 Manholes

All manholes shall be precast concrete, minimum 1,050 mm inside diameter and shall conform to A.S.T.M. C478. Manhole slabs shall be precast or cast in place on compacted material to Municipal Standards using 20 MPA concrete and shall be 1,600 mm square.

Precast concrete lids shall be designed to withstand H-20 loading conditions. Cast iron frames and covers and manhole ladder rungs shall conform to Municipal Standards.

4.3.5 Temporary Cleanouts

Temporary cleanout barrels, covers, base and lids shall conform to standards for manholes, or as accepted.

4.3.6 Service Connections

Polyvinyl chloride pipe and fittings shall be used for all service connections.

4.3.7 Pipe Bedding

Pipe bedding classifications shall conform to Municipal standards for Class "A", Class "B" or Class "C" bedding. Pipe bedding selection may vary for different materials installed and for different locations within the Municipality.

4.4 INSTALLATION

4.4.1 Excavation, bedding, backfill, Restoration

Excavation, bedding, backfill and restoration shall conform to the requirements of Section 3.4.1 of this Schedule.

4.4.2 Pipe Laying

Sanitary sewer gravity and force main piping installation shall conform to the requirements of Section 3.4.2 of this Schedule. Vertical tolerance shall be 7 mm, plus or minus, for sanitary sewer gravity mains and 25 mm, plus or minus for gravity sewer force mains.

4.4.3 Manholes, Cleanouts, and Appurtenances

Manholes, cleanouts and appurtenances shall be installed at the locations shown on the approved design drawings and in accordance with the Standard Drawings.

Manholes shall be set plumb and shall be constructed concurrently with the laying of the pipe. Manholes shall be constructed so as to be free from both ground water infiltration and exfiltration of sewage. All joints shall be butter mortared, including base, barrel, cover, bricking and frame.

Inlet and outlet elevations shall be as shown on the approved design drawings with tolerances as specified for pipe laying.

4.4.4 Service Connections

Service connections shall be installed at the locations and depths shown on the approved drawings with the same tolerances as specified for pipelaying.

4.4.5 Flushing and Testing

Prior to flushing and testing, all new mains are to be cleaned of debris by passing a line sized "pig" through the main, and immediately afterwards capping the pipe ends in preparation for testing. This procedure will help to identify any misalignments on curved mains.

All sanitary sewers shall be visually inspected and flushed to determine that they are straight and free from silt, sand, earth or other debris. Exfiltration tests shall be carried out on gravity sewers with either air or water as outlined below.

Testing for sanitary sewer forcemains shall conform to the testing criteria for watermains, but need not include disinfection.

Exfiltration Test:

The allowable exfiltration (water method) shall be 10 litres per millimetre of pipe diameter per kilometre per day.

The allowable exfiltration (air method) shall be determined by filling the test section with air to a constant pressure of 25 kPa and maintaining a pressure above 20 kPa for a minimum of 5 minutes. After the stabilization period, the air supply shall be cut off and the pressure allowed to drop to 20 kPa. Timing shall commence at 20 kPa and shall continue until the pressure reaches 15 kPa. The minimum acceptable time period shall be determined by the formula:

Minimum Time in min. = 0.040 x pipe dia. in millimetres

Where prevailing groundwater is above the sewer line being tested, the test pressure shall be increased 10 kPa for each metre of groundwater above the pipe.

An infiltration test may be required in areas of high groundwater, at the discretion of the Approving Officer.

The Approving Officer shall be notified 24 hours in advance of the leakage testing and may elect to witness the test. All test data and leakage calculations are to be submitted to the Approving Officer.

5.0 STORM DRAINAGE

5.1 INTRODUCTION

All storm drainage facilities shall be designed and installed as stated in this Schedule or as accepted.

5.2 DESIGN PARAMETERS

5.2.1 Design Methods and Flows

Design flows shall be based on the concept of the major and minor drainage systems and must attempt to maintain zero increase in peak flows over the pre development flows.

a) Minor System

The minor system consists of localized areas of development serviced by a localized piping system which discharges to the major component.

This system shall be designed to accommodate a two year storm event. However, in doing so, it is mandatory that a comprehensive flood routing plan be developed which analyses the impact of surcharging flows on adjacent services and property.

b) Major System

The major component of the system consists of a trunk mains which intercept flows from the minor system, natural drainage channels, overland flood routes and retention or detention facilities designed to reduce peaks. Overland flow through easements on private property is to be discouraged.

This system shall be designed for a 100 year storm based on a recognized calculation method. It shall further conform to any stormwater management plan which may have been established by the Municipality for each particular basin. Amendments to this program may only be permitted upon consultation with and detailed analysis by the Municipality.

In areas of potential flood plain, the major system hydraulic grade line shall be identified and, to prevent flooding, minimum basement elevations shall be identified and established by covenant.

5.2.2 Flow Capacities for Storm Sewers and Open Channels:

Capacities for capacities of storm sewer mains and open channels shall be determined using Manning's Formula:

$$Q = \frac{A\,R^{0.667}\,S^{0.5}}{N}$$

Q = Design Flow in m^3/sec
A = Cross Sectional Area in m^2
R = Hydraulic Radius in m
S = Slope of hydraulic garde line in m/m
N = Roughness coefficient
= 0.013 for A.C., Conc. and P.V.C. pipe
= 0.024 for unpaved corrugated steel pipe
= 0.013 for concrete and asphalt line channels
= 0.02 for gravel lined channels
= 0.05 for natural and grassed channels

5.2.3 Minimum Pipe Diameters, Velocities and Cover

The minimum diameter for storm sewer installations shall be as follows:

a)	Storm Sewer Mains	=	200 mm
b)	Catch Basin Leads	=	200 mm
c)	Storm Sewer Service Connections	=	150 mm (Residential/Single Family)
		=	200 mm (All Other)
d)	Driveway Culverts	=	375 mm

Storm sewer mains shall be installed with a minimum clear cover above the pipe crown of 1.0 m.

Unless otherwise accepted, the minimum velocity for pipes flowing full or half full shall be 0.60 m/s.

Where grades for storm sewers exceed 15%, pipe anchors shall be installed.

Offsets for storm sewer mains shall be as shown on the standard drawings. Offsets may be changed where existing services require otherwise.

5.2.4. Manholes and Catch Basins

Manholes shall be installed at all vertical grade changes and on horizontal alignment changes where no curves are used. The maximum allowable spacing between storm sewer manholes shall be 150 m. Increased spacing on sewers larger than 375 mm may be considered.

Catch basins shall be placed at regular intervals along roadways, at intersections and at low points. Wherever possible, the leads should be connected directly to a storm manhole. Saddle or wye connections shall be used where leads tie directly to the main.

The maximum allowable spacing for catch basins shall be 120 m.

5.2.5 Inlet and Outlet Structures

Inlet and outlet structures shall be designed to meet the requirements of each particular installation, however, the following guidelines shall be used as a basis for the minimum design requirements:

a) Endwall

Used to retain embankment fill over pipe. End walls shall be designed with a minimum height of 300 mm above the pipe crown and a minimum width of 300 mm on either side of the pipe.

b) Wingwalls

Used to transition outlet and inlet to existing channel shape. Wingwall heights shall match the endwall height, however, sloping may be used depending on the installation requirements. Wingwall lengths shall be a minimum of 1.5 times the endwall width. Wingwalls shall be installed on a 30° or 45° angle from a perpendicular to the endwall.

c) Aprons or Spillways

Used to prevent erosion of channel bottoms at inlet and outlet structures and shall be located to meet the requirements of each particular installation.

d) Energy Dissipators

Used to reduce intake or discharge velocities. Energy dissipators shall be installed as required.

e) Trash Grate

To be bolted and removable with a normal maximum 150 mm spacing of vertical bars.

f) Sedimentation devices shall be installed on all outlets to a creek.

All designs for inlet and outlet structures shall be subject to acceptance by the Approving Officer.

5.2.6 Ditches

Where ditching has been approved either alone or in conjunction with an underground system, all ditching shall be constructed to Municipal Standards for each particular road classification and shall be hydro-seeded in the following manner:

a) A grass seed fertilizer and binder mixture applied at the rates shown in Section 2.4.6.

Energy dissipators may be required by the Approving Officer to prevent erosion due to slopes. Sediment control devices may be required.

Erosion protection may be required by Approving Officer in fill area ditching.

5.2.7 Service Connection

Storm sewer connections to single family residential lots are required unless indicated otherwise by the Approving Officer.

Storm sewer connections for multi-family, commercial, institutional or industrial lots shall be a minimum 200 mm diameter and shall be installed up to property line at a minimum depth of 1.0 m. All services shall be marked with a 40 mm x 90 mm stake at the property line. The top 150 mm of the stake shall be painted green.

Wherever possible, service connections shall be located 3.0 m from joint property lines on the lower side of the lot.

5.2.8 Trench Drains and Rock Pits

Trench drains and rock pits may be permitted in certain circumstances.

5.2.9 Natural Watercourses

Natural watercourses shall be protected as directed.

5.2.10 List of Standard Drawings

The following drawings form part of Section 5:

Title	No.	Title	No.
Standard Manhole	S-1	Trench Details in Gravelled Areas	S-7
Exterior Drop Manhole	S-2	Trench Bedding Details	S-8
Manhole Benching	S-3	Catch Basin Assembly	S-9
Standard Sewer Connection	S-4	Catch Basin Adjustment	S-11
Encasement Pipe Detail	S-5	Manhole Cover and Frame	S-15
Trench Details in Paved Areas	S-6	Rainfall Intensity Curve	S-16

5.3 MATERIALS

5.3.1. Pipe

The materials outlined in Table 5.3.1 shall be considered acceptable for drainage installation throughout the Municipality.

Table 5.3.1 - Acceptable Storm Drainage Pipe

Material	Size Range (mm)	Minimum Specification	Use
Reinforced Concrete	300 & Larger	ASTM C76, Class III	Major trunk mains, culverts
*Non-Reinforced Concrete	300 - 900	ASTM C14, Class III	Major trunk mains
**Polyvinyl Chloride	100 - 150 200 - 375 450 - 600	CSA B182.1 SDR25 ASTM, D3034, SDR 35 ASTM, F679, SDR 35 equiv. or ASTM F794	Service Connections Minor collection mains & service connections
***Corrugated Steel Pipe	375 & Larger		Culverts

* Consideration may be given to use of asphalt coated corrugated steel pipe on major trunk mains.

** Use of non-reinforced concrete pipe may be considered.

*** Use of ribbed PVC pipe, ASTM F794 may be considered.

5.3.2 Pipe Joints

All pipe shall be jointed with rubber gaskets or gasketed fittings and couplings.

5.3.3 Manholes

Manhole barrels shall be precast concrete, 1,050 mm min. inside diameter and shall conform to ASTM C478 for all mains up to 380 mm in diameter. For mains 400 mm and larger in diameter cast in place structures combined with precast sections shall be utilized.

Manhole slabs shall be precast or cast in place on compacted material to Municipal Standards using 20 MPa concrete and shall be 1,600 mm square.

Pipe intersections in manholes shall utilize smooth hand formed concrete channels to maintain uniform flows. Minimum invert drops shall be as follows:

Straight Run	=	no drop required
Defections to 45°	=	20 mm drop
Deflections of 45° - 90°	=	30 mm drop

5.3.4 Catch Basins

All catch basins shall be precast concrete 750 mm inside diameter. Precast barrels shall conform to ASTM C478.

Catch basin slabs shall be precast or cast in place on compacted material to Municipal Standards.

Catch basins leads shall be 200 mm diameter and shall be installed a minimum of 460 mm fro the upper side of the precast slab to allow for sediment collection. Catch basin leads shall be installed at a minimum 2% slope from the catch basin to the main.

Catch basins leads shall be 200 mm diameter and shall be installed a minimum of 460 mm fro the upper side of the precast slab to allow for sediment collection. Catch basin leads shall be installed at a minimum 2% slope from the catch basin to the main.

5.3.5 Inlet and Outlet Structures

Endwalls and wingwalls shall be constructed using concrete filled sandbags, reinforced concrete or prefabricated sections. Aprons and spillways shall be constructed of reinforced concrete or rip-rap.

5.3.6 Service Connections

Asbestos cement or polyvinyl chloride pipe shall be used for all service connections.

5.4 INSTALLATION

5.4.1 Excavation, Bedding, Backfill, Restoration

Excavation, bedding, backfill and restoration shall conform to the requirements of Section 3.4.1. of this Schedule.

5.4.2 Pipe Laying

Storm sewer piping installation shall conform to the requirements of Section 3.4.2 of this Schedule. Vertical tolerances shall be 7 mm, plus or minus for storm sewer gravity mains.

5.4.3 Manholes, Catch Basin and Appurtenances

Manholes, catch basins and appurtenances shall be installed at the locations shown on the approved design drawings and in accordance with the Standard Drawings and Section 4.4.3 of this Schedule.

5.4.4 Service Connections

Service connections shall be installed at the locations and grades shown on the approved drawings with the same tolerances as specified for pipe laying.

5.4.5 Flushing and Testing

Prior to flushing and testing, all new mains are to be cleaned of debris by passing a line sized "pig" through the main, and immediately afterwards capping the pipe ends in preparation for testing. This procedure will help to identify any misalignments on curved mains.
All storm sewers shall be visually inspected and flushed to determine that they are straight and free from silt, sand, earth or other debris. Exfiltration tests shall be carried out with either air or water as outlined in Section 4.4.5.

An infiltration test may be required in areas of high groundwater at the discretion of the Approving Officer.

5.4.6 Ditching

Ditches shall be graded to line, width and grade as shown on the approved drawings. Culverts, inlet and outlet structures, energy dissipators and other appurtenances shall be as shown on the approved drawings.

6.0 STREET LIGHTING

6.1 INTRODUCTION

All street lighting systems shall be designed by a Professional Engineer competent in lighting design, and in accordance with the International Illuminating Society and Municipal standards.

All materials, equipment and specifications shall be subject to approval of the Provincial Electrical Inspector prior to submission to the Approving Officer for consideration.

The developer shall be responsible for obtaining all permits and payment of any fees required by the Provincial Electrical Inspector or the power utility company prior to start of construction.

Upon completion, the consulting engineer or contractor shall make provision to energize the system for inspection purposes and notify the Approving Officer the system is ready to inspect. After completion of such inspection by the Approving Officer of his appointed agent and correction of remaining deficiencies, the Municipality will then make application to energize the system when service is required.

Special permission must be obtained from the Approving Officer for use of 347/600V street light services and distribution.

Provision for future lighting of parks shall be made by installing ducts from the nearest street-light or junction to the park property line.

6.2 DESIGN PARAMETERS

6.2.1 Minimum Levels of Illumination

The levels of average horizontal illumination, in lux, for roadways and pedestrian walkways shall not be less than those outlined in Table 6.2.1.1.

Table 6.2.1.1 - Average Horizontal Illumination (LUX)

Road Classification	Main Commercial Areas	Industrial & Intermediate Commercial Areas	Residential Areas
Arterial	22	15	*11
Collector	13	10	* 6
Local	10	6	4
Pedestrian Walkways	6	6	4

* Average horizontal illumination shall apply only to arterial or collector roads abutting residential properties. Arterial or collector roads traversing a residential area but not abutting residential properties shall be designed to meet industrial and intermediate commercial area standards.

Differentiation between areas shall be at the discretion of the Approving Officer.

The maximum uniformity ratio of horizontal illumination for roadways and pedestrian walkways using a maintenance factor of 0.90 shall be as outlined in Table 6.2.1.2.

Table 6.2.1.2 - Uniformity Ratios

Road Classification	Uniformity Average: Minimum
Arterial	3:1
Collector	4:1
Local	5:1
Pedestrian Walkways	5:1

6.2.2 Pole Locations

For arterial and collector roadways, pole installations shall utilize a staggered arrangement on both sides of the roadways and where possible be located on lot lines, away from driveways and underground services. On local roadways, pole installations shall utilize a one-side arrangement along the sidewalk side, however a staggered arrangement may be considered provided private utility companies are satisfied that no conflicts exist.

Illumination levels differ for different classifications of roadways and where these roads meet, a transition area shall be incorporated. These shall have a gradual increase in illumination level until the higher level is reached.

On curves the luminaire spacing shall be reduced to ensure uniformity of illumination. Where poles are situated on the inside of bends the spacing must be reduced to $\pm$55% of the spacing on straight sections. On the outside of bends the spacing must be reduced to $\pm$70% of the normal spacing. Reduction figures are general guidelines and uniformity levels should dictate the required spacing.

Consideration shall be given to the relative positions of luminaires and trees to ensure that a uniform light distribution is maintained.

6.2.3 Underground Ducting Locations

In general, conduit shall be placed on the light side of the roadway. However, where a staggered type lighting pattern is utilized, conduit shall be placed on both sides of the roadway.

6.2.4 Lamp Standards and Luminaires

The types of standards and luminaires for different road classifications shall be as per Table 6.2.4.

Table 6.2.4 - Standards and Luminaires

Road Classification	Standard Type	Height	Luminaire Description
Arterial	Davit Arm NAPCO #29180-110-000 as per Std. Dwg. No. 1	9.14 m	150 watt high pressure sodium, Powerlite LXBC2227S-150 c/w Sylvania LU150/55/D deluxe coated lamp or as accepted.
Collector	Davit Arm NAPCO #29180-110-000 as per Std. Dwg.	7.62 m	150 watt high pressure sodium Powerlite LXBC2227S-150 c/w Sylvania LU150/55/D deluxe coated lamp or as accepted.
Local	Davit Arm NAPCO #29180-110-000 as per Std. Dwg. E-1 or accepted post top as per Std. Dwg. E-2	7.62 m 6.0 m	100 Watt high pressure sodium, Powerlite LXBC2227S-100 c/w Sylvania LU100/D deluxe coated lamp or as accepted as per Std. Dwg. No. E-4
Pedestrian Walkways	accepted post-top	6.0 m	as per Std. Dwg. No. E-4

All luminaires shall be High Pressure Sodium type for energy efficiency.

Standards for combination traffic signal - street light poles shall be in accordance with Std. Dwg. No. E-3.

6.2.5 List of Standard Drawings

The following drawings form part of Section 6:

Davit Streetlight	E-1
Post Top Streetlight	E-2
Streetlight Anchor Base for Type A & C Poles	E-3
Streetlight Anchor Base for Type B & D Poles	E-4
Handhole Wiring	E-5
Service Base	E-6
Median Warning Light Mounting Detail	E-7
Junction Box Details for Traffic Signals	E-8
Signal Head Patterns	E-9

6.3 MATERIALS

All materials shall be C.S.A. approved and conform to the following specifications:

6.3.1 Poles

Poles shall be one piece octagonal tapered, hot dipped galvanized steel to A.S.T.M. Standard A153 (610 gms/m^2 inside and outside) designed to withstand 160 km/h wind loading. All poles shall be refinished after installation to cover damaged areas. Street light poles and accessories shall be as detailed on the standard drawings.

6.3.2 Pole Bases

Precast concrete trapezoidal bases shall be installed on all pole installations. Under certain situations cast in place bases may be considered.

6.3.3 Conduit

All conduit, couplings, adapters and bends for street lighting shall be Scepter Manufacturing Co. Ltd. or equivalents, rigid unplasticized polyvinyl chloride, 50mm diameter minimum, Canadian Electrical Code, with maximum 30% conduit fill, unless otherwise accepted. Installation shall be in strict accordance with the manufacturer's recommendations using C.S.A. certified cement. Steel conduit for power service shall be hot-dipped galvanized malleable iron.

6.3.4 Grounding

Grounding of neutral wire to grounding rod at each service and installation of a continuous ground conductor in the conduit system shall be provided in accordance with the Provincial Electrical Code, #8 size, colour coded green.

6.3.5 Conductors

All conductors shall be type RW 90 X-link stranded copper. Minimum conductor size shall be #14. Conductor minimum size for advance warning flashers shall be #12. High traffic heads shall be wired with cabtire.

6.3.6 Connectors

Connectors shall be solderless insulated connectors of the Marrette type, taped with black P.V.C. tape. Full compression lugs shall be used for connecting ground conductors to ground studs in hand-holes.

6.3.7 Luminaires

All luminaires shall be acrylic type II, III or IV with cut-off or semi-cut-off distributions, in accordance with Section 6.2.4.

Under special circumstances, the Approving Officer may required polycarbonate vandal resistant refractors.

6.3.8 Lamps

All lamps shall be 150 watts or 100 watt high pressure sodium as applicable, colour corrected, deluxe coated.

6.3.9 Conduit Bedding

Bedding for buried conduit shall be sand or crushed granular aggregate as specified for PVC water piping. Utility warning tape shall be installed above all buried conduit.

6.3.10 Junction Boxes

Junction boxes shall be cast aluminum or concrete as shown on Standard Drawing No. E-11. Cast aluminum boxes shall be used in sidewalks in commercial areas; concrete boxes may be used in all other areas.

6.3.11 Service Panels

Service panels shall be C.S.A. approved of the pole mounting or kiosk type as shown on the Standard drawings.

6.3.12 Photo-Cell Units

Photo-cell units shall be cadmium sulphide type having externally adjustable sensitivity, thermal on and off delay type for 120 volt operation and an integrally contained control relay capable of switching at least 1000 volt-amperes. The unit shall be provided with a twist-lock base to match the receptacle provided in the luminaire and the action shall be such that in daylight the relay is energized, holding open its normally closed contacts. The unit shall have a built-in surge protector and a lightning arrester.

Where pole mounting is required an outdoor receptacle with wall mounting bracket shall be provided.

6.3.13 Ground Rods

Ground rods shall be 19 mm diameter steel with hot forged point. Top ends shall be galvanized for a minimum distance of 250 mm for 1500 mm rods and 450 mm for 3 metre rods. Ground rods shall be full length copper weld.

6.3.14 Paint

Primer shall be Pittsburgh No. SN1120 or approved equal, and paint shall be Pittsburgh No. VN3366, or approved equal.

6.4 INSTALLATION

6.4.1 Layout and Positioning

Poles, pole bases, conduit and appurtenances shall be accurately located in accordance with the accepted drawings. Conduit shall be installed parallel or perpendicular to the road centreline and routed so as to run in a direct line between adjacent poles or junction boxes.

6.4.2 Conduit Installation

Conduit shall be installed in accordance with the manufacturer's recommendations.

Empty conduits shall be provided with an insulated #12 AWG copper wire and capped immediately after installation of the pull wire.

6.4.3 Poles, Bases and Luminaires

Bases shall be set plumb and oriented such that one side of the bolt square layout is parallel to the road centreline.

Poles shall be set plumb with no more than 6 shims per pole.

Luminaires shall be securely fastened to the poles, levelled and cleaned after pole erection.

6.4.4 Wiring and Equipment

Wiring and equipment installation shall conform to the B.C. Electrical Code and manufacturer's recommendations.

6.4.5 Inspection and Testing

Inspection and testing shall conform to the provisions of the B.C. Electrical Code and the provisions of Section 6.1 hereof.

6.4.6 Installation on Power Utility Poles

Where street lighting is to be installed on power utility poles, the installations shall conform to the lighting level requirements of this schedule and to the materials and installation requirements of the utility owner.

7.0 NON-MUNICIPAL UTILITIES

7.1 INTRODUCTION

Non-municipal utilities include natural gas, power, telephone and cablevision services.

7.2 NATURAL GAS

Natural gas services are not required as a condition of subdivision, however, where natural gas services are to be installed, natural gas main and service installations shall conform to the requirements of the utility owner and natural gas mains shall be installed on both sides of new or upgraded roadways and located in accordance with the standard drawings herein. Installation of natural gas services, where available, is to be encouraged.

7.3 POWER

Electrical power services are required in accordance with Section 5 of this Bylaw. Where underground or overhead power services are to be installed, the installations shall conform to the requirements of the utility owner. Underground and overhead installations shall be located in accordance with the standard drawings herein.

7.4 TELEPHONE AND CABLEVISION

Telephone services are required in accordance with Section 5 of this Bylaw. Cablevision services are not required as a condition of subdivision, however, where cablevision service is available, installation of cablevision services is to be encouraged.

Where underground or overhead telephone and cablevision services are to be installed, the installations shall conform to the requirements of the respective utility owners and shall be located in accordance with the standard drawings herein.

8.0 STANDARD DRAWINGS

8.1 GENERAL NOTES

1. Where ASTM, AWWA or other non-Municipal Standard Specifications are referred to, the most recent edition at the date of commencement of construction will apply.

2. All castings shall be true to pattern and free from cracks, gas holes, flaws, and excessive shrinkage. Surfaces of the castings shall be free from burnt on sand and shall be reasonably smooth. Runners, risers, fins, and other cast on pieces shall be removed. In other respects, the castings shall conform to whatever points may be specially agreed upon between the manufacturer and the Approving Officer.

   Frame material specification - Cast Iron ASTM A48 - Class 20

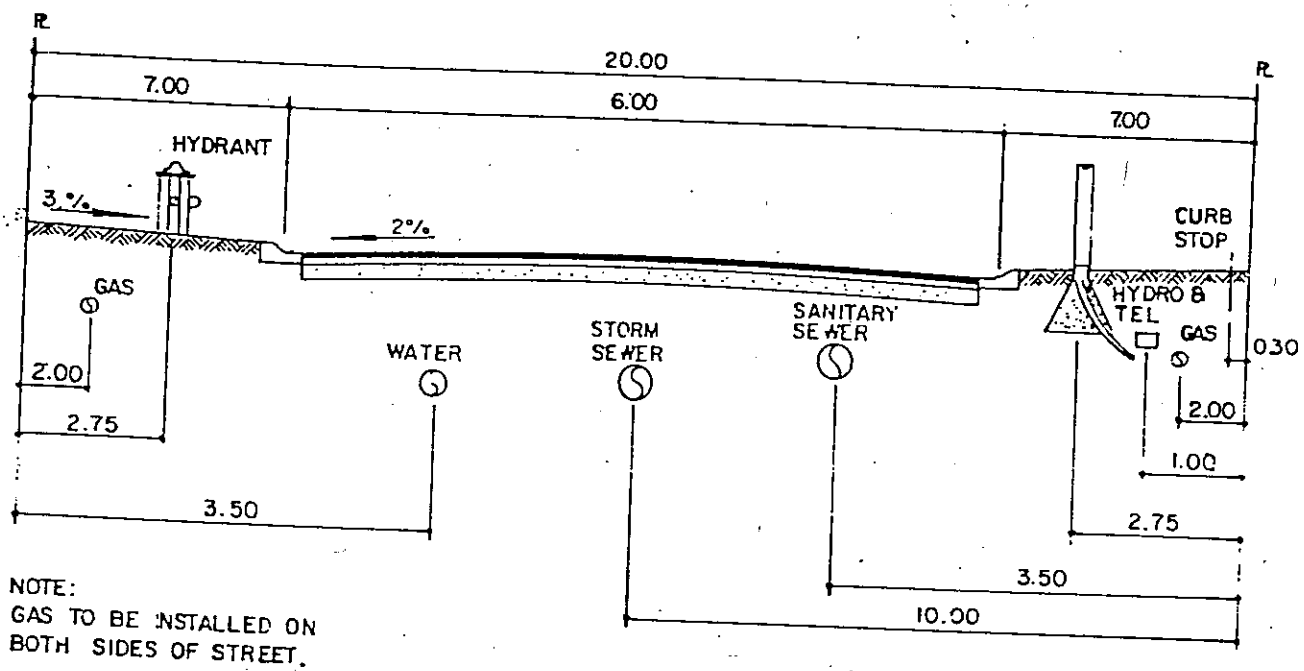
   Grate and cover material specification - Ductile Iron ASTM A445 or cast steel grade 60 - 90 (Table 11 ASTM A 148)

3. "as approved" means as accepted for the specific application by the Approving Officer.

4. All valve boxes, manholes and catch basin covers or grates to be set 5 - 10 mm below finished paved asphalt road grade, and 20-25 mm below finished gravel surface grade.

5. Standard drawings are to represent the preferred methodology under standard conditions and are to be used wherever practical. This does not rule out the development or use of other methods after appropriate approvals have been obtained from the Municipality. Any special conditions or deviations from standard drawings must be submitted as design details and will, after approval, take precedence over the standard drawing. Therefore, any standard drawing developed for non-standard situation must specify on the drawing the specific use intended.

6. It is not the purpose of the standard drawings to detail a manufacturer's product but only the conditions of the Municipality's use of such product.



NOTE:

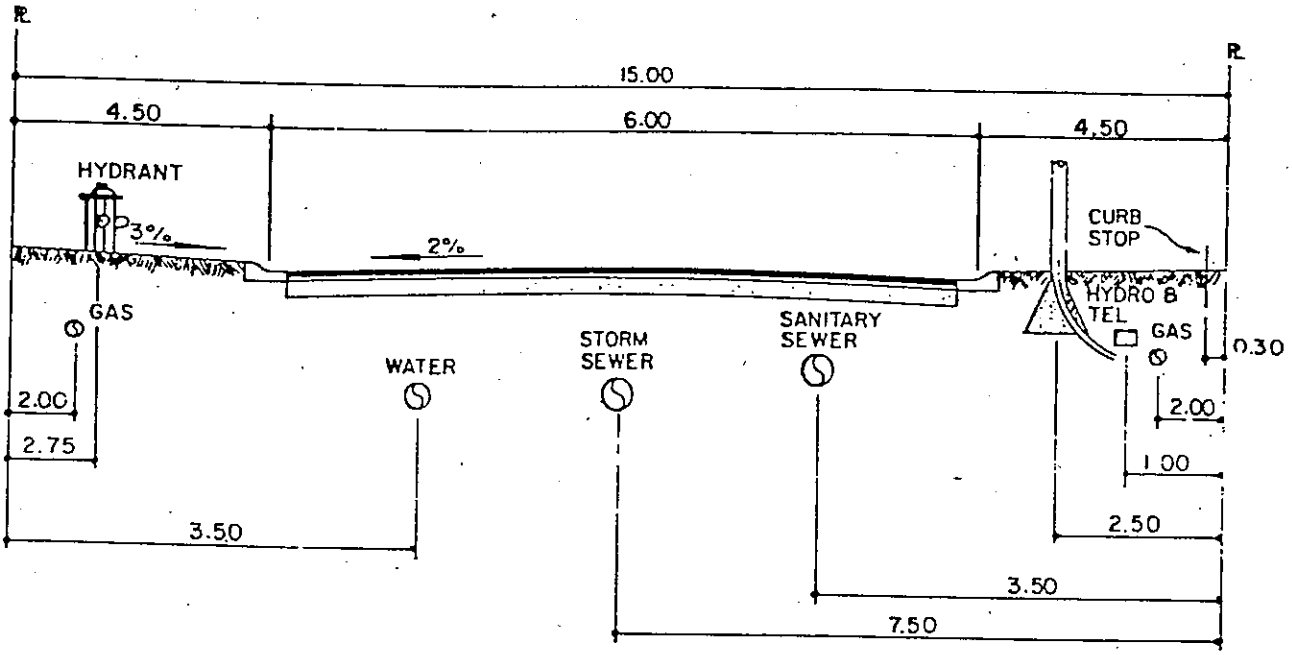
1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. ROLLED TYPE CURB AND GUTTER TO BE USED WHERE RESIDENTIAL PROPERTIES FRONT ON STREET.
3. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 4.0 LUX.
4. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

Stanley
STANLEY ASSOCIATES ENGINEERING LTD

REV'N	DATE	DATE	APPROVED	DWG Nº

VILLAGE OF PORT CLEMENTS

MINOR LOCAL ROAD - URBAN



NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. ROLLED CURB AND GUTTER TO BE USED WHERE RESIDENTIAL PROPERTIES FRONT ON STREET
3. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 4.0 LUX.
4. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

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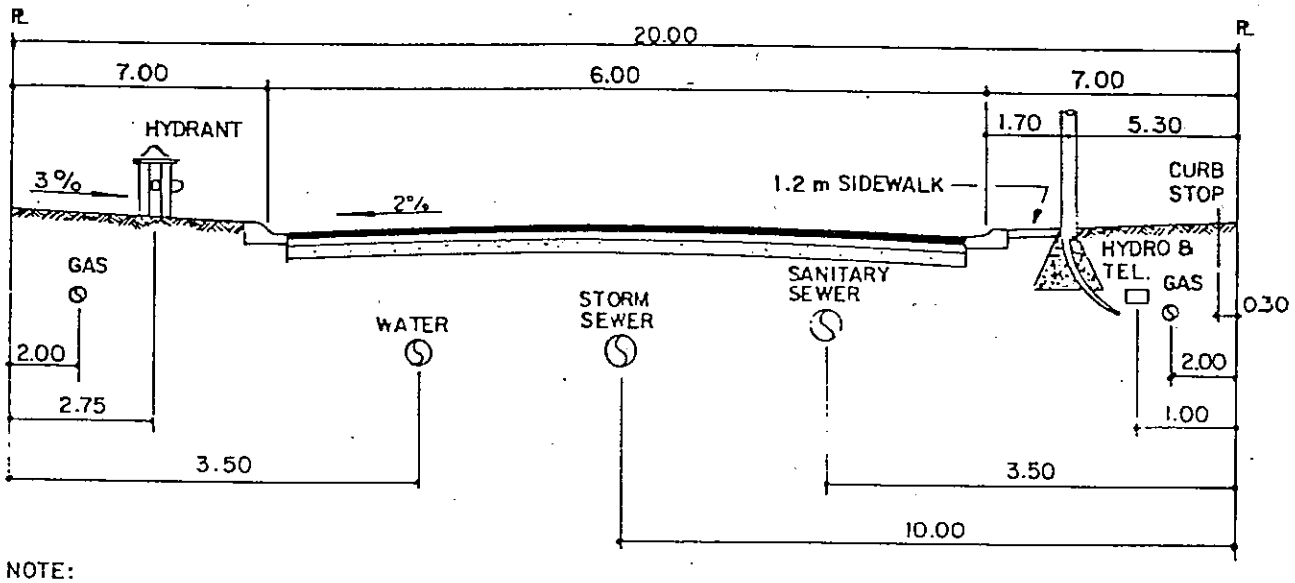
VILLAGE OF PORT CLEMENTS

CUL-DE-SAC ROAD, URBAN

REV'N	DATE	DATE	APPROVED	DWG Nº RIA



NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. SIDEWALK ONE SIDE ONLY.
3. ROLLED TYPE CURB TO BE USED WHERE RESIDENTIAL PROPERTIES FRONT ON STREET.
4. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 6.0 LUX.
5. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

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VILLAGE OF PORT CLEMENTS

MAJOR LOCAL ROAD - URBAN

REV'N	DATE	DATE	APPROVED	DWG Nº
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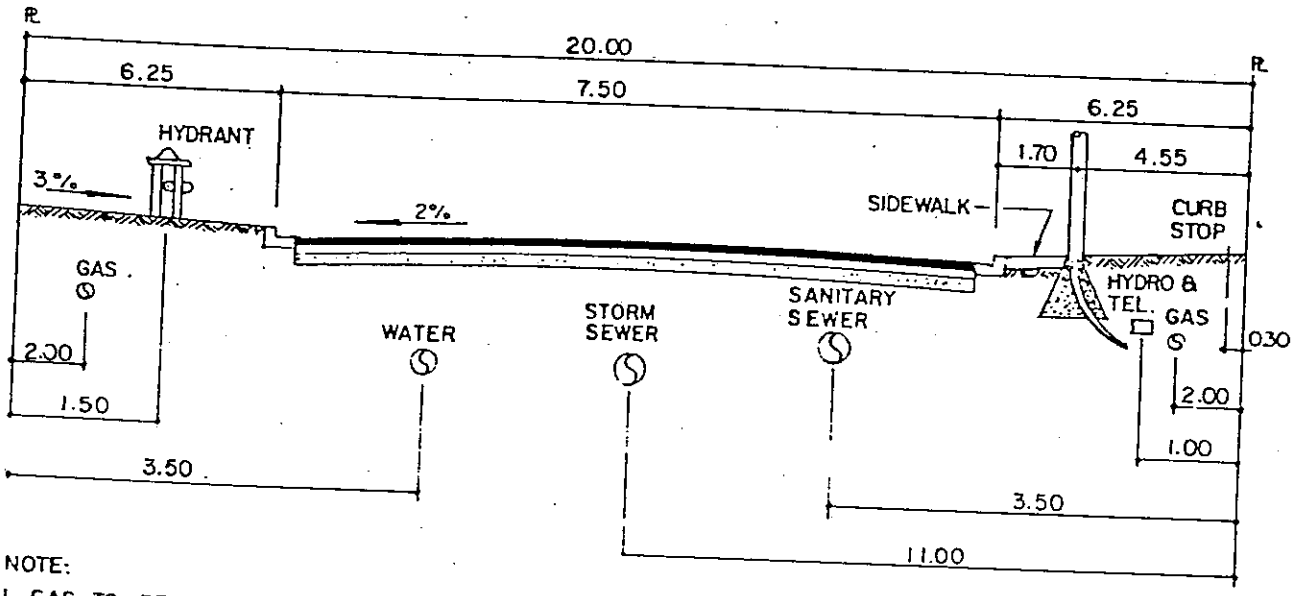

NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. SIDEWALK ONE SIDE ONLY, OR BOTH SIDES WHERE MULTIPLE RESIDENTIAL FRONT BOTH SIDES OF STREET.
3. BARRIER TYPE CURB.
4. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 10.0 LUX
5. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

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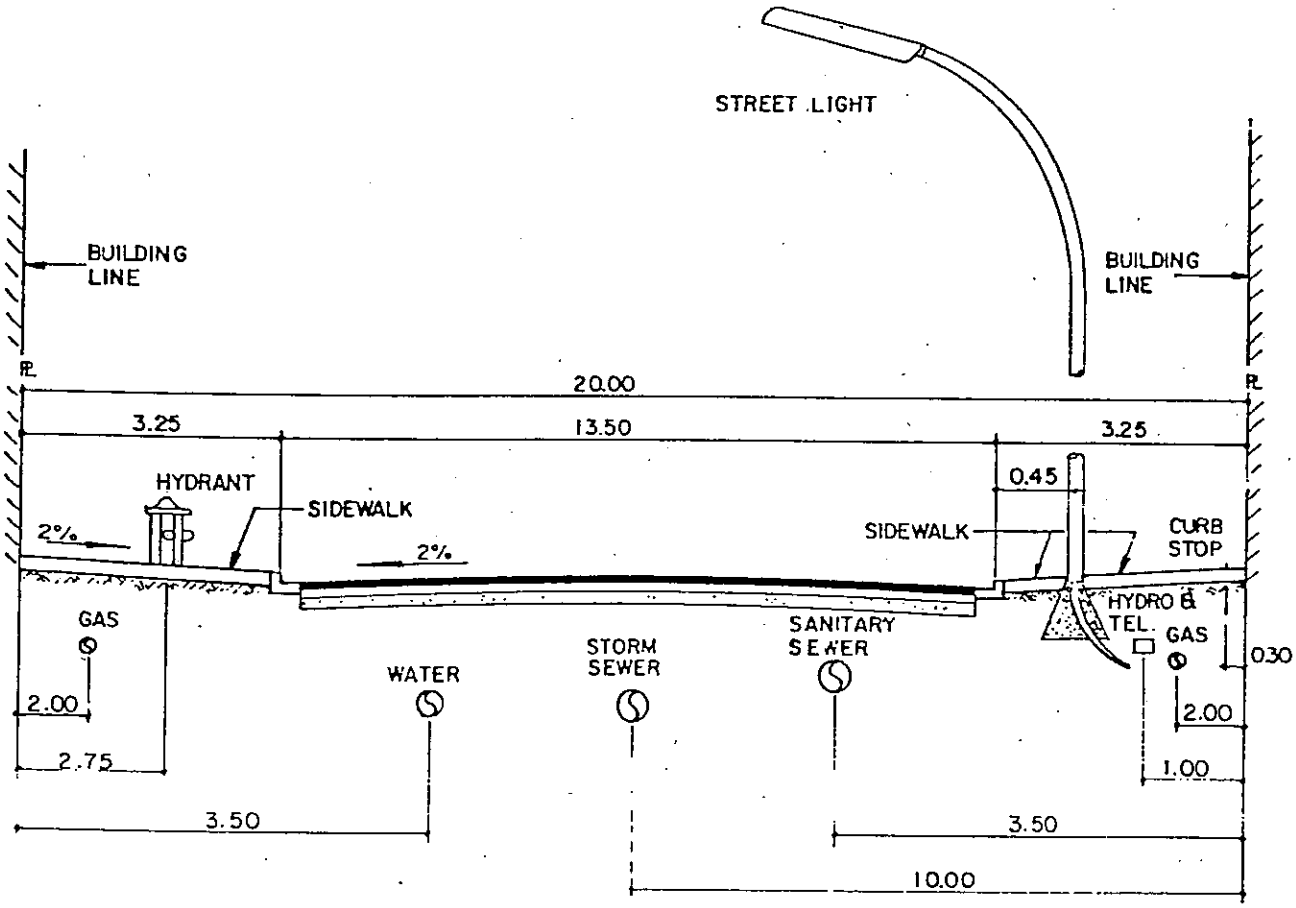
REV,N	DATE	DATE	APPROVED	DWG Nº

VILLAGE OF PORT CLEMENTS

COLLECTOR URBAN



NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. SIDEWALK ON BOTH SIDES OF STREET
3. BARRIER TYPE CURB.
4. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 10.0 LUX.
5. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

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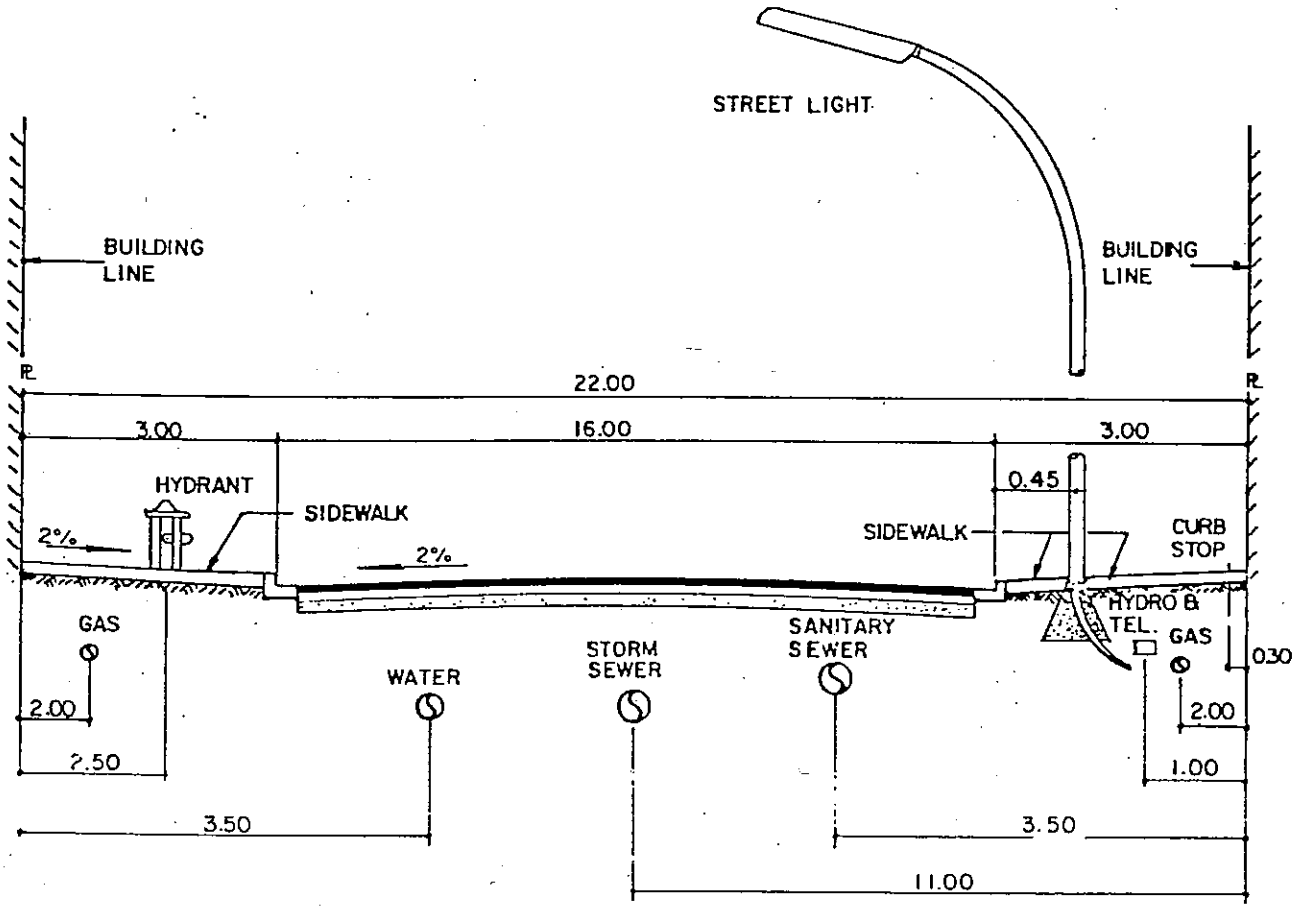
VILLAGE OF PORT CLEMENTS

MINOR COMMERCIAL – 13.5 m.
(SPECIAL APPROVAL REQUIRED)

REV'N	DATE	DATE	APPROVED	DWG Nº R4



NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. SIDEWALK ON BOTH SIDES OF STREET
3. BARRIER TYPE CURB.
4. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 13.0 LUX.
5. UNDERGROUND WIRING AS DIRECTED BY THE APPROVING OFFICER.

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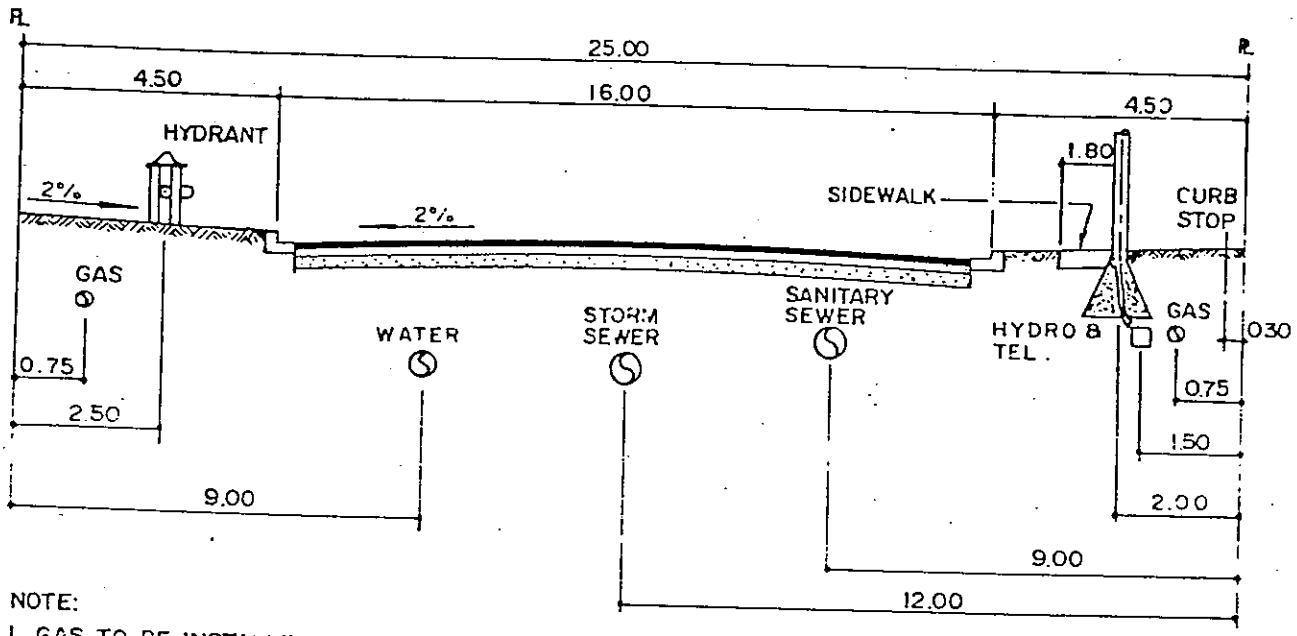
VILLAGE OF PORT CLEMENTS

MAJOR COMMERCIAL - 16.0 m.

REV.N	DATE	DATE	APPROVED	DWG Nº R5



NOTE:

1. GAS TO BE INSTALLED ON BOTH SIDES OF STREET.
2. SIDEWALK ONE SIDE ONLY, OR BOTH SIDES WHERE COMMERCIAL OR MULTIPLE RESIDENTIAL FRONT BOTH SIDES OF STREET.
3. BARRIER TYPE CURB ONLY
4. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 13.0 LUX.
5. UNDERGROUND WIRING REQUIRED AS DIRECTED BY THE APPROVING OFFICER.

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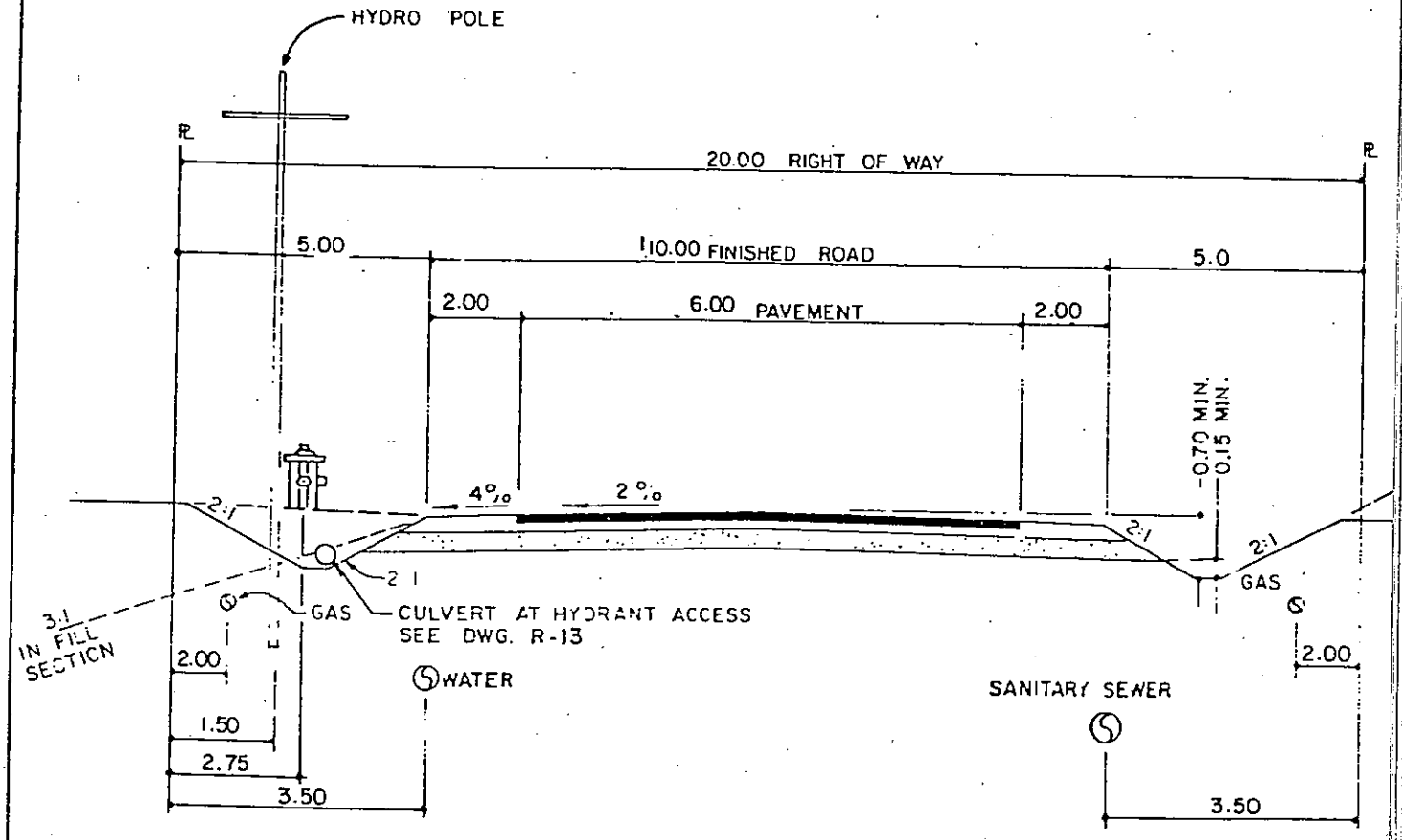
VILLAGE OF PORT CLEMENTS

ARTERIAL – 4 LANE UNDIVIDED

REV.N	DATE	DATE	APPROVED	DWG Nº
				R 6



NOTE:

1 MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 6 0 LUX.

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VILLAGE OF PORT CLEMENTS

LOCAL

REV,N	DATE	DATE	APPROVED	DWG Nº R7

Stanley

STANLEY ASSOCIATES ENGINEERING LTD

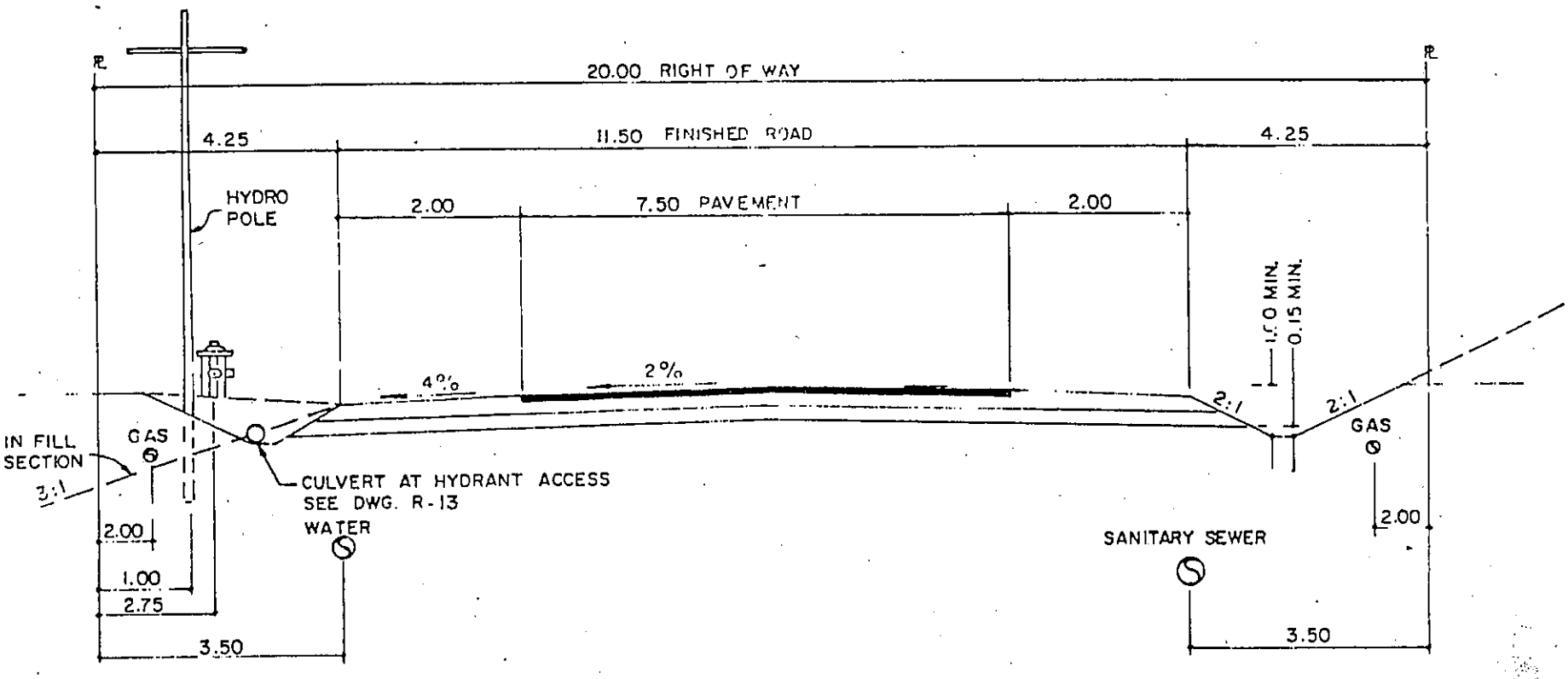
REV'N	DATE

DATE	APPROVED

VILLAGE OF PORT CLEMENTS

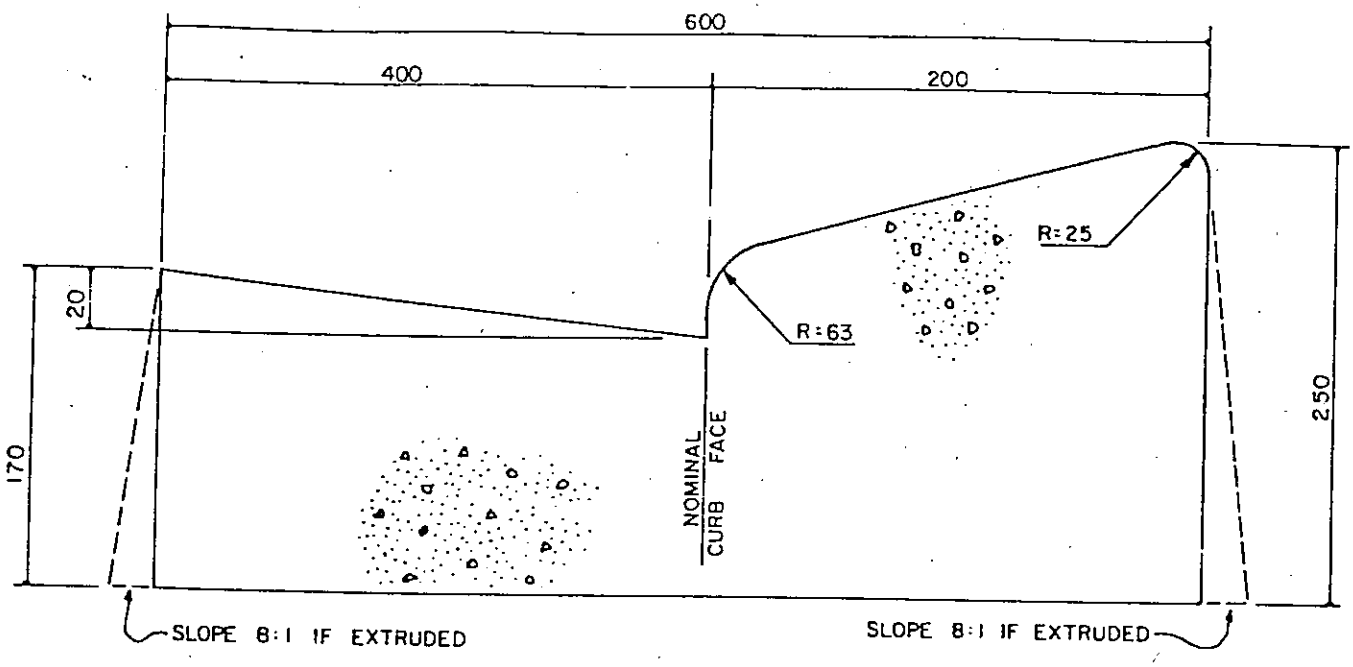
COLLECTOR

DWG. Nº R 8

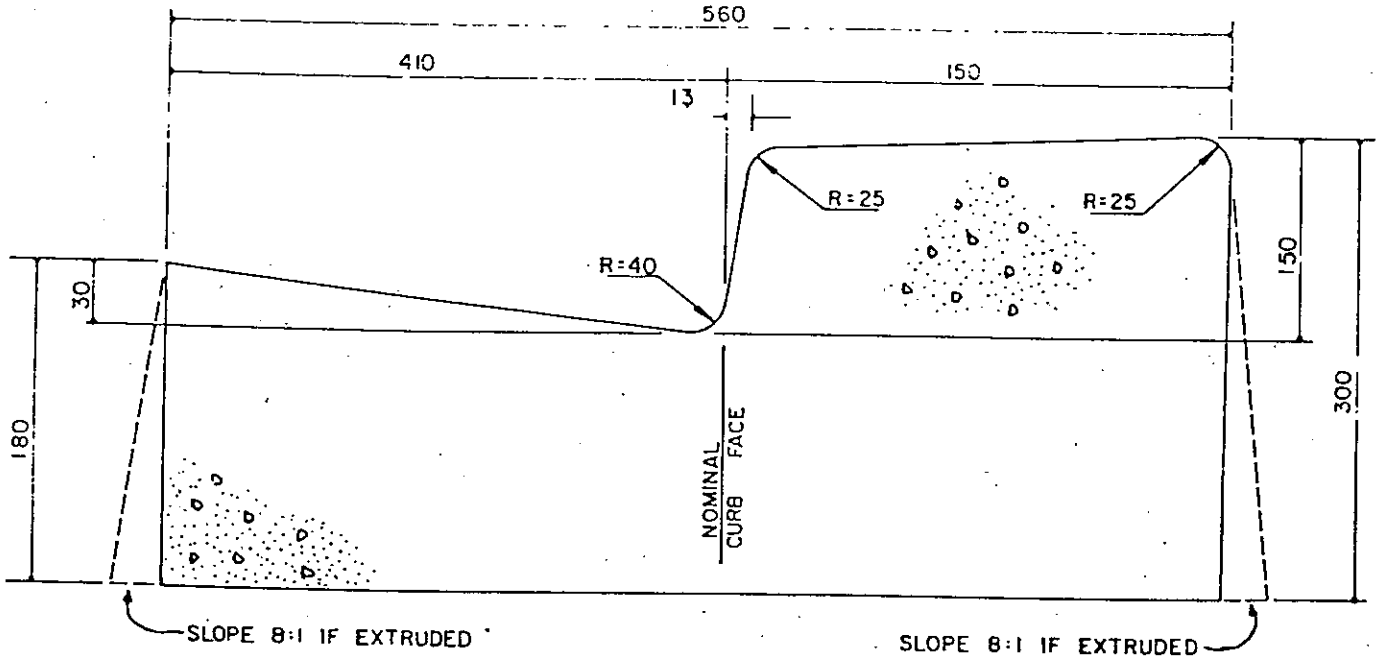


NOTE:

1. MINIMUM AVERAGE MAINTAINED HORIZONTAL ILLUMINATION = 11.0 LUX.



ROLLED CURB AND GUTTER
n.t.s.



BARRIER CURB AND GUTTER
n.t.s.

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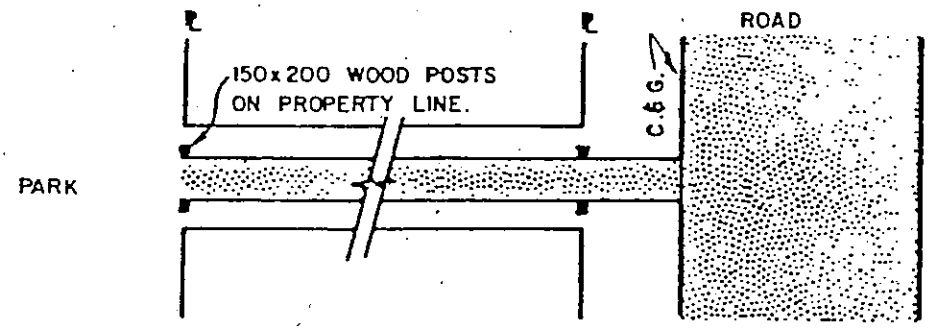
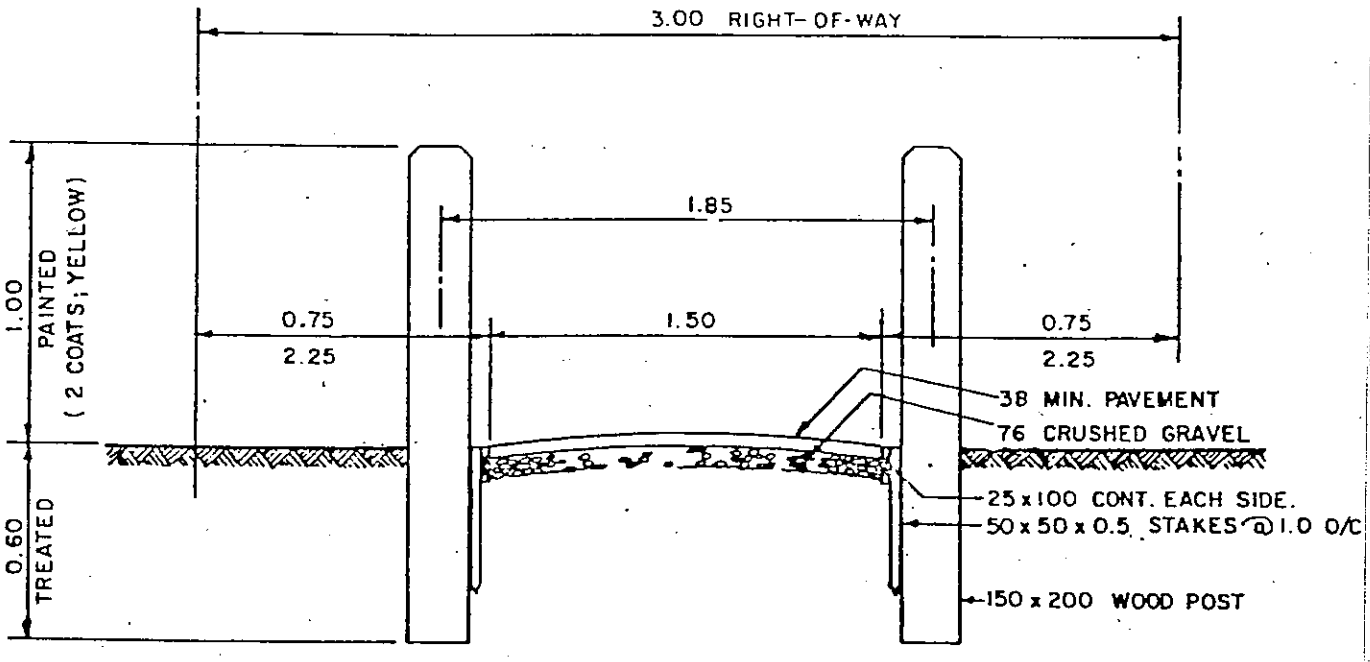
REV.N	DATE	DATE	APPROVED	DWG Nº
				R9

VILLAGE OF PORT CLEMENTS

CURB AND GUTTER



PLAN



SECTION

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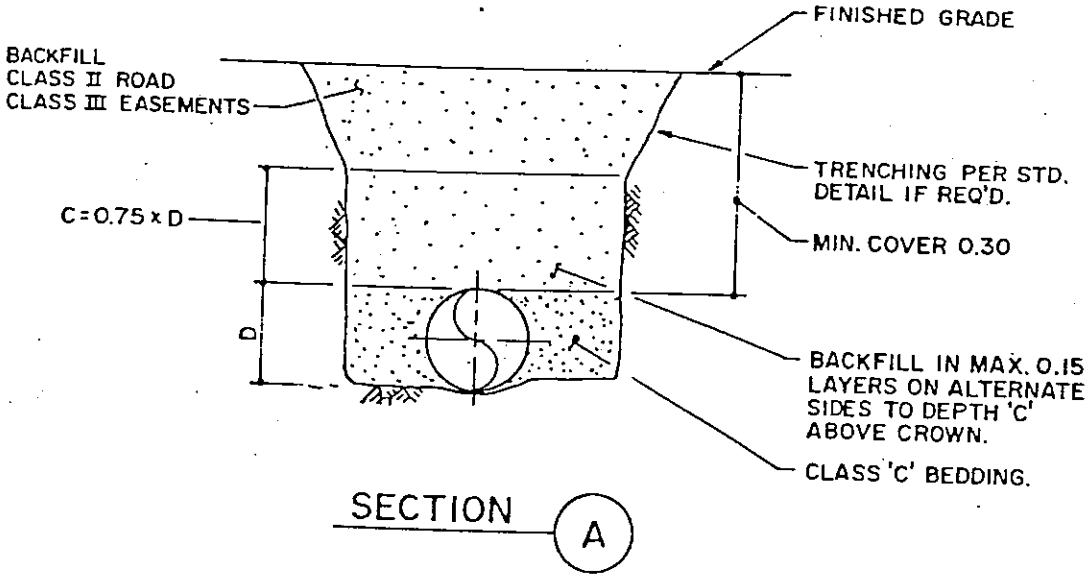
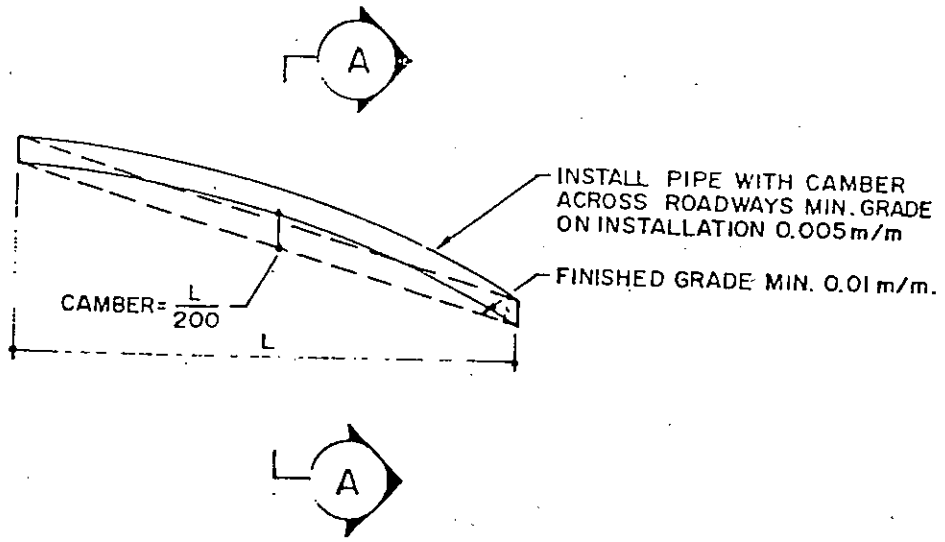
VILLAGE OF PORT CLEMENTS

PAVED WALKWAY

REV.N	DATE	DATE	APPROVED	DWG No. R 10

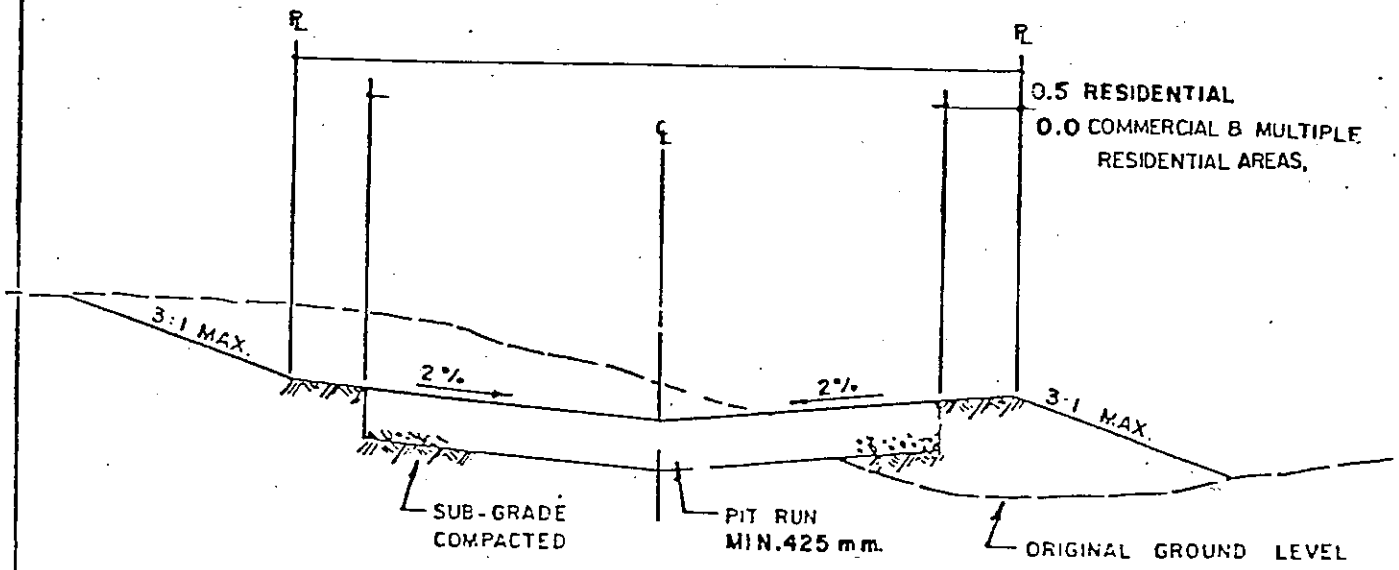


SECTION A



ELEVATION

Stanley STANLEY ASSOCIATES ENGINEERING LTD.			VILLAGE OF PORT CLEMENTS		
			CULVERT INSTALLATION		
	REV,N	DATE	DATE	APPROVED	DWG No. R 11



NOTES:

1. SIDE SLOPES IN CUT & FILL TO BE DONE AT TIME OF SUBDIVISION ROUGH GRADING.
2. DESIGN OF ROAD STRUCTURE TO SUIT LOCAL CONDITIONS.
3. PAVING OPTIONAL

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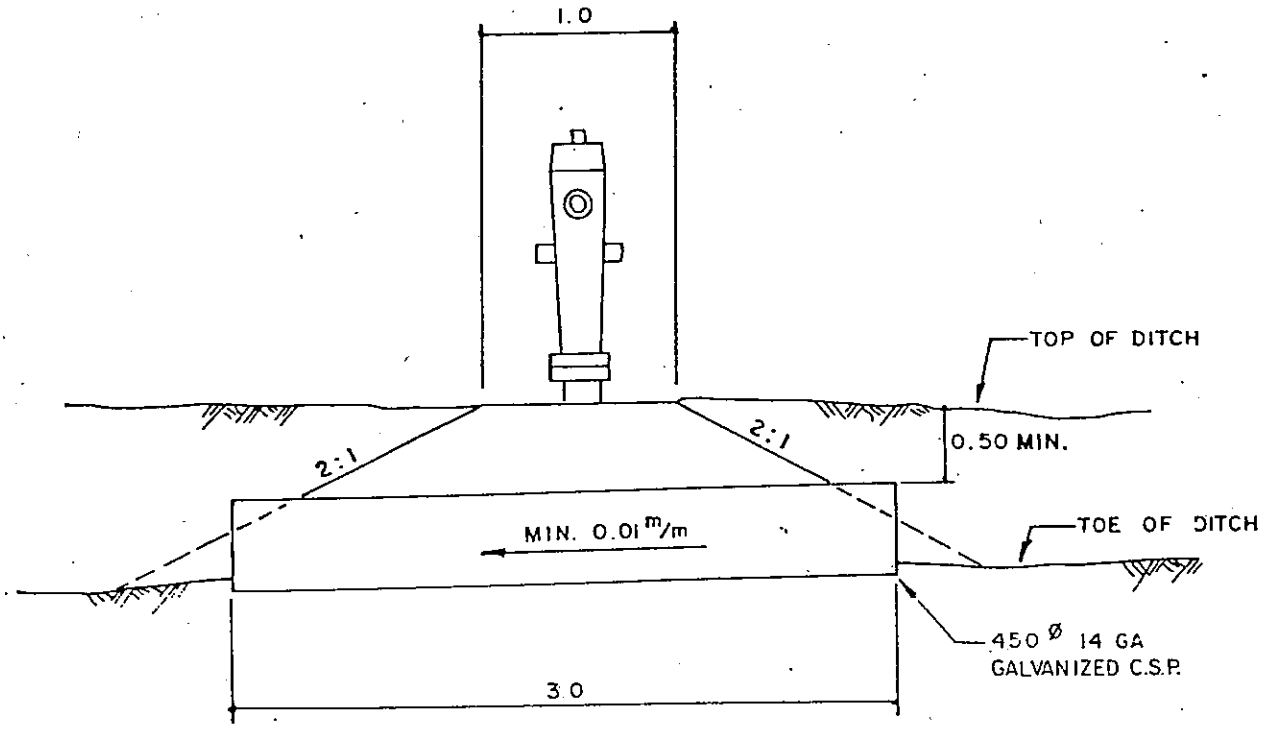
VILLAGE OF PORT CLEMENTS

LANE

REVN	DATE	DATE	APPROVED	DWG. No. R 12



ELEVATION

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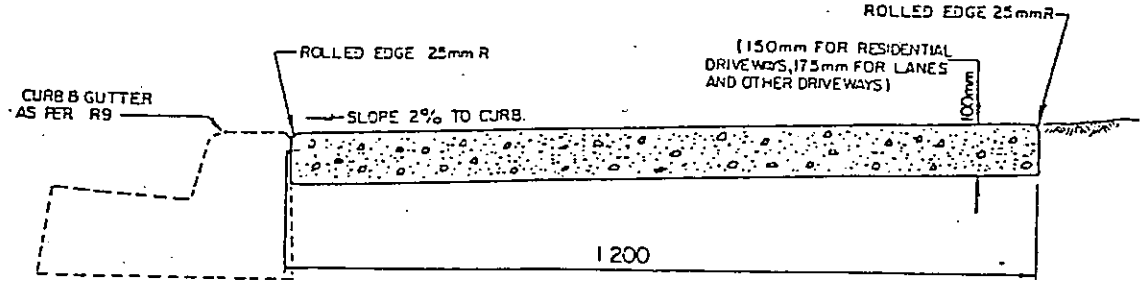
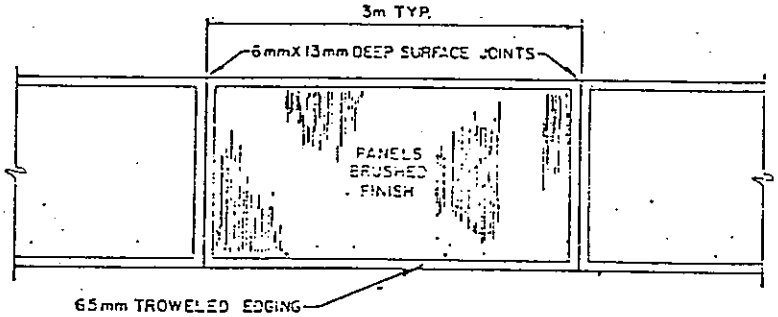
VILLAGE OF PORT CLEMENTS

HYDRANT ACCESS PATH
(RURAL ROADS)

REV N	DATE	DATE	APPROVED	DWG. No.
	1			R 13



X-SECTION



PLAN

NOTES:

1. SUB-BASE AND BASE GRAVELS TO BE AS SPECIFIED FOR ADJACENT ROAD AND SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
2. SIDEWALK SHALL BE EXTRUDED OR FORMED.
3. CONCRETE SHALL CONFORM TO C.S.A. A23.1 EXPOSURE CLASS A (5-7% ENTRAINED AIR & W/C = 0.45) 28 MPa.
4. ALIGNMENT TOLERANCES ± 3mm IN ANY 3m SECTION.
5. TRANSVERSE CONTRACTION JOINTS SHALL BE AT 3m C/C USING SURFACE GROOVING TOOL AND SHALL BE STRAIGHT AND PERPENDICULAR TO RADIUS.
6. FULL DEPTH X FULL WIDTH X 15mm WIDE EXPANSION JOINT TO BE PLACED AT THE BEGINNING AND END OF EACH CURB RETURN
7. WITH ROLLED CURB, SIDEWALK DEPTH TO BE 150mm THROUGHOUT.

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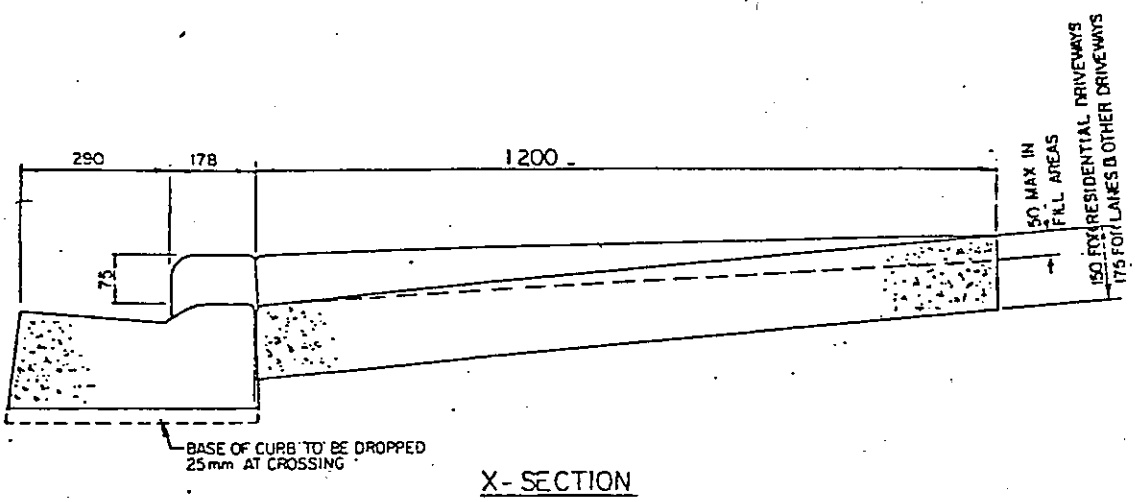
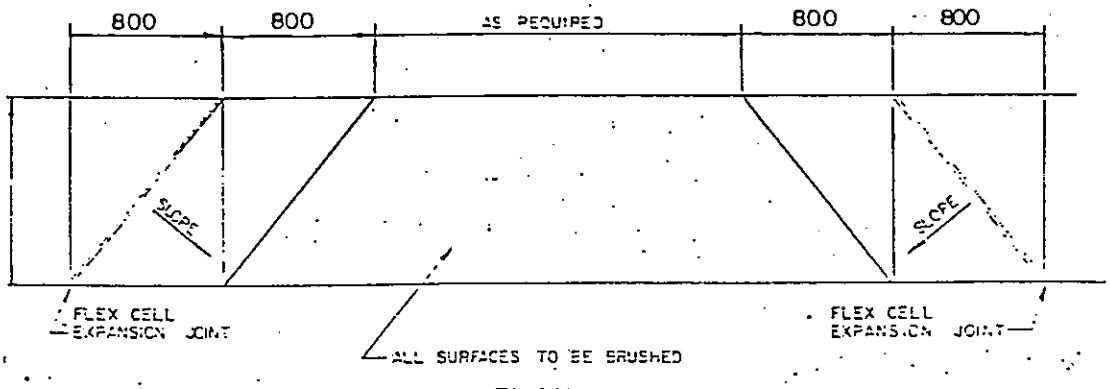
VILLAGE OF PORT CLEMENTS

SEPARATE SIDEWALK

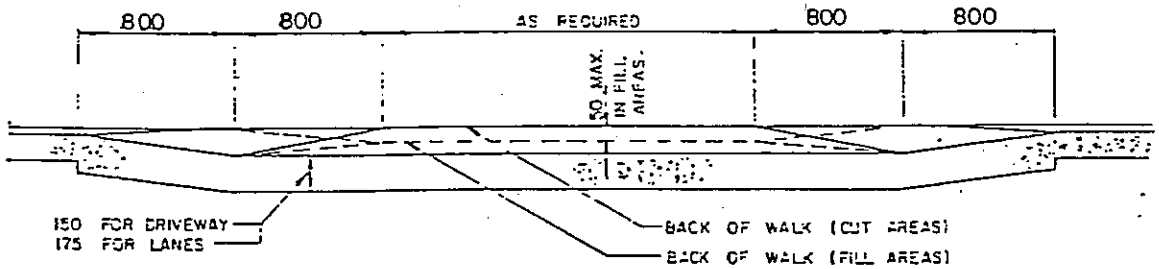
REV'N	DATE	DATE	APPROVED	DWG.NO.
		MAY '89		R14



X-SECTION



PLAN



ELEVATION

NOTES:
(1) SUB-BASE SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY
(2) BASE SHALL BE CRUSHED GRAVEL, COMPACTED TO 100% STANDARD PROCTOR DENSITY
(3) CURB & GUTTER OR CURB & GUTTER WITH SIDEWALK SHALL BE EXTRUDED OR FORMED
(4) CONCRETE SHALL CONFORM TO CSA A 23.1 EXPOSURE CLASS A (ENTRAINED AIR 5 W/C=0.45) 28 MPa
(5) ALIGNMENT TOLERANCES = 3 mm IN ANY 3000 SECTION.
(6) TRANSVERSE CONTRACTION JOINTS SHALL BE AT 3000 mm c/c USING SURFACE GROOVING TOOL.
(7) ALL CONTRACTION AND EXPANSION JOINTS SHALL BE STRAIGHT.
(8) NO EXPANSION JOINT IN CROSSING.

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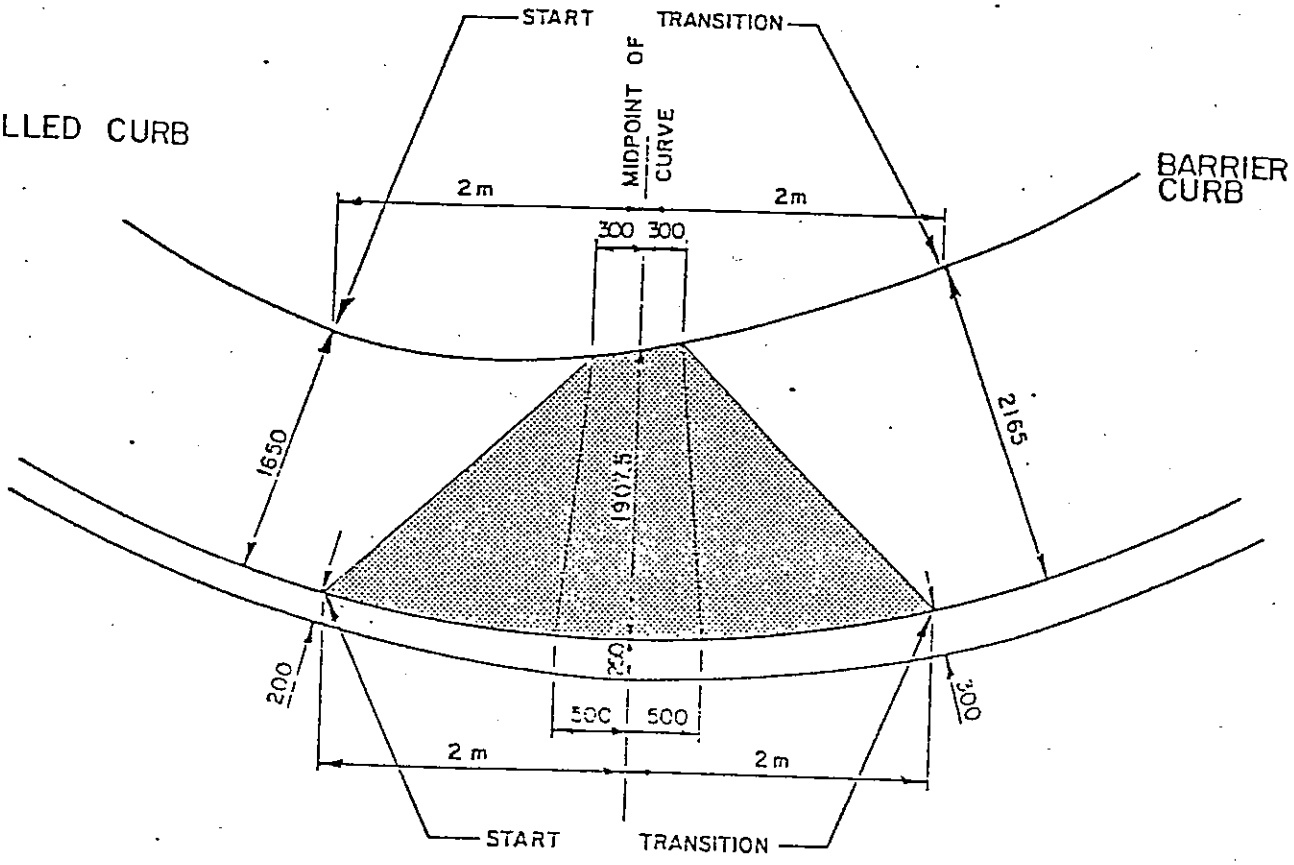
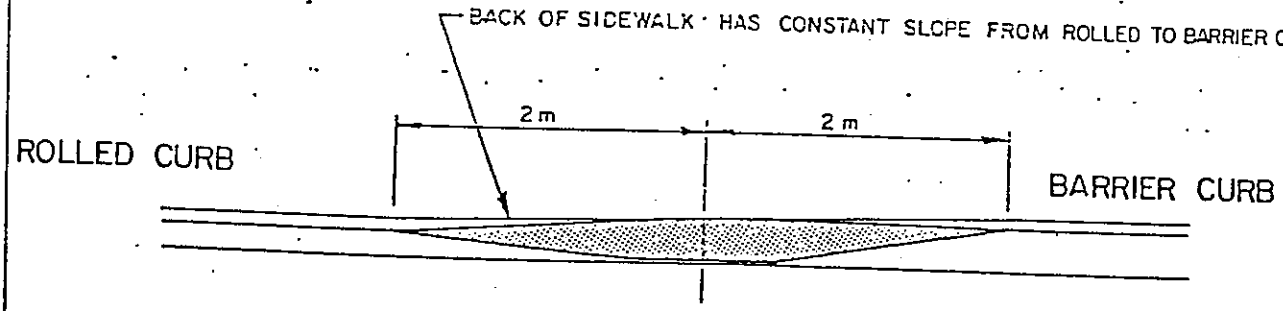
VILLAGE OF PORT CLEMENTS

SIDEWALK CROSSING FOR BARRIER CURB

REV'N	DATE	DATE	APPROVED	DWG.NO.
				R15



PLAN



FRONT ELEVATION

NOTE USE 1/2 ROLLED CURB & 1/2 BARRIER CURB TO FORM TRANSITION BETWEEN CURBS

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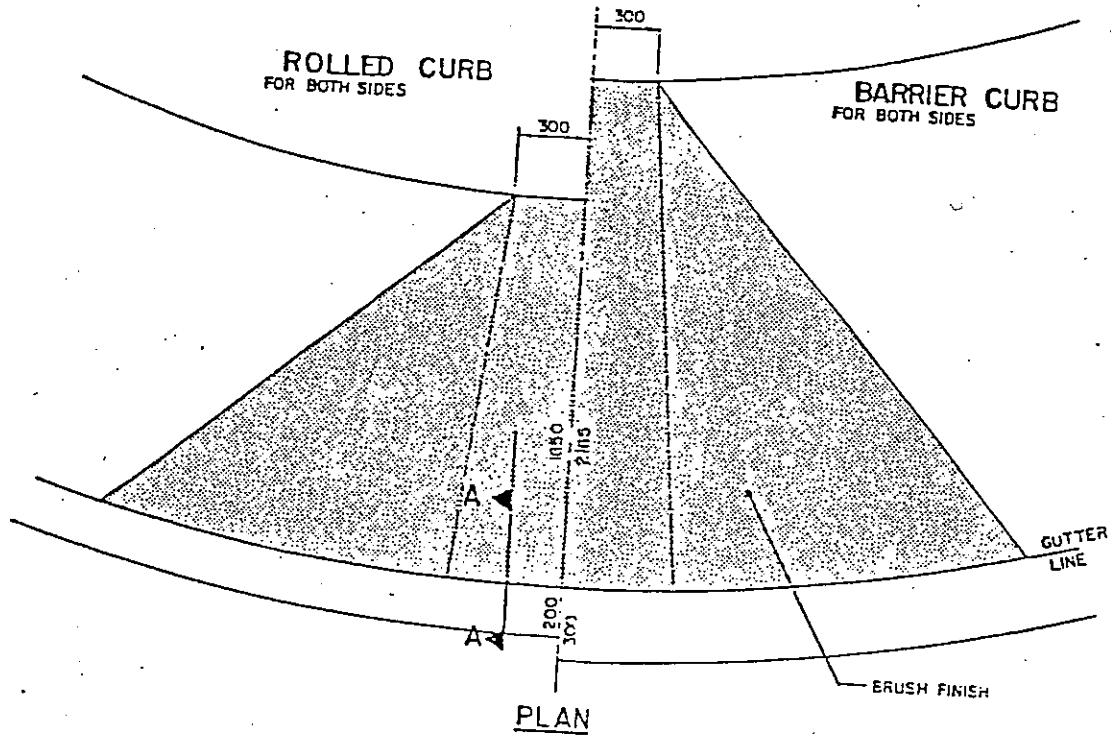
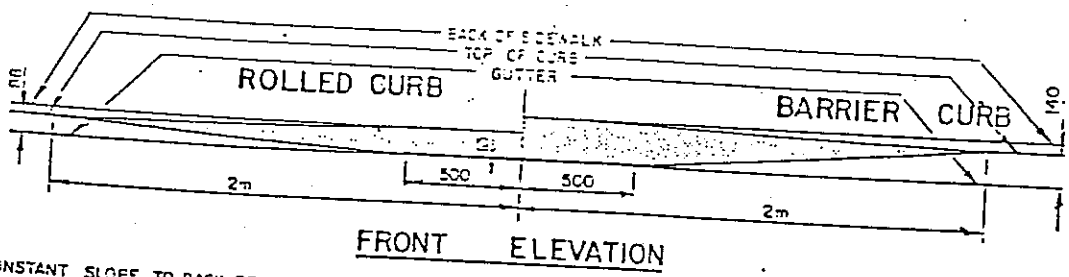
VILLAGE OF PORT CLEMENTS

TRANSITION CURB

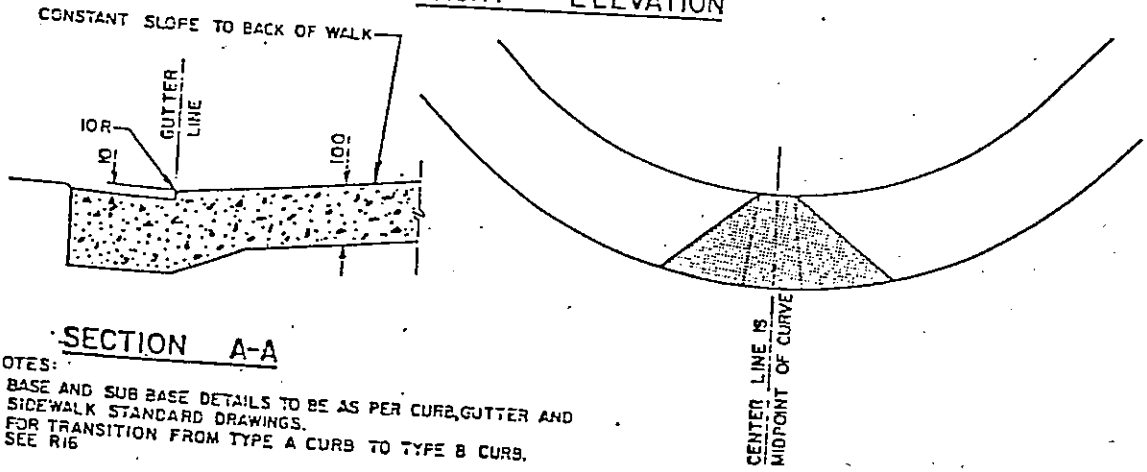
REV'N	DATE	DATE	APPROVED	DWG.NO. R16



PLAN



FRONT ELEVATION



SECTION A-A

NOTES:

1. BASE AND SUB BASE DETAILS TO BE AS PER CURB, GUTTER AND SIDEWALK STANDARD DRAWINGS.
2. FOR TRANSITION FROM TYPE A CURB TO TYPE B CURB, SEE R16

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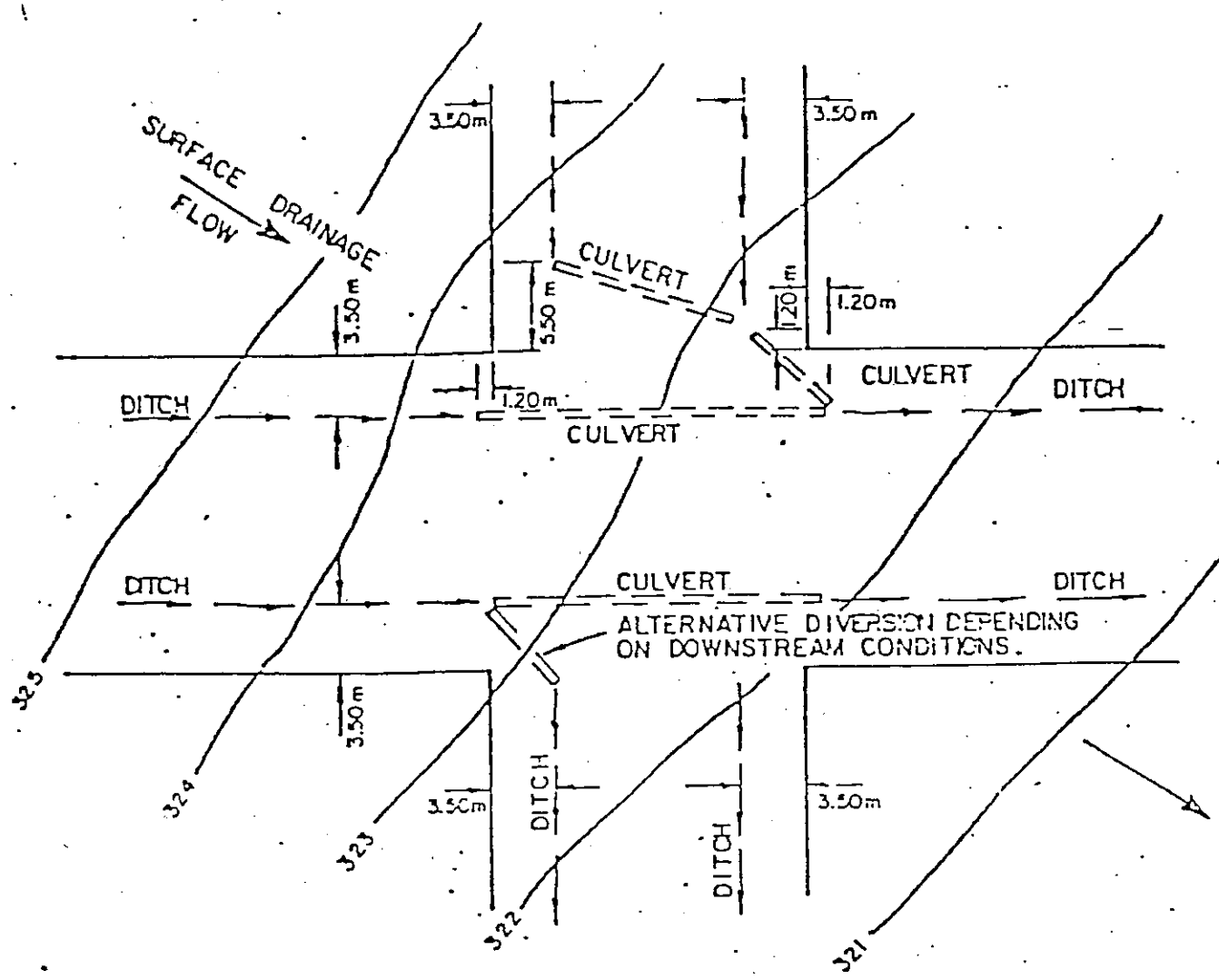
VILLAGE OF PORT CLEMENTS

WHEELCHAIR RAMP

REV'N	DATE	DATE	APPROVED	DWG. NO.
				R17



NOTES:

1. MINIMUM DIAMETER FOR ALL CULVERT PIPE TO BE 300 mm
2. APPROVED PIPE: (i) GALVANIZED CORRUGATED STEEL WITH RIVETED OR LOCK SEAMS, GAUGES AS SPECIFIED UNDER MATERIALS
   (ii) CONCRETE WITH GASKETS AS SPECIFIED UNDER MATERIALS.
3. SAND OR GRAVEL 125mm MINUS BEDDING REQUIRED FOR ALL CULVERT INSTALLATIONS
4. IF THE HORIZONTAL DIRECTION OF FLOW AT CULVERT INLETS AND OUTLETS EXCEEDS 30°, THE SANDBAG BULKHEADS REQUIRE CURVED WING WALLS TO FUNNEL THE FLOW.

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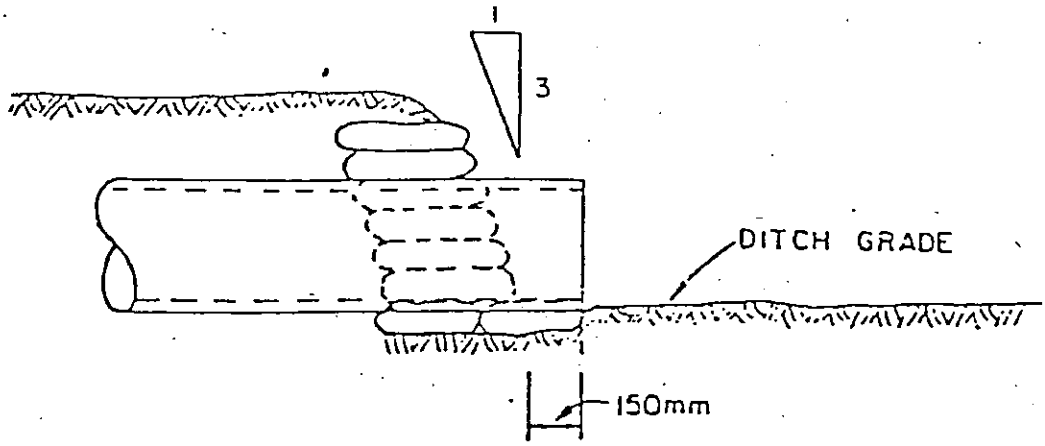
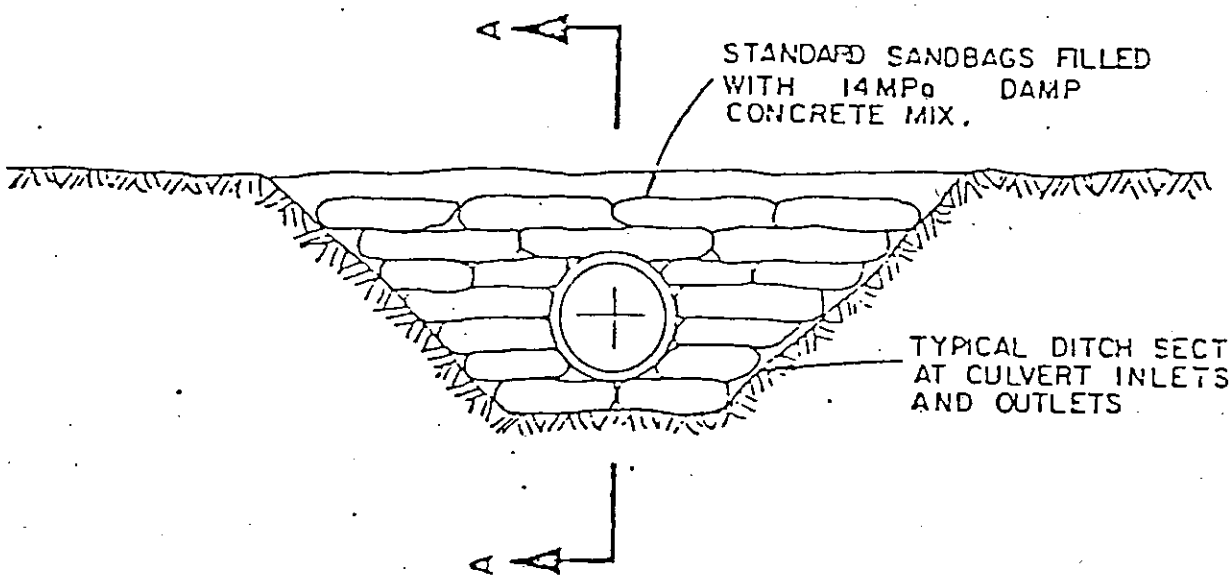
VILLAGE OF PORT CLEMENTS

TYPICAL CULVERT INSTALLATIONS

REV'N	DATE	DATE	APPROVED	DWG. NO. R18



SECTION A-A



ELEVATION

NOTES :

1. IF THE HORIZONAL DIRECTION OF FLOW AT CULVERT INLETS AND OUTLETS EXCEEDS 30°, THE SANDBAG BULKHEADS REQUIRE CURVED WING WALLS TO FUNNEL THE FLOW.

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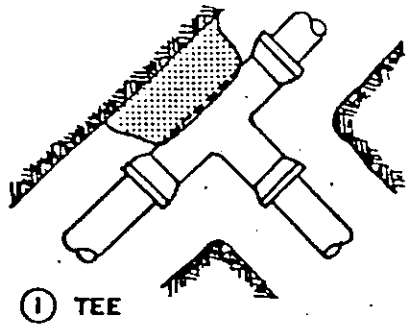
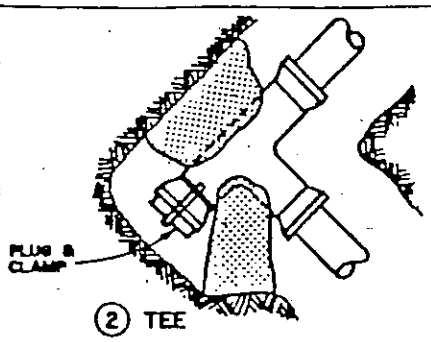
REV'N	DATE	DATE	APPROVED	DWG.NO
				R19

VILLAGE OF PORT CLEMENTS

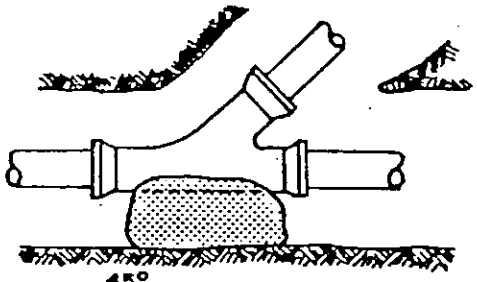
SANDBAG BULKHEAD FOR CULVERT INLETS AND OUTLETS



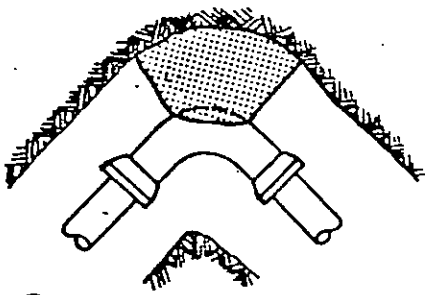
① TEE



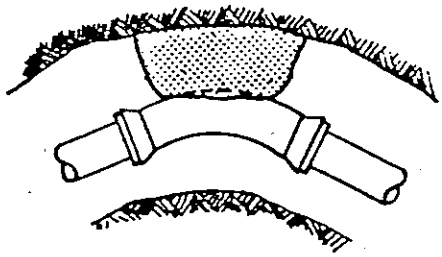
② TEE



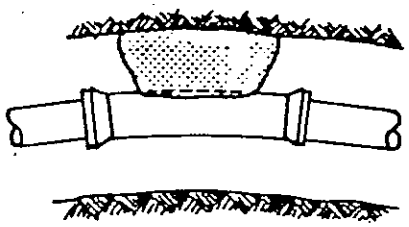
③ 45° WYE



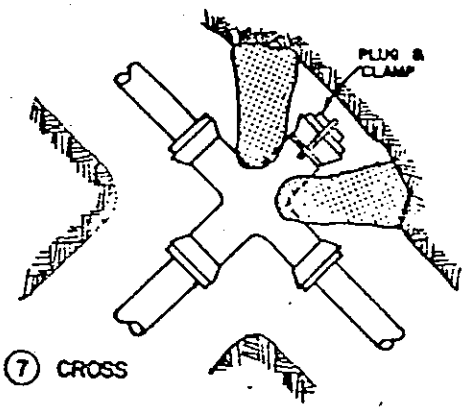
④ 90° BEND



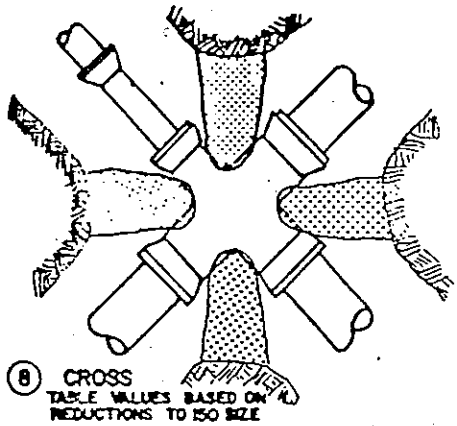
⑤ 45° BEND



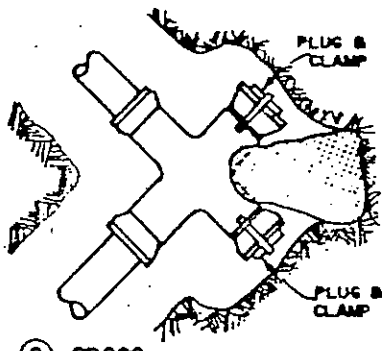
⑥ 22½° & 11¼° BEND



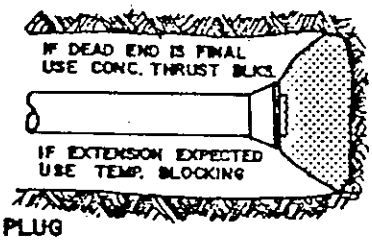
⑦ CROSS



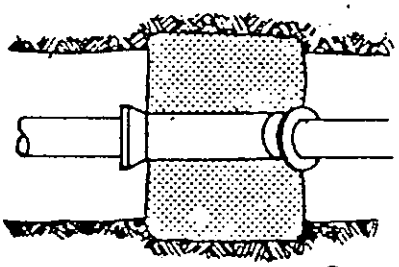
⑧ CROSS
TABLE VALUES BASED ON REDUCTIONS TO 150 SIZE



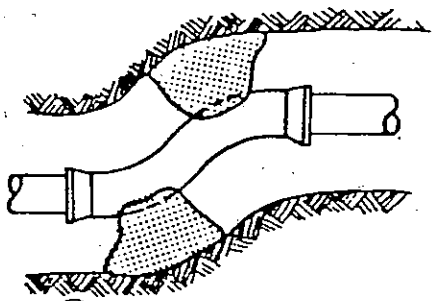
⑨ CROSS



⑩ PLUG



⑪ 45° VERTICAL SAG



⑫ OFFSET BEND

CONC. BEARING AREAS IN SQUARE METERS						
PIPE SIZE	100	150	200	250	300	400
1, 7, 10	0.2	0.4	0.7	1.0	1.4	1.9
2, 4, 9	0.3	0.5	0.9	1.4	2.0	2.6
3, 5, 11	0.1	0.3	0.5	0.6	1.0	1.4
6	0.1	0.1	0.3	0.4	0.6	0.7
8			0.2	0.5	0.7	1.6
12	0.3	0.6	1.0	1.2	2.2	2.9

NOTE: 1. DESIGN ASSUMPTIONS
a) HYDRAULIC HEAD = 1380 kPa
b) SOIL BEARING = 96 kPa (MED. SOFT CLAY)
2. TEMPORARY BLOCKING MUST BE APPROVED BY THE ENGINEER
3. FOR PIPE SIZES NOT IN TABLE, SEE SPECS.

150 MIN.

CONCRETE : 25 mPa @ 28 DAY STRENGTH (TYP.)

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VILLAGE OF PORT CLEMENTS

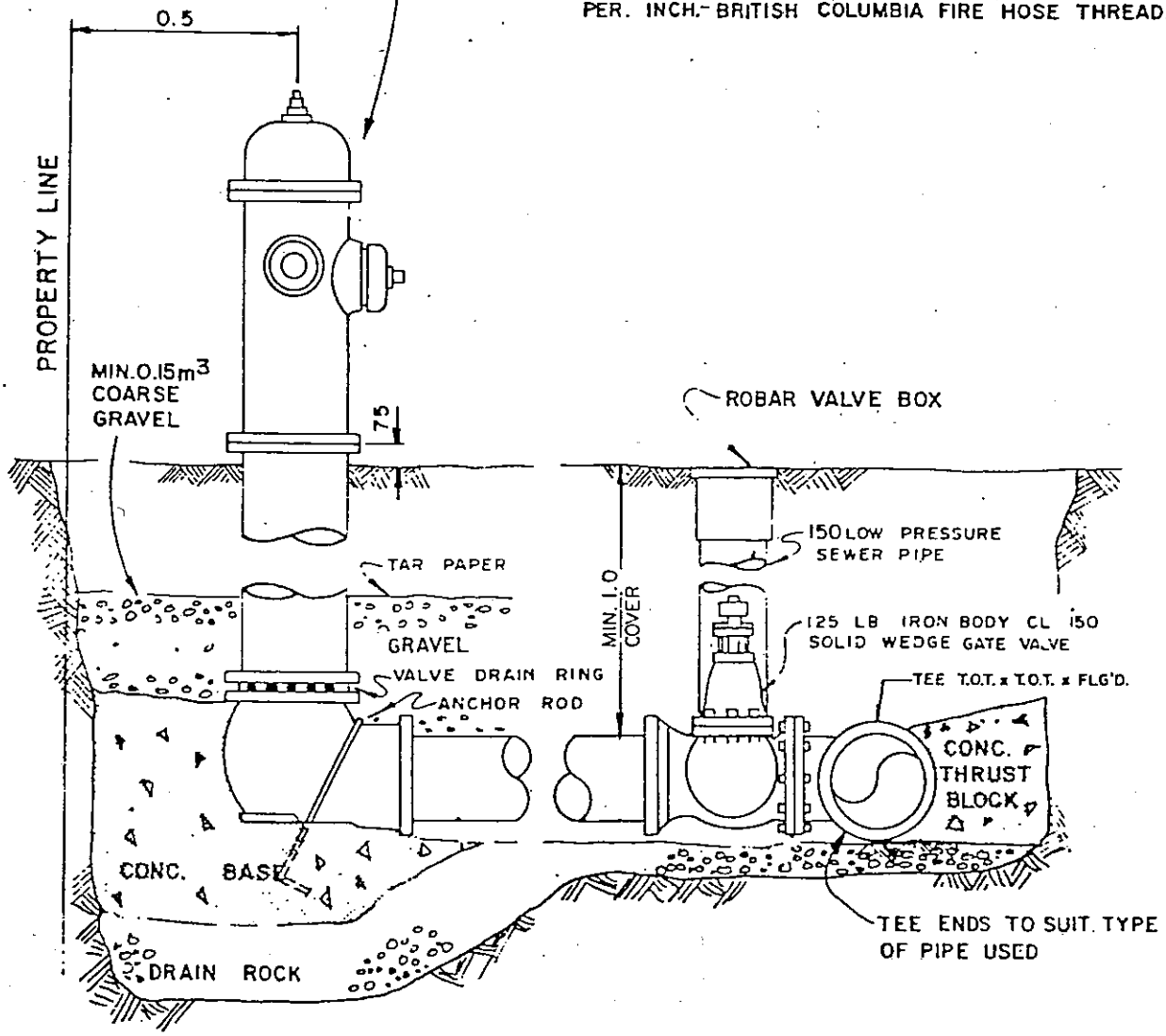
THRUST BLOCKS

REV.N	DATE	DATE	APPROVED	DWG. No. W1

FIRE HYDRANTS SHALL BE COMPRESSION TYPE AND SHALL CONTAIN:

A. PUMPER PORT - N.F.P.A. STANDARD 100 I.D & 125 O.D. - FOUR (4) THREADS PER. INCH AMERICAN NATIONAL FIRE HOSE COUPLING THREAD.

B. 2 HOSE OUTLETS - 63 Ø NOMINAL I.D - 8 THREADS PER. INCH - BRITISH COLUMBIA FIRE HOSE THREAD.



NOTES:

1. BEARING AREA OF THRUST BLOCK TO BE MIN. OF 0.5m²
2. DRAIN HOLES TO BE PLUGGED IN AREAS OF HIGH WATER TABLE.
3. HYDRANT TO BE INSTALLED WITH PUMPER PORT FACING STREET.

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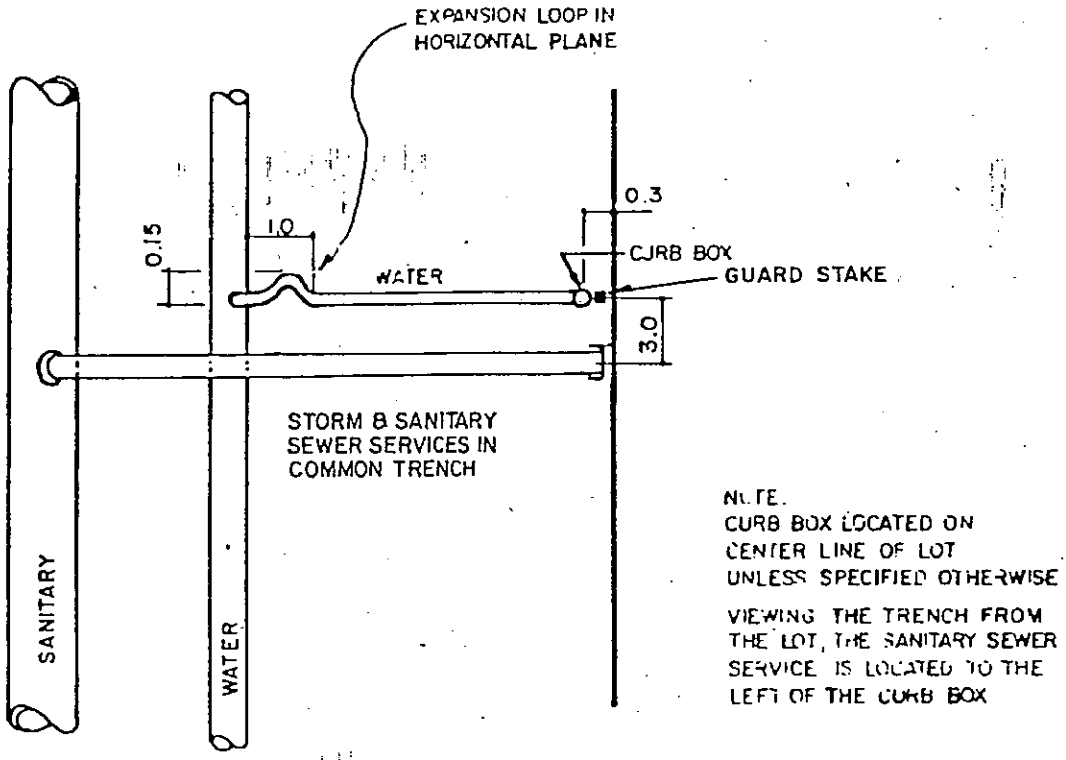
VILLAGE OF PORT CLEMENTS

FIRE HYDRANT ASSEMBLY

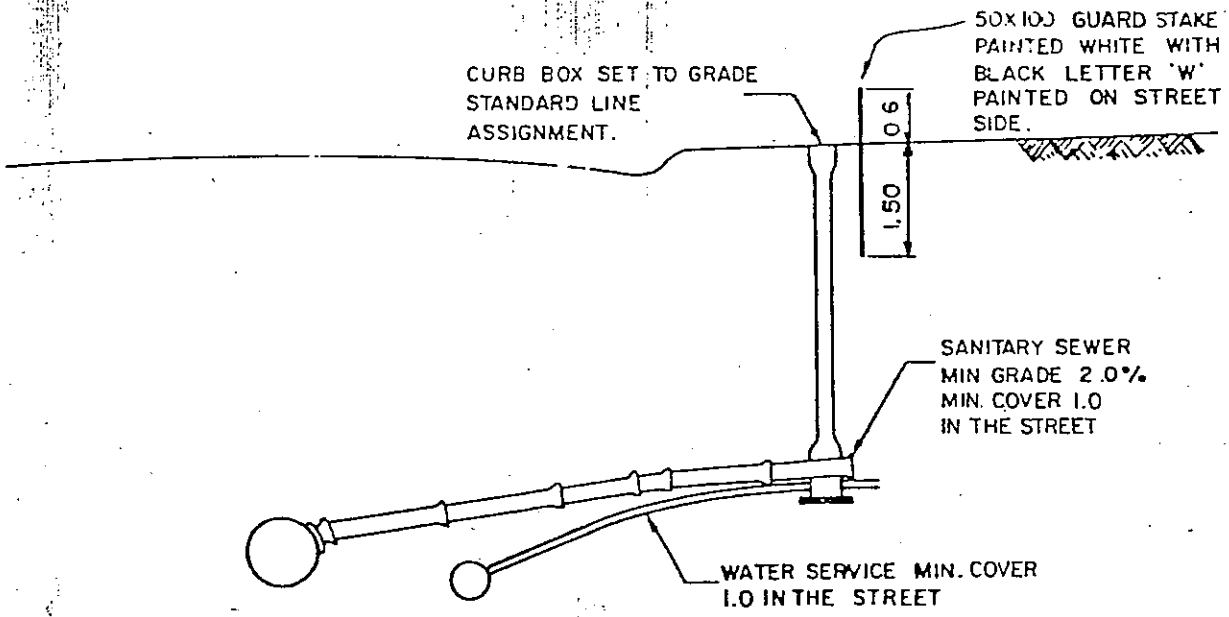
REV,N	DATE	DATE	APPROVED	DWG. No. W2



NOTE.
CURB BOX LOCATED ON CENTER LINE OF LOT UNLESS SPECIFIED OTHERWISE

VIEWING THE TRENCH FROM THE LOT, THE SANITARY SEWER SERVICE IS LOCATED TO THE LEFT OF THE CURB BOX

PLAN



ELEVATION

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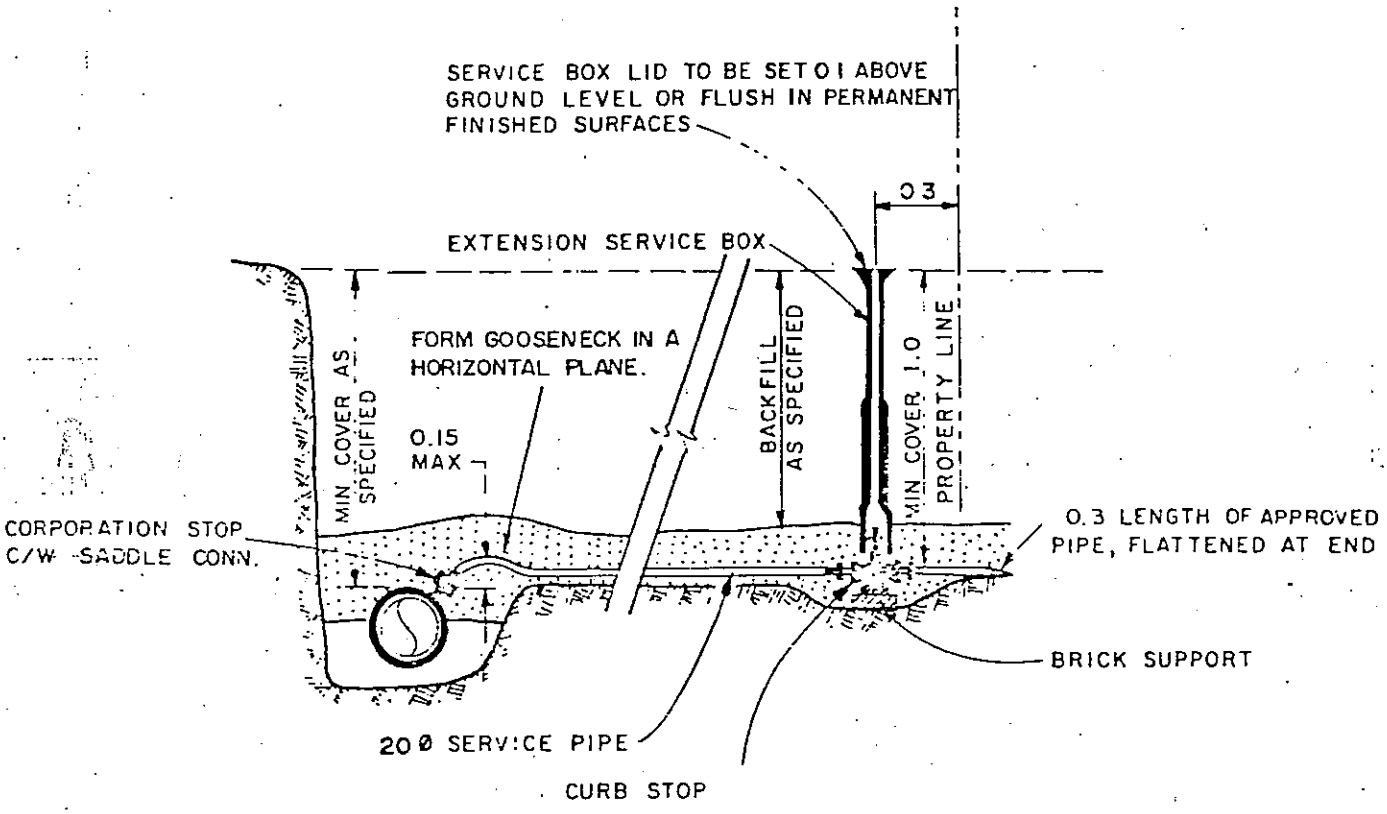
VILLAGE OF PORT CLEMENTS

SEWER & WATER SERVICES

REV.N	DATE	DATE	APPROVED	DWG. No. W 3



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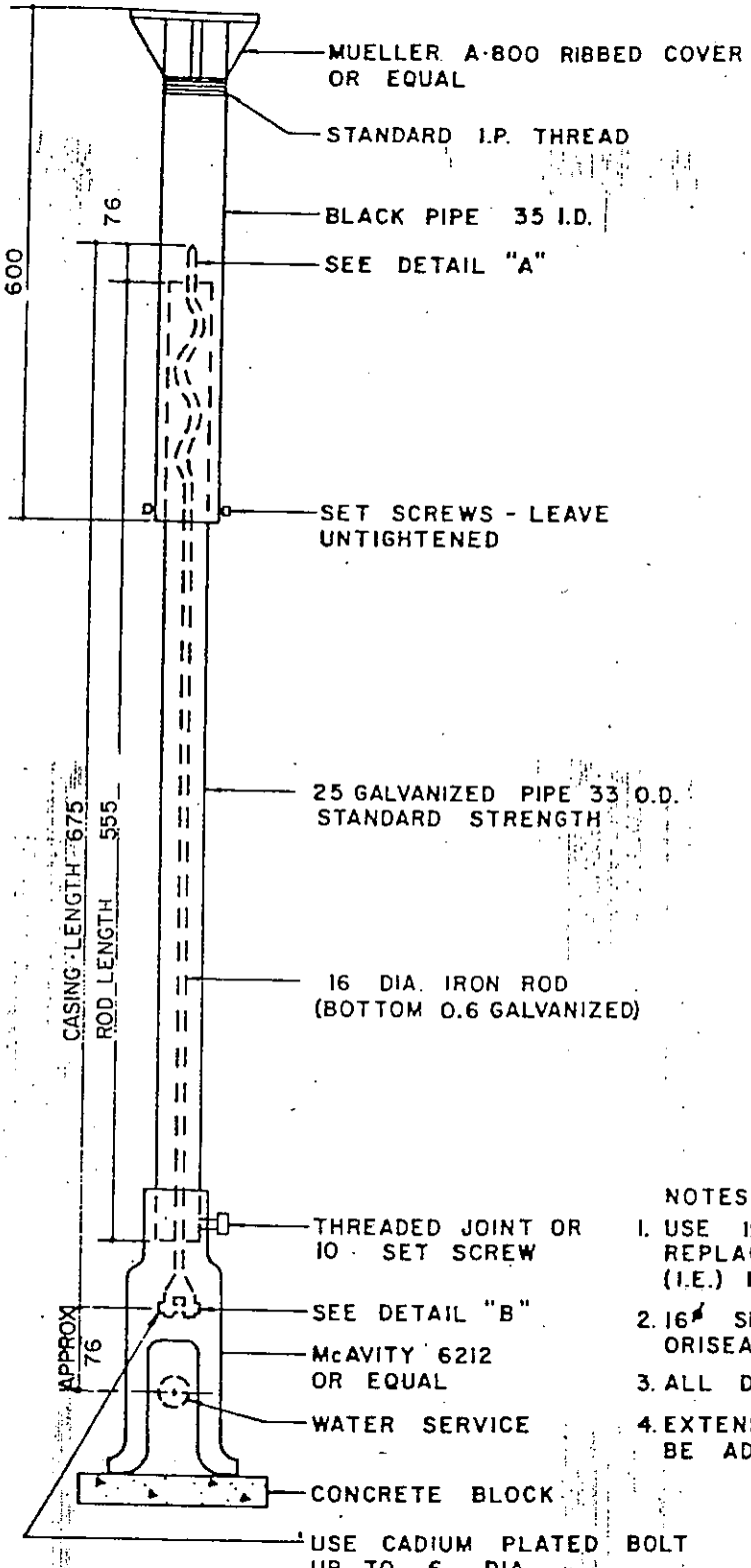
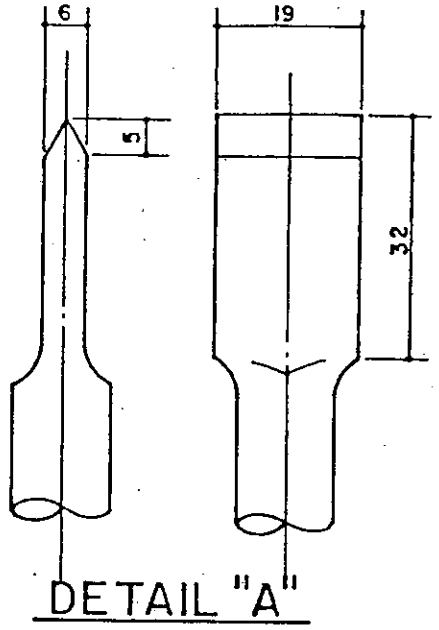
VILLAGE OF PORT CLEMENTS

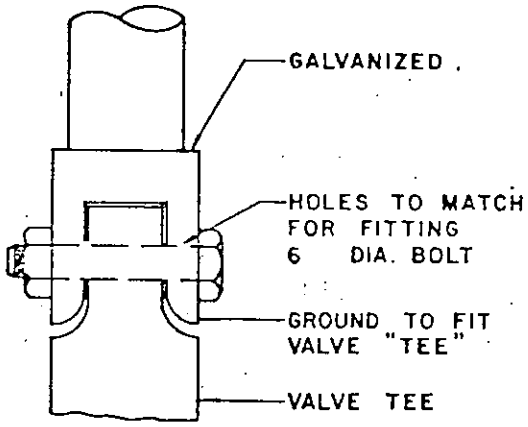
WATER SERVICE CONNECTION DETAIL

REV.N	DATE	DATE	APPROVED	DWG. No. W 4





DETAIL "A"



DETAIL "B"

NOTES:

1. USE 19ϕ STRAIGHT SERVICE RODS WHEN REPLACEMENT OF 16ϕ ROD IS REQUIRED (I.E.) FOR OLD CURB COCKS
2. 16ϕ SERVICE RODS TO BE USED FOR ORISEAL CURB COCKS.
3. ALL DIMENSIONS BASED ON 1.0m COVER
4. EXTENSION SERVICE BOX MUST BE ADJUSTABLE

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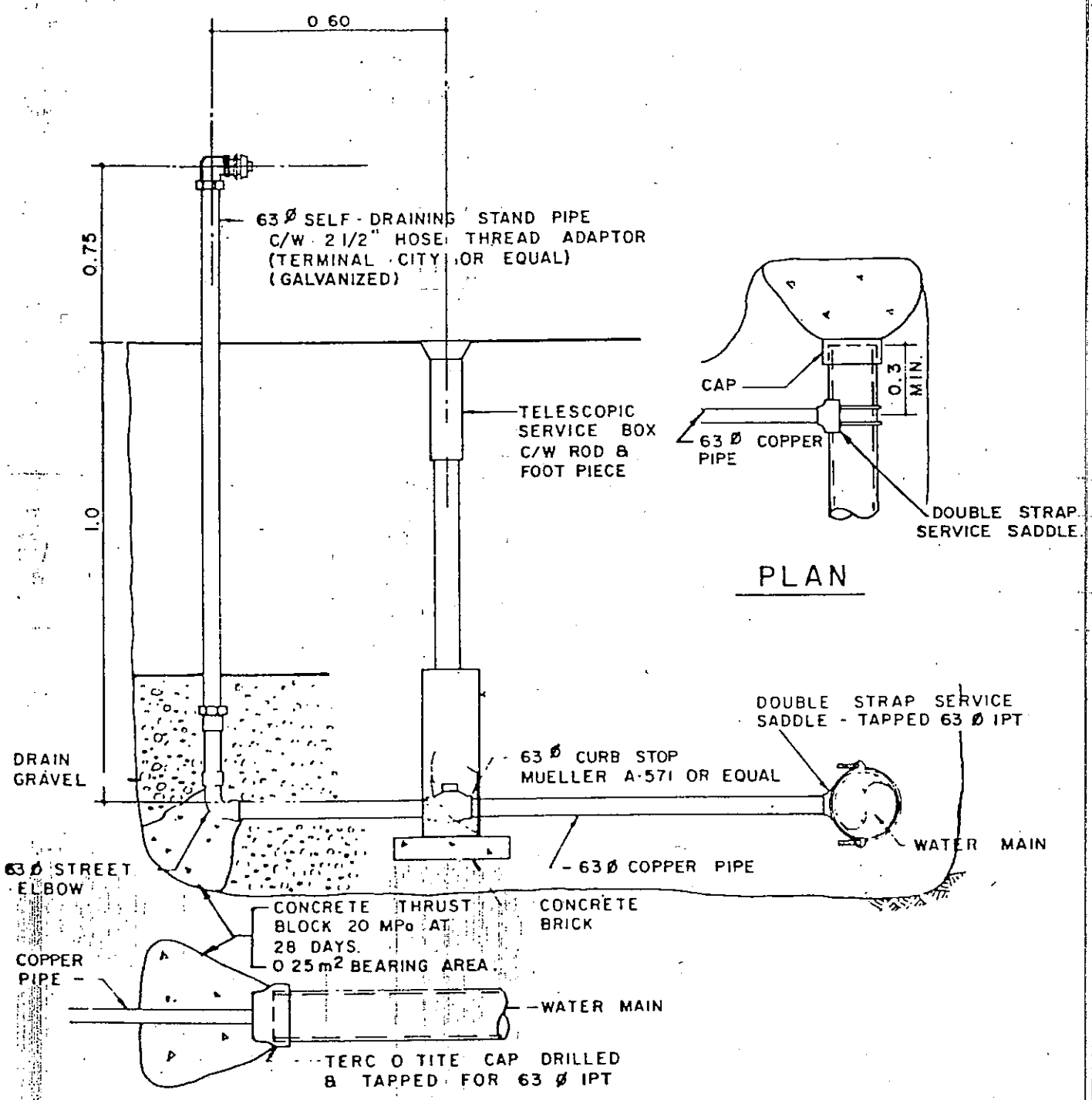
REV.N	DATE	DATE	APPROVED	DWG. No.

VILLAGE OF PORT CLEMENTS

EXTENSION SERVICE BOX DETAIL



ALT. END DETAIL

PLAN

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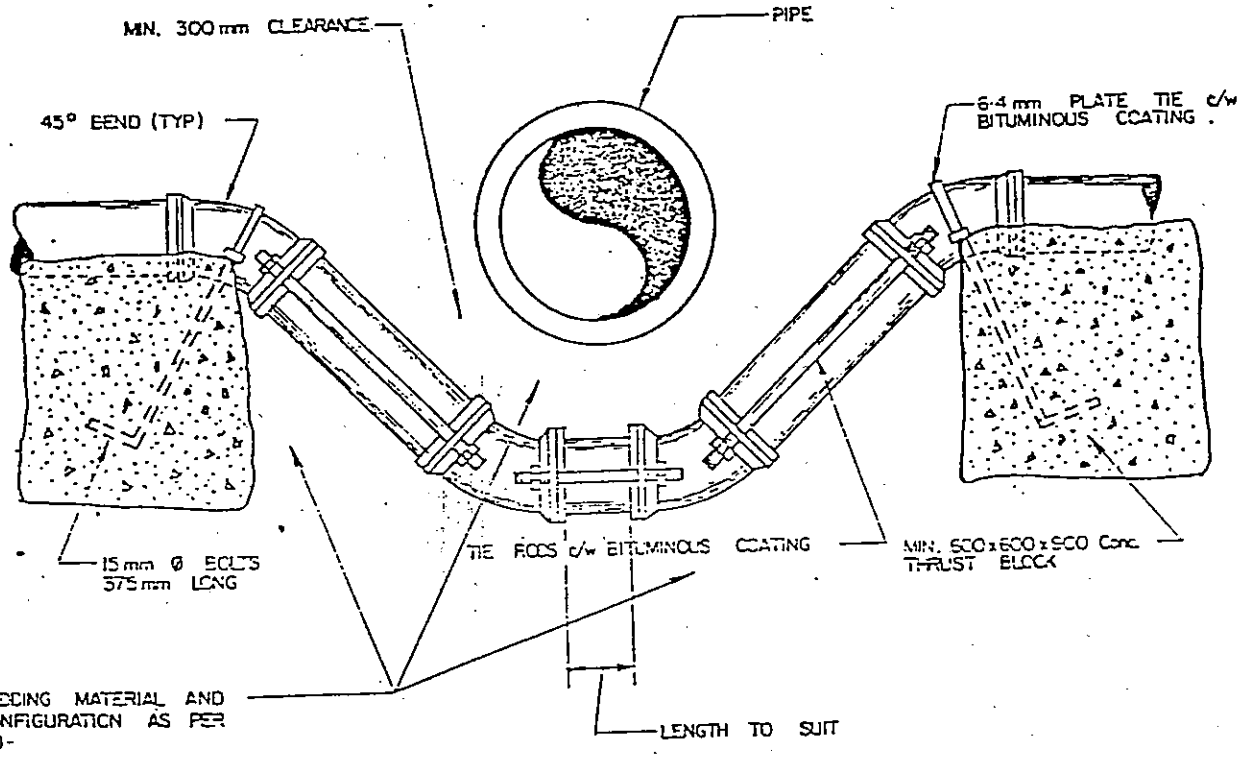
VILLAGE OF PORT CLEMENTS

STAND PIPE DETAIL

REV N	DATE	DATE	APPROVED	DWG. No. W 6



NOTES:

1. CONCRETE TO BE 25 MPa COMPRESSIVE STRENGTH AT 28 DAYS.

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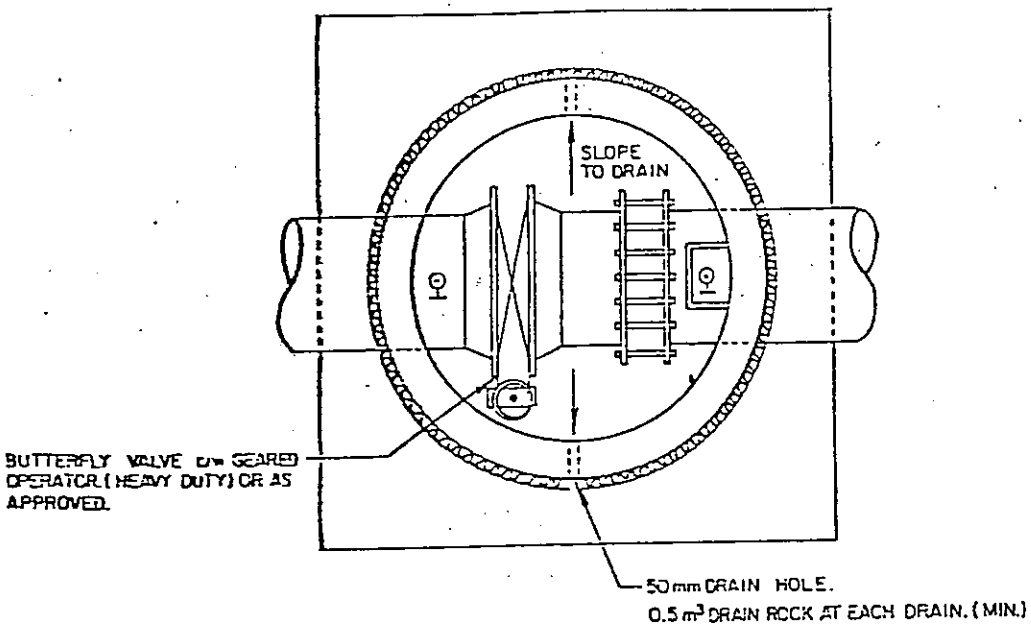
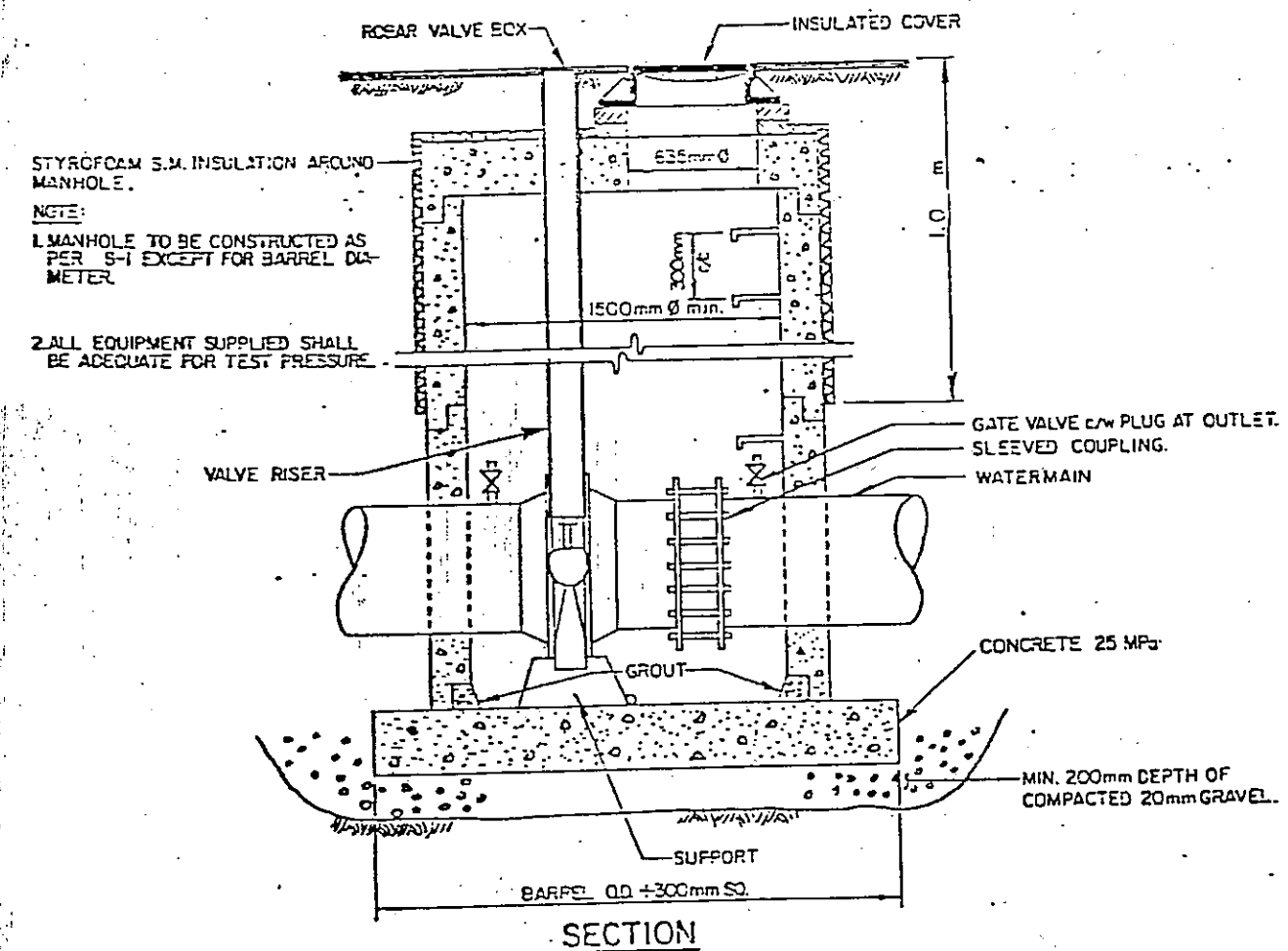
VILLAGE OF PORT CLEMENTS

WATERMAIN RELOCATION

REV'N	DATE	DATE	APPROVED	DWG.NO. W7



PLAN



SECTION

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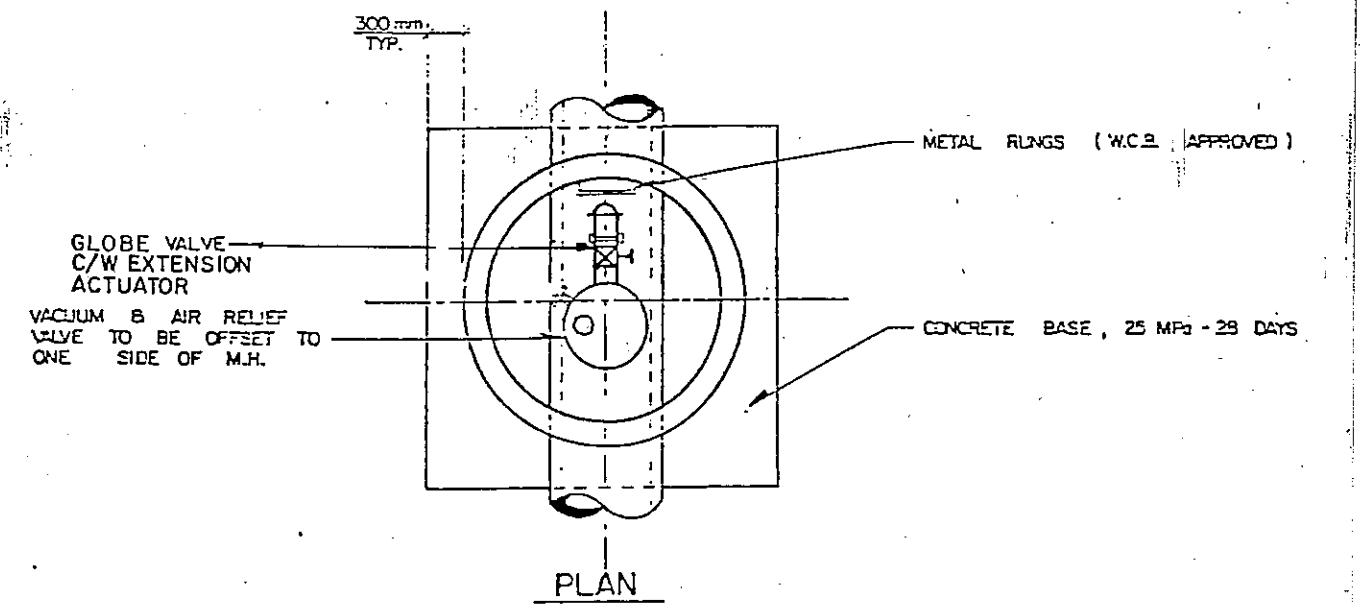
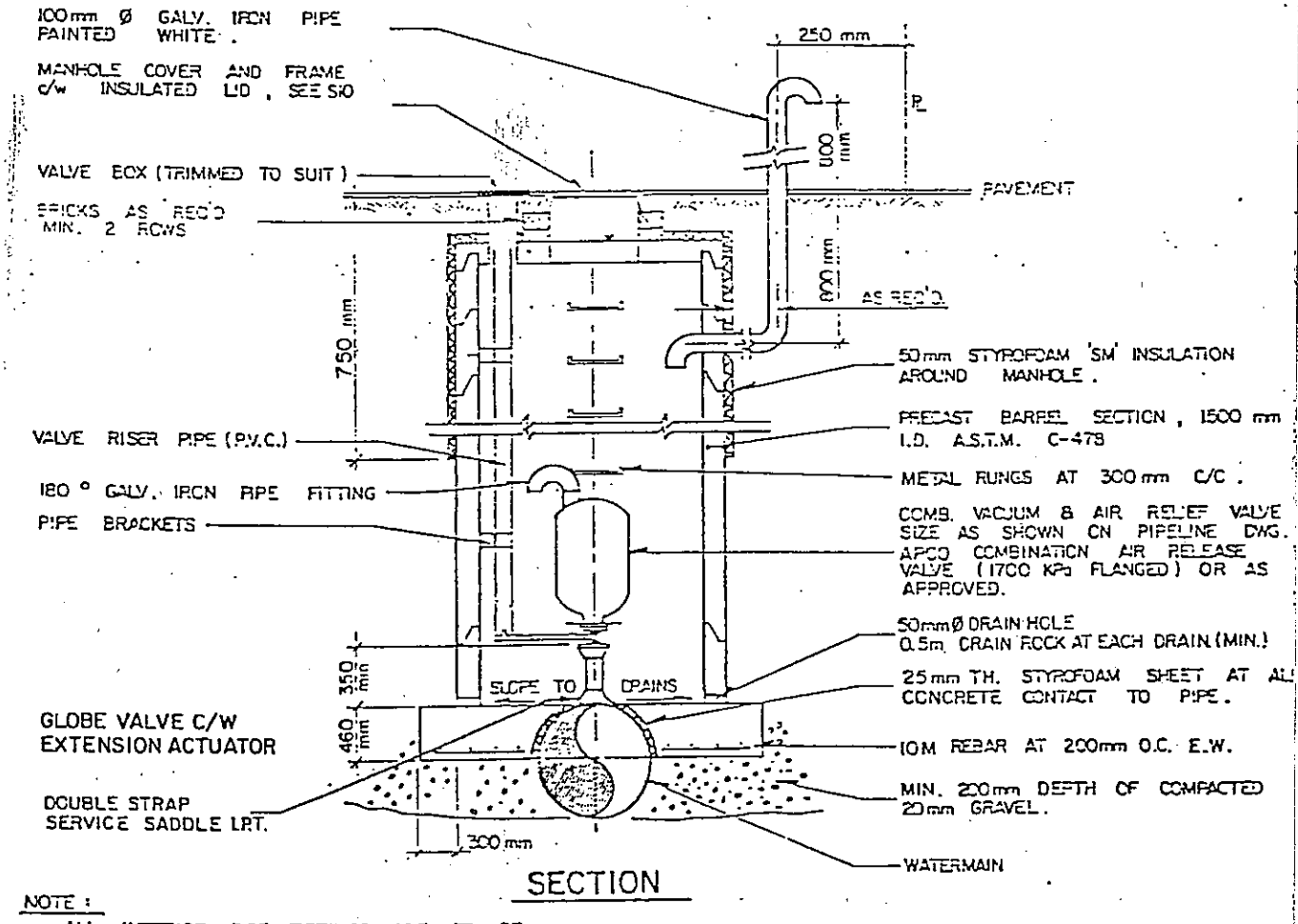
VILLAGE OF PORT CLEMENTS

BUTTERFLY VALVE CHAMBER

REV'N	DATE	DATE	APPROVED	DWG.NO.
				W8



PLAN



SECTION

NOTE :

ALL INTERIOR PIPE FITTINGS ARE TO BE COATED WITH 2 COATS OF TARMASTIC 101 BITUMINOUS PAINT OR AS APPROVED AFTER WIRE BRUSHING THESE FITTINGS

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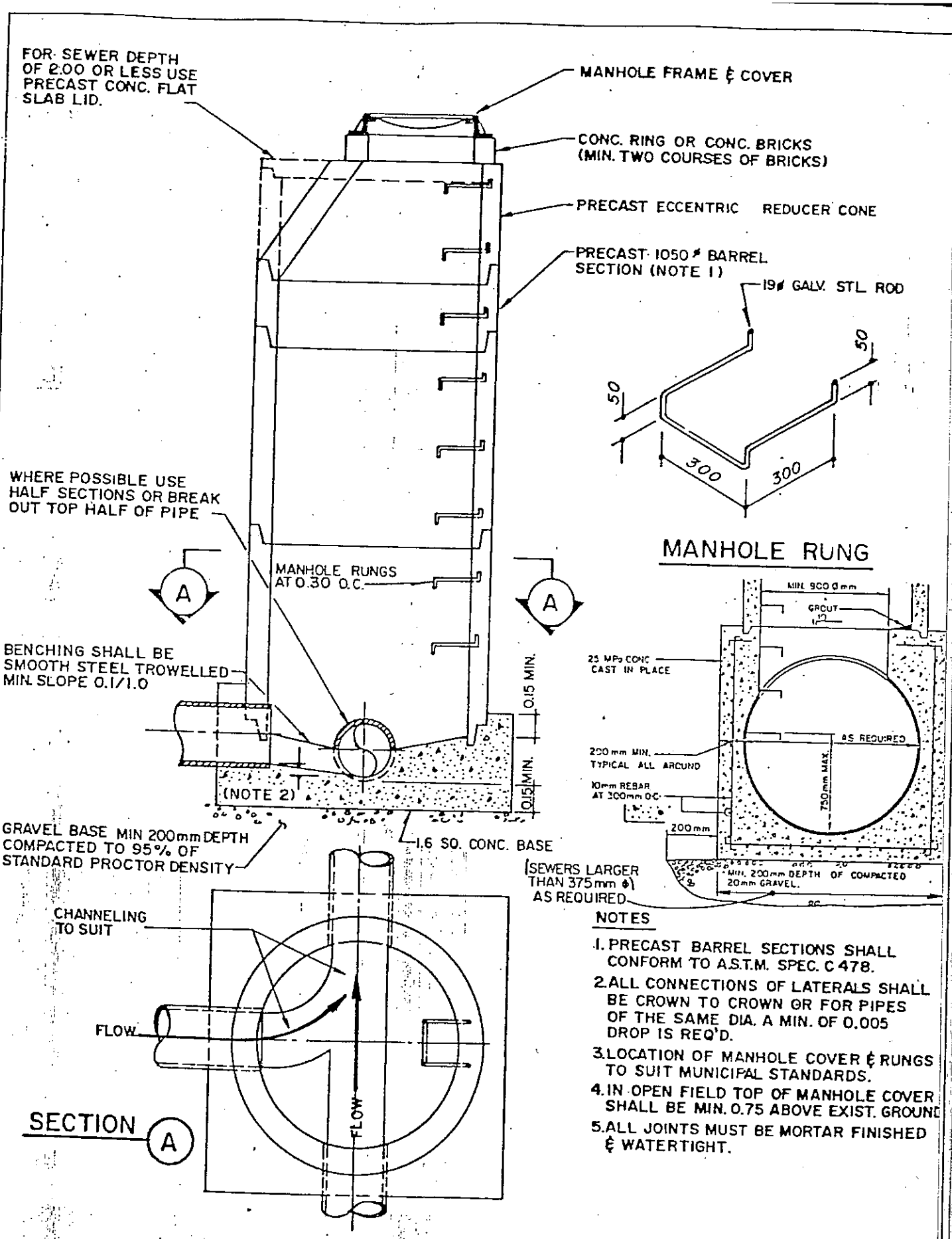
VILLAGE OF PORT CLEMENTS

AIR RELEASE VALVE CHAMBER

REV'N	DATE	DATE	APPROVED	DWG.NO. W9



NOTES

1. PRECAST BARREL SECTIONS SHALL CONFORM TO A.S.T.M. SPEC. C 478.
2. ALL CONNECTIONS OF LATERALS SHALL BE CROWN TO CROWN OR FOR PIPES OF THE SAME DIA. A MIN. OF 0.005 DROP IS REQ'D.
3. LOCATION OF MANHOLE COVER & RUNGS TO SUIT MUNICIPAL STANDARDS.
4. IN OPEN FIELD TOP OF MANHOLE COVER SHALL BE MIN. 0.75 ABOVE EXIST. GROUND
5. ALL JOINTS MUST BE MORTAR FINISHED & WATERTIGHT.

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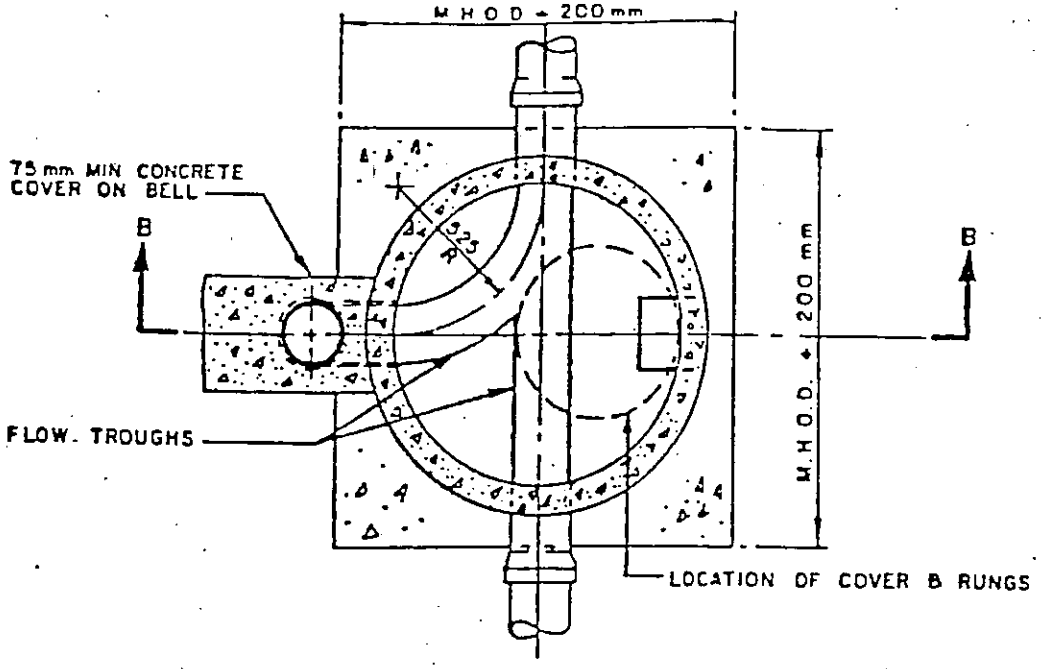
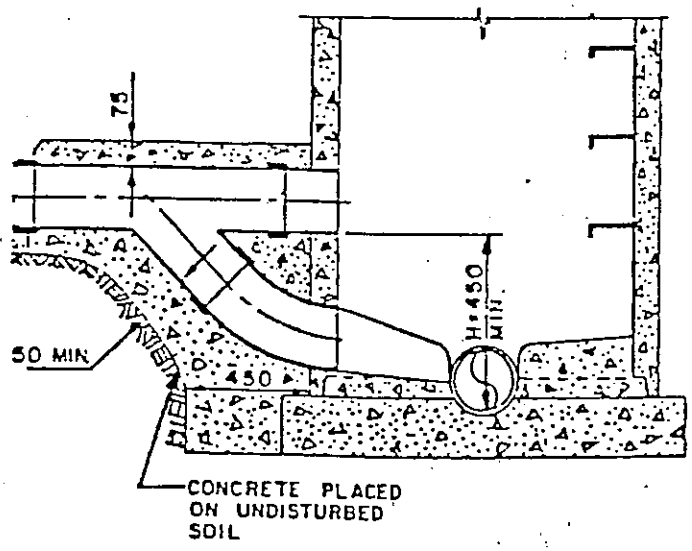
VILLAGE OF PORT CLEMENTS

STANDARD MANHOLE

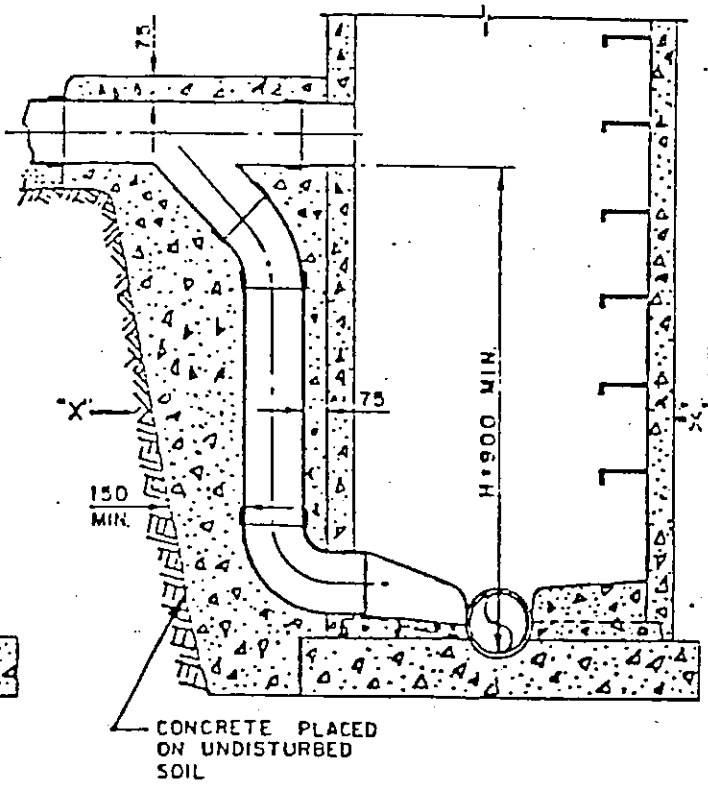
REV.N	DATE	DATE	APPROVED	DWG. No.
1	JUNE '89			



PLAN AT "X-X" SHOWING DROP



SECTION B-B
DROP MANHOLE TYPE II



SECTION B-B
DROP MANHOLE TYPE I

NOTES:

1. FOR DETAILS ON CONE TYPE MANHOLES SEE DRAWING S
2. SEE DWG. No. S1 & S3 FOR DETAILS ON INVERT CHANNELLING IN MANHOLE.
3. ALL DIMENSIONS ARE GIVEN IN millimetres UNLESS OTHERWISE INDICATED.

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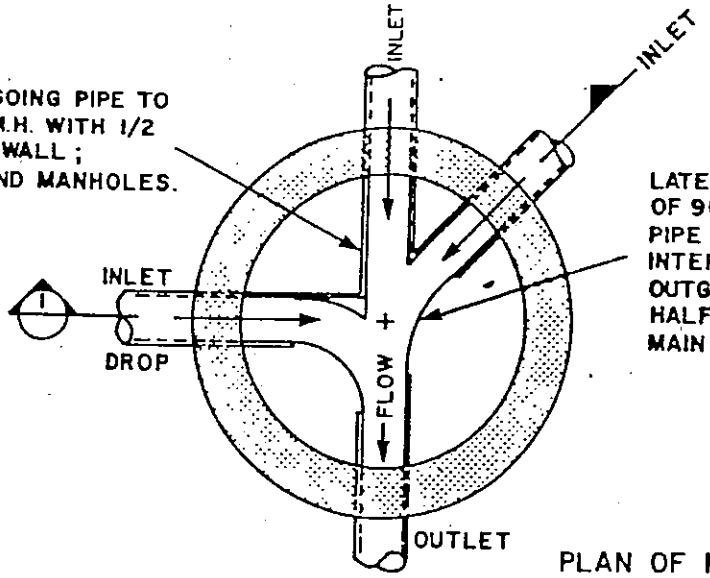
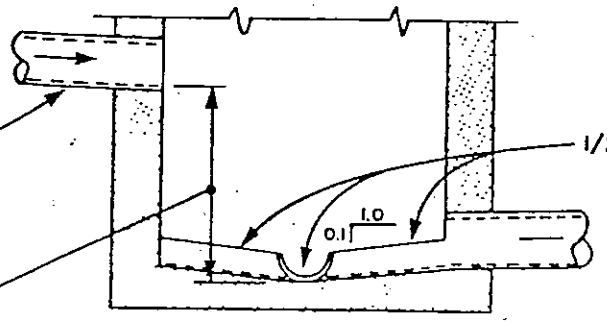
VILLAGE OF PORT CLEMENTS

EXTERIOR DROP MANHOLE

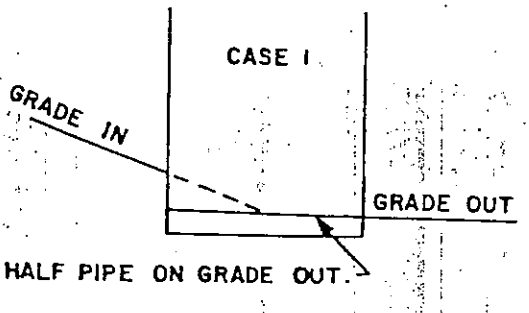
REV.N	DATE	DATE	APPROVED	DWG. No.
				S2

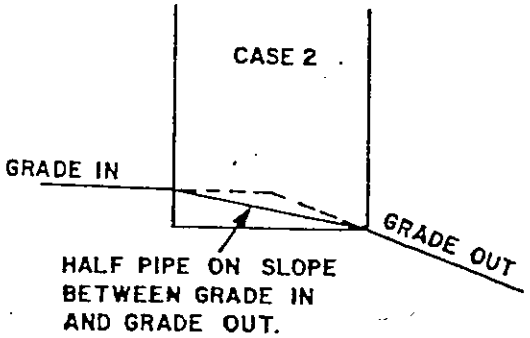


PLAN OF MANHOLE



SECTION THRU MANHOLE (1)





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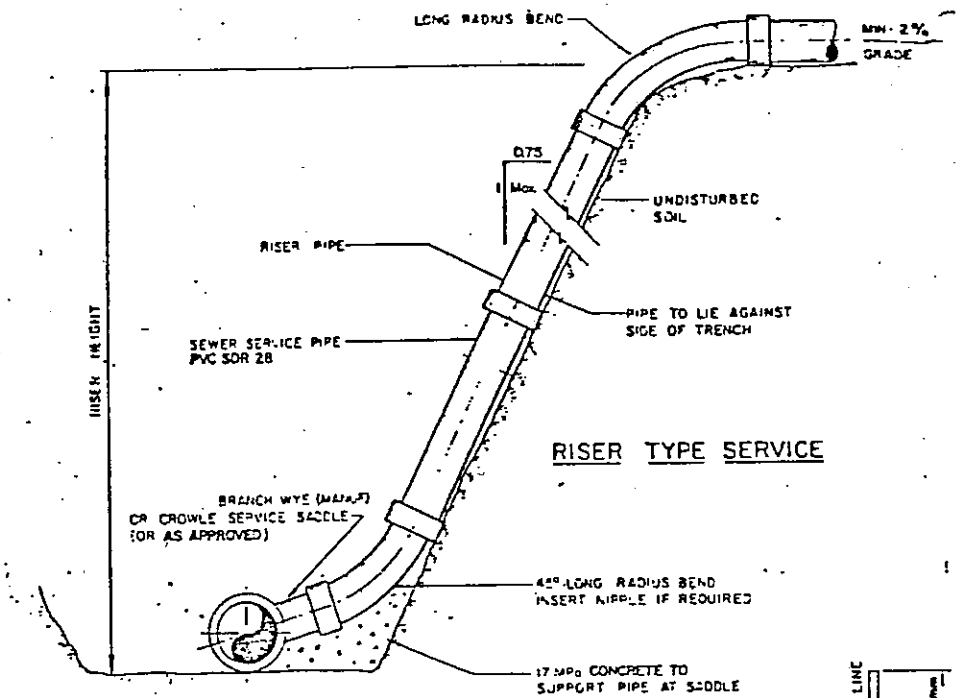
VILLAGE OF PORT CLEMENTS

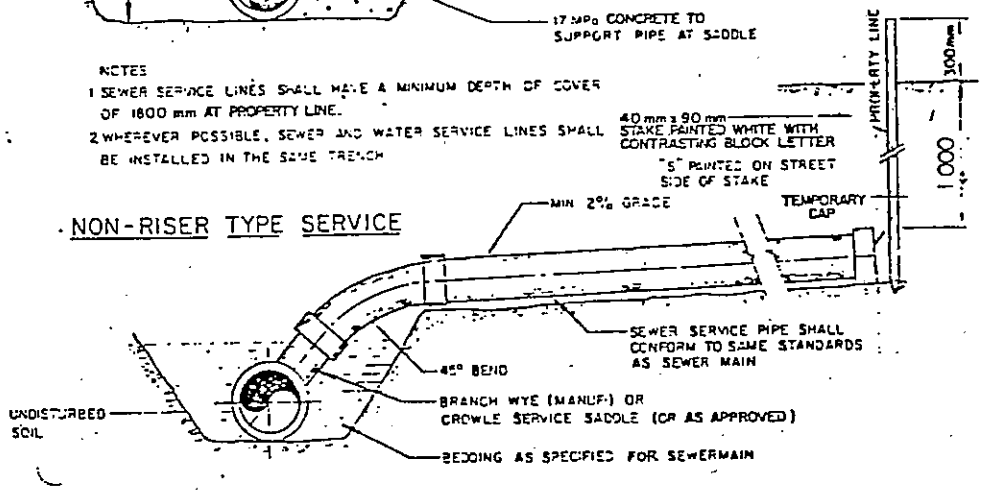
MANHOLE BENCHING

REV,N	DATE	DATE	APPROVED	DWG. No. S 3

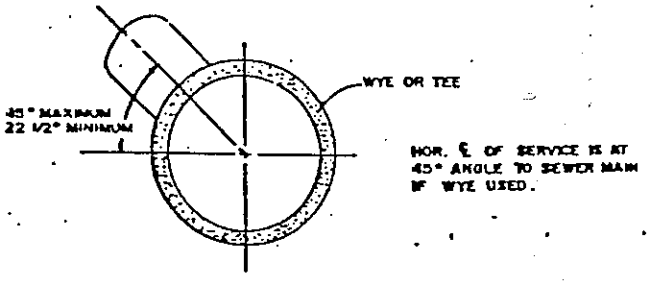


RISER TYPE SERVICE

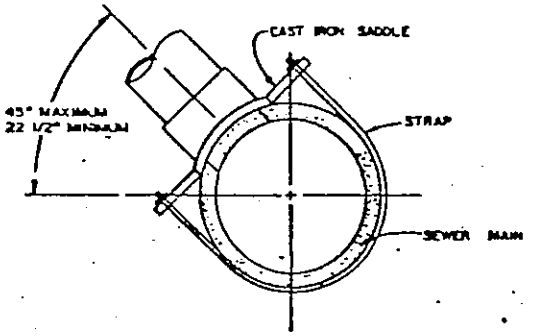
NOTES
1 SEWER SERVICE LINES SHALL HAVE A MINIMUM DEPTH OF COVER OF 1800 mm AT PROPERTY LINE.
2 WHEREVER POSSIBLE, SEWER AND WATER SERVICE LINES SHALL BE INSTALLED IN THE SAME TRENCH



NON-RISER TYPE SERVICE



WYE CONNECTION
(TO NEW SEWER MAINS)



SADDLE CONNECTION
(TO EXISTING SEWER MAINS)

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VILLAGE OF PORT CLEMENTS

STANDARD SEWER CONNECTIONS

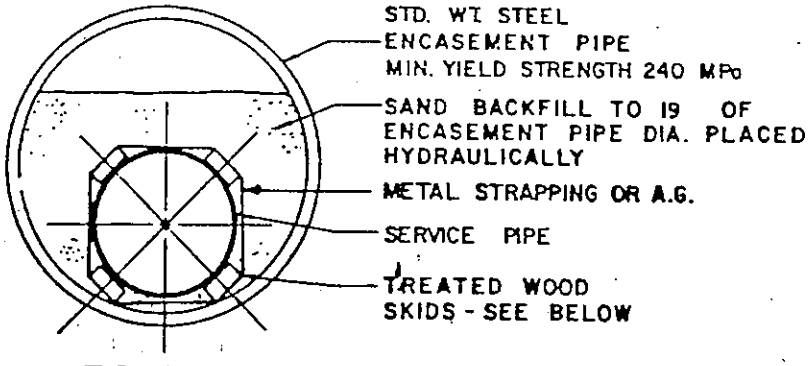
REV'N	DATE	DATE	APPROVED	DWG.NO. S4

NOTES:
SKIDS MUST BE EVENLY SPACED AROUND PIPES

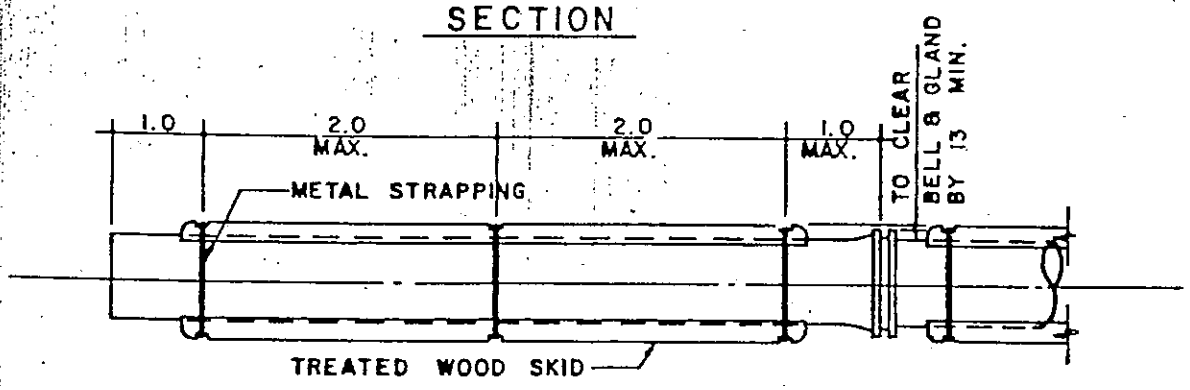
4 SKIDS ARE REQ'D FOR PIPES 300 & UNDER
5 SKIDS FOR 350 - 400
6 SKIDS FOR 450 - 600
8 SKIDS FOR 750 AND OVER

TABLE OF CASING SIZES	
PIPE SIZE DIA. IN mm	CASING SIZE DIA. IN mm
75	225
100	250
150	300
200	400
250	450
300	500
350	550
400	600
450	650
500	700
600	875
675	975
750	1075
850	1150
900	1225
1000	1375
1075	1450

DUCTILE IRON AND ASBESTOS CEMENT PIPES



SECTION



SKID LOCATION DETAIL

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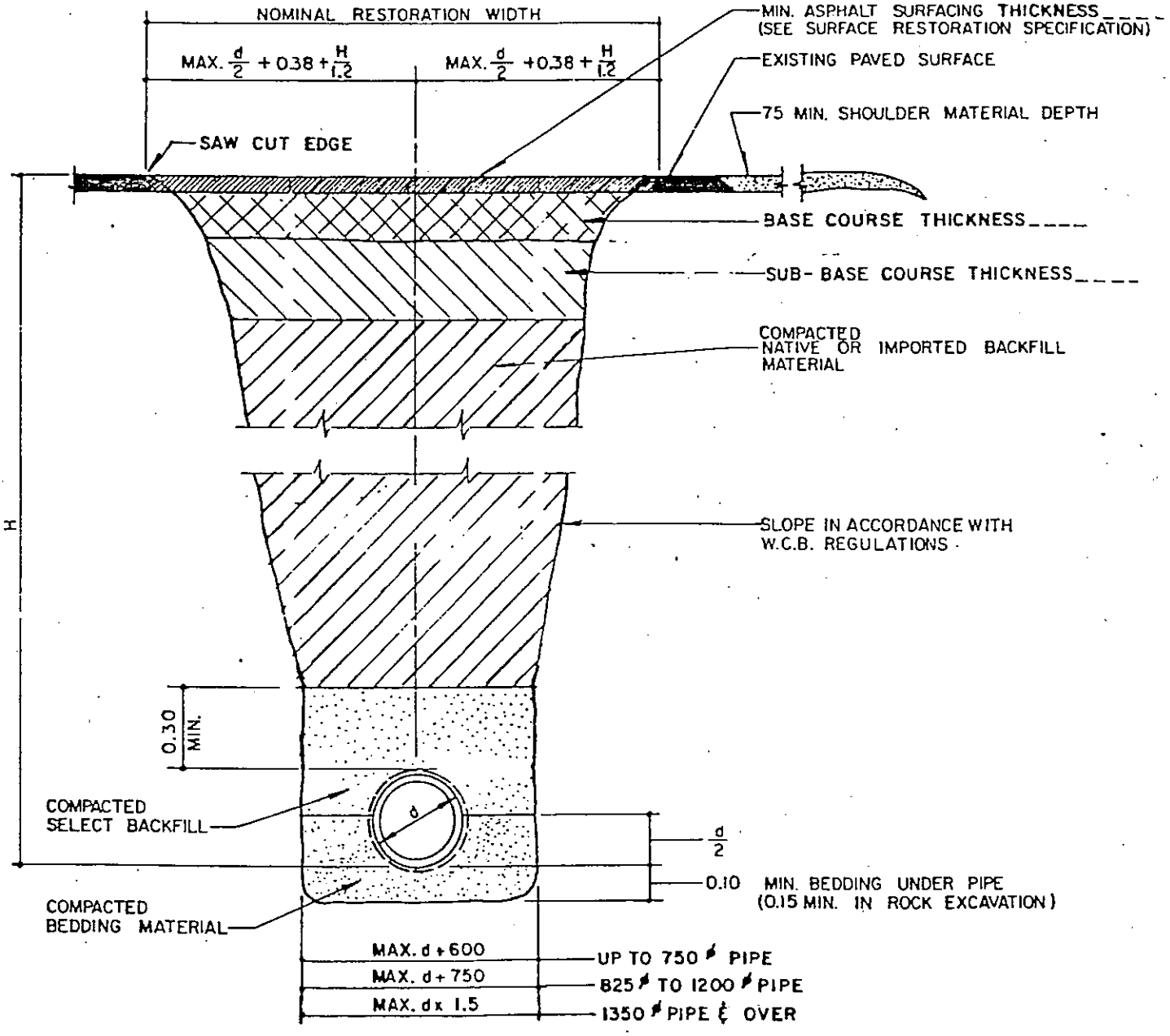
VILLAGE OF PORT CLEMENTS

ENCASEMENT PIPE DETAIL

REV.N	DATE	DATE	APPROVED	DWG. No. S5



NOTE:

"d" = OUTSIDE DIAMETER OF THE PIPE

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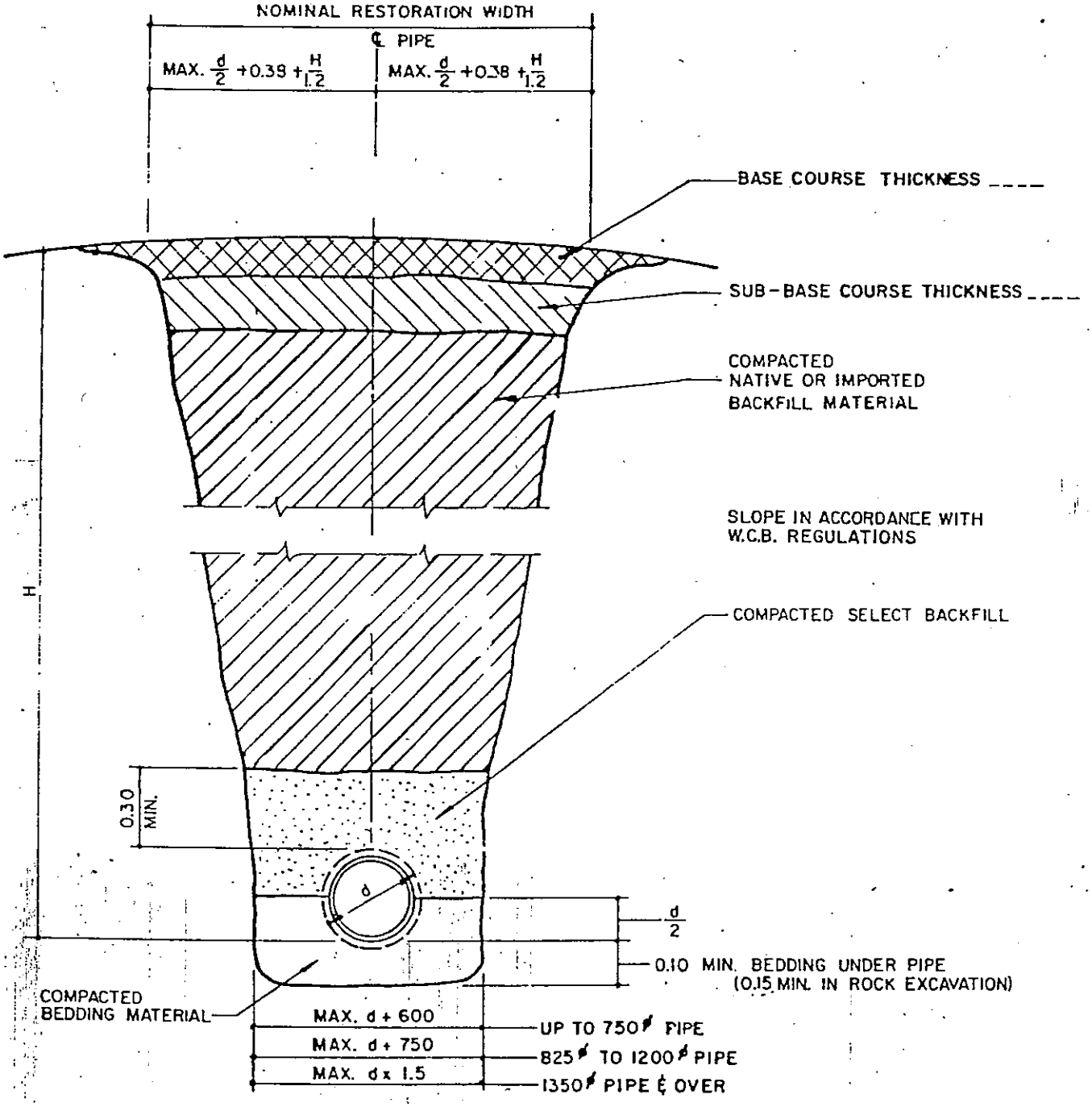
VILLAGE OF PORT CLEMENTS

TRENCH DETAILS IN PAVED AREAS

REV.N	DATE	DATE	APPROVED	DWG No. S 6



NOTE:

d = OUTSIDE DIAMETER OF THE PIPE BELL AT ITS LARGEST SECTION

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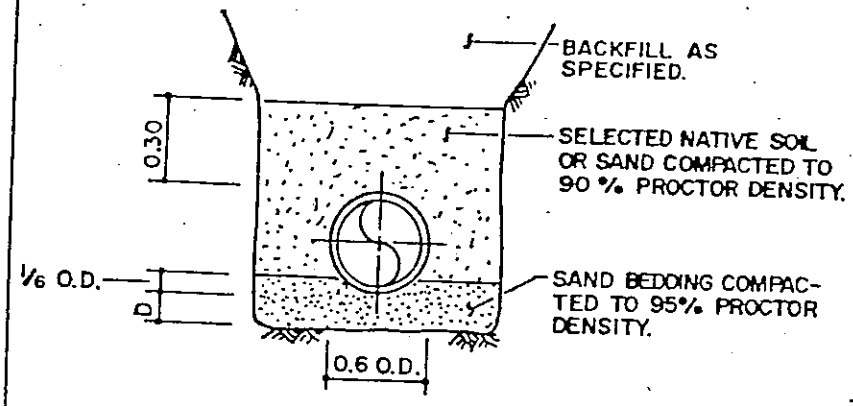
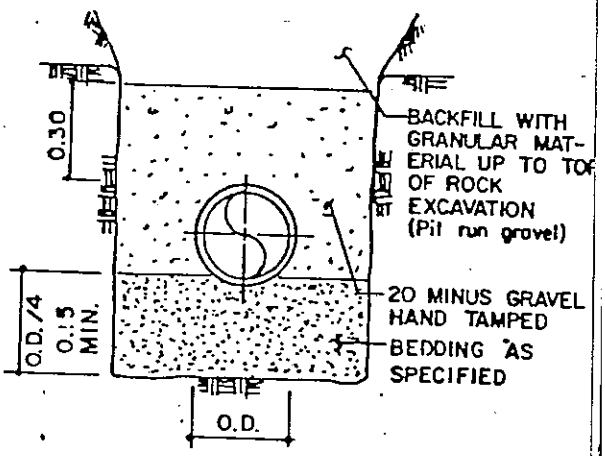
VILLAGE OF PORT CLEMENTS

TRENCH DETAILS IN GRAVELLED AREAS

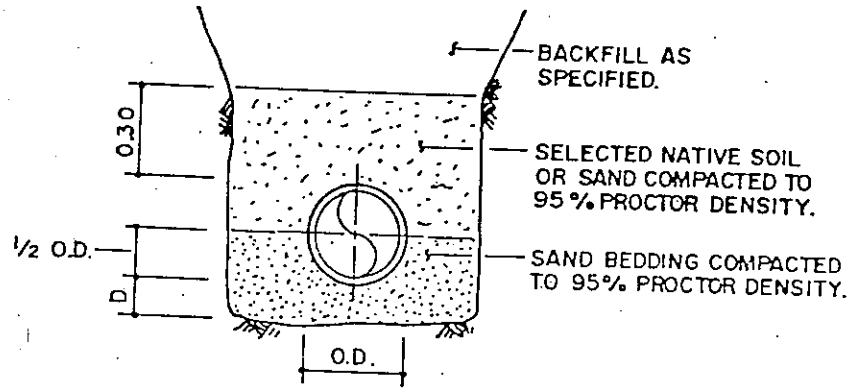
REV.N	DATE	DATE	APPROVED	DWG. No.
				S7



CLASS 'C'

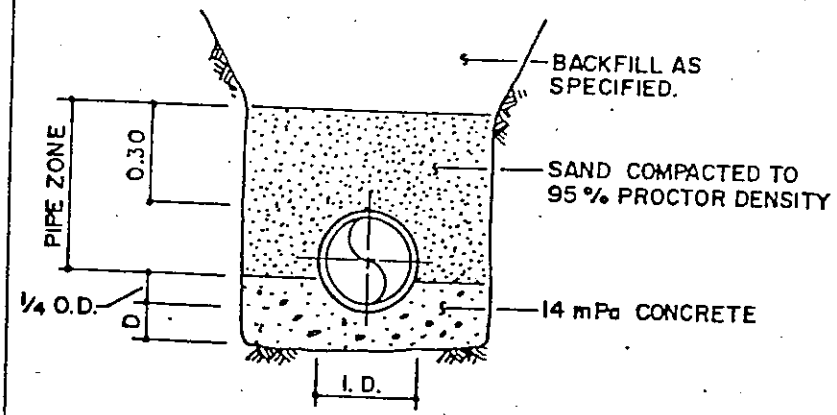


ROCK TRENCH



CLASS 'B'

PIPE SIZE	D (MIN.)
675 or smaller 750 to 1500 1650 and larger	75 100 150
PIPE SIZE	TRENCH WIDTH
750 or smaller 825 to 1200 1350 and over	O.D. + 600 MAX. O.D.+ 750 MAX. O.D. X 1.5 MAX.



CLASS 'A'

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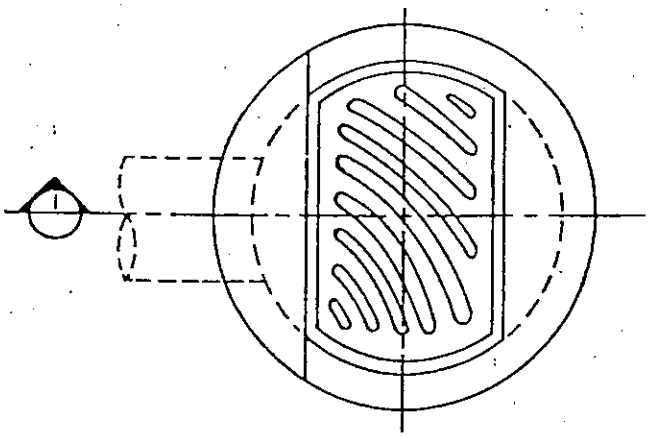
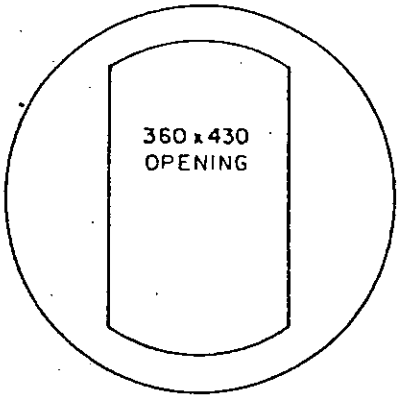
VILLAGE OF PORT CLEMENTS

TRENCH BEDDING DETAILS

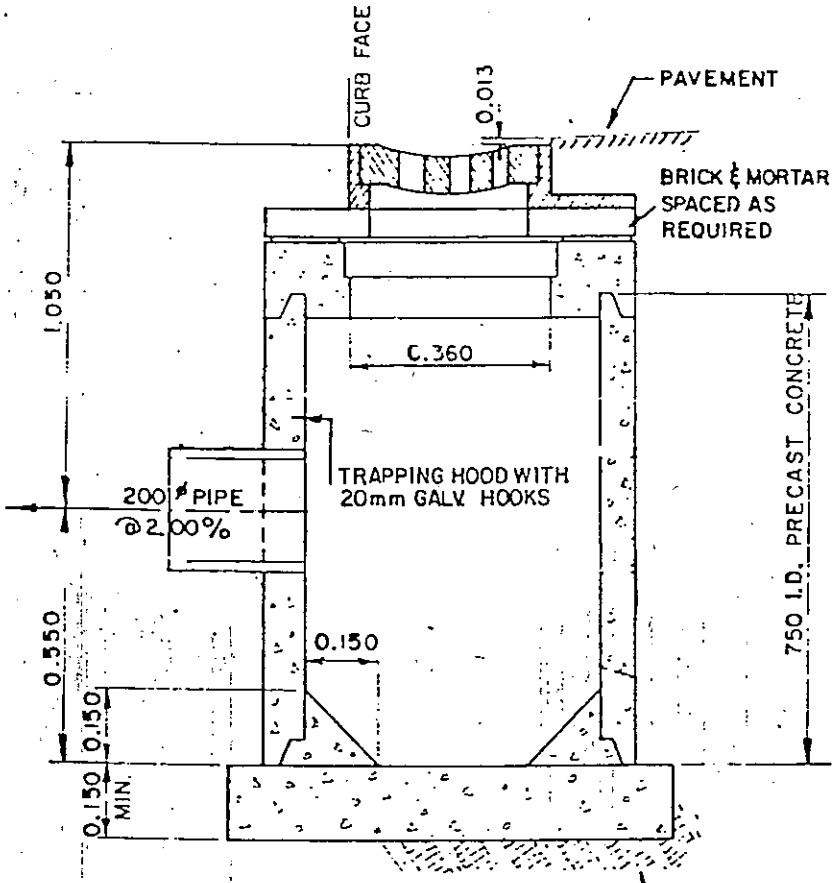
REV.N	DATE	DATE	APPROVED	DWG. No.
				S 8



PLAN



H20 LID



SECTION 1

MIN. 200mm – 20mm MINUS CRUSHED GRAVEL COMPACTED

NOTES

1. GRATING – MAINLAND FOUNDRY TYPE 'D' 14 F 91
   FRAME – MAINLAND FOUNDRY TYPE 'D' 14 F 91A
2. MAXIMUM 3, MINIMUM 1 COURSE OF BRICK OR PRECAST CONCRETE RISER RING LAID IN PORTLAND CEMENT MORTAR
3. PRECAST CONCRETE LID REINFORCED TO H20 HIGHWAY LOADING
4. MORTAR SHALL COMPLY TO A.S.T.M C-270 LATEST REVISION
5. PRECAST REINFORCED CONCRETE SECTIONS SHALL CONFORM TO A.S.T.M. C-478 LATEST REVISION
6. PRECAST REINFORCED RISER RINGS TO CONFORM TO A.S.T.M C-478 LATEST REVISION

NOTE:
WHERE DISTANCE TO PROPOSED 'TIE-IN' MANHOLE EXCEEDS 10 METRES, THE STORM SEWER SHALL BE EXTENDED AND A NEW MANHOLE INSTALLED.

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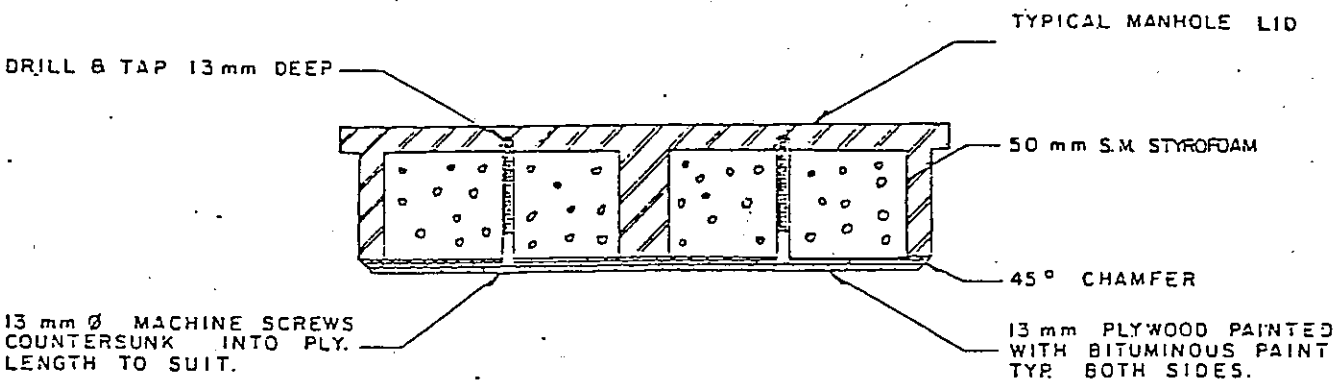
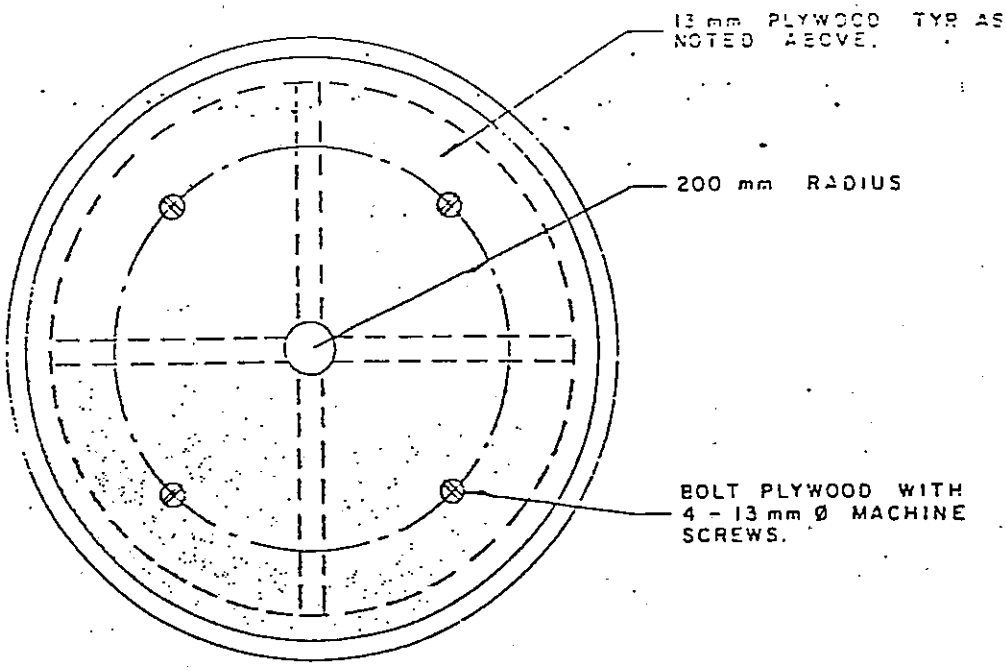
VILLAGE OF PORT CLEMENTS

CATCH BASIN ASSEMBLY

REV'N	DATE	DATE	APPROVED	DWG N°
				S 9



SECTION



BOTTOM OF COVER

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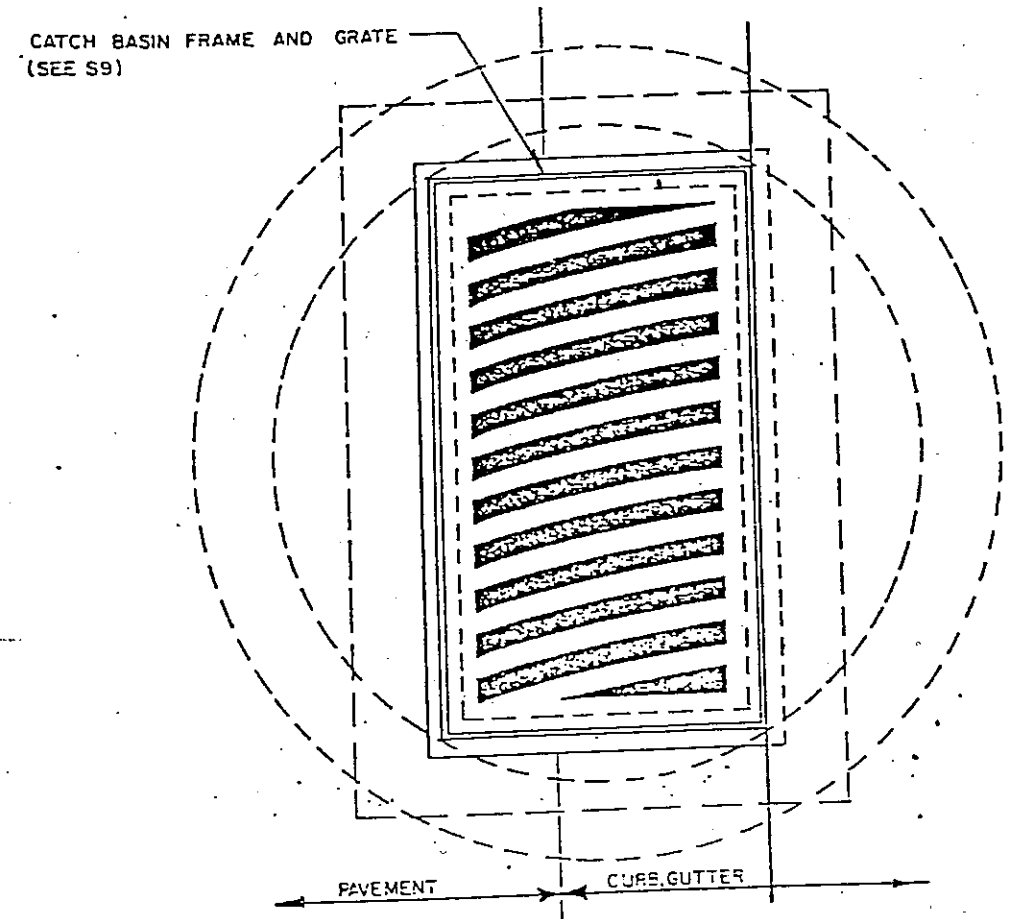
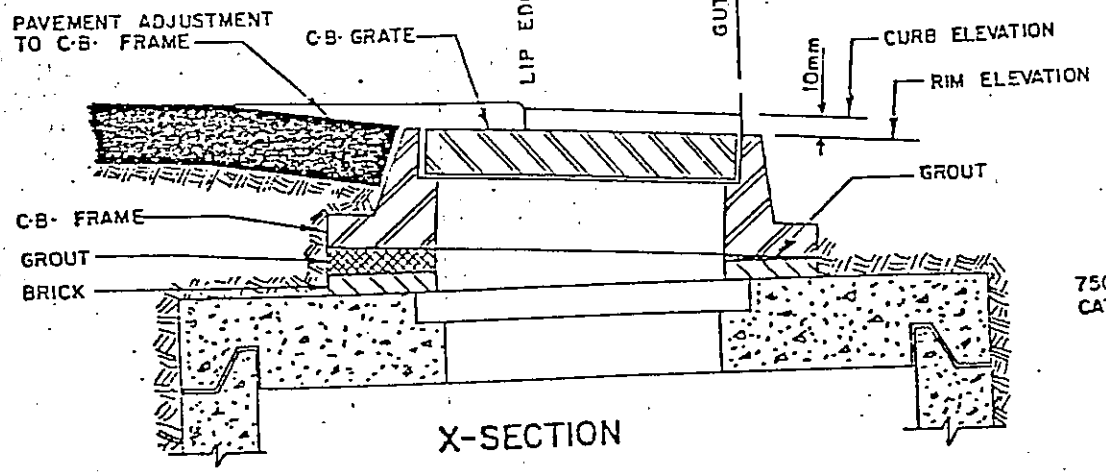
VILLAGE OF PORT CLEMENTS

MANHOLE COVER INSULATION DETAIL

REV'N	DATE	DATE	APPROVED	DWG.NO.
				S16



PLAN



X-SECTION

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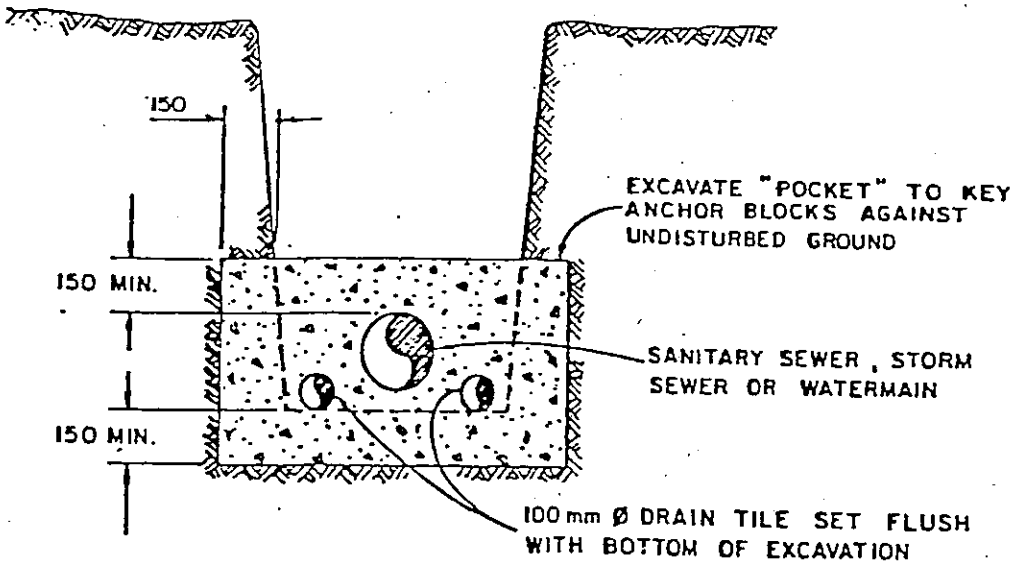
REV'N	DATE	DATE	APPROVED	DWG.NO.
				S11

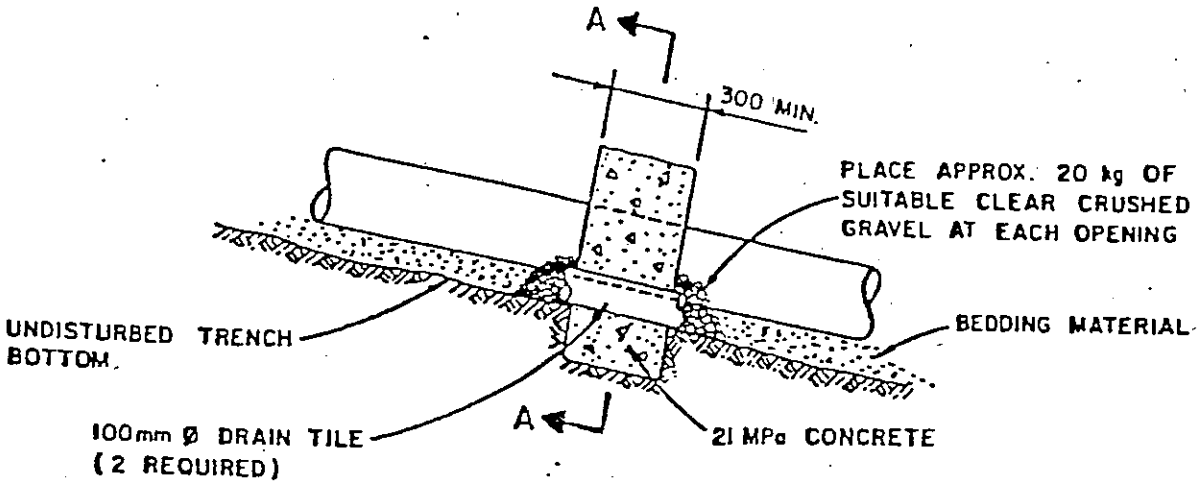
VILLAGE OF PORT CLEMENTS

CATCH BASIN ADJUSTMENT



SECTION A-A

SPACING OF CONCRETE BLOCKS		
SANITARY & STORM SEWERS		WATERMAINS
SLOPE	MAX. SPACING	
15 % UP TO 20 % 20 % – 35 % 35 % – 50 % 50 % – OVER	AS REQUIRED 9.0 m 6.0 m 4.0 m	ON GRADES 8% OR GREATER TWO BLOCKS PER PIPE LENGTH REQUIRED.



LONGITUDINAL SECTION

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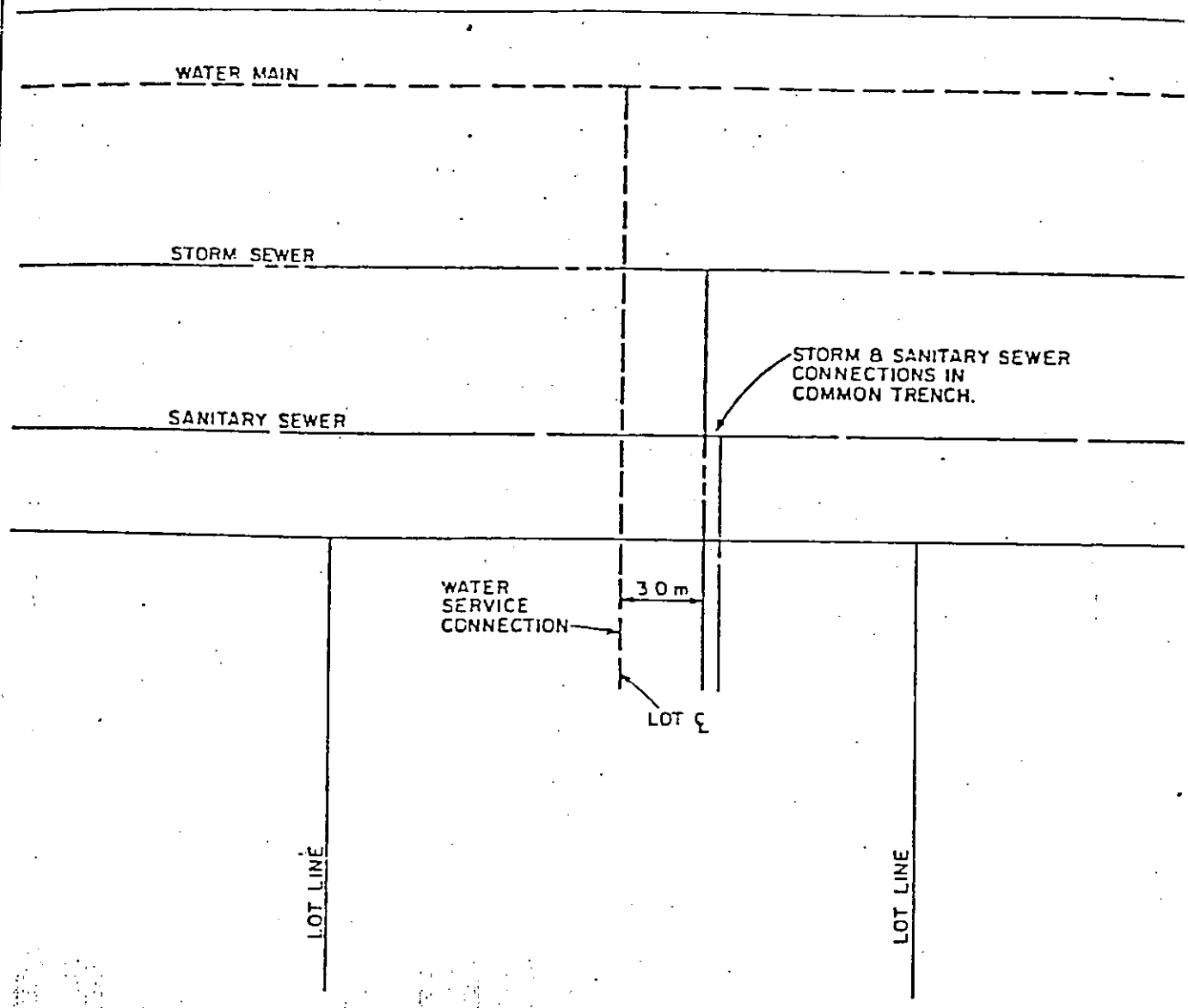
VILLAGE OF PORT CLEMENTS

ANCHOR BLOCK

REV'N	DATE	DATE	APPROVED	DWG. NO. S12



NOTE

SERVICE CONNECTIONS FOR DRAINAGE AND SEWER SHALL BE MEASURED FROM THE CENTRE OF THE LOT. FOR SLOPED LOTS THE SEWER CONNECTIONS SHALL BE LOCATED ON THE LOWEST SIDE OF CENTRE.

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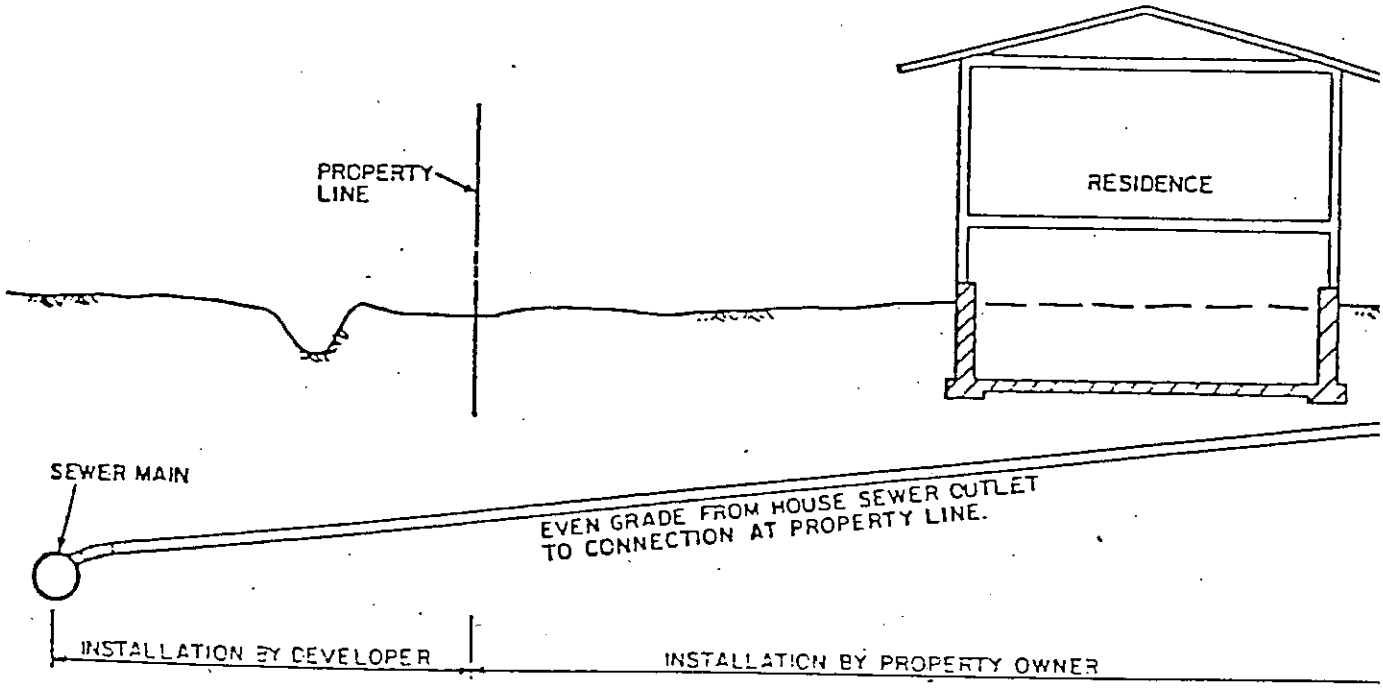
VILLAGE OF PORT CLEMENTS

LOCATION OF SERVICE CONNECTIONS

REV,N	DATE	DATE	APPROVED	DWG. No
				S 12



NOTES:

1. THE SECTION FROM THE HOUSE SEWER OUTLET TO THE PROPERTY LINE INCLUDING THE CONNECTION TO THE EXIST. SERVICE LINE IS THE PROPERTY OWNER'S RESPONSIBILITY.
2. MIN. PIPE DIA. IS 100 mm.
3. MIN. PIPE COVER AT PROPERTY LINE IS 2.5 m.
4. SAND BEDDING REQUIRED FOR ALL TYPES OF PIPE FROM 100 mm BELOW THE PIPE TO THE SPRINGLINE.
5. RAINWATER AND FOUNDATION DRAINS ARE NOT TO BE CONNECTED TO THE SANITARY SEWER.
6. MIN. GRADE FOR 100 mm DIA. PIPE IS 2.0% OR 20 mm/m.
7. ANY CHANGE IN DIRECTION TO BE MADE WITH WYES OR 1/8 BENDS.

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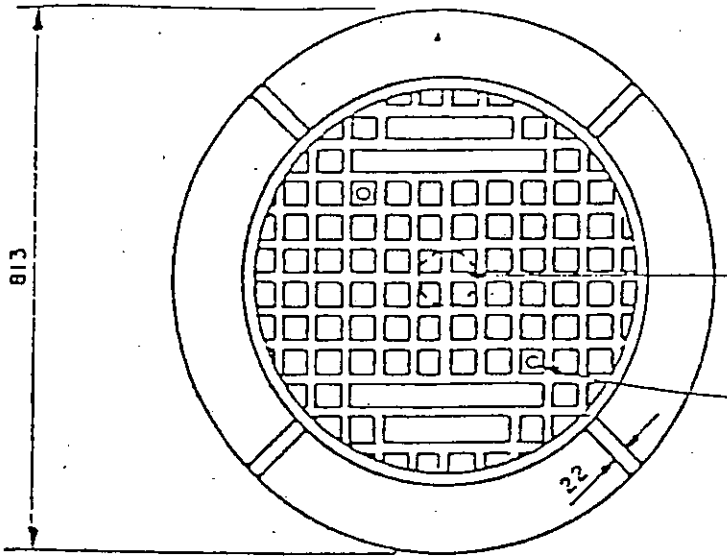
VILLAGE OF PORT CLEMENTS

TYPICAL RESIDENTIAL SEWER CONNECTION

REV.N	DATE	DATE	APPROVED	DWG. No.
				S14

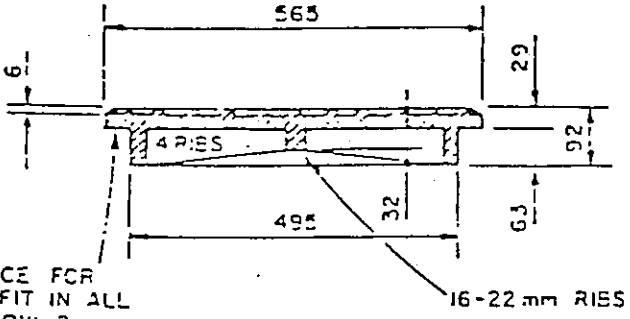


NOTE:
LETTERING SHALL BE 25 mm FLATTENED FACE GOTHIC LETTERING WITH FACE OF LETTERS RAISED TO THE SAME LEVEL AS THE TOP OF THE RIBS

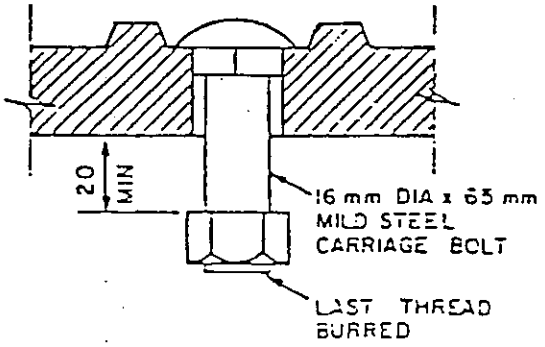
MANUFACTURES SYMBOL 90 mm MAX. DIMENSION, CIRCLE OR SQUARE

22 mm DIA. HOLE FOR CARRIAGE BOLT TWO REQ'D AS SHOWN

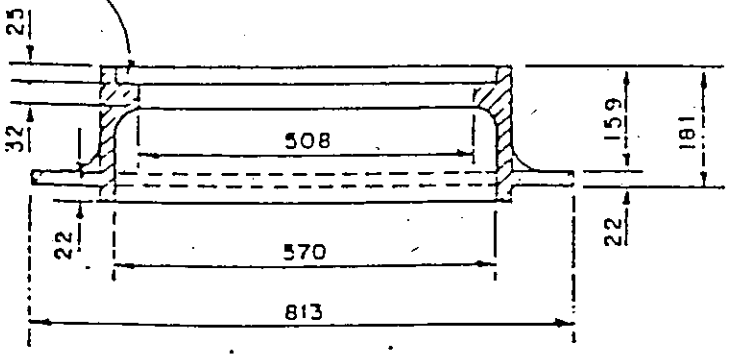
PLAN



COVER



CARRIAGE BOLT DETAIL



FRAME

APPROXIMATE WEIGHTS

COVER – 60-66 kg
FRAME – 102-108 kg

NOTE:
ALL DIMENSIONS ARE GIVEN IN millimetres UNLESS OTHERWISE INDICATED

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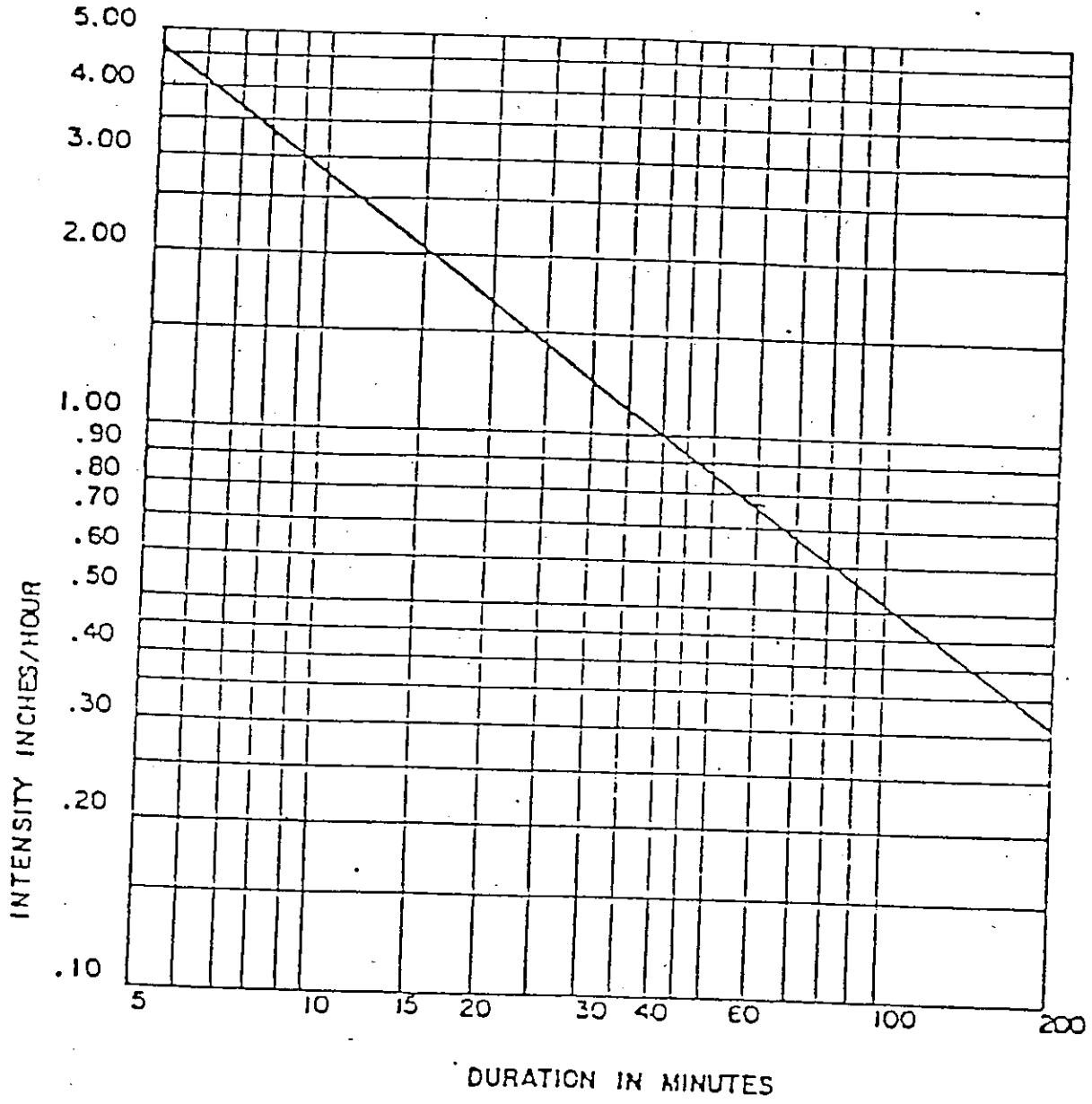
VILLAGE OF PORT CLEMENTS

MANHOLE COVER & FRAME

REV.N	DATE	DATE	APPROVED	DWG. No. S 15



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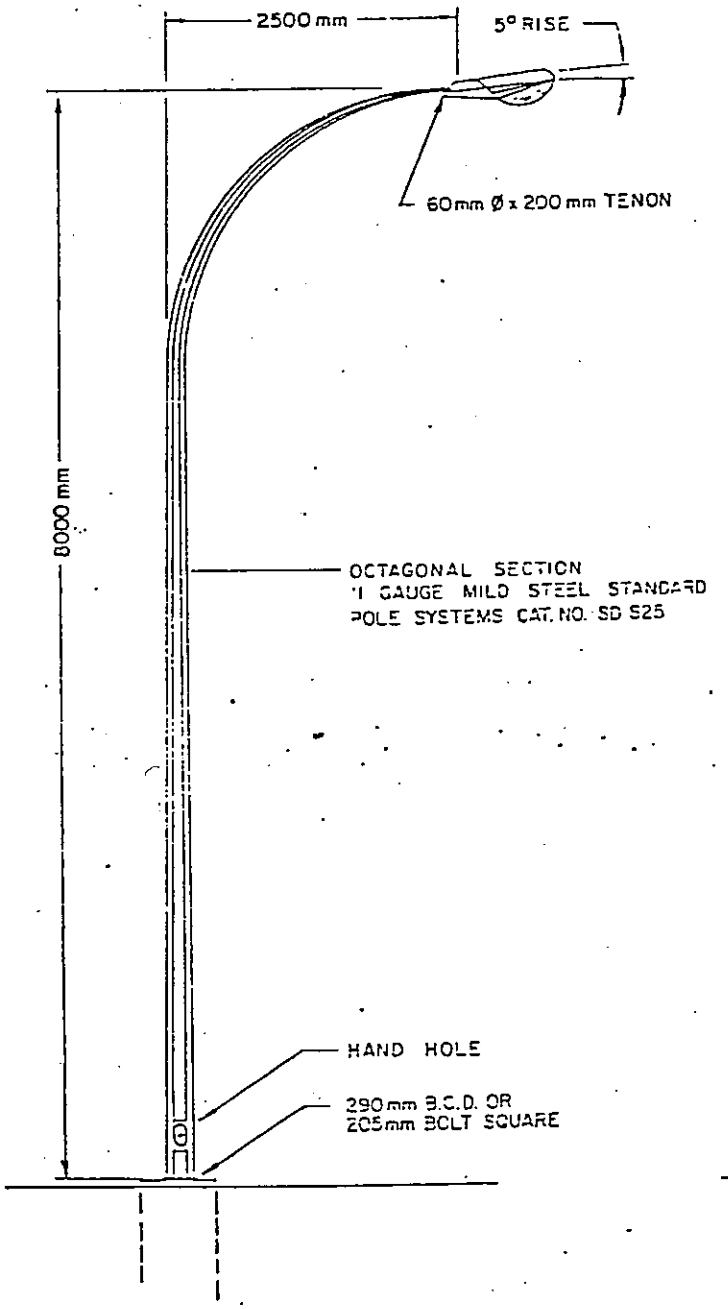
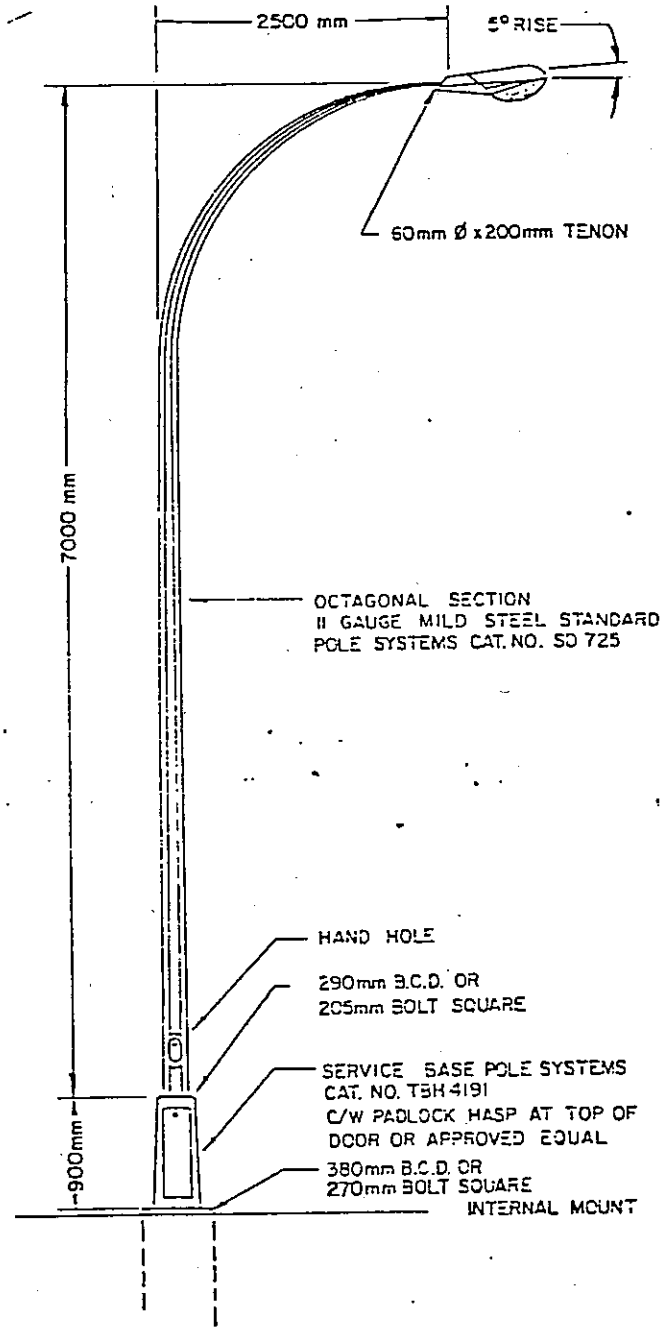
VILLAGE OF PORT CLEMENTS

RAIN FALL INTENSITY DURATION CURVE

REV,N	DATE	DATE	APPROVED	DWG. No
				S16



TYPE A



TYPE B

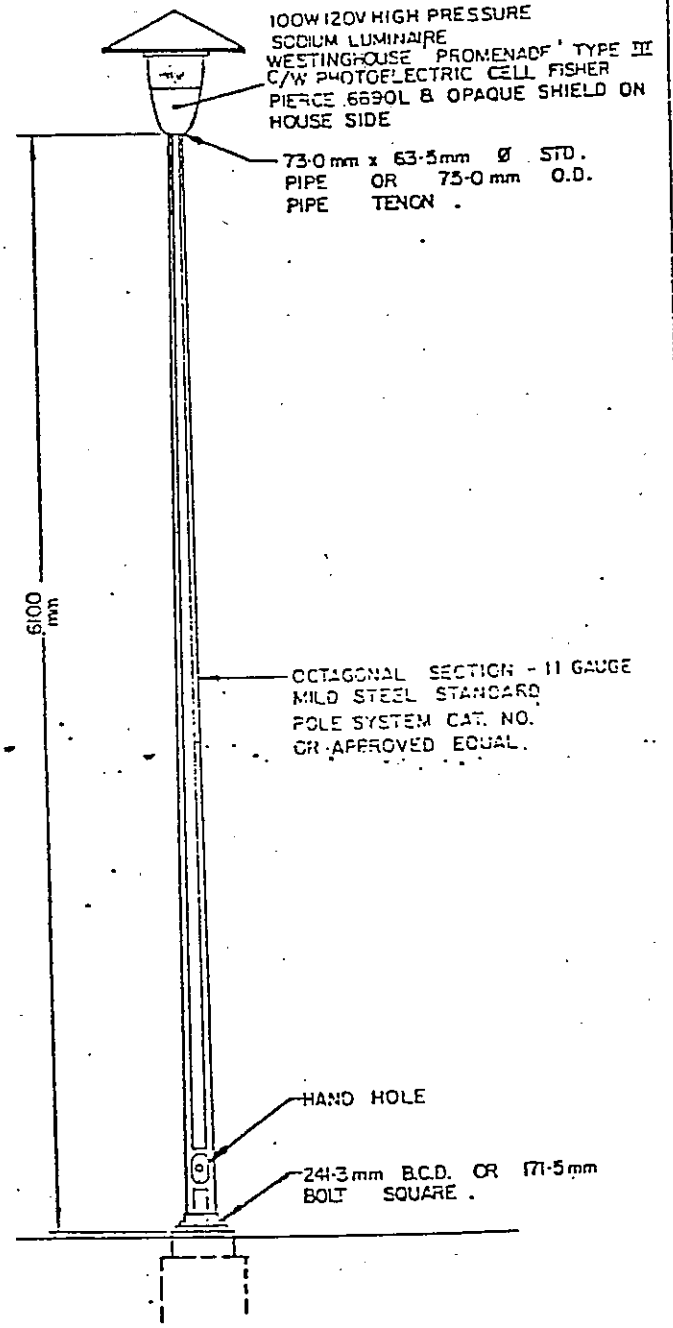
1. POLES AND SERVICE BASES TO BE GALV. WITH ZINC CHROMATE PRIMER AT FACTORY AND PAINTED AFTER ERECTION WITH ONE COAT OF GREEN TREM CLAD.
2. BASE BOLT COVERS TO BE USED ON TYPE 'B' POLES ONLY.

Stanley
STANLEY ASSOCIATES ENGINEERING LTD.

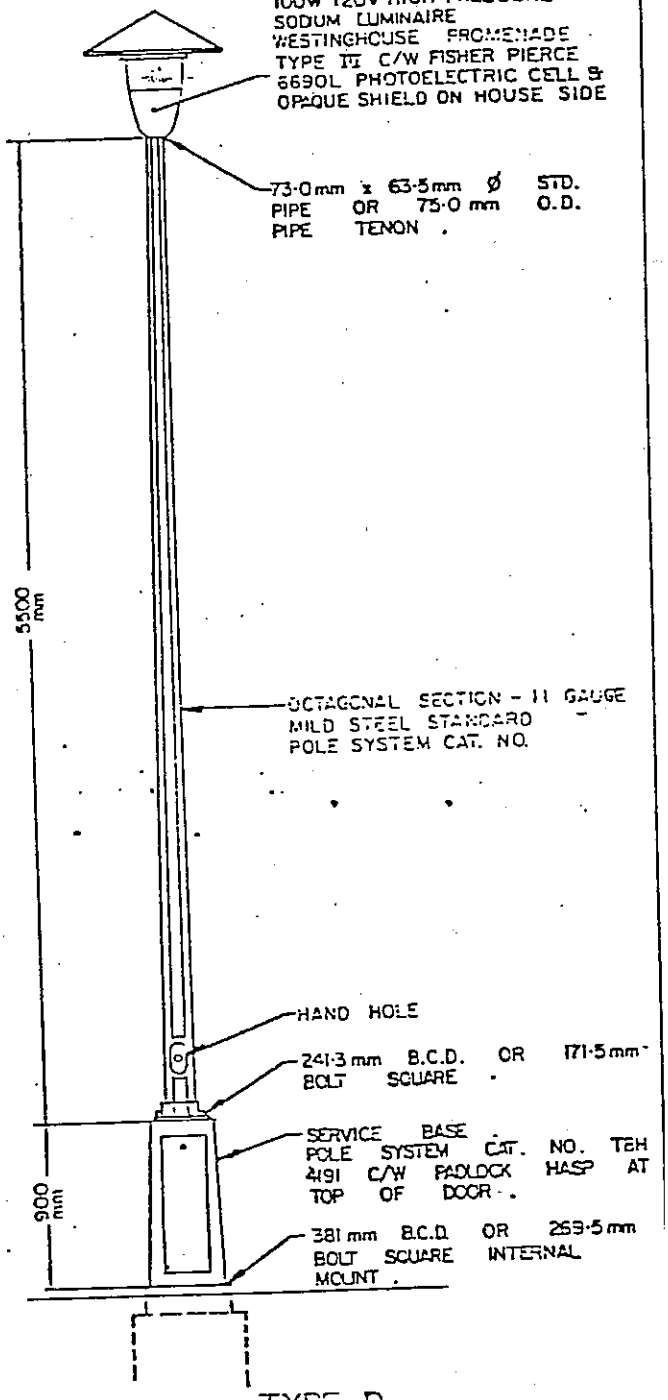
VILLAGE OF PORT CLEMENTS

DAVIT STREET LIGHTS

REV'N	DATE	DATE	APPROVED	DWG. NO.
				E1



TYPE C



TYPE D

NOTE:
1. POLES AND SERVICE BASES TO BE ZINC CHROMATE PRIMED AT FACTORY AND PAINTED AFTER ERECTION WITH ONE COAT OF GREEN TREM CLAD.
2. INSTALATION OF POST-TOP STREET LIGHTING REQUIRES APPROVAL IN ADVANCE FROM THE VILLAGE

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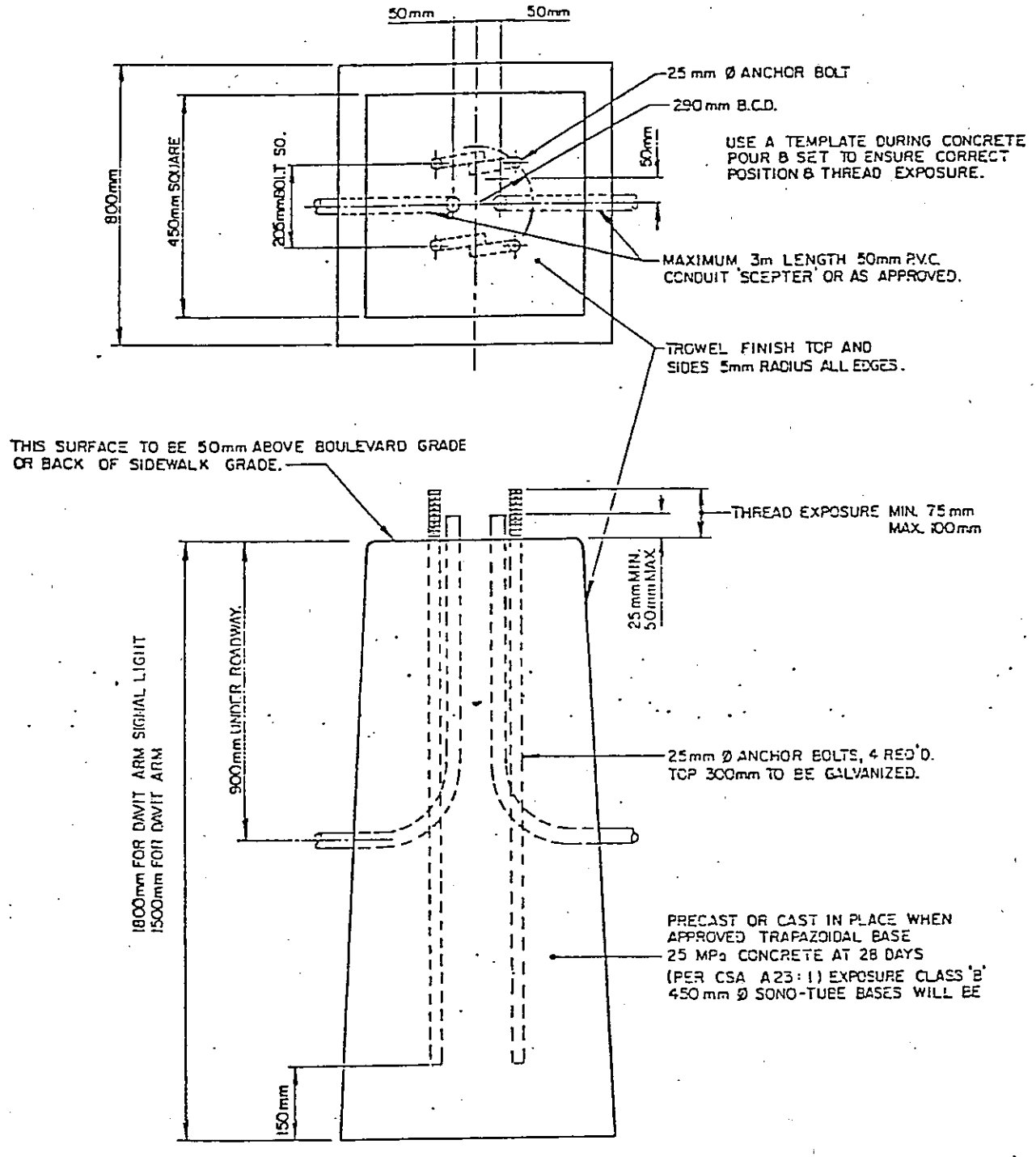
VILLAGE OF PORT CLEMENTS

POST TOP STREET LIGHTS

REV N	DATE	DATE	APPROVED	DWG.NO. E2



NOTE:

STRUCTURAL (CIVIL) ENGINEER SHALL MODIFY BASE REQUIREMENTS TO COMPENSATE FOR SITE SOIL CONDITIONS.

Stanley

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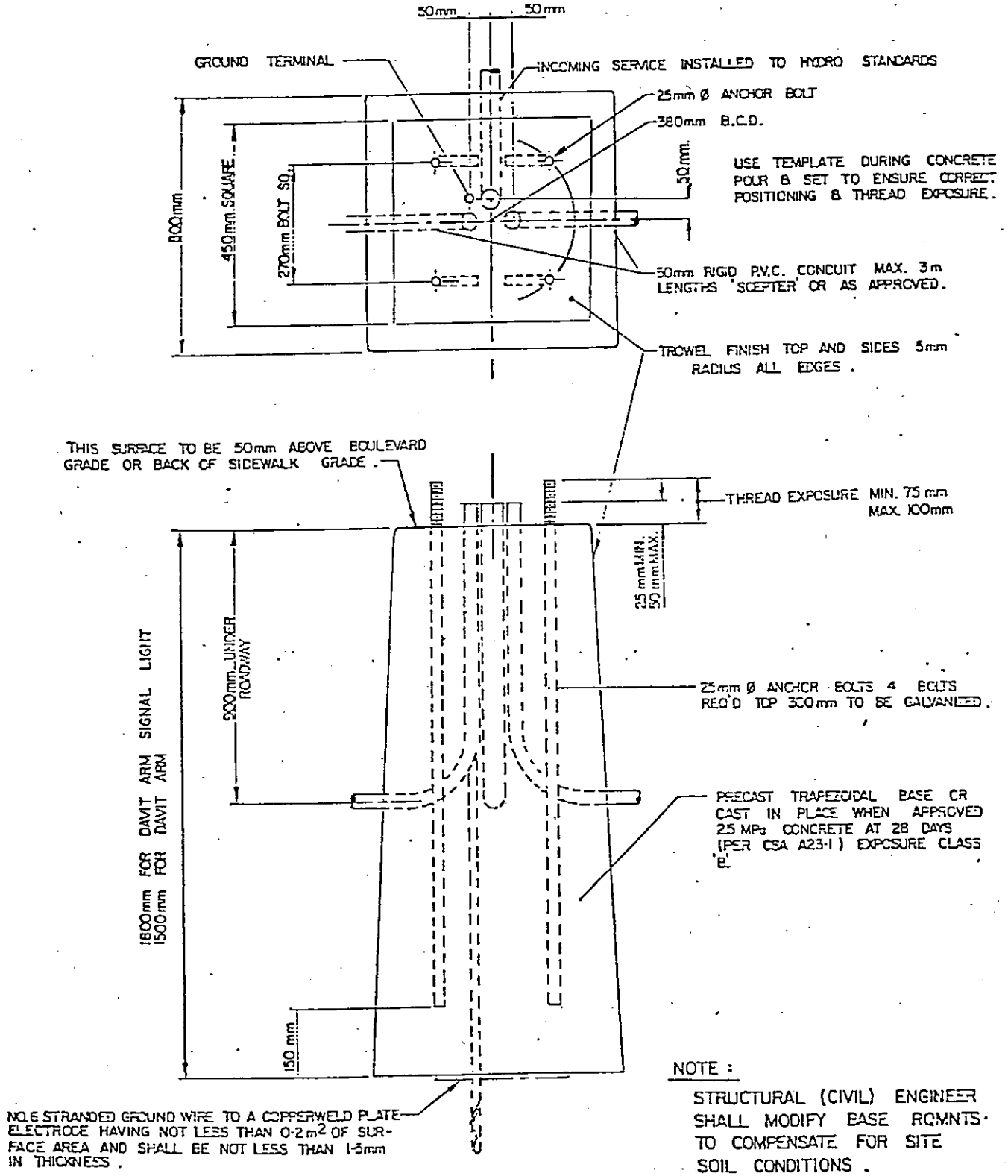
VILLAGE OF PORT CLEMENTS

STREET LIGHT ANCHOR BASE FOR TYPE A & C POLES

REV'N	DATE	DATE	APPROVED	DWG.NO. E3

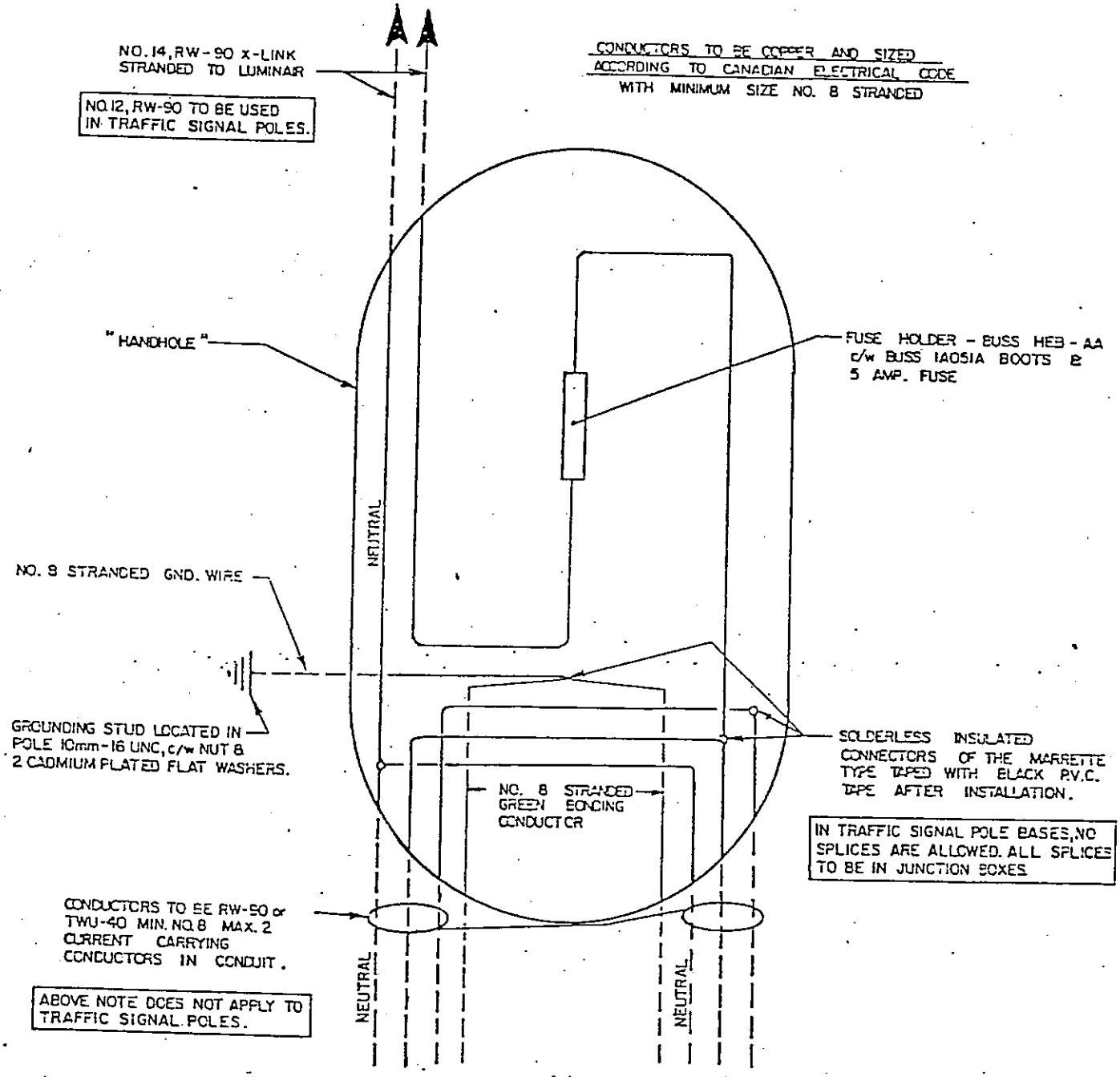


Stanley
STANLEY ASSOCIATES ENGINEERING LTD.

VILLAGE OF PORT CLEMENTS

STREET LIGHT ANCHOR BASE FOR TYPE B & D POLES

REV'N	DATE	DATE	APPROVED	DWG.NO. E4



SEE POLE & DWGS. FOR SERVICE BASE SPECS. THIS WILL BE NECESSARY WHEN MORE THAN 2 CONDUITS ENTER A POLE.

GROUND ELECTRODE ONLY REQUIRED AT MAIN SERVICE. ONLY BONDING REQUIRED AT EACH POLE.

Stanley
STANLEY ASSOCIATES ENGINEERING LTD

VILLAGE OF PORT CLEMENTS

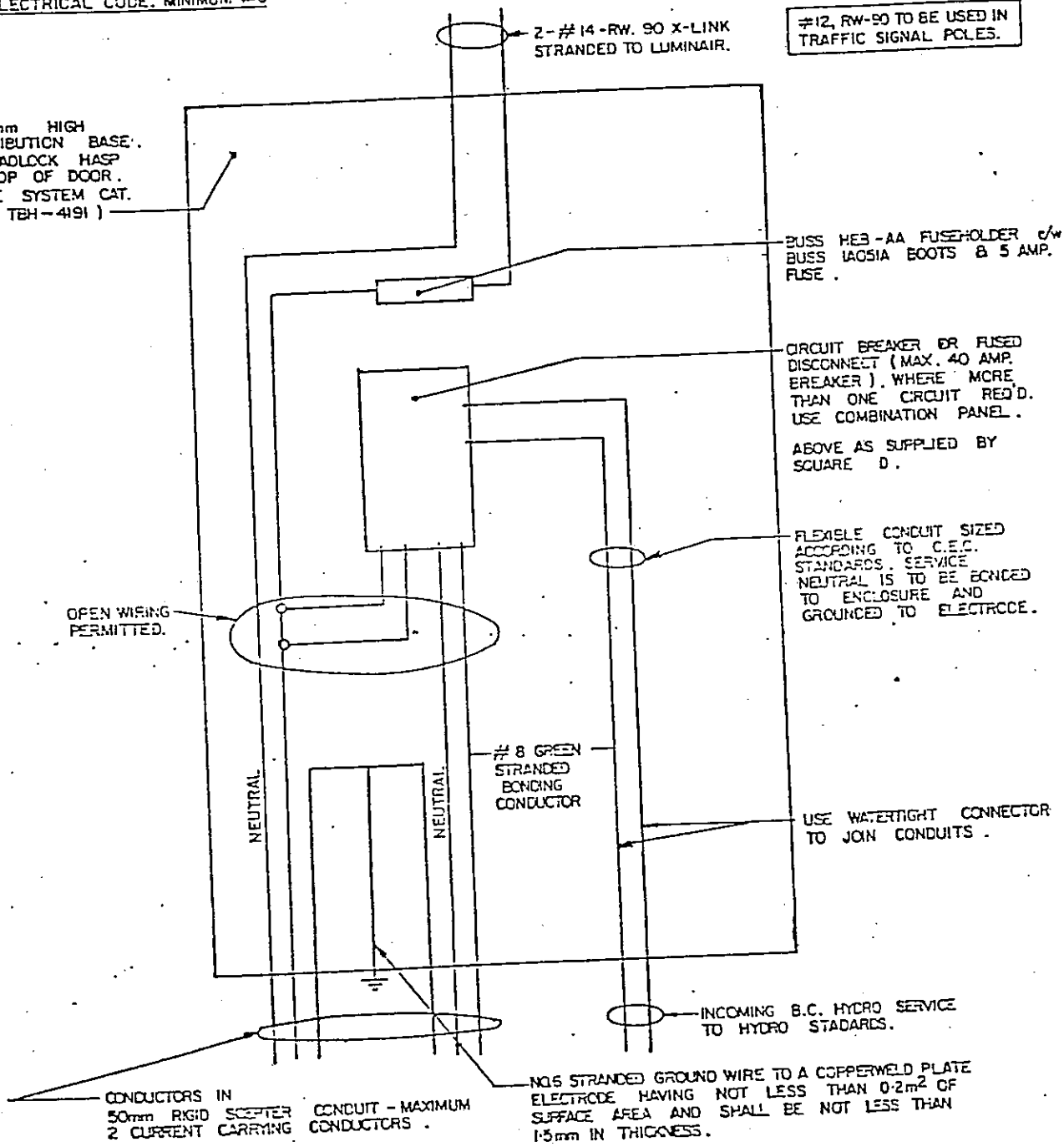
HANDHOLE WIRING SCHEMATIC 120 V. STREET LIGHT

REV'N	DATE	DATE	APPROVED	DWG. NO.
				E5

CONDUCTORS TO BE COPPER AND SIZED ACCORDING TO CANADIAN ELECTRICAL CODE. MINIMUM #8

CONDUCTORS BETWEEN POLES TO BE RW 90

#12, RW-90 TO BE USED IN TRAFFIC SIGNAL POLES.



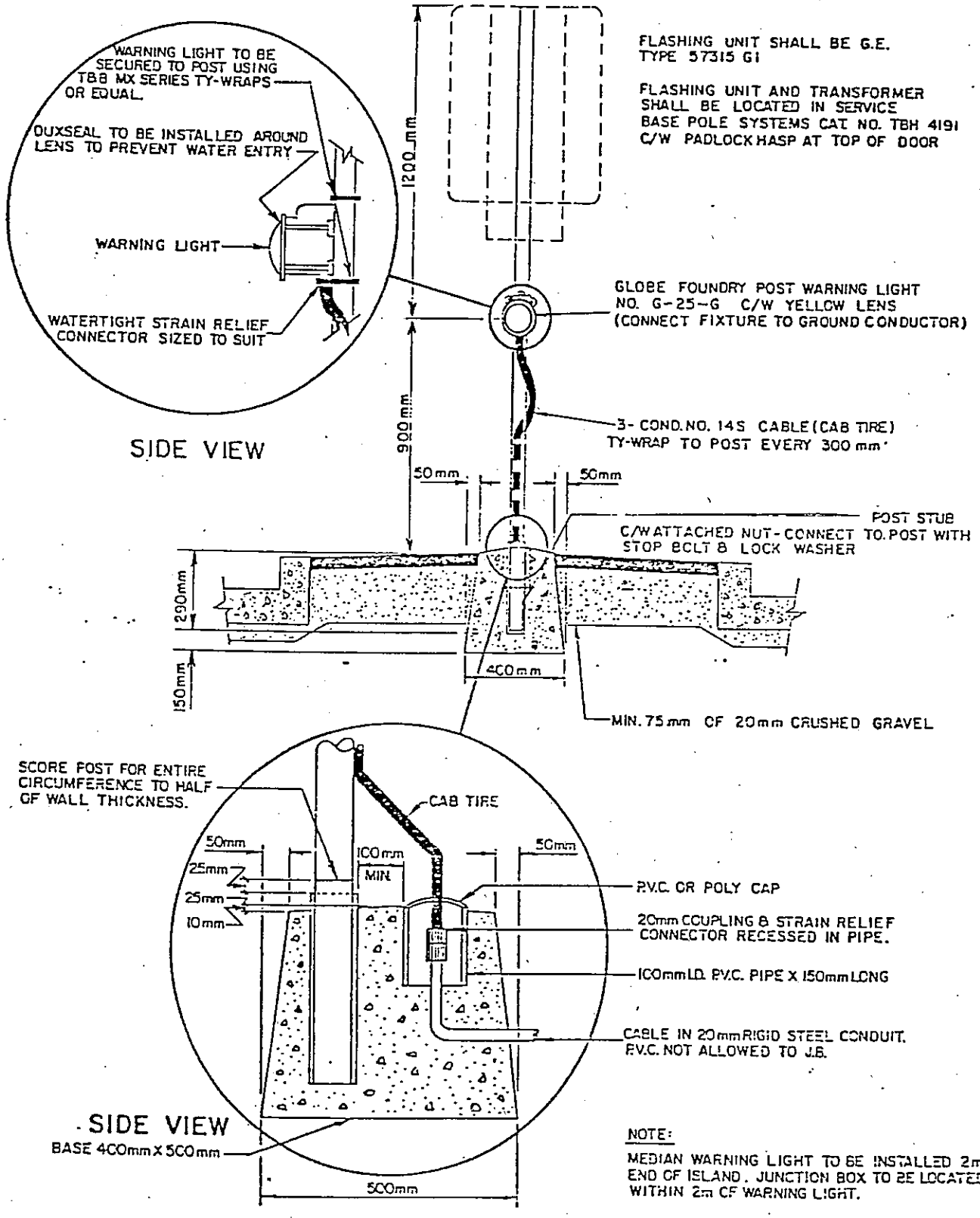
IN GROUND JUNCTION BOXES WILL NOT BE ALLOWED. SEE POLE & BASE DWGS. FOR SERVICE BASE SIZES. THIS WILL BE NECESSARY WHEN MORE THAN TWO CONDUITS ENTER A POLE.

Stanley
STANLEY ASSOCIATES ENGINEERING LTD

VILLAGE OF PORT CLEMENTS

SERVICE BASE SCHEMATIC 120V. STREET LIGHT

REV'N	DATE	DATE	APPROVED	DWG.NO.
				E6



NOTE:

MEDIAN WARNING LIGHT TO BE INSTALLED 2m FROM END OF ISLAND. JUNCTION BOX TO BE LOCATED WITHIN 2m OF WARNING LIGHT.

Stanley

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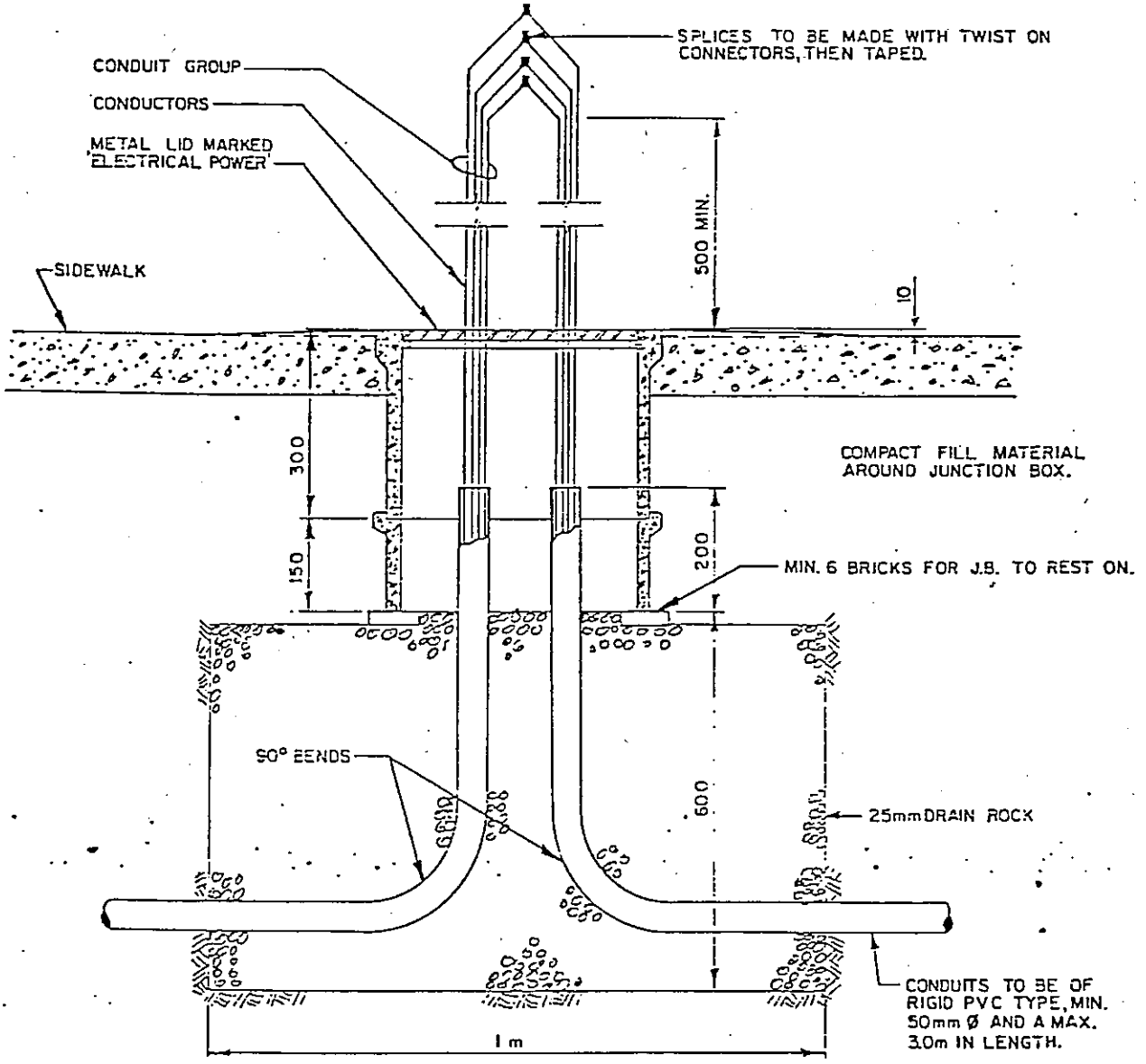
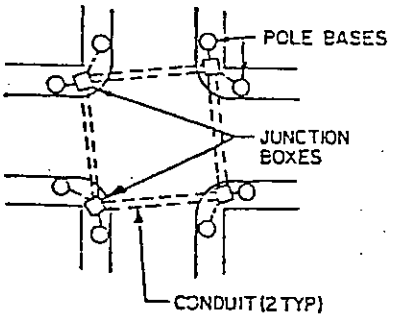
VILLAGE OF PORT CLEMENTS

MEDIAN WARNING LIGHT MOUNTING DETAIL

REVN	DATE	DATE	APPROVED	DWG. NO.
				E7





CONDUIT LAYOUT

NOTE:

1. JUNCTION BOXES SHALL BE 760mm BY 300mm AS PER A.E. CONCRETE PRECAST PRODUCTS.
2. CONDUCTORS TO BE PULLED THROUGH POLE BASES AND SPLICED ONLY IN JUNCTION BOXES.
3. CONDUITS TO BE IDENTIFIED AT EACH END.
4. CONDUCTORS TO BE IDENTIFIED BY WIRE MARKERS AS WELL AS CONDUCTOR COLOUR.
5. CONDUCTORS FOR TRAFFIC SIGNALS TO BE #14 AWG RW90 X-LINK STRANDED COPPER.
6. CONDUCTORS FOR STREET LIGHTS TO BE MIN. #8 AWG RW90 X-LINK STRANDED COPPER.

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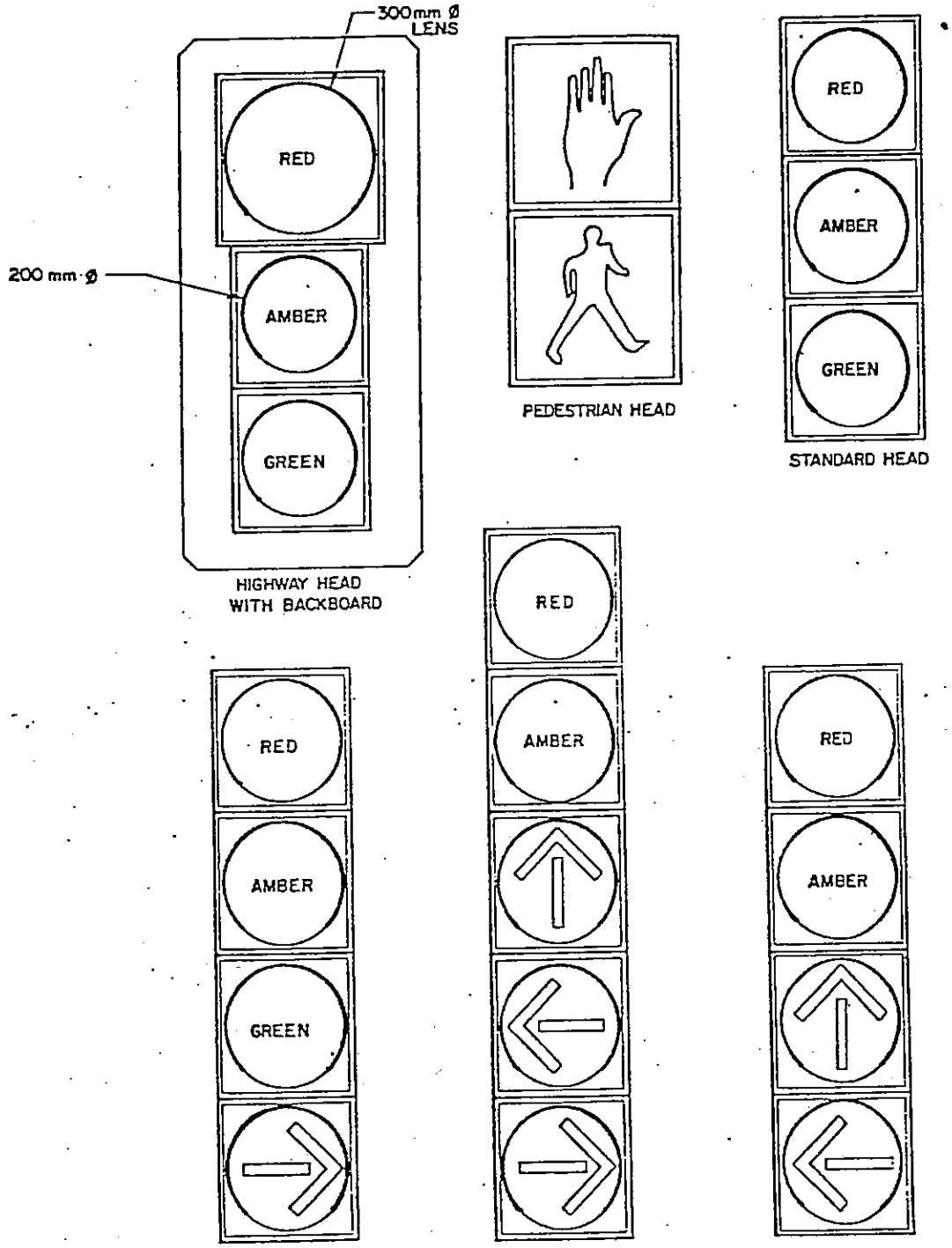
VILLAGE OF PORT CLEMENTS

JUNCTION BOX FOR TRAFFIC SIGNALS

REV'N	DATE	DATE	APPROVED	DWG.NO. E8



SPECIAL HEADS

CORRECT DISPLAY SEQUENCES FOR VARIOUS SIGNAL HEADS.

Stanley

STANLEY ASSOCIATES ENGINEERING LTD.

REV'N	DATE	DATE	APPROVED	DWG.NO. E9

VILLAGE OF PORT CLEMENTS

SIGNAL HEAD PATTERNS

SCHEDULE "B"

VILLAGE OF PORT CLEMENTS

SUBDIVISION SERVICING BYLAW NO. 195

SCHEDULE "B"

LEVELS OF WORKS AND SERVICES

The levels of works and services to be provided in subdivisions and developments shall conform to the following table for the various zones as set out in the Village of Port Clements Zoning Bylaw No. 184 and amendments thereto.

Description	R-1	R-2	RM-1	RM-2	C-1	C-2	M-1	M-2	M-3	I-1	I-2	P	RS
1. Water Service													
• Municipal	R	R	R	R	R	R	R	N	N	N	N	R	N
• Private Individual	N/A	N	N/A	N/A	N/A	N/A	N/A	R	R	R	R	R	R
2. Sanitary Sewer													
• Municipal	R	N	R	R	R	R	R	N	N	N	N	R	N
• Private Individual	N/A	R	N/A	N/A	N/A	N/A	N/A	R	R	R	R	R*	R
3. Drainage													
• Enclosed Channel	N	N	N	N	N	N	N	N	N	N	N	N	N
• Open Channel	R	R	R	R	R	R	R	R	R	R	R	R	R
4. Street Lighting													
• Ornamental	N	N	N	N	N	N	N	N	N	N	N	N	N
• Hydro Pole Mounted	R	R	R	R	R	R	R	N	R	R	N	R	N
5. Sidewalks													
• Both sides	N	N	N	N	N	N	N	N/A	N	N/A	N/A	N	N/A
• One side	R**	N	R**	N	N	N	N	N/A	N	N/A	N/A	N	N/A
6. Highways													
• Local	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7	R-7
• Collector	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8
7. Non-Municipal Services													
• Power, underground	N	N	N	N	N	N	N	N	N	N	N	N	N
• Power, overhead	R	R	R	R	R	R	R	R	R	R	R	N	N
• Telephone, underground	N	N	N	N	N	N	N	N	N	N	N	N	N
• Telephone, overhead	R	R	R	R	R	R	R	R	R	R	R	N	N

* Remote parks only

** Collector streets only

R - Required

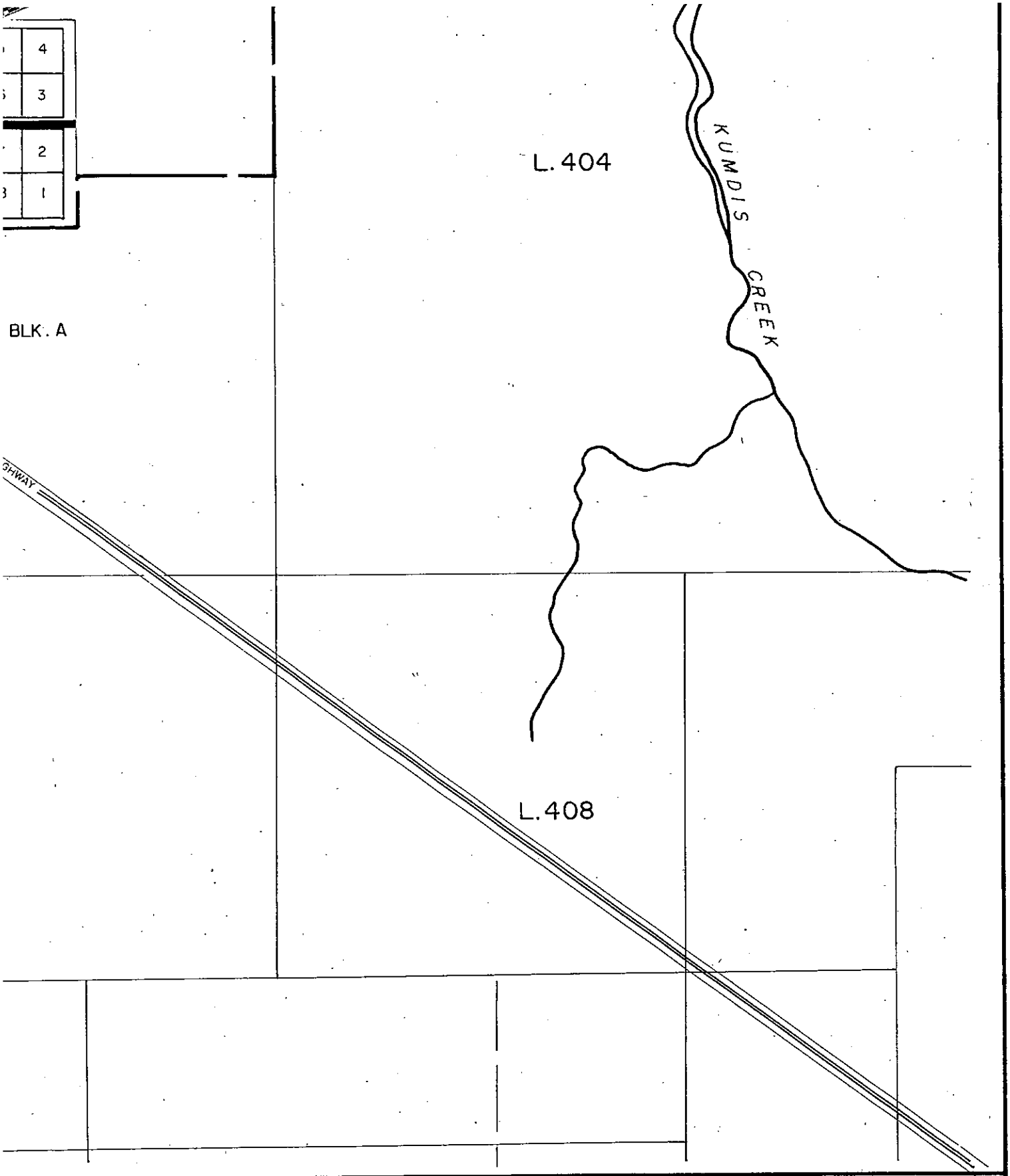
N - Not required, may be allowed

N/A - Not allowed

R-7 - Local Road Standard

R-8 - Collector Road Standard

SCHEDULE "C"



VILLAGE OF PORT CLEMENTS
SUBDIVISION SERVICING BYLAW

ROADWAY CLASSIFICATIONS

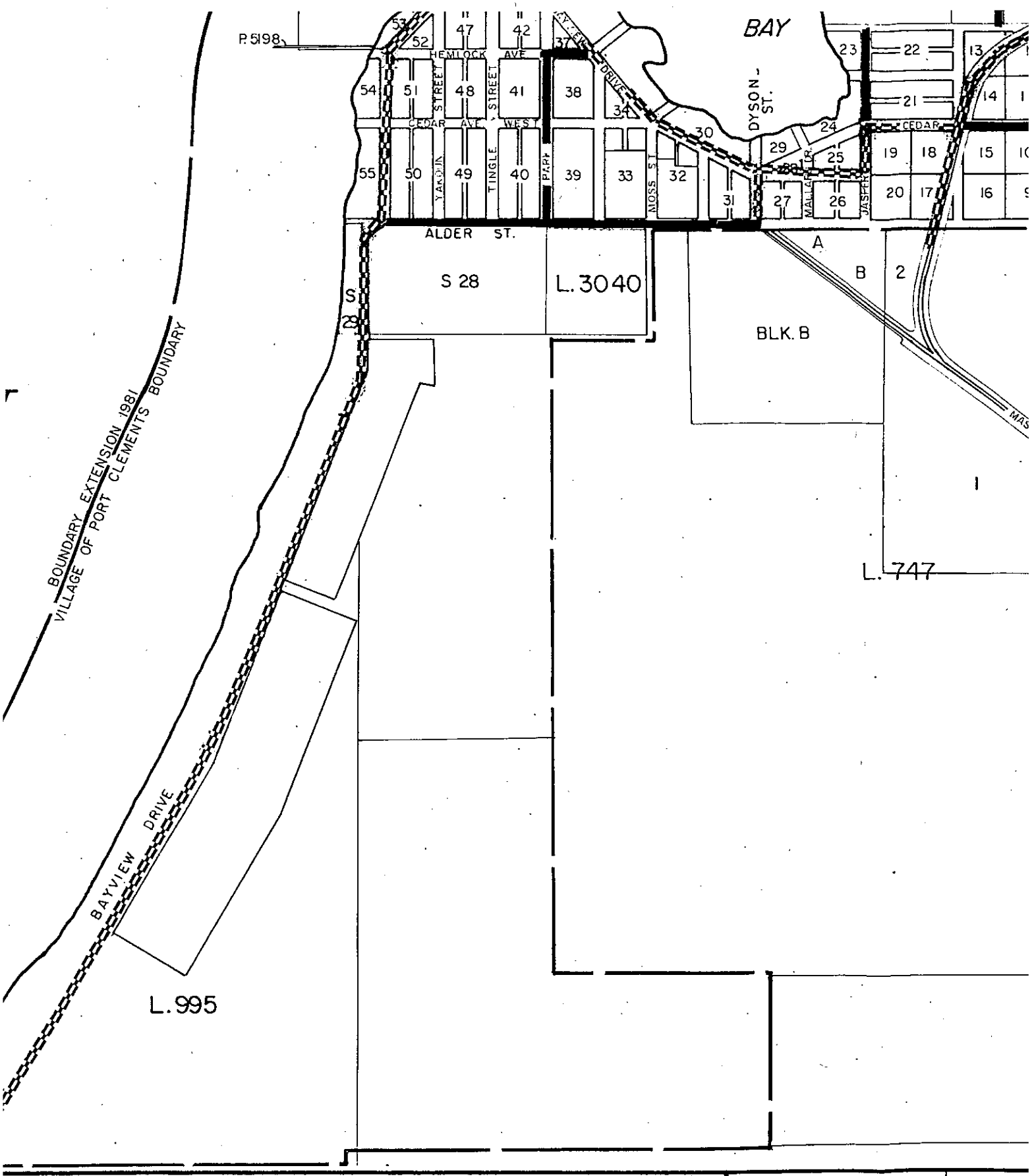
DATE JULY, 1990

SHEET No

JOB No 90-485-01-01

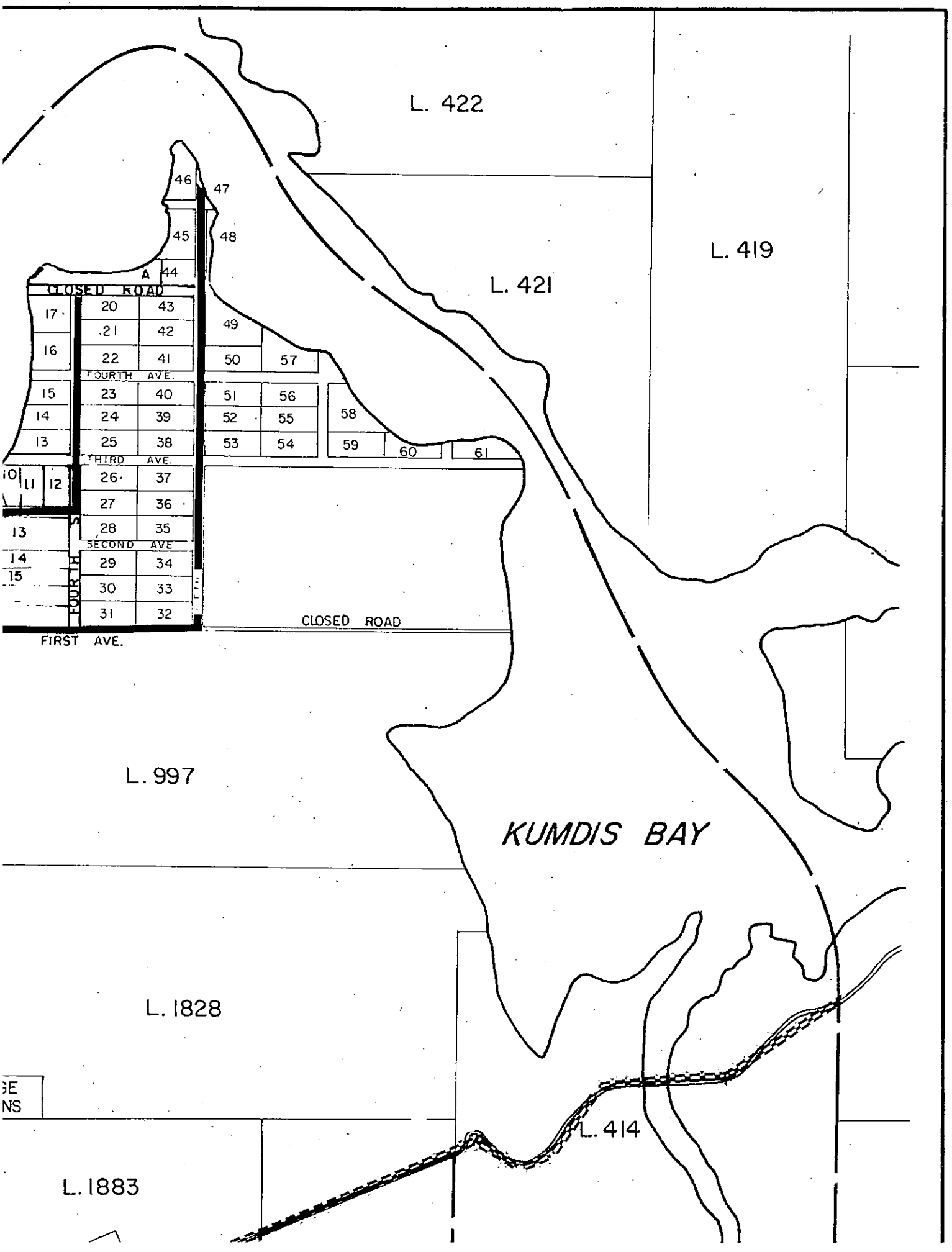
REVISION No

DRAWING No



Stanley

DESIGN	APPROVED
M.A.P.	
DRAWN B.	CHECKED
SCALE 1:10 000	


L. 422
L. 419
L. 421
L. 997
KUMDIS BAY
L. 1828
L. 414
L. 1883
CLOSED ROAD
FOURTH AVE.
THIRD AVE.
SECOND AVE.
FIRST AVE.
FOURTH ST.
CLOSED ROAD
A
46
47
45
48
44
17
20
43
21
42
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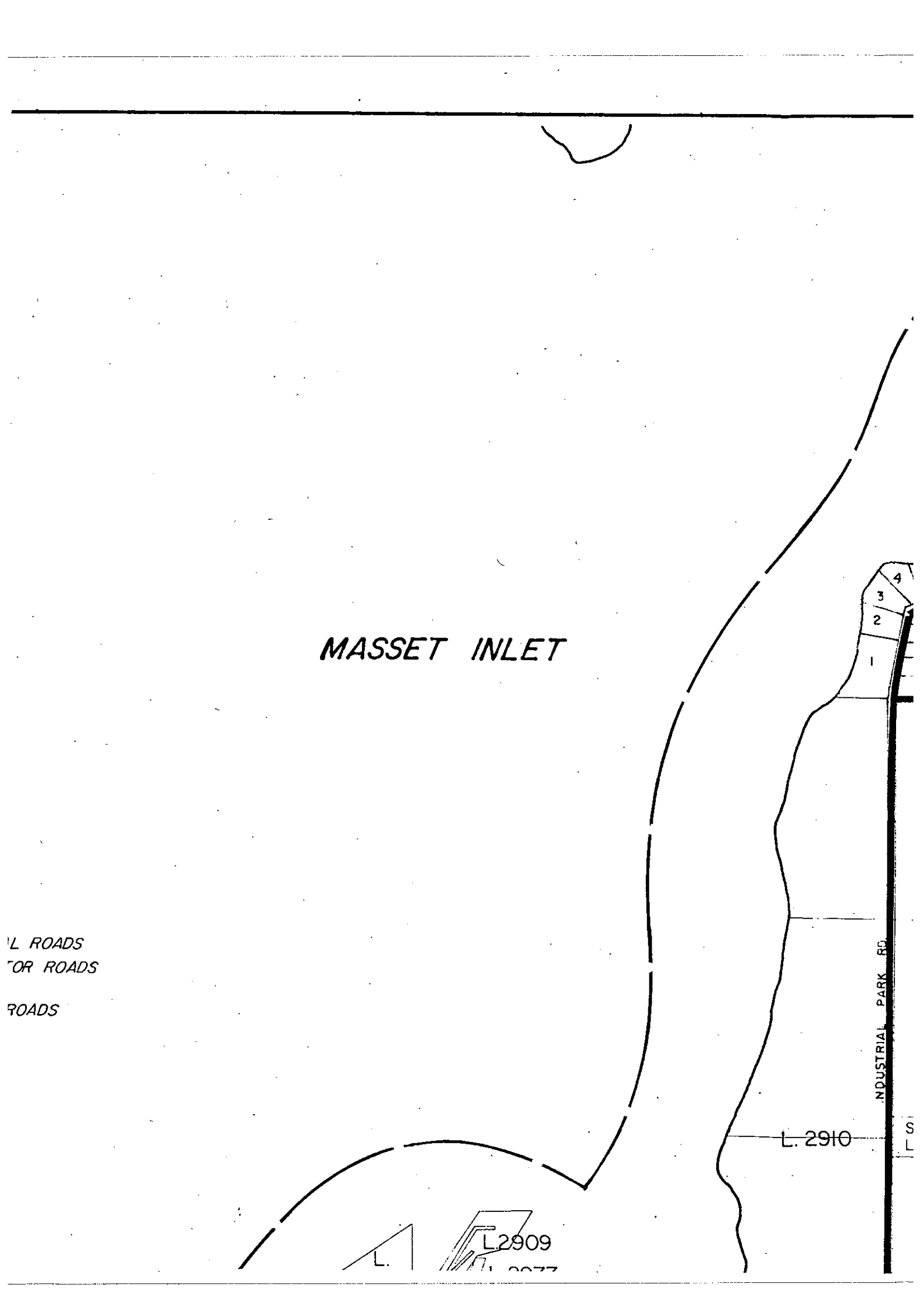
MASSET INLET
L ROADS
OR ROADS
ROADS
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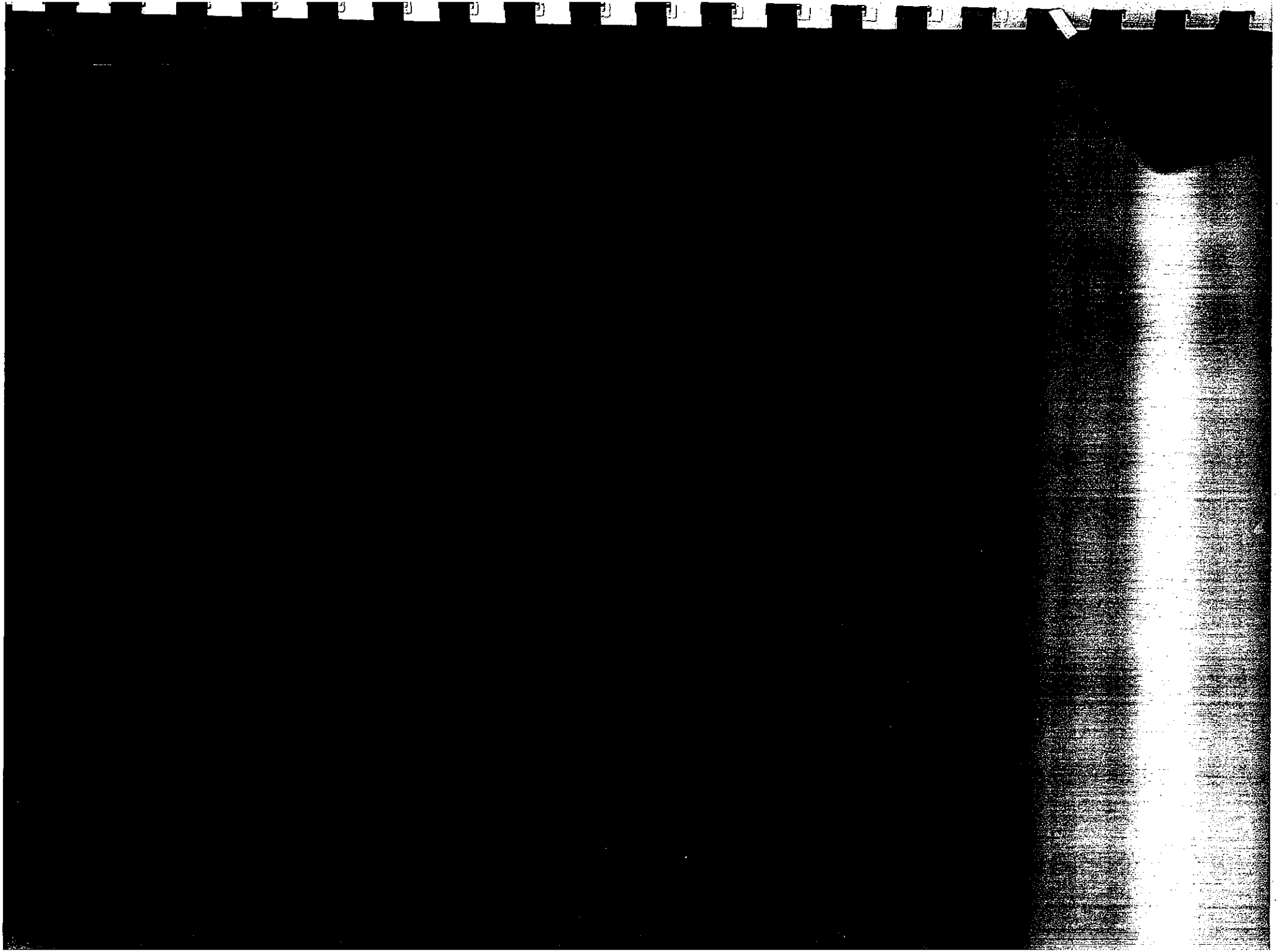
3
2
1
INDUSTRIAL PARK RD.
L. 2910
L2909
L.

APPENDIX "A"



APPENDIX "A"

TABLE OF CONTENTS

APPENDIX "A" ACCEPTABLE STANDARDS FOR DRAWING SUBMISSIONS

APPENDIX A

ACCEPTABLE STANDARDS FOR DRAWING SUBMISSIONS

This Appendix outlines the minimum standards for design and record drawings which will be acceptable to the Municipality. This Appendix is included for information only and does not form part of the Village of Port Clements Subdivision Servicing Bylaw.

A.1 INTRODUCTION

All design drawings and record drawings, except record drawing transparencies, shall be signed and sealed by a Professional Engineer registered in British Columbia.

All drawings shall be sized A-1 (594 mm x 641 mm). Record drawing transparencies shall be 3 mil double matte mylar. Plan-profile drawings shall be 2 m x 20 mm grid with the top. half profile and the bottom half plan. The title block shall be located in the lower right hand corner of the sheet, with the consultant's name shown only in a 200 mm x 50 mm space beside the title block. A sample of a prepared plan-profile sheet may be obtained from the Municipality.

A.2 SYMBOLS AND LETTERING

Standard symbols for the various facilities shall be used on all drawings. Standard details for items such as manholes, catchbasins, hydrant assemblies, etc. need not be shown in detail, unless deviation from details shown on the applicable Standard Drawings is proposed or has occurred.

Lettering shall be an open style vertical gothic style applied using a mechanical template, computer graphics system or equivalent, using generally upper case lettering and black india ink. Lettering shall be a minimum of 2.0 mm high and shall be fully legible.

North arrows shall point either toward the top of the sheet or toward the left hand edge of the sheet and shall be placed on the right hand side near the top of the sheet.

A.3 SCALES AND DIMENSIONING

All scales shall be standard metric scales and shall conform to the following.

General Plan:	not less than 1:1000
Key Plan:	not less than 1:2000

Plan-Profile Drawings

Plan:	1:500
Profile:	Horizontal 1:500
	Vertical 1:50

Plan-Profile Drawings (Optional for Rural roads only)

Plan:	1:1000
Profile:	Horizontal 1:1000
	Vertical 1:100

Intersection Details

Plan:	1:200
Profile:	Horizontal 1:200
	Vertical 1:20

Miscellaneous Details: Appropriate metric scale

Pipe sizes shall be shown in millimetres using 1" - 25 mm (ASTM designation). Distance and location dimensions shall be shown in metres and, where existing dimensions are in imperial scale, shall be soft converted using the factor one foot = 0.3048 m.

All elevations shown on drawings shall be based on Integrated Survey (Geodetic) datum where such survey exists within 2 km of work site.

A.4 INFORMATION TO BE INCLUDED ON DRAWINGS

A complete set of drawings shall consist of a general plan, key plan, plan and profile of roads and services and additional plans showing special details. For urban subdivisions, three separate sets of plan-profile drawings are required to show:

- roads, streets, lanes, walkways and related facilities
- storm and sanitary sewers, watermains and related facilities
- underground wiring and ornamental street lighting

All known existing underground services, watercourses and structures on or adjacent to the site shall be shown, along with a notation as to whether they are to be retained, removed, relocated or redirected.

The following information shall be included with design drawings submitted for approval, with design information and notes added so as to be easily removable at the record drawing stage.

A.4.1 General Plan

- all mains, including gas mains
- all existing and proposed property lines for subdivision
- all existing and proposed buildings for development
- location and monument number of integrated survey monuments and any other monuments and/or bench marks used in preparing the design drawings

A.4.2 Key Plan

- the key plan may be drawn on one corner of the General Plan
- location of subdivision or development with respect to major roadways and trunk water and sewer lines
- drainage pattern and tributary drainage area

A.4.3 Roads

Plan/Profile

Plan

- Property lines
- offsets to ditch lines, edge of pavement curbface
- grading limits, appropriate horizontal curve information
- B.C. and EC for all horizontal curves
- centreline of road
- road and right of way widths
- sidewalk and walkway locations and widths
- culvert locations, sizes and invert elevations
- catch basin locations and rim elevations
- curb return radii
- driveways
- manhole cover elevations
- street name
- poles, fences and other surface features

Profile

- centreline and gutter profiles
- vertical curve information
- B.C. and EC for all vertical curves
- vertical points of intersection and grades between points
- centrelines of intersecting roads
- original ground profile at centreline (and on both sides of right-of-way as applicable
- ditch invert profiles as applicable
- culvert inverts
- walkway profiles

Intersection Plan/Profile

Plan

- gutter elevations at maximum 7.5 m intervals
- curb return data
- finished road elevations at maximum 7.5 m grid

Profile

- profile of gutter along curb returns showing minimum of five (5) elevations along the curb return and extending 7.5 m in each direction from the ends of the curb return.

Details

- typical road construction details
- typical pavement structure(s)
- curb, gutter, sidewalk details
- walkway details
- sidewalk crossing details

A.4.4 Storm and Sanitary Sewers, Watermains

Plan	:	centreline of sewers and watermains
	:	centreline of ditches
	:	property lines
	:	pipe size and material, including pressure class
	:	locations of manholes, catch basins, cleanouts, culverts, service connections, valves, fittings, hydrants and related appurtenances in relation to roadway, easement and/or lot property lines.
	:	invert elevations of all storm and sanitary service connections at the property line
	:	minimum basement elevations where applicable.
	:	varying backfill or surface restoration requirements,
Profile	:	existing and finished ground elevation on pipe centreline
	:	invert of water and sewer pipe(s) profile
	:	ditch profiles
	:	invert elevation of each pipe entering or leaving manholes and cleanouts and at all changes in gradient,
	:	slope (in percent) of the pipe(s)
	:	location and elevation of all other services, including service connections, which cross the pipe(S)
Details	:	manholes, catch basin and cleanouts, cover and frame and intersection details
	:	typical service connections
	:	pipe bedding, trench and anchor block details
	:	storm inlet/outlet details
	:	valves, thrust blocks, hydrants, standpipe, air-release valve details

A.4.5 Underground Wiring and Street Lighting

Plan	:	roadway, easement and lot property lines
	:	location of underground ducting, overhead wiring, street light poles, power poles, telephone poles, kiosks, service and control equipment and all related appurtenances
	:	all other existing and proposed underground and overhead utilities
	:	wiring diagrams

A.4.6 On-Site Servicing Drawings

Off-site services in municipal utility rights-of-way shall be included in the set of drawings for off-site services. A separate and distinct set of plans shall be submitted for on-site services on private property and these services shall not be included on the same plans as off-site services located in municipal utility rights-of-way.

On-site services may be shown on a plan drawing which includes the following minimum information:

- o size and location of all water mains, valves, fittings, hydrants and appurtenances
- o size, slope, location and design capacity of all sewerlines
  invert elevations of manholes, sumps and major pipe intersections
- o basement and/or floor slab elevations for all buildings
- o clearance where pipes cross
- o existing and proposed elevations around the site perimeter, at key points at pavement and building edges, catchbasin rims, etc.
- o if warranted by site topography, existing and proposed contours

A.4.7 Record Drawings

Record drawings shall clearly illustrate the work as it has been constructed, shall accurately locate all services and service connections and shall include all changes from the drawings as originally approved for construction. Road cross-section sheets, standard detail sheets, general plan, key plan, intersection detail plan-profiles, etc. need not be submitted as record drawings.

A.5 DRAWING SUBMISSIONS

Drawing submissions are required as follows:

a) preliminary layout plan (2 paper prints).

b) upon acceptance in principle of a), preliminary servicing plan (2 paper prints).

c) upon acceptance in principle of b), detailed design drawings for review (2 sets, paper prints) one set may be returned for revisions, if necessary.

d) revised detailed design drawings for review (2 sets paper prints), repeated as necessary.

e) upon acceptance of c) or d), one additional complete set of paper prints, plus 2 sets of paper prints of waterworks drawings.

f) upon receipt of any required Provincial Government approvals, and upon notification by the Municipality's Engineer, sufficient additional paper prints to allow five complete sets of the latest accepted drawings to be assembled. (Two sets, stamped and signed "Approved for Construction" will be returned to the Developer's Engineer when all applicable agreements have been signed and all required security deposits, cash deposits and insurance documentation has been received by the Municipality).

g) after detail design drawings are accepted, the Owner shall engage a registered B.C. Land Surveyor to perform all legal surveys and prepare the subdivision plan and all utility easement plans for registration.

h) upon completion of the work, record drawings consisting of 2 sets of paper prints of drawings which are signed and sealed, one set of full sized positive transparencies of drawings which are not signed or sealed and the "original" and two sets of copies of service record sheets in a form acceptable to the Municipality, which shall be signed and sealed.

APPENDIX "B"

APPENDIX B

TYPICAL FORMS AND AGREEMENTS

The forms contained herein will be acceptable to the Municipality. These forms are included for information only and does not form part of the Village of Port Clements Subdivision Servicing Bylaw.

SERVICING AGREEMENT

No. _____

between

Village of Port Clements

and

_____

DATE: _____

SERVICING AGREEMENT

THIS AGREEMENT made this_____ day of_____, 19___;

BETWEEN:

THE VILLAGE OF PORT CLEMENTS incorporated under the "Municipal Act" of the Province of British Columbia, and having its Municipal Offices at

_____.

(hereinafter called the "Municipality")

OF THE FIRST PART

AND:

_____

_____

_____

(hereinafter called the "Owner")

OF THE SECOND PART

WHEREAS:

A. The Owner holds an interest in lands and premises within the Village of Port Clements, in the Province of British Columbia, more particularly known and described as follows:

_____

_____

_____

_____

(hereinafter called the "Lands")

B. The Owner desires to subdivide the Land or Develop on the Land.

C. The Approving Officer or the Municipality has agreed to approve the subdivision of the Lands or the Development respectively subject to the terms and conditions contained in this Contract, and the posting with the Municipality of the security deposit described herein.

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the promised covenants and agreement hereinafter set forth, the parties hereto covenant, agree, represent and promise as follows:

APPENDICES

1. The following Appendices will be read with and form part of this Agreement:

   Appendix "A" - A copy of the subdivision plan of the Lands;

   Appendix "B" - A list of the "Works" and an estimate of their respective construction costs.

   Appendix "C" - Construction drawings to be used for the construction of the "Works".

OWNER TO DO WORK

2. The Owner covenants and agrees to construct and provide all the works and services listed an shown on Appendices "B" an "C" hereto, as approved by the Municipality, in accordance with the standards contained in Schedule "A" of the Municipality's Subdivision Servicing Bylaw.

TRANSFER OF INTEREST IN WORKS

3. The Owner covenants and agrees with the Municipality to assign, transfer and convey to the Municipality all of its right, title and interest in the works on any and all of the lands, upon or in which the works are situate, upon the completion of the works, (as witnessed by the issuance of a certificate of substantial completion). The Owner will from time to time and at all times so long as it exercises any rights of ownership in the "said lands" upon the request of the Municipality, make, do and execute or cause or procure to be make, done and executed, all such further acts, deeds, right-of-way, easements and assurances for the more effectual carrying out of this Agreement.

PERMISSION TO DO WORK

4. The Municipality covenants and agrees to permit the Owner to construct the "Works", including that portion of the "Works" to be constructed on dedicated highways controlled by the Municipality; on the terms and conditions herein, and in the manner required by and at the places specified in the Plans and Specifications; provided that nothing in this Agreement shall be construed as an undertaking,

promise or covenant on the part of the Municipality to made available the use of or access to the "Works" for any purpose, and without limiting the foregoing, for the purpose of serving the Lands or any other real property whatsoever either owned or controlled by the Owner or its associates or otherwise, but rather the Municipality reserves the right in its sole and absolute discretion to make available, operate, alter, use, extend, diminish, discontinue, tear up, sell, rent or otherwise dispose of the "Works" as its Council from time to time deems fit.

CHANGES TO BYLAWS

5. The Owner covenants and agrees to comply with any changes in subdivision requirements or standards enacted by Bylaw prior to the actual commencement upon the lands of the works completed by this Agreement.

LOT GRADING

6. The Owner covenants and agrees to adhere in all respects to the contours, elevations and drainage patterns indicated on the lot grading plan or storm water management plans prepared by the Engineer and/or engineering Company indicated in Clause II hereof, and which are attached as Appendix "C" to this Agreement.

START OF WORK

7. The Owner covenants and agrees not to commence work until the Municipality's Engineer provides the Owner with written permission to proceed with construction in the form provided in Appendix ___. to the Municipality's Subdivision Servicing Bylaw.

COMPLETION OF WORK

8. The Owner shall complete the construction of the works, specified in Appendix "C" as Project No. _____ of the Municipality, to the satisfaction of the Municipality by the _____ day of _____. A.D. 19 ___.

OWNER TO GRANT RIGHTS OF WAY

9. The Owner covenants and agrees to grant to the Municipality all necessary road dedications, statutory rights-of-way and easements over the said lands to accommodate the said works and, where the said works are located upon or under privately owned lands other than the said lands, to obtain at the Owner's expense, all necessary road dedications, statutory rights-of-way and easements over such lands, in favour of the Municipality where applicable, to accommodate the said works.

DESIGN BY P.ENG.

10. The Owner covenants and agrees that all works required herein, shall be designed by a Professional Engineer, who shall be registered with the Association of Professional Engineers of British Columbia and retained by the Owner. Plans and specifications for the said works shall be prepared by or under the direct supervision of the said Professional Engineers of British Columbia and retained by the Owner. Plans and specifications for the said works shall be prepared by or under the direct supervision of the said Professional Engineer and all plans shall bear his professional seal and signature.

The Owner covenants and agrees to ensure that his Design Engineer (as specified in Clause II) maintains professional liability and errors and omissions insurance to a value of $250,000 per occurrence during the term of his engagement.

The Owner covenants and agrees to retain the Design Engineer during the construction period for the purposes of inspection to ensure compliance with the approved design and to provide certification of the as-built records.

ENGINEERING DRAWINGS

11. The Owner covenants and agrees that the intent of this Agreement is that the Owner shall construct fully completed works, and grant necessary easements as shown in the plans and specifications prepared by:

_____

_____

_____

under Drawing Nos.:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

and as received for the purposes of this Agreement by the Engineer of the Municipality on the ____ day of _____, A.D., 19 ___.

CHANGES TO DESIGN BY MUNICIPALITY

12. The Municipality's Engineer may alter the Plans, because of conditions at the site, so that the works function and operate in a manner satisfactory to the Municipality's Engineer. Should the works, as provided herein, prove to be in any way defective or should they not operate to the satisfaction of the Municipality's Engineer, then the Owner shall, at his own expense, modify and reconstruct the works so that the works shall be fully operative and function to the satisfaction of the Municipality's Engineer.

SUBSTANTIAL COMPLETION

13. A Certificate of Substantial Completion, shall be provided by the Municipality's Engineer on the completion of the construction listing all the deficiencies. This letter of Substantial Completion shall not be construed as acceptance of the works.

"AS-BUILT" SUBMISSION

14. The Owner covenants and agrees to submit to the Municipality the final "as-built" drawings and records of construction, and test results, as accepted by the Municipality's Engineer, pursuant to Schedule 'A' of the Municipality's Subdivision Servicing Bylaw, within 60 days of the date of the Letter of Substantial Completion.

MAINTENANCE PERIOD AND RESPONSIBILITY

15. The Owner covenants and agrees to maintain every part of the "Works" in perfect order and in complete repair for a period of one year from the date shown on the certificate of Substantial Completion in accordance with the requirements of the Municipality's Subdivision Servicing Bylaw.

Should the Owner, for any reason, fail to maintain when ordered, then the Municipality's Engineer, at his option, after giving the Owner seven days written notice (emergencies expected), may do so, and the whole costs, charges and expenses so incurred by the Municipality will be payable by the Owner, as provided herein. The decision of the Municipality's Engineer will be final with respect to; the necessity for repairs, or the adequacy of any work done.

CERTIFICATE OF ACCEPTANCE

16. The Municipality covenants and agrees that upon satisfactory completion by the Owner of all of the covenant and conditions in this Agreement, including the maintenance of the works in complete repair for a period of one (1) year, to provide the Owner with a Certificate of Acceptance of the works, signed by the Municipality's Engineer. Notice of acceptance of the work will be issued by the Municipality's Engineer when all deficiencies have been corrected, "As-Built" drawings and service location cards received, and the maintenance period outlined herein has expired. The Certificate of Acceptance will be in the form outlined in Appendix _____ to the Municipality's Subdivision Servicing Bylaw. All such works and services remain at the risk of the Owner until the "Certificate of Acceptance" for the work has been issued.

FINAL BUILDING INSPECTION

17. The Owner covenants and agrees that the Municipality will withhold the granting of a Final Inspection for the use of any building or part thereof, constructed upon the land until all the essential services herein have been completed to the satisfaction of the Municipality's Engineer.

OWNER INDEMNIFIES

18. The Owner covenants and agrees to save harmless and effectually indemnify the Municipality against:

(a) All actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and whomsoever brought by reason of the execution of the works required by this Agreement. All such claims recoverable from the Municipality or any property which the Municipality by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, during the term of the Owner's work, shall be paid by the Owner, and if recoverable from the Municipality shall, together with any costs and expenses incurred in connection therewith, be charged to and paid forthwith by the Owner.

(b) All expenses and costs which may be incurred by reason of the execution of the required works by this Bylaw, resulting in damage to any property owned in whole or in part by the Municipality by custom or duty is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, shall be paid by the Owner, and if paid by the Municipality shall, together with any costs and expenses incurred in connection herewith, be charged to and paid forthwith by the Owner.

(c) All expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, Worker's Compensation Board assessments, unemployment insurance, federal or provincial tax, and of encroachments due to mistakes in survey, and all such claims recoverable from the Municipality, or the property of the Municipality, or any property of the Municipality, or any property which the Municipality by duty or custom is duly obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, shall be paid by the Owner, and if recovered from the Municipality shall, together with any costs and expenses incurred in connection therewith be charged to and paid forthwith by the Owner.

(d) All expenses and costs which may be incurred by the Municipality as a result of faulty workmanship and defective material in any of the works installed by the Owner.

The above clauses shall not be construed as to extinguish any rights which the Municipality would have were it not for the inclusion of Clause 18 in this Agreement.

INSURANCE BY OWNER

19. The Owner will at his sole expense throughout the currency of the work carry Comprehensive Liability Insurance acceptable to the Municipality in the amount of at least three million dollars ($3,000,000.00) with insurance companies licensed to carry on business in the Province of British Columbia in partial discharge of its obligation under Clauses 18(a), (b), (c) and (d).

INSURANCE COVERAGE

20. The Owner covenants and agrees to provide the following insurance coverage, and to provide the Municipality with a copy of the insurance policy prior to the commencement of any construction of the works:

(a) To protect the Owner and the Municipality against all claims arising out of:

i) Death or injury to persons; and

ii) Damage to, or loss of use of, any property of third persons, including without limiting the foregoing; the following classes of property: Real property, chattels, land, works, buildings, structures, wires, conduits, pipes, mains, shafts, sewers, tunnels, and apparatus in connection therewith, even when the damage or loss of use is caused by vibration, moving, shoring, underpinning, raising, rebuilding or demolition of any building, structure or support, or by excavation, tunnelling or other work below the surface of the ground or water; and

iii) Damage to or loss of all building, structures, stores, equipment and materials included in or required for the carrying out of the "Works".

(b) Every policy of insurance required will:

i) Name "Village of Port Clements" as an additional insured; and

ii) State that policy applies to each insured in the same manner and to the same extent as if a separate policy had been issued to each insured; and

iii) State that the policy cannot be cancelled, lapsed or materially changed without at least thirty (30) days written notice to the Municipality, delivered to Village of Port Clements Municipal Clerk.

SECURITY DEPOSIT

21. As security for the due performance of all of the covenants and promises contained in this Agreement the Owner has forthwith deposited with the Municipality a security deposit in the amount to $ _____, in the form of cash or a Letter of Credit acceptable to the Municipality (herein called the "Security Deposit").

FORFEIT OF SECURITY DEPOSIT

22. In the event that the Owner fails to construct and install the Works and Services prescribed herein within the time specified in Clause 8, the said Security Deposit of $_____ will be forfeited to the Municipality.

DESIGN BOND

23. Where security is provided in lieu of approved working drawings, (hereinafter called a "Design Bond") the Owner agrees to have the working drawings completed to the satisfaction of the Municipality's Engineer within 90 days of the date of this Agreement. Failure to do so will result in forfeiture of the Design Bond in the amount of $_____ which shall be used by the Municipality to complete the design. Once forfeited, the Design Bond becomes non-refundable in whole or in part.

USE OF SECURITY

24. The Owner agrees that if all the works or obligations are not completed, installed or performed pursuant to this Agreement, the Municipality may complete or fulfil the works or obligations at the cost of the Owner and deduct from the security deposit held by the Municipality the cost of such completion, and the balance of the deposit shall be returned to the Owner, less any additional administration fees or costs incurred. If there is insufficient money on deposit with the Municipality then the Owner will pay such deficiency to the Municipality immediately upon receipt of the Municipality's bill for completion. It is understood that the Municipality may do such work either by itself or by Contractors employed by the Municipality. If the works are completed as herein provided, then the deposit shall be returned to the Depositor.

RELEASE OF SECURITY DEPOSIT

25. If the Municipality's Engineer is satisfied that the Owner has complied with the covenants contained in this agreement and if there is no litigation pending or threatened by any third party against the Municipality as a result of, or arising from the construction of the "Works", the Municipality's Engineer may return all, or any portion of the Security Deposit to the Owner at such times and in such amounts as he may deem proper, provided only that he will retain an amount equal to 15% of the Security deposit, with a minimum of $1,000 and a maximum of $20,000 to secure the performance of the maintenance required of the Owner (hereinafter called the "Maintenance Deposit").

RETURN OF SECURITY DEPOSIT

26. If the Municipality's Engineer is satisfied that the Owner has complied with Covenants contained in this agreement and if there is no litigation pending
or threatened by any third party against the Municipality as a result of, or arising from the construction of the "Works", the Municipality's Engineer may direct that the Maintenance Deposit be returned to the Owner and thereinafter the Owner's responsibility for the "Works" shall cease.

ADMINISTRATION FEE

27. The Owner covenants and agrees to pay to the Municipality a non-refundable fee in the amount of $ _____ to cover Municipal administration and processing costs. These fees are payable prior to the signing of this Agreement or the commencement of construction of the works.

NO OTHER REPRESENTATIONS

28. It is understood and agreed that the Municipality has made no representations, covenants, warranties, guarantees, promises or agreements (verbal or otherwise) with the developer other than those in this agreement.

COMPLIANCE WITH BYLAWS

29. Subject to this Agreement, the within works and the development herein shall comply with all of the Bylaws of the Village of Port Clements.

NO WAIVER

30. The Owner covenants and agrees that nothing contained or implied herein shall prejudice or affect the rights and powers of the Municipality in the exercise of its functions under any public and private statutes, bylaws, orders and regulations, all of which may be fully and effectively exercised in relations to the said lands as if the Agreement had not been executed and delivered by the Owner.

WHENEVER the word "will" is used in this Agreement it will be construed as imperative (mandatory).

WHENEVER the singular or the masculine is used in the Agreement it will be construed as meaning the plural or the feminine or body corporate or politic where the context or the parties hereto so require.

THIS CONTRACT SHALL ENURE TO THE benefit of and be binding upon the parties hereto, their respective successors and assigns.

IN WITNESS WHEREOF the parties hereto have executed this contract the day and year first above written.

FOR CORPORATE BODY

THE CORPORATE SEAL OF

was hereunto affixed in the presence of:

_____

Authorized Signatory

_____

SEAL

FOR PRIVATE INDIVIDUAL

SIGNED, SEALED AND DELIVERED by the above named in the presence of:

Name: _____

Address: _____

_____

Occupation: _____

_____

Owner's Signature

SIGNED, SEALED AND DELIVERED

THE CORPORATE SEAL OF The Village of Port Clements was hereunto affixed in the presence of:

_____

MAYOR

_____

CLERK

SEAL

Date: _____

Bank of _____

_____

BRITISH COLUMBIA

The Village of Port Clements
P.O. Box 198
PORT CLEMENTS, BC
VOT 1R0

Dear Sirs:

At the request of (Developer), we hereby establish in your favour our irrevocable credit for a sum not exceeding

Dollars ($).

This credit shall be available to you by sight drafts drawn on the Bank of (Name/Address) ,BC when supported by your written demand for payment made upon us.

This Letter of Credit is required in connection with an undertaking by the Developer to perform certain works and services required by you.

We specifically undertake not to recognize any notice of dishonour of any sight draft that you shall present to us for payment under this Letter of Credit.

You may make partial drawings or full drawings at any time.

We shall honour your demand without enquiring whether you have a right as between yourself and our Customer.

If you have not demanded on this Letter of Credit in full by (expiry date).

It will be considered cancelled unless other arrangements or a renewal have been made with the Bank prior to the aforementioned date.

Our reference for this Letter of Credit is Bank of BC, (Address) LETTER OF CREDIT NO. _____.

BANK OF _____

_____

The Developer hereby specifically agrees that it shall not take any action to dispute the validity of this Letter of Credit unless it shall have expired prior to demand.

We hereby agree to indemnify the Bank of , against any costs of actions relative to the above. We also authorize the Bank of to make such payment as may be necessary and debit our account.

_____

_____

Developer

PERMISSION TO CONSTRUCT

Authorization to proceed with construction is hereby granted to:

NAME OF DEVELOPER _____

ADDRESS _____

For the works described generally as:

_____

_____

_____

Authorized Start Date _____ Completion Date _____

Authorized Hours of Work: From _____ hrs. to _____ hrs.
Monday to Saturday Inclusive.

Check the following: (All must be completed)

___ Approved plans covering the works are attached.
___ Certificates of Insurance are attached.
___ Administration fee has been paid.
___ Security deposit has been paid.
___ A Servicing Agreement has been completed - No. _____

Design Engineer: _____

Contact: _____

Phone No.: _____ (Bus:) _____ (Res:)

Special Conditions:

_____

_____

_____
MUNICIPAL ENGINEER

File No.: _____

cc: Contractor

CERTIFICATE OF INSPECTION

I HEREBY certify that all engineering and construction services, required under the Subdivision Servicing Bylaw of the Village of Port Clements for the subdivision of:

LEGAL DESCRIPTION: _____

PROJECT NO.: _____

which services were designed by:

NAME OF FIRM: _____

ADDRESS: _____

and approved for construction on drawing numbers:

drawing number	date	drawing number	date
_____		_____	
_____		_____	
_____		_____	

have been installed and inspected by or under the direction of:

_____

_____

I FURTHER CERTIFY that the "As-Built" drawings hereby submitted represent the works and services as installed for the aforementioned subdivision.

_____

_____

(Signature and name of the Professional Engineer responsible for design)

ENGINEER'S SEAL

CERTIFICATE OF SUBSTANTIAL COMPLETION

DEVELOPER: _____

CONTRACTOR: _____

_____

_____

PROJECT NO.: _____

SERVICING
AGREEMENT NO.: _____

DATE: _____

This certificate is issued pursuant to the Subdivision Servicing Bylaw.

The **MAINTENANCE PERIOD** for the Works will begin on _____

The **MAINTENANCE PERIOD** for the Works will end on _____

The attached is a **LIST OF DEFICIENCIES** related to the Works:

The Certificate of Acceptance will be issued when all deficiencies have been cleared, the maintenance period expired, and the Municipal Engineer has been satisfied all conditions of the Servicing Agreement have been fulfilled.

This Certificate has been made to the best of the Engineer's knowledge ie. information and belief. It does not constitute acceptance of any Work not in accordance with the requirements of the Subdivision Servicing Bylaw, and not listed as a deficiency herein, whether or not such defect(s) could have been observed or discovered during construction.

_____
Municipal Engineer

cc: Contractor

CERTIFICATE OF ACCEPTANCE

DEVELOPER: _____

CONTRACTOR: _____

_____

_____

PROJECT NO.: _____

SERVICING
AGREEMENT NO.: _____

DATE: _____

All deficiencies, defects or faults in the Work observed or discovered within the period preceding the date of this Certificate having been rectified, this Certificate is issued pursuant to the Referenced Servicing Agreement.

This Certificate has been made to the best of the Municipal Engineer's knowledge, information and belief. It does not constitute acceptance of any work not in accordance with the requirements of the Servicing Agreement whether or not such defect(s) could have been observed or discovered during construction.

_____
Municipal Engineer

cc: Contractor

RIGHT-OF-WAY AGREEMENT

THIS INDENTURE made the day of , A.D., 199 .

BETWEEN:

(Hereinafter called the "Grantor")

OF THE FIRST PART

A N D:

THE VILLAGE OF PORT CLEMENTS,
a municipal corporation having its
place of business at Cedar Avenue West,
in the Village of Port Clements,
Province of British Columbia

(Hereinafter called the "GRANTEE")

OF THE SECOND PART

WHEREAS, the Grantor is the registered owner or is entitled to become the registered owner of an estate in fee simple of ALL AND SINGULAR those certain parcels or tracts of land and premises situate, lying and being in the Village of Port Clements, in the Province of British columbia and being more particularly known and described as:

(Hereinafter called the "Lands of the Grantor")

AND WHEREAS to facilitate the installation of a system of sewerage Works, and/or waterworks, and/or drainage works, and/or gas works including all pipes, valves, fittings and facilities in connection therewith and/or hydro electric works including all wires, poles, conduits and other facilities in connection therewith;

(Hereinafter called the "Works")

The Grantor has agreed to permit the construction by the Grantee of the aforementioned Works on a portion of the said Land and to grant for that purpose the right-of-way hereinafter described;

NOW THEREFORE THIS INDENTURE WITNESSETH that in consideration of the sum of Two ($2.00) Dollars of lawful money of Canada, now paid by the Grantee to the Grantor (the receipt and sufficiency of which is hereby acknowledged by the Grantor), and in consideration of the covenants and conditions hereinafter contained to be observed and performed by the Grantee and for other valuable consideration:

1.0 THE GRANTOR DOTH HEREBY:

1.1 Grant, convey, confirm and transfer, in perpetuity, unto the grantee the full, free and uninterrupted right, license, liberty,, privilege, permission and right-of-way to lay down, install, construct, entrench, operate, maintain, inspect, alter, remove, replace, bury, cleanse, string, and otherwise establish one or more systems of Works upon, over, under and across that part of the Land of the Grantor as shown outlined in red on Right-of-Way Plan No.

(Hereinafter called the "Perpetual Right-of-Way")

1.2 Covenant and agree to and with the Grantee that for the purposes aforesaid and upon, over, under and across the Perpetual Right-of-Way the Grantee shall for itself and its servants, agents, workmen, contractors and all other licensees of the Grantee together with machinery, vehicles, equipment, and materials be entitled at all times to enter, use, pass and repass, labour, construct, erect, install, dig, carry away soil or other surface or subsurface materials, clear of all trees, growth, buildings or obstruction now or hereafter in existence, as may be necessary, useful, or convenient in connection with the operations of the Grantee in relation to the Works;

1.3 Grant, convey, confirm and transfer unto the Grantee for itself, and its servants, agents, workmen, contractors and all other licensees of the Grantee together with machinery, vehicles, equipment and materials the right at all reasonable times to enter upon and to pass the repass over such of the Lands of the grantor as may reasonably be required for the purpose of ingress to and egress from the Perpetual Right-of-Way;

1.4 Grant, convey, confirm and transfer unto the Grantee for itself, and its servants, agents, workmen, contractors and all other licensees of the Grantee together with machinery, vehicles, equipment and materials for a period of days only from the date of this Agreement, the full, free and uninterrupted right, license, liberty, privilege, permission and Right-of-Way to enter upon, pass and repass, clear, labour, and use for the purpose of

ingress and egress to and from the Perpetual Right-of-Way and for the purpose of storing machinery, vehicles, equipment, material or supplies used or to be used in connection with the construction of the Works herein described, and for the purpose of placing or storing the surface or subsurface material to be excavated from the Perpetual Right-of-Way upon and over, but not under that part or part s of the Lands of the Grantor, shown outlined in green on Right-of-Way Plan No.

(Hereinafter called the "Working Right-of-Way")

Provided always, and it is hereby agreed that nothing herein contained shall permit the Grantee to dig, trench or otherwise disturb the subsurface of the Working Right-of-Way and the Grantee shall only clear such trees and growth and interfere and disturb the surface of the Working Right-of-Way in a manner that is reasonably necessary in the conduct of its operations thereon;

2.0 THE GRANTOR HEREBY COVENANTS TO AND AGREES WITH THE GRANTEE, as follows:

2.1 That the Grantor will not, nor permit any other person to erect, place, install or maintain any building, structure, mobile home, concrete driveway or patio, pipe, wire or other conduit on, over or under any portion of the Perpetual Right-of-Way so that it in any way interferes with or damages or prevents access to, or is likely to cause harm to Works authorized hereby to be installed in or upon the Perpetual Right-of-Way;

2.2 That the Grantor will not do nor knowingly permit to be done any act or thing which will interfere with or injure the said Works and in particular will not carry out any blasting on or adjacent to the Perpetual Right-of-Way without the consent in writing of the Grantee, provided that such consent shall not be unreasonably withheld;

2.3 That the Grantor will not substantially diminish the soil cover over any of the Works installed in the Perpetual Right-of-Way and in particular, without in any way limiting the generality of the foregoing, will not construct open drains or ditches along or across any of the Works installed in the Perpetual Right-of-Way;

2.4 That the Grantor will, from time to time and at all times upon every reasonable request and at the cost of the Grantee, do and execute or cause to be made, done or executed all such further and other lawful acts, deeds, things, devices, conveyances and assurances in law whatsoever for the better assuring unto the Grantee of the rights hereby granted.

3.0 THE GRANTEE HEREBY COVENANTS TO AND AGREES WITH THE GRANTOR, as follows:

3.1 That the Grantee will not bury any debris or rubbish of any kind in excavations or backfill, and will remove shoring and like temporary structures as backfilling proceeds;

3.2 That the Grantee will thoroughly clean all lands to which it has had access hereunder of all rubbish and construction debris created or placed thereon by the Grantee and will leave such lands in a neat and clean condition;

3.3. That the Grantee will, as soon as weather and soil conditions permit, and so often as it may exercise its right of entry hereunder to any of the Lands of the Grantor, replace the surface soil as nearly as may be reasonably possible to the same condition as it was prior to such entry, in order to restore the natural drainage to such lands. **PROVIDED HOWEVER** that nothing herein contained shall require the Grantee to restore any trees or other surface growth but the Grantee shall leave such lands in a condition which will not inhibit natural regeneration of such growth;

3.4 That the Grantee will, as far as reasonably possible, carry out all work in a proper and workmanlike manner so as to do as little injury to the Lands of the Grantor as possible;

3.5 That the Grantee will make good at its own expense all damage or disturbance which may be caused to the surface soil of the Lands of the Grantor in the exercise of its rights hereunder;

3.6 The Grantee will, as far as reasonably possible, restore any fences, lawns, flower beds, at its cost as nearly as may be reasonably possible to the same conditions that they were in prior to any entry by the Grantee upon the Lands;

4.0 **THE PARTIES HERETO EACH HEREBY COVENANT TO AND AGREE WITH THE OTHER**, as follows:

4.1 The said Works referred to above, together with all pipes, valves, conduits, wires, casings, fittings, lines, meters, appliances, facilities, attachments or devices used in connection therewith shall constitute the Works;

4.2 Notwithstanding any rule of law or equity to the contrary, the Works brought on to, set, constructed, laid, erected in, upon or under the Perpetual Right-of-Way by the Grantee shall, at all times, remain the property of the Grantee notwithstanding that the same may be annexed or affixed to the freehold and shall at any time and from time to time be removable in whole or in part by the Grantee;

4.3 In the event that the Grantee abandons the Works or any part thereof the Grantees may, if it so elects, leave the whole or any part thereof in place.

4.4 That no part of the Title in Fee Simple to the soil shall pass to or be vested in the grantee under or by virtue of these presents and the Grantor may fully use and enjoy all of the Lands of the Grantor subject only to the rights and restrictions herein contained;

4.5 That the covenants herein contained shall be covenants running with the land and that none of the covenants herein contained shall be personal or binding upon the parties hereto, save and except during the Grantor's seisin or ownership of any interest in the Lands of the Grantor, and with respect only to that portion of the Lands of the Grantor of which the Grantor shall be seised or in which he shall have an interest, but that the Lands of the Grantor, nevertheless, be and remain at all times charged therewith;

4.6 If, at the date hereof, the Grantor is not the sole registered owner of the Lands of the Grantor, this Agreement shall nevertheless bind the Grantor to the full extent of his interest in fee simple, this Agreement shall likewise extend to such after-acquired interests;

4.7 Where the expression "Grantor" includes more than one person, all covenants herein on the part of the Grantor shall be construed as being several as well as joint;

4.8 This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, administrators, executors, successors and assigns as the case may be and wherever the singular or masculine is used, it shall be construed as if the plural or the feminine or neuter, as the case may be, had been used, where the parties or the context hereto so require and the rest of the sentence shall be construed as if the grammatical and terminological changes thereby rendered necessary had been made.

IN WITNESS WHEREOF the parties hereto have executed these presents in the manner and on the date hereinafter appearing.

SIGNED, SEALED AND DELIVERED by the Grantor this day of , 199 .

_____
Name

_____
Address

_____

_____
Occupation
(as to all signatures of Grantor)

THE CORPORATE SEAL OF THE GRANTOR was hereunto affixed this day of , 199 .
in the presence of:

_____

_____

THE CORPORATE SEAL OF THE VILLAGE OF PORT CLEMENTS was was hereunto affixed this day of , 199 .
in the presence of:

_____
Mayor

_____
Clerk

CONSENT TO GRANT OF RIGHT-OF-WAY

KNOW ALL MEN BY THESE PRESENTS that

is the registered holder of a charge by way of against the within described property which said charge is registered in the Land Title Office, under Number(s) , for and in consideration of the sum of One ($1.00) Dollar paid by the Grantor the said Chargeholder (the receipt whereof is hereby acknowledged), agrees with the Grantor, its successors and assigns, that the within Right-of-Way shall be an encumbrance upon the within described property in priority to the said charge in the same manner and to the same effect as if it had been dated and registered prior to the said charge.

IN WITNESS WHEREOF the parties hereto have caused these presents to be signed, sealed and delivered in the presence of or in the presence of its duly authorized officers this day of , 199 .

THE CORPORATE SEAL OF THE GRANTOR was hereunto affixed this day of , 199 . in the presence of:

_____

_____

APPENDIX "C"

APPENDIX "C"

ADMINISTRATIVE PROVISIONS

INDEX

APPENDIX "C"

ADMINISTRATIVE PROVISIONS

1. DEFINITIONS

In this Appendix unless the context otherwise requires:

"Engineer" means a professional engineer licensed to practice in the Province of British Columbia.

"Engineering Drawings, Standards and Requirements" means drawings and specifications prepared and given under the hand and seal of a professional engineer.

2. CONSTRUCTION OF HIGHWAYS

The Village shall permit the Developer to layout, construct and erect works and co-ordinate the installation of the private utility works in the highways to be dedicated by the subdivision plan, subject to the terms and conditions hereinafter provided in General Provisions and subject to the By-Laws of the Village governing the use of highways and subject to all Provincial and Federal statutes and regulations governing construction and the use of highways.

3. SUBDIVISION PLAN

The Developer shall be solely responsible for the preparation of subdivision plans and for the registration of the approved subdivision plans in the Land Title Office at Prince Rupert. In no case shall a single phase of development be approved unless the tentative subdivision plan for the entire development has been submitted to and approved by the Approving Officer.

The Developer shall forward to the Village a copy of the approved and registered subdivision plan once it has been registered at the Land Title Office in Prince Rupert.

The Developer shall forward to the Village a copy of the approved prospectus once it has been registered with the Superintendent of Brokers, Insurance and Real Estate.

4. ENGINEERING DRAWINGS

Prior to commencing any works the Developer shall produce engineering drawings satisfactory to the Approving Officer for the installation of the underground, surface and overhead works connected with the servicing of the subdivision including the works to be supplied and installed by the private utility companies. The Village may require the Developer to engage the services of a qualified consulting engineering firm or qualified engineer acceptable to the Village to prepare the engineering information which may be required by the Village relevant to the development of the subdivision. Engineering drawings prepared and signed by private utility companies in support of their works will be acceptable.

The engineering drawings shall be submitted to and shall receive the approval of the Approving Officer prior to commencement of construction. Such approval shall be construed only to mean that the drawings meet the general intent of the Bylaw and the Schedules attached hereto and shall not derogate from the right of the Approving Officer to require such changes, the necessity for which becomes apparent from time to time, in order that the requirements of the Bylaw shall be met.

The Developer shall submit to the Village the two paper prints suitable for submission to the Provincial Ministry of Environment for a Health Certificate for waterworks. The Developer shall obtain all other necessary Provincial Agency approvals prior to commencement of construction of any works. A copy of these Provincial Agency permits and a print of each approved drawing shall be filed with the Approving Officer.

Following approval of the detailed engineering drawings, these prints of the approved drawings and contract documents shall be deposited with the Village. Any additions or revisions shall receive the Approving Officer's approval prior to construction of the subject matter of the addition or revision.

5. SCHEDULE

If applicable, following the submission and approval of the subdivision plan, the Developer shall submit in writing a tentative time schedule for the development of the complete subdivision showing the approximate commencement of each phase of the subdivision. Prior to commencing any work on a phase of subdivision development, the Developer shall submit a more detailed time schedule of the works to be constructed from land clearing to completion of street surface improvements.

6. INSPECTION

The Developer's consulting engineer, at the Developer's expense, shall provide full layout and inspection services for all works installed by the Developer or his contractors and shall ensure that all works are constructed and installed in accordance with the standards and

specifications contained in this Bylaw. The consulting engineer shall file all his inspection reports with the Approving Officer, who may refuse to accept such report if there is reason to doubt the adequacy of such inspection. Should such report in the opinion of the Approving Officer be unsatisfactory, the Village may carry out the inspections at the cost of the Developer.

The Developer shall have the right to appoint its own inspectors to inspect the Developer's works from time to time and this inspection shall be at the Village's cost. Any inspection carried out by the Village shall, in no way, relieve the Developer of any obligations or responsibility whatsoever in connection with the installation of the works of the subdivision. If the Village discovers any defect or requires any correction, the matter shall be reported to the Developer's inspector for appropriate action. The Village shall not issue any direct order to the Developer's contractor except in the case of emergency. Requests from the Village to the Developer's inspector shall be acted on immediately.

7. MATERIALS

The Developer shall submit to the Approving Officer prior to commencing construction on any phase of the subdivision, a complete list of the type of materials to be incorporated in the subdivision works along with the time schedule of construction. The materials list shall set out the type of materials to be incorporated in the works, the name of the manufacturer, a description of the material, its composition, the class or grade, the ASTM or AWWA specification number and trade name of the materials. All materials used in the works must conform to the Village's standards as set out in this Bylaw. Any materials not meeting the Village's standards or the approval of the Approving Officer shall not be incorporated in the works.

8. CERTIFICATE OF ACCEPTANCE

(a) Upon completion of any phase of subdivision, the Developer shall supply to the Village a notification of completion of the works under the hand and seal of the consulting engineering of the Developer as well as "as-constructed" drawings of the works and completed Municipal Service Record Cards as shown on Standard Drawing No. B-100. If the work is acceptable to the Approving Officer, a Certificate of Completion shall be issued. Such Certificate may be issued separately for the portion of works being the water distribution system, sanitary sewer, collection system and appurtenant structures, service connections, storm drains, street lights and controls and all private utility facilities necessary to service a phase of the subdivision for use. Subject to the guarantee, as hereinafter provided, the Village shall, on issuance of the certificate of Acceptance, be responsible for the maintenance and operation of the works covered thereby.

(b) A second Certificate of Completion may be issued for any phase of subdivision at the completion of the surface works including the installation of street paving, final boulevard grading and cleanup.

(c) On receipt of the Developer's notification of completion, the "as-constructed" drawings and the Municipal Service Record Cards, the Approving Officer shall inspect the works and upon being satisfied that the works are completed according to the approved plans and specifications he may issue his Certificate of Acceptance to the developer. This Certificate may be in two parts for any phase of subdivision as described above. No phase of subdivision works shall be accepted until they are ready to operate and this shall include connection to Village services or appropriate outfalls or other services provided by the Approving Officer.

(d) If, upon application for Certificate of Acceptance, the Approving Officer refuses to accept the works the Developer shall repair the works installed and correct deficiencies in the works not resulting from normal wear and tear and acts of God and not resulting from the action of the Village.

9. FINAL INSPECTION

Within 12 months of the issuance of the Certificate of Acceptance, the Approving Officer will reinspect the works accepted and shall give notice to the Developer of any deficiencies and damage, not resulting from normal wear and tear of operation and acts of God and not resulting from the actions of a third party and the Developer shall forthwith correct the deficiencies and repair the damage. If the damage or deficiencies are not repaired or corrected forthwith upon written notice of the same, then the necessary repair and corrections may be done by the Village at the expense of the Developer.

10. ONE YEAR GUARANTEE

As provided above, the Developer shall repair the works installed and correct deficiencies in the works not resulting from normal wear and tear and act of God and not resulting from the action of a third party for a period of one year from the date of the Certificate of Acceptance. The Approving Officer may, at his option, carry out the repair and correct deficiencies without notice to the Developer if, in the opinion of the Approving Officer, the work must be done immediately because of a hazard of any kind to the public or to ensure the proper operation of the works considered defective or damaged. The Village shall bill the Developer for such emergency works undertaken and the Developer shall pay the cost thereof to the Village.

11. CONVEYANCE OF RIGHTS-OF-WAY AND EASEMENTS

(a) Upon acceptance of the work by the Approving Officer, the developer shall execute such documents as shall be produced by the Village conveying to the Village all right, title and interest of the Developer in the works.

(b) The Developer shall grant to the Village all rights-of-way as shall be required by the Village for the purpose of servicing the works installed where the works are installed on property other than highways. The Developer shall execute such right-of-way agreements as the Village may produce to the Developer for this purpose prior to the Certificate of Acceptance being issued by the Approving Officer.

12. LEGAL SURVEYS

The Developer shall be responsible for all the legal surveys in connection with the subdivision and shall prepare all the documents necessary for registration of the subdivision. The Developer shall, at his sole expense, maintain sufficient legal survey control to the satisfaction of the Approving Officer throughout the construction program and shall, upon completion of the construction of highways and boulevard, cause each legal lot corner to be posed by a qualified land surveyor at the Developer's sole cost.

13. BARRICADES AND DETOURS

(a) The Developer shall provide all such barricades, lighting and signs as shall be required to protect the public while the works are being installed. In order to maintain traffic movement with the lease possible inconvenience, the Developer shall construct, where necessary in the opinion of the Approving Officer, such detours, temporary bridges and barriers as may be required to allow the public to drive safely around the works being installed.

(b) Prior to commencing excavation on or in the vicinity of highways, the Developer shall contact the owners of all the utilities that may be affected by this work and request from them instructions for the emergency action to be taken in the event of damage to a utility or service connection.

14. WAIVER

Where, because of the size, location or service requirements of any subdivision, the services of a professional engineer is not required, in the opinion of the Approving Officer, the provision set out above dealing with the engineering drawings, construction and inspection of works not applicable may be waived by the Approving Officer.

15. INDEMNITY AND INSURANCE

The Developer shall save harmless and effectually indemnify the Village against:

(a) All actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and whomsoever brought by reason of the execution of the said works and all such claims recoverable from the Village or the property of the village, or any

property which the Village by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, shall be paid by the Developer, and if paid by the Village shall, together with any costs and expense incurred in connection therewith, be charged to the developer.

(b) All expenses and costs which may be incurred by reason of the execution of the said works resulting in damage to any property owned in whole or in part by the Village for which the Village by custom or duty is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, shall be paid by the Developer, and if paid by the Village shall, together with any costs and expense incurred in connection therewith, be charged to the developer.

(c) All expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, Workers' Compensation assessments, unemployment insurance, federal or provincial tax, check-off and for encroachments owing to mistakes in survey, and all such claims recoverable from the Village or the property of the Village, or any property which the Village by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, shall be paid by the Developer, and if recovered from the Village shall, together with any costs and expenses incurred in connection therewith, be charged to the Developer. Provided this paragraph shall not be construed as to extinguish any rights which the Village would have were it not for the inclusion of this paragraph.

(d) The Developer shall, at his sole expense throughout the currency of the work, carry comprehensive liability insurance in the amount of at least **One Million Five Hundred Thousand ($1,500.000) Dollars** with insurance companies licensed to carry on business in the Province of British Columbia in partial discharge of its obligation under Clauses 15(a), 15(b), and 15(c) of this Section and in every such policy of insurance the Village shall be named as an additional insured with proceeds payable as the interest of the Village and Developer may appear. The Developer shall forthwith, and prior to commencement of the work, furnish the Village with a certified copy of every policy of insurance herein required.

16. FAULTY MATERIAL OR WORKMANSHIP GUARANTEE

The Developer shall indemnify and save harmless the Village against all expenses and costs which may be incurred by the Village as a result of faulty workmanship and defective material in any of the works installed by the Developer, provided that such fault or defect is called to the attention of the Developer in writing prior to one year from the date of the Approving Officer's Certificate of Acceptance.

As provided in Clause 7, "Materials", the Approving Officer shall approve all materials going into the works prior to their installation but such approval shall, in no way, relieve the Developer of liability for replacing or repairing the material if it proves to be defective or is damaged in installation.

17. REBATE OF FEDERAL SALES TAX

The Village will co-operate with the Developer by signing and certifying such correct documents as presented to it to assist the Developer in obtaining the rebate of Federal Sales Tax on all materials used in the installation of water distribution, sewerage or drainage systems. The Developer shall be responsible for determining from the Federal Tax and how the rebate is to be claimed. No claim for payment by the Village may be made by the Developer for loss resulting from failure on the part of the Developer to obtain a tax rebate on materials.

18. OVERSIZE WORKS

It is recognized that large diameter trunk service mains may be required to pass through a subdivision in order to service properties beyond the subdivision boundaries. In addition, extra street widths may be required to accommodate future anticipated traffic flow thorough the subdivision or around the perimeter roads. The following are therefore set as standard sizes and depths for service mains and road widths, the cost of which are to be the responsibility of the Developer and the difference in cost between actual sizes, depths or widths required may be paid by the Village in compliance with the Municipal Act to the Developer or by the Developer to the Village depending upon the installing agency at the current rates determined on the basis of such costs to the Village in the year of installation.

(a) Sanitary Sewer

The standard size shall be up to and including 250 mm diameter. Standard depth shall be up to and including 4.5 metres from centreline of the finished road surface. No compensation shall be paid to the Developer if the depth of a sanitary sewer required to service his own subdivision exceeds 4.5 metres or exceeds 250 mm diameter.

(b) Water Mains

The standard size shall be up to and including 250 mm diameter, standard depth shall be up to 2.5 metres of cover. Waterworks fittings and valves shall be standard up to and including 250 mm diameter. All fire hydrants, valves and leads are to be supplied at the sole cost of the Developer. No compensation shall be paid to the Developer if the size of the water main required to service his own subdivision exceeds 250 mm diameter or the depth of cover exceeds 2.5 metres.

(c) Storm Sewers

The standard main size shall be up to and including 600 mm diameter. Standard depth shall be up to and including 4.5 metres from centreline of the finished road to pipe invert. No compensation shall be paid to the Developer if the storm sewer depth exceeds 4.5 metres or 600 mm in diameter in order to service his own subdivision.

(d) Road Allowance

The standard width shall be 20 metres. Additional right-of-way required over and above the 20 metre width to accommodate the collector streets within the subdivision shall be paid by the Village at the unit price per hectare as agreed upon or upon failure to agree as set by arbitration pursuant to the Arbitration Act.

(e) Street Width

The standard width from curb face to curb face shall be up to and including 13 metres. Additional road widths required by the Village for additional traffic lanes shall be paid by the Village at the unit prices paid by the Village for such work in that construction season.

(f) Special Structures

Special structures or works such as pumping station or outfalls may be submitted for consideration for cost sharing if the said structures or works are to be used to service lands outside the subdivision. The cost sharing formulae shall be negotiated and agreed between the Developer and the Village prior to any works in the subdivision being commenced.