

VILLAGE OF GOLD RIVER

BY-LAW NO. 187

A By-law to regulate the subdivision of land and to establish a standard of services to be provided in new subdivisions.

WHEREAS it is desirable to regulate the subdivision of land in order to promote the harmonious and economical development of the Municipality;

AND WHEREAS Council may by by-law regulate the area, shape and dimensions of parcels of land and the dimensions, locations, alignment and gradient of highways in connection with the subdivision of land, and may make different regulations for different uses and for different zones of the Municipality;

THEREFORE the Municipal Council of the Village of Gold River enacts as follows:

1. No land shall be subdivided within the Municipality of Gold River unless and until the subdivision has first received the approval of the Approving Officer.
2. The Approving Officer shall not approve the subdivision of any parcel of land unless all the relevant requirements of this By-law have been observed.

DEFINITIONS:

3. In this By-law, unless the context otherwise requires, the following words shall have the meanings hereinafter assigned to them:

"Access Streets" are minor streets which are parallel to and adjacent to arterial streets and which provide access to abutting properties and protection from through traffic.

"Approving Officer" shall be an Officer duly authorized by the Municipal Council to administer this By-law.

"Collector Streets" are those which carry traffic from minor streets to the major system of arterial streets and highways including the principal entrance streets of a residential development and streets for circulation with such a development.

"Highway" means a street, road, lane, 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.

"Lot" means a parcel which by reason of its dimensions cannot be subdivided without contravening the provisions of Section 29.

"Major Streets" are those which are used primarily for fast or heavy traffic; wherein a significant proportion of the traffic or travel along the same has both its origin and destination outside of the area under consideration.

"Minor Streets" are those which are used primarily for travel and access to and from the parcels contiguous thereto created in the subdivision.

"Municipality" shall mean the Municipality of Gold River.

"Municipal Superintendent of Works" shall mean the Superintendent of Public Works duly appointed by Council and shall include such other person and persons as the Council may by resolution, appoint to discharge the duties prescribed for the Superintendent by this By-law.

"Owner" and "Registered Owner" means any person registered in the books of the Victoria Land Registry Office as owner of the land, or any charge on the land being subdivided, whether entitled thereto in his own right or in a representative capacity or otherwise.

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

"Subdivision Plan" means a plan made in accordance with the provisions of Section 80 of the Land Registry Act.

"Subdivision" means the division of land into two or more parcels whether by plan or by metes and bounds description or otherwise of the consolidation of two or more parcels into one parcel by subdivision plan.

4. Each and every subdivision of land submitted for approval shall:
 - (a) be suited to the configuration of the land being subdivided,
 - (b) be suited to the use to which it is intended,
 - (c) shall not make impracticable the future subdivision of the land within the proposed subdivision or any other adjacent land.
5. Unless otherwise defined therein, any word or expression in this By-law shall have the same meaning as any similar word or expression contained in the Municipal Act and the Land Registry Act.
6. The provisions of Sections 88 to 98 inclusive of the "Land Registry Act" shall apply to the subdivision of lands within the Municipality, pursuant to this By-law.

PROCEDURE

Preliminary Application

7. The Applicant may make an application for preliminary approval of the subdivision. This application shall be accompanied by four (4) copies of a sketch plan drawn to a convenient scale, showing the proposed subdivision with the estimated dimensions of the several parcels, and of each street and lane which the owner proposes to create. A survey made by a British Columbia land surveyor is not required for this preliminary application.
8. The Approving Officer shall examine the preliminary application and shall advise the applicant in writing within thirty (30) days from receipt by him of such application, either that the subdivision proposal could be approved, and state the conditions of such approval if any, or that it could not be approved. In the latter case the reasons for so deciding shall be stated.
9. Preliminary approval of any proposed subdivision shall not be construed as final approval of such subdivision for land registration purposes.
10. Preliminary approval shall be effective for a period of three (3) months unless upon application of the owner an extension is granted. If the final plan has not been tendered for approval within this time limit, the preliminary plan must again be submitted.

Final Application

11. The final application shall conform substantially to the approved preliminary plan and if desired by the subdivider it may constitute only that portion of the approved preliminary plan which he proposes to record and develop at that time.
12. Every final application shall be made in writing, addressed to the Municipal Clerk and shall be accompanied by the subdivision plans tendered for approval; or where recourse to subdivision plans is not required, the application shall describe clearly the proposed method of subdivision, using a sketch or plan to assist the written statement and giving the correct legal description of the parcel being subdivided.
13. Every applicant for approval of a subdivision hereunder shall tender an examination fee of Two Dollars (\$2.00) with the application.
14. The application for subdivision approval shall be made by the owner or his duly authorized agent. Before an application for subdivision approval, made by a person other than the owner, is dealt with, such other person may be required to produce satisfactory evidence that he is duly authorized by the owner to make such application.

15. If the subdivision is to be made by recourse to a subdivision plan, prepared in accordance with the provisions of the "Land Registry Act" the plan or plans required for registration purposes tendered with the application for approval shall be accompanied by four (4) blue or white print paper copies thereof, which copies shall be retained by the Municipality.

Approving Officers Decision

16. Within sixty (60) days from the date on which an application is tendered for examination and approval, or within sixty (60) days of the furnishing by the applicant of such information as may be required, including satisfactory evidence that all of the relevant provisions of this By-law and of the Municipal and Land Registry Acts have been duly complied with, the proposed subdivision shall either be approved or rejected in the manner provided by this By-law.
17. When any subdivision plan is approved the Approving Officer shall sign and date the plan thereof, tendered for approval in the form provided on such plan, under the provisions of the Land Registry Act. The subdivision plan or plans thus approved shall be returned to the applicant less the four (4) paper copies thereof mentioned in Section 15.
18. Where approval is granted to any subdivision created without a plan, approval shall be attested by a certificate signed by the Approving Officer and dated.
19. A certificate of final approval shall be valid for sixty (60) days from the date thereof, after which time approval shall be deemed to have been revoked unless an extension of time is granted by the Registrar under Section 99 of the "Land Registry Act"
20. If the subdivision is rejected the applicant shall be so advised in writing and the reason for rejecting the subdivision shall be given. If subdivision plans were tendered with the application they shall be returned to the applicant undersigned, less the four (4) paper copies thereof mentioned in Section 15.

Additional Information Which May be Required

21. If the application for subdivision approval indicated that there is reason to anticipate a further resubdivision of the relevant lands, the person tendering the subdivision for approval shall be requested to furnish a sketch plan showing the ultimate method of subdivision and showing how the current application fits into such ultimate subdivision.
22. The person tendering a subdivision plan for examination and approval shall, if required, furnish profiles of every new street shown on the plan and such topographical detail as may indicate the problems to be dealt with in developing the subdivision.
23. Where unusual soil or drainage conditions obtain or will develop on part or all of the subdivision area, the applicant may be required to furnish information or to aid in the gathering of such information as will allow the determination of the area, shapes and orientations of parcels which will be adequate in view of the nature of the ground and the anticipated use of the land.
24. Where the lands of any adjoining or neighbouring owner are or might be in the opinion of the Approving Officer, detrimentally affected by the subdivision under application for approval; the applicant may be required to furnish sufficient evidence to show that notice of intention to subdivide, and of the scheme of subdivision and of the application pending has been given to such adjoining or adjacent owners.
25. Where the expressed or obvious intention in the application for approval involves the establishment of a boundary or boundaries in reconciliation with existing buildings or structures on the affected parcels, or where the position of a proposed new boundary is controlled by the location of such buildings or structures and in all cases where the proposed boundary establishment cannot be sufficiently identified on the ground by inspection, the applicant for approval may be required to produce a plan or sketch, verified by a British Columbia Land Surveyor showing the proposed new boundary or boundaries in relation to the affected parcels and to the

buildings or structures thereon.

- 26. Notice in writing of the proposed subdivision may be served on any owner or other person whose land or interest therein might be in the opinion of the Approving Officer, detrimentally affected by it, and such further inquiry into the effect of the proposed subdivision upon adjoining or neighbouring lands may be made as will establish the desirability or other wise of the proposed subdivision.
- 27. In considering an application for subdivision approval, the Approving Officer may hear objections from any interested persons, and may refuse to approve the subdivision if in his opinion the anticipated development of the subdivision would injuriously affect the established amenities of adjoining or adjacent properties or would be against the public interest or would increase excessively the cost to the Municipality of providing public utilities or other municipal works or services.
- 28. In considering an application for subdivision approval, the Approving Officer may refuse approval if the location and bulk of any existing building or structure in relation to any new parcels created would result in a breach of or non-compliance with the provisions of the Building, Zoning, Water Works, Sewer-Sanitary or other relevant by-laws of the Municipality.

Design Standards

- 29. (a) The lot size, width, depth, shape and orientation shall be appropriate for the location of the subdivision and for the type of development and use contemplated.
- (b) The minimum lot areas in a subdivision shall be in accordance with the following standards:

ZONE	Minimum Lot Area (Sq. Ft.)
Single Family Residential (R.1)	6000
Multiple Family Residential (RM.1)	8000
Multiple Family Residential (RM.2)	8000
Mobile Home Residential (RMH.1)	5500
Central Commercial (C.1)	3000
Fringe Commercial (C.2)	12000
Service Industrial (M.2)	6000
General Holding (G.1)	5 Acres

Note: See zoning by-law for qualifications of these standards.

- (c) Corner lots for residential use shall have a minimum extra width of fifteen feet (15') to permit appropriate building set-back from and orientation to, both streets.

Streets

- 30. In examining any proposed plan of subdivision the sufficiency and suitability of the proposed street system shall be considered. The arrangement, character, extent, width, grade and location of all streets shall be considered in their relation to existing and planned streets, to topographical conditions, to public convenience and safety, and in their appropriate relation to the proposed uses of the land to be served by such streets.
- 31. The arrangement of streets in a subdivision shall either:
 - (a) Provide for the continuation or appropriate projection of existing principal streets in surrounding area; or
 - (b) Be so arranged as to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical.

32. Minor streets shall be so laid out that their use by through traffic will be discouraged.
33. Where a subdivision borders or contains an existing or proposed arterial street, or a controlled access highway, as designated by the Lieutenant-Governor in Council, the Approving Officer shall withhold approval subject to such regulations as are made under the terms of the "Controlled Access Highways Act" and may require access streets, reverse frontage, deep lots with rear service lanes, or such other treatment as may be necessary for the adequate protection of residential properties and to afford separation of through and local traffic.
34. Where the land subdivided borders on the shore of any body of water and the parcels into which the land is subdivided do not exceed one acre access shall be given by sufficient public highways to such water at distances not greater than six hundred and sixty (660) feet between centre lines and where the parcels into which the land is subdivided exceed one acre, at distances not greater than thirteen hundred and twenty (1,320) feet between centre lines.
35. Jogs in street alignment shall be avoided unless the distance between centre lines at the jog is one hundred and twenty-five (125) feet or more.
36. Where bends occur in street alignment it may be required that the angle shall be replaced by a curve of suitable radius.
37. Reversed curves in street alignment shall be separated by tangents if so required.
38. As far as possible, intersecting streets shall meet at right angles.
39. Highways shall be created to a width deemed appropriate having regard to the particular highway involved and the requirements of the area being subdivided, provided however that the owner shall not be required on subdivision to provide without compensation:
 - (a) For the purpose of a highway allowance within the subdivision, land exceeding in depth sixty-six (66) feet; or
 - (b) For the purpose of widening a highway that is less than sixty-six (66) feet in width and that borders or is within the subdivision, land of a depth exceeding thirty-three (33) feet of the difference between sixty-six (66) feet and the width of the highway, whichever is the lesser.
40. Half streets shall be prohibited except where essential to the reasonable development of the subdivision in conformity with the other requirements of these regulations; and where it will be practicable to require the dedication of the other half when adjoining property is subdivided.
41. Cul-de-sac streets designed to be so permanently shall where practical not exceed 500 feet to the turn-around, and shall be provided at the closed end with a turn-around having an outside roadway diameter of at least one hundred (100) feet.

Blocks

42. Pedestrian footpaths, not less than ten (10) feet wide, shall be required where they are essential to provide circulation or access to schools, playgrounds, shopping centres, transportation, beaches, and other community facilities.

Lots

43. Double frontage lots should be avoided if other suitable alternatives can be provided except where essential to provide separation of residential development from traffic arteries or to overcome specific disadvantages or topography and orientation. Lots abutting such a traffic artery or other disadvantageous use shall have a minimum depth of one hundred and fifty (150) feet.

- 44. (a) The subdividing of the land shall be such as to provide, by means of a public street, each parcel with satisfactory access to an existing public street.
- (b) In no case the frontage of the parcel onto the street be less than one-tenth of the perimeter of the parcel.
- (c) The Council may by an affirmative vote of at least two-thirds of all the members thereof, exempt a person proposing to subdivide land from a limitation prescribed under subsection (b).
- 45. Side lot lines shall be substantially at right angles or radical to street lines.
- 46. During construction of the subdivision, the contractor shall call for periodic Municipal inspection of all work in connection with the subdivision and the provisions of all relevant by-laws pertaining thereto.
- 47. All work required to be done in connection with the subdivision of any lands shall be carried out at the sole expense of the owner of such lands, and to the satisfaction of the Approving Officer, before approval of such subdivision hereunder, provided however that upon a certified cheque or bearer bonds of the Government of Canada or any Province thereof or bearer bonds of which payment of the principal and interest are unconditionally guaranteed by the Government of Canada or any Province thereof, for an amount to cover the cost of the work as estimated by the Municipal Superintendent of Works being deposited with the Municipal Clerk as a guarantee that the work will be done within a period of nine (9) months to the satisfaction of the Municipal Superintendent of Works; the Approving Officer may approve of the subdivision prior to the completion of such work.
- 48. The general conditions and procedures for the specific installation of municipal services shall be as outlined in Specifications "A" to "F" inclusive which are attached to and made a part of this By-law.
- 49. District of Gold River Subdivision Regulation By-law No. 105, 1970 is hereby repealed.
- 50. This By-law may be cited for all purposes as "Village of Gold River Subdivision Regulation By-law No. 187, 1976".

PASSED by the Municipal Council on the 19th day of MAY A.D. 1976.

RECONSIDERED, PASSED and Finally ADOPTED by the Council, signed by the Mayor and the Clerk and sealed with the Corporate Seal, all on the 1st day of SEPTEMBER A.D. 1976.

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I HEREBY CERTIFY THAT THIS IS A TRUE COPY OF BYLAW NO. 187 AS ADOPTED SEPTEMBER 1, 1976

[Handwritten signature]

MAJOR

[Handwritten signature]

N.H. PAULSON

CLERK

A true copy of By-Law No. registered in the office of the Inspector of Municipalities this 22nd day of September 1976.

[Handwritten signature]
Deputy Inspector of Municipalities

"N.H. PAULSON"

CLERK

VILLAGE OF GOLD RIVER

SPECIFICATION "A"

GENERAL CONDITIONS AND PROCEDURE FOR THE
INSTALLATION OF MUNICIPAL SERVICES

GENERAL CONDITIONS

1.0 Scope

- 1.01 These specifications shall apply to the design and installation of services within the Municipality of Gold River. They apply to the design and installation of storm drains, sanitary sewers, watermains and roads, together with their respective connections and appurtenances and any other services which are required to be designed and/or installed.
- 1.02 These specifications do not cover the design or installation of street lighting, ornamental lighting, power, telephone or television services, but include the layout and preparation of as-built drawings for these services.
- 1.03 These specifications are applicable unless superseded by a more recently issued specification.
- 1.04 The Standard Drawings as referred to in various sections shall form an integral part of these specifications but the specifications shall take precedence over both Standard Drawings and Design Drawings.

2.0 Detailed Specifications and Conditions

- 2.01 The following specifications and conditions shall apply to all or any of the respective services:

Specification A: General Conditions

Specification B: 1. Preparation of Engineering Drawings
2. As-built Drawings

Specification C: 1. Design of Sewers and Drains
2. Installation of Sewers and Drains

Specification D: 1. Design of Watermains
2. Installation of Watermains

Specification E: 1. Design of Roads
2. Construction of Roads

Standard Drawings

- 2.02 All services shall be designed and installed as detailed in the foregoing specifications and conditions, and according to the procedure as set out in this section.
- 2.03 No departure from these specifications shall be permitted except with the written approval of the Superintendent of Works. The Superintendent of Works may give verbal approval to revisions which he considers to be sufficiently minor. A record of these changes shall be kept with a copy to the Superintendent of Works.
- 2.04 The performance and responsibilities of all parties and persons carrying out the installation of services shall be as set out in Specification A-General Conditions.

3.0 Definitions

In these specifications, unless the context otherwise requires, the following words shall have the meaning hereinafter assigned to them:

- 3.01 "Approving Officer" shall mean the person or persons authorized by the Municipal Council to act in this capacity under the terms of the Land Registry Act.
- 3.02 "Applicant" shall mean a person who has applied for approval of a proposed subdivision or to service an existing parcel of land, whether as the owner or an agent for the owner of the land included therein.
- 3.03 "Consulting Engineer" shall mean the professional engineer retained by the Applicant to be responsible for the design, layout and supervision of installation, recording of as-built information and performing those duties in connection with the provision of Municipal services as set out in these specifications and conditions.
- 3.04 "Contractor" shall mean any person, persons or corporation which shall undertake the installation of Municipal services on behalf of either the Applicant or the Municipality.
- 3.05 "Municipal" or "Municipality" shall refer to the Corporation of the Village of Gold River.
- 3.06 "Superintendent of Works" or his authorized representative shall mean a Municipal employee authorized by the Municipal Council who shall from time to time make such inspections and tests of any work being carried out as he considers necessary and shall co-ordinate works being carried out within the Municipality.

PROCEDURE

4.0 Engineering Design

- 4.01 The Applicant shall retain a Consulting Engineer who shall be responsible for the design and preparation of drawings and specifications for all services (except lighting, telephone and electric power) as required within the Village of Gold River. These services shall be designed in accordance with Municipal specifications which are available from the Municipal Office.
- 4.02 The Design Drawings shall show all existing and proposed services. It shall be the Consulting Engineer's responsibility to secure approval from the respective utilities for the locations so proposed.

5.0 Submission of Engineering Design

- 5.01 Upon completion of the Design Drawings, the Consulting Engineer shall submit eight white prints of each to the Superintendent of Works together with:
- (a) calculations of sanitary sewer and storm drain capacity and pipe loading, where these services are to be installed;
 - (b) a print of the registerable plan of the subdivision (if not already supplied by the Applicant);
 - (c) where applicable, a request by the Applicant to the Superintendent of Works for consideration of the financing of the additional costs of services as provided by Council policy.
- 5.02 No street names shall be used which will duplicate or be confused with the names of the existing streets. All streets to be created shall be named on the drawings, names to have been approved by Council or its appointed Committee prior to the submission of drawings.
- 5.03 The Consulting Engineer shall bring to the attention of the Applicant the need for any rights-of-way outside the subdivision which the Applicant may have to obtain.

6.0 Design Review

6.01 All design drawings and relevant data shall be checked by the Superintendent of Works and any revisions discussed with the Consulting Engineer. The Public Works Department shall design the street lighting if such is required.

7.0 Design Approval

7.01 Upon completion of all revisions and the inclusion of street lighting where required the Consulting Engineer shall submit the originals of all drawings, duly signed and sealed, to the Municipal Office.

7.02 Upon completion of all drawings to the satisfaction of the Superintendent of Works as being in accordance with good engineering practice, he shall sign the originals of all drawings and return them to the Consulting Engineer.

7.03 Where approval has been granted to the design of services for any parcel of land, the Municipal Superintendent of Works shall issue to both the Applicant and the Consulting Engineer the Design Approval Certificate which shall set out those services to be installed by the Applicant or by the Municipality together with their respective estimates of cost if so requested and order of construction.

7.04 No work shall be commenced within any new parcel of land on any of the services to be provided by the Applicant until a Design Approval Certificate has been issued.

7.05 A permit to construct any works on the public road allowance shall be issued by the Municipal Superintendent of Works. The work must be carried out by a licensed contracting firm holding public liability insurance coverages of a minimum \$1,000,000. Proof of insurance shall be furnished to the Corporation prior to commencement of construction.

8.0 Right-of-way Documents

8.01 The Municipality will prepare and register any rights-of-way required for Municipal purposes and, unless it is found to be impractical, the rights-of-way will be required prior to registration of the subdivision plan.

8.02 Where a right-of-way plan is deemed necessary, it shall be prepared by a B.C. Land Surveyor at the Applicant's expense.

8.03 Right-of-way documents for electric power, telephone and cablevision facilities shall be prepared and registered by the respective utility companies.

9.0 Construction Approval

9.01 Upon receipt of a Design Approval Certificate, the Applicant may proceed to install Municipal services subject to the following provisions:

(a) Blasting for excavation will be permitted only after securing a Permit from the Public Safety Officer, and only when proper precautions are taken for the protection of persons and property,

(b) Prior to the commencement of any work, the Consultant Engineer shall make arrangements to inspect the site of the work in company with the Superintendent of Works.

9.02 A copy of all approved drawings and specifications shall be maintained at the construction site during the installation of services.

9.03 Underground subdivision services shall not be permitted to operate as part of existing Municipal services until the respective subdivision services have been inspected, tested and approved in writing by the Superintendent of Works.

10.0 Engineering Supervision

10.01 The Consulting Engineer shall also be responsible for the layout, inspection and approval of materials and the supervision of installation of all services which are the responsibility of the Applicant. The Consulting

Engineer or his authorized representative shall be available at all times to visit the site during the installation of services.

- 10.02 The Consulting Engineer shall also be responsible for maintaining field surveys from which services not the responsibility of the Applicant may be installed if such installations are to be made before the acceptance of work being done by the Applicant.
- 10.03 In addition to supervision carried out by the Consulting Engineer, the Superintendent of Works will periodically inspect the work and assist in co-ordinating the subdivision works with any related Municipal works. The Superintendent of Works shall bring the use of any unacceptable materials or practices to the attention of the Contractor and/or the Consulting Engineer. If remedial action is not taken to the satisfaction of the Superintendent of Works he may order the work to cease.
- 10.04 If the Consulting Engineer wishes to make any changes in design either before or during the execution of the work, he shall first submit a marked print showing proposed revisions to the Municipal Office. If approval is granted for revision, the original drawing shall be immediately revised, signed by the Superintendent of Works and new prints issued. These two operations may be carried out simultaneously.

11.0 Testing

- 11.01 The Municipality shall disinfect and test all watermains and test all sanitary sewers and shall charge the Applicant for the cost of such operations in accordance with a standard schedule of fees.

12.0 As-built Drawings

- 12.01 Within two weeks of completion of all services to be installed by the Applicant, the Consulting Engineer shall deliver "as-built" drawings to Superintendent of Works. These drawings shall include the following statement signed and sealed by the Consulting Engineer- " I certify that the following services _____ (name them) _____ were inspected during construction and installed in accordance with Municipal specifications and as shown on these drawings."

13.0 Rectification, Repair and Maintenance

- 13.01 The Applicant shall be responsible for and at his own expense execute all work, repair, alteration, reconstruction or replacement required to remedy any defect, fault or deficiency in or developing in the completed work not only up to the receipt and approval of the Consulting Engineer's "as-built" drawing but also during a period herein referred to as the period of maintenance of twelve (12) months after the date of approval of all the as-built drawings.
- 13.02 All such works of rectification, repair and maintenance shall, during this period of maintenance, be executed as the need for them becomes apparent or upon the written request of the Superintendent of Works. Should the Applicant neglect or fail to commence the execution of such works within a space of three (3) days from the date of written request for their performance, the Corporation shall be entitled to obtain the remedy using the maintenance security held under Clause 14.0

14.0 Municipal Acceptance

- 14.01 Upon the authorization of the Superintendent of Works and after the receipt of satisfactory as-built drawings, maintenance security and the acceptance of the required works, any relevant deposits guaranteeing the satisfactory installation of the works shall be returned to the Applicant.
- 14.02 Maintenance security shall be held by the Village of Gold River in the form of a bond or deposit for the one (1) year period of maintenance. The deposit shall be five (5) per cent of the cost of the works to a maximum of five thousand dollars and with a minimum of a five hundred dollar deposit.
- 14.03 The Superintendent of Works may release a portion of any deposit for works requiring an extended period to construct provided that:
 - (a) the estimated value of the total work exceeds \$10,000.00;
 - (b) the Consulting Engineer certified in writing the extent and value of

work completed and that said works meet the specifications of the Municipality;

(c) approval is obtained from the Municipality that work to date is acceptable;

(d) an amount equal to 15% of the total value is withheld until the acceptance by the Municipality of all "as-built" drawings.

15.0 Building Permits

15.01 No building permits shall be issued until the subdivision plan is registered and all essential services provided as required under current Municipal By-laws.

16.0 Sales Tax Refund

16.01 Upon application to the Consulting Engineer and acceptance of the storm drainage as part of the Municipal system, the necessary certification will be sent to the Applicant for him to apply for a refund of the Federal Sales Tax.

THE VILLAGE OF GOLD RIVER

SPECIFICATION "B"

1. PREPARATION OF ENGINEERING DRAWINGS

1.0 Scope

This specification shall govern the preparation of engineering drawings for all Municipal Services.

2.0 Drawing size, material, and basic layout

2.01 Standard sheet size is 22" x 34". A metric size (594 mm x 841 mm) is also acceptable.

2.02 Use transparent plan profile paper, Plate A, 4 x 20 lines to the inch with profile at top of sheet. Leave 2" clear space in the lower part of plan for Municipal title block and legend. Standard sheet with legend imprinted may be purchased from the Municipality.

2.03 The plans shall not extend onto the profile section of the drawing. All profiles must be on the profile section of the drawing.

3.0 Scales

Normally:	Horizontal 1" = 50'	Vertical 1" = 8'
Details *	Horizontal 1" = 20'	Vertical 1" = 4'
Cross Sections:	Horizontal 1" = 10'	Vertical 1" = 10'
Structural Details :	½" = 1'	

* e.g. a detail of piping around two closely spaced manholes.

4.0 Drawing Technique

Points of drawing technique that are significant to the preparation of drawings are as follows:

4.01 Care in ensuring balanced distribution of detail throughout the drawing.

4.02 Well-spaced, properly formed and proportioned letters and figures.

4.03 Lines uniform in weight and density.

4.04. Three widths of lines are required. Generally all underground services and connections are shown as thick lines, all surface services and ground profiles as medium lines, and all extension and dimension lines as thin lines. Proposed construction is shown as dashed lines and existing is shown as solid lines.

4.05 Dimensioning of a drawing is extremely important and should be such that it will not be misinterpreted. Dimensions should be given from an iron pin, lot line, chainage station, a center line or any other reference that can be readily established.

5.0 General Requirements for all Services

5.01 Elevations shall be relative to the Municipal datum. Bench mark numbers, locations and elevations can be obtained from the Survey Section at the Municipal Yard. The reference bench mark and elevation shall be shown on the design drawing.

5.02 Show the elevation of any basement floors which would have a critical effect on the design of services and the final landscaping grade as established to prevent flooding from overland flows.

5.03 All existing rights-of-way and their permitted uses must be checked through the Land Registry Office and lightly shaded on the design drawing. Proposed rights-of-way for new services are to be shown as a dashed line, together with their width, permitted uses, and the note "acquire".

5.04 Where there is more than one profile, clearly identify each.

5.05 A north arrow, adjacent lots and plan numbers, street names, and the legal description of the parcel being subdivided, shall be shown on the drawing. In general the north arrows should be orientated towards the top of the plan.

5.06 All services are generally shown on one plan with curbs, sewers, drains, gas water and underground wiring and poles identified as C, S, D, G, W, and U/G, H or T respectively.

6.0 Requirements for Subdivision Site Plan

A site plan to scale 1" = 200' shall accompany each set of engineering drawings and shall include the following information:

6.01 Plan of all streets, rights-of-way and lot lines with street named and lots numbered.

6.02 Indicate existing watermains, sanitary sewer mains and manholes, storm drains and manholes - dimensions not required.

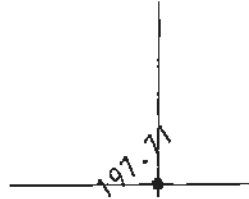
6.03 Contours at 5 foot intervals except on very steeply sloping ground, where 10 foot intervals will be accepted.

6.04 Existing streets adjacent to proposed subdivision.

6.05 If the subdivision is to be developed in stages, each proposed stage shall be clearly outlined and order of development indicated.

7.0 Requirements for Roads

7.01 Show all iron pins adjacent to the works and the existing ground elevation at each pin with the symbol.



7.02 Both plan and profile must be tied to an iron pin, preferably near or at 0 +00 Chainage. If the chainage exceeds 400 feet a second tie shall be shown.

7.03 Show the road width and the curb offsets measured from the property line to the back of the gutter (curb face).

7.04 Chainages of the BC and EC of horizontal curves shall be shown together with the delta angle, centerline radius, tangent length, and centerline arc length. Curb radii are not required if the centerline radius and road width are shown, except on curb returns at intersections, at the end of cul-de-sacs, and on any curbs where alignment is not directly related to the centerline radius.

7.05 The per cent grade to two decimal places shall be shown on the profile together with the following information on vertical curves:

(a) The chainage and elevations of BVC, EVC and V.P.I.;

(b) The external value, e;

(c) The length of vertical curve;

(d) Elevations along the vertical curve at 25 foot intervals;

(e) The elevation and chainage of the low spot of sag curves, or the high spot of crest curves.

7.06 Road profiles shall show the top of curb elevations.

7.07 Detail the extent of the road construction.

7.08 On superelevated curves, cul-de-sacs and crossfall sections on vertical or horizontal curves show a profile of each curb (no centerline profile) and list the chainage and elevation of each curb at 25 foot intervals.

7.09 The profile shall be shown at true centerline length and projected above the plan in as close relationship as possible.

7.10 Locate catch basins (using road chainage) and show drains between the catch basin and the lateral.

7.11 Existing and proposed driveway locations adjacent to the works shall be shown as well as a profile of each driveway from the road centerline to the end of the driveway within the property.

8.0 Requirements for Sewer and Drain

The following information shall be shown on the profile:

8.01 Size, type, class of pipe and class of bedding.

8.02 Per cent grades to two decimal places. If critical mark "CR" after the grade, if not critical show the minimum grade thus (1.80% Min.).

8.03 Invert elevations at both inlet and outlet of manholes.

8.04 Information on vertical curves as detailed under Specification B 1, Section 7.05.

The following information shall be shown on the plan:

8.05 Information on horizontal curves as detailed under Specification B1, Section 7.04.

8.06 Tie locations of manholes, cleanouts, and other appurtenances to iron pins.

8.07 Pipe offsets from property line.

8.08 Locate house connections at the property line by showing a distance from an iron pin, and at the main by a chainage distance from the downstream manhole.

8.09 Ground and invert elevations of house connections at the property line or at the end of the connection in a right-of-way.

8.10 The grade or various grades of the connection from the upper end to the drop to the main (if other than 2.0%).

The following additional information shall also be shown on an appropriate part of the drawing:

8.11 Sanitary sewer manholes shall be lettered on plan and profile where sewer and drains are on the same plan.

8.12 Storm drain manholes shall be numbered on plan and profile.

8.13 The class of pipe, class of bedding and maximum trench width at top of pipe.

8.14 Structural details of all manholes not covered by Standard Drawings No. 12 and 13.

8.15 Where the sanitary sewer or water and storm drain are to be installed in a common trench, detail a typical cross-section showing distance between pipes, class of pipe and bedding and maximum trench width.

9.0 Water

9.01 Tie the location of hydrants and other appurtenances to the nearest iron pin and show the distance between the hydrant, the valve and the main.

9.02 Show the offset of the main from the property line and locate the end of the main to the nearest iron pin.

9.03 Indicate extent of work required of the Municipality in making the connection to the existing watermain.

9.04 Indicate the size, type, class of pipe and class of bedding on the plan.

9.05 A profile of the watermain is not required unless there is a possible conflict with other services.

10.0 Underground Hydro, Gas and Communication Services

10.01 Dimension the offset from property line and/or iron pins of the underground conductors or mains and the location of all appurtenances related to the system including house connections.

- 10.02 Refer to appropriate utilities for complete details of existing underground installations.
- 10.03 Dimension the location of all poles, both existing and proposed, from the pole road face to property line and/or iron pins.

THE VILLAGE OF GOLD RIVER

SPECIFICATION "B"

2. AS-BUILT DRAWINGS

Recording services as-built- by Consulting Engineers or Municipal Superintendent of Works.

1.0 Scope

1.01 This procedure pertains to the as-built drawings of the following services: drainage, sewers, water, gas, roads, curbs, lighting, sidewalks, underground power, telephone and television, culverts, bridges, and other miscellaneous permanent structures.

2.0 General

2.01 The as-built drawings shall clearly show the location of all services as installed using offsets from survey pins. The extent shall be shown by lining the constructed service in the appropriate colour. The locations will be shown either by check-marking the original dimensions on the drawing (if they are correct) or by showing the revised dimension. In addition, the location to the end of underground pipe will also be shown.

Sanitary sewer	red
Storm drains, culverts	green
Water	dark blue
Gas	brown
Curb, sidewalk and road	orange
Lighting Pole	Pale Blue
Underground power, telephone and television	purple

2.02 On as-built drawings submitted by Municipal crews, the Superintendent of Works shall include the following information on each drawing:

- (a) Name of Superintendent of Works who recorded each service;
- (b) Field book number and page;
- (c) Date of completion;
- (d) Date on which "as-built" details were added;
- (e) Bench mark location and elevation.

2.03 The as-built drawings are to be completed within two weeks of the completion of the installation of all above ground and underground services and submitted to the Village of Gold River:

Building permits will not be issued until required as-built drawings are submitted and accepted.

2.04 The as-built drawings are to be stamped and certified as per Section 12.01, Specification A, by the Consulting Engineer as having been installed to the design drawings and Village of Gold River Specifications throughout.

3.0 Details Required

3.01 Drain and Sewer

- (a) Size, pipe material, pipe class and location of mains.
- (b) Location of manholes, cleanouts, and other appurtenances.
- (c) Grades of mains;
- (d) Locate all house connections at the property line by showing a distance from an iron pin. Also dimension by chaining house connections at the main from the downstream manhole;
- (e) Ground elevation and invert elevation of the end of connection at property line or at the end of the pipe in a right-of-way to .
- (f) Grade or the various grades of the connection from the upper end to the drop to the lateral - (if other than 2.00 %)

(g) Location of rock cuts and hardpan requiring blasting and maximum depth of the rock excavation to nearest foot.

3.02 Water and Gas

- (a) Size, type and location of pipes;
- (b) Location of valves, tees, hydrants and other appurtenances;
- (c) Location of rock cuts and maximum depth of rock excavation to nearest foot;
- (d) Profile at pipe invert at 50' intervals,

3.03 Road, Curb, Sidewalks

- (a) Location of curbs, sidewalk and elevation of curbs;
- (b) Location of ditches and edge of pavement in minimum road construction;
- (c) End of curbs sidewalks and pavement;

3.04 Lighting

- (a) Location and wattage of luminaires;
- (b) Location of underground wiring and standards. Location of relays, P.E. controls and circuitry;

3.05 Bridges, Buildings, Etc

- (a) Location of structure;
- (b) Elevation of deck or floor;
- (c) Location of nearby underground services;

3.06 Underground Wiring

- (a) Location and cross section of conduit banks or conductors;
- (b) Location and dimensions of all appurtenances.

4.0 Tolerances

4.01 All horizontal locations shall be to the nearest half foot and all vertical locations to the nearest hundredth foot (0.01') except that ground elevations and house connection invert at property line shall be the nearest tenth foot (0.10')

THE VILLAGE OF GOLD RIVER

SPECIFICATION "C"

1. DESIGN OF SANITARY SEWERS AND STORM DRAINS

1.0 General

1.01 Upstream drainage and sewerage areas, land use, and other criteria required to accommodate upstream sewerage and drainage is normally specified by the Superintendent of Works.

Advance notice will be required to enable such work to be fitted into the work schedule.

1.02 The recurrence interval used in designing storm drains up to 36" shall be ten years, and greater than 36" shall be twenty-five years, unless otherwise stated by the Superintendent of Works. "C" Factor shall be 0.6 minimum unless otherwise stated by the Superintendent of Works.

1.03 Storm drainage shall be discharged from the subdivision in accordance with the Subdivision By-law as amended.

1.04 The Municipality reserves the right to make all connections to existing storm drain and sanitary sewer systems at the expense of the developer.

1.05 The current "Guidelines for Assessing Sewerage Works" as prepared by the Pollution Control Branch of the Province of British Columbia will generally be conformed with.

2.0 Capacity of Pipes

2.01 Pipes shall be designed to carry the required quantity when flowing full.

2.02 Pipe capacity is to be determined by the Manning Formula using a roughness co-efficient of $n = 0.013$ for smooth-bore pipe.

2.03 The minimum grade of sanitary sewers shall be that which produces a minimum velocity of two feet per second in the pipe. However, a velocity of three feet per second must be attained in the pipe above the last manhole of a non-extendable system.

2.04 The minimum grade for storm drains shall normally be that which provides a velocity of three feet per second in the pipe. A reduction to two and one half feet per second may be granted in extreme cases on request.

2.05 House connections shall normally be four inch diameter pipe laid at a grade not less than 2.00 % connected to the main with monolithic wyes or tees. Hubs of acceptable design and material shall be used when monolithic fittings are not available. They shall be connected to the main as shown in the following standard drawings: { See Specification C2, Section 5.04. }

(a) #8 Sanitary Sewer House Connection Details

(b) #9 Storm Drain Connection Details.

(c) #10 House Connection to Trunk Sewer.

House connection grades need only be shown on the Design Drawing if they are other than two per cent. Connections for other than single family dwellings shall be designed according to the criteria contained herein for main lines.

2.06 Catch basin leads shall be minimum six inch diameter, Class 3300 Asbestos Cement or equivalent laid at a minimum grade of one per cent. Not more than one catch basin shall be connected to a six inch lead. Double catch basins shall be connected to a minimum eight inch lead.

2.07 Open ditches shall enter an enclosed storm drains system through a silt trap as per Standard Drawing # 6. The pipe accepting the flow from the ditch shall be ten inches in diameter or larger. Driveway culverts shall be a minimum of ten inches in diameter.

2.08 Main storm drains and sanitary sewers shall not be less than eight inches in diameter, except that sanitary sewers in the upper part of non-extendable systems may be six inches in diameter.

2.09 Rainfall design curves and other pertinent data may be obtained from the Municipal Office.

3.0 Alignment and Grade

3.01 Pipe lines shall be normally designed to follow a straight alignment and constant grade between manholes.

3.02 Curved alignments may be accepted. In these cases the radius of curvature shall be not less than two hundred feet, or that radius recommended by the pipe manufacturer, whichever is the greater.

3.03 Changes in grades of pipe between manholes may be accepted. In these cases transitions must be accomplished by a designed vertical curve of not less than one hundred feet in length.

4.0 Field Supporting Strength

4.01 The quality and type of pipe and fittings, together with required class of bedding and trench widths shall be so selected that the pipe will support the anticipated gravity earth and any surface dead and live loads with a safety factor of 1.5. Pipe class, trench width and class of bedding must be shown on the drawing. Allowable pipe strengths shall conform to applicable current A.S.T.M., C.G.S.B., or C.S.A. specifications.

4.02 Details of pipe bedding classes are shown on Standard Drawing No. 14.

4.03 Without prejudice to the generality of Clause 4.01, all rigid pipe must have at least Class C bedding.

4.04 Ductile iron pipe shall be used for storm drains and sanitary sewers:

- (a) For pipe lines within 30" of the foundation wall or footing;
- (b) Under an area carrying vehicular traffic or similar loadings if the ground cover is less than 30" (except that Class 3300 A.C. pipe or equivalent may be used for catch basin leads);
- (c) In other locations if the ground cover is less than 18".

5.0 Location of Services

5.01 It is desirable to locate sanitary sewers and storm drains within the road allowance. House connections shall be installed to each proposed lot, and connected to the main (not manholes) and where feasible in a common trench.

5.02 Where topographic or other circumstances render it more desirable to locate services on private property, the services shall be installed in a Municipal right-of-way acquired as detailed in Specification B1.

5.03 Where a single storm drain or sanitary sewer right-of-way is required, the minimum acceptable width is ten feet.

5.04 Where more than one service is installed in a right-of-way, the width of the right-of-way must be increased sufficiently to accommodate the pipe sizes required together with suitable clearances. The normal acceptable width of shared right-of-ways is fifteen feet. However, a minimum of twelve feet may be acceptable for installations up to five feet in depth.

5.05 It is preferable that right-of-ways are located within a single property adjacent and parallel to property boundaries and must be clear of proposed building sites.

5.06 Where sanitary sewer and/or storm drain facilities are not yet available right-of-ways shall be provided by the applicant for the eventual installation of the sanitary sewer and/or storm drain as required by the Superintendent of Works.

5.07 Where sanitary sewers and storm drains are installed in a common trench, there shall be a minimum six inch lateral clearance between the walls of the pipes and trench walls.

6.0 Manholes and Cleanouts

6.01 The maximum distance between sanitary sewer and storm drain manholes may vary according to the pipe diameters as shown in the tables below:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
6" up to and including 15"	400 feet
16" up to and including 48"	600 feet
over 48"	1,000 feet

6.02 Manholes shall be provided at the following additional locations:

(a) At all changes of grade and/or alignment except as provided under Section 3 of this Specification:

(b) At all changes of pipe size:

(c) At all pipe junctions other than house connections.

6.03 Drop manholes on sanitary sewers and storm drains may be allowed only where particular circumstances preclude the use of normal manholes. Drop manholes shall be constructed in accordance with details as shown on Standard Drawing #12. Allowance must be made in the design for the effect of the resulting turbulence on the hydraulic capacity of the system.

6.04 The relative elevations entering and leaving a manhole are to be such as to ensure that the manhole does not reduce the hydraulic capacity of the system.

Allowances for energy losses or changes in velocity are to be determined in accordance with sound hydraulic principles.

Normally, for an R/D ratio of 3, the head loss across a 90° manhole may be considered equal to $0.005 V^2$ where:

R = Centerline radius of channel in manhole, in ft.

D = Internal diameter of pipe, in ft.

V = Velocity in upstream pipe, in fps.

Junctions shall require special treatment as shall all situations involving a pipe flowing into a smaller pipe on a steeper slope.

6.05 Cleanouts in lieu of a manhole are permitted at the end of non-extendable sanitary sewer and storm drain. These shall be constructed as shown on Standard Drawing #2.

6.06 Stubs as required shall be placed in manholes to allow for future connections. The length of stubs shall be two feet from the outside of the manhole and the end shall be securely capped.

6.07 Manholes are normally constructed in accordance with the details as shown on Standard Drawings #12 and #13. In cases where these details will not suffice, a detailed design drawing must be approved by the Municipality. All manholes with pipes 18" or larger in diameter must be individually designed.

THE CORPORATION OF THE VILLAGE OF GOLD RIVER

SPECIFICATION 'C'

2. INSTALLATION OF SANITARY SEWERS AND STORM DRAINS

1.0 General

- 1.01 This specification shall cover the installation of the pipes, manholes and other appurtenances used in the construction and installation of storm drains and sanitary sewers throughout the Municipality.
- 1.02 Provision shall be made to maintain the flow of all sewers, drains, house or inlet connections and all watercourses and ditches which may be met with during the progress of the work. The contents of any sewer, drain, house or inlet connection shall not be allowed to flow into the trench or into the mains except where permission is given by the Superintendent of Works. All offensive matter shall be immediately removed from the proximity of the work, using such precautions in doing so as may be directed by the Works Inspector.

2.0 Pipe

- 2.01 The following pipe is permitted for sanitary sewers providing it is designated on the Design Drawing:

Material	Class	Size	Use	Current Standard
Asbestos Cement	Building Sewer	4"	for house connections only	34-GP-96
Asbestos Cement	2400 or higher	6" & up	main sewers	34-GP-22
Ductile Iron		4" & up	where less than 30" cover under roads and 18" cover elsewhere	
Other - as approved by the Superintendent of Works				

- 2.02 The following pipe is permitted for storm drains providing it is designated on the Design Drawing:

Material	Class	Size	Use	Current Standard
Concrete	non-reinforced	6" to 18"	main storm drain	ASTM C14
Concrete	reinforced	8" to 114"	main storm drain	ASTM C76
Asbestos Cement	2400 & higher	6" to 36"	main storm drain	CGSB 34-GP-22
Corrugated Steel Pipe	Asphalt Coated	36" & up	main storm drain	in accordance with specifications to be obtained from the Manufacturers.
Asbestos Cement drain pipe	Building Sewer	4" & 6"	house connections	CGSB 34-GP-96
Other - as approved by the Superintendent of Works				

All pipe shall be free of defects and of the size and class shown on the drawings.

3.0 Alignment and Grade

- 3.01 Line and grade stakes shall be set out at not more than fifty foot intervals on a straight line and constant grade, at twenty-five foot intervals on horizontal or vertical curves, and at maximum twenty-five foot intervals where the grade is one per cent or less.
- 3.02 At each stake position grade boards shall be erected to enable the pipe to be laid to a constant grade between the boards, At least three grade board shall be in place at the location of the open trench. In vertical curves the pipe shall be laid to grade by using the two grade boards on either side of the joint being set to grade.
- 3.03 House connections exceeding fifty feet in length shall be laid to grade boards established by the layout instrumentman.

4.0 Excavation

- 4.01 Where the sewer or drain location is not to be under any pavement, driveway or gravel shoulder, topsoil to a maximum depth of one foot shall be removed and stockpiled for eventual replacement.
- 4.02 The trench shall be excavated to the required alignment, width, depth, and grade as shown on the approved Design Drawing.
- 4.03 Where trenches are excavated on the travelled portion of a road, all excavated material shall be removed from the site, except in such cases where approval is given by the Superintendent of Works and Consulting Engineer for the use of this material for backfilling.
- 4.04 The clear width of trench at the top of the pipe shall be no greater than that specified on the Design Drawing. Where this is exceeded, reference must be made to the Consulting Engineer who shall get the approval of the Superintendent of Works before further construction may continue.
- 4.05 If the bottom of the trench is organic or other unsuitable material, the trench shall be dug to firm ground or such other remedial measures taken as required by the Consulting Engineer, subject to the approval of the Superintendent of Works.
- 4.06 Any excavation carried out below pipe invert elevation shall be backfilled with pit run gravel or crushed rock together with sufficient sand for bedding the pipe, compacted in a maximum of 6" lifts.
- 4.07 All water, soft silt or other disturbed material shall be removed from the bottom of the trench prior to placement of bedding.
- 4.08 All solid rock, boulders and large stones shall be removed to provide a minimum clearance of 6" around the pipe.
- 4.09 No blasting may proceed without first securing a Municipal Blasting Permit. (See Specification A, Section 9.01(a)).
- 4.10 Where an existing structure or underground installation may be affected by the works, it is the responsibility of the Applicant to inform the owner of such utility sufficiently in advance to enable the owner to specify what protective measures must be taken. It is the responsibility of the Applicant to cooperate fully in such measures.
- 4.11 Where an unforeseen obstruction is encountered which interferes with the designed alignment, the Applicant shall cease construction and not proceed until such time as revised proposals are approved by the Superintendent of Works.

5.0 Installation of Pipe

- 5.01 Pipes shall be handled, stored and laid in accordance with the recommendations of the manufacturer.
- 5.02 All rigid pipe is to be provided with a minimum of at least Class C bedding. For classes of bedding and installation see Standard Drawing #14.
- 5.03 All pipe must be laid to the designed lines and elevations within the following tolerances.

Horizontal tolerance from true line shall not be greater than 0.20 from the designed location and the rate of deviation shall not exceed 0.10 feet in twenty-five feet.

Vertical tolerance from true grade varies with the grades and shall not exceed the limitations as detailed in the table below.

Grade	Maximum departure from design elevation	Maximum Rate of deviation
Over 5%	0.10 feet	0.02 feet in 10 feet
2% to 5%	0.05 feet	0.01 feet in 10 feet
Less than 2%	0.02 feet	0.01 feet in 10 feet

- 5.04 All service connections to a sanitary sewer or storm drain shall be made with the crown of the connecting pipe meeting the sanitary sewer or storm drain at an elevation not lower than the crown of the sanitary sewer or storm drain. (See Standard Drawing #8, Sanitary Sewer; #9, Storm Drain; #10, House Connection to Trunk Sewer).
- 5.05 Where a sanitary sewer is being constructed as an extension to an existing Municipal system, the end of the existing pipe shall remain sealed until the sewer extension is completed and flushed, tested and accented by the Municipality. Upon acceptance, the seal may be removed and one length pipe installed to connect the extension to the existing system.

6.0 Bedding Material

- 6.01 The class of bedding will be indicated on the design drawing. Details of the various classes of pipe bedding are shown on Standard Drawing #14.
- 6.02 Bedding material shall be sand.
- 6.03 Selected hand placed backfill as shown on Standard Drawing #14 shall consist of finely divided material free from debris, large stones and lumps.

7.0 Backfilling of Trenches

- 7.01 Where a pipe is installed beneath an existing or foreseeable future pavement, driveway or gravel shoulder, the backfill shall be pit run gravel machine compacted in maximum 12" lifts to a minimum of ninety-five percent proctor density. The gravel backfill at all depths shall extend at least three feet beyond the curb, driveway or future edge of pavement.

If required by the Superintendent of Works, a controlled amount of water shall be added by sprinkling to ensure optimum water content for compaction.

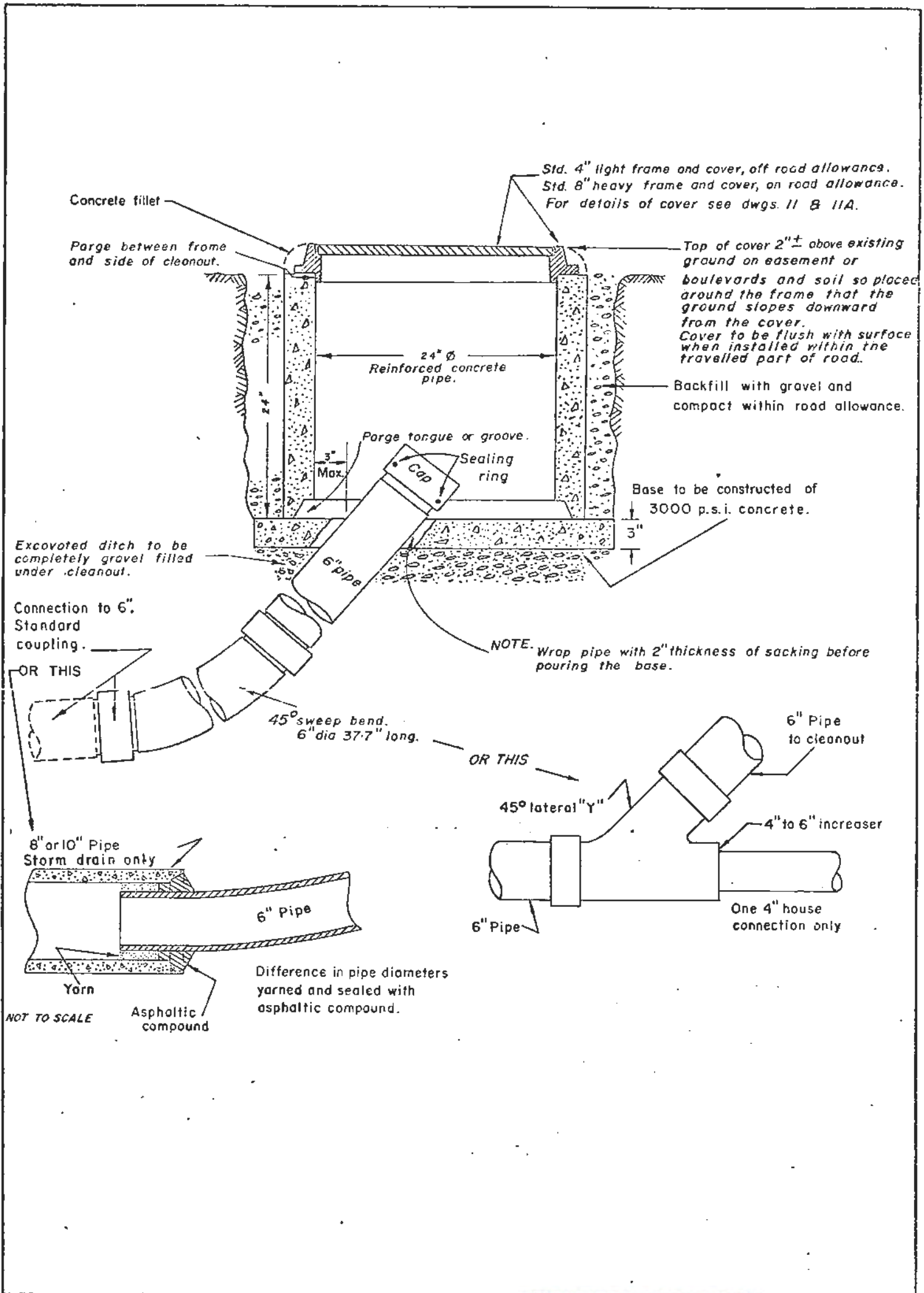
- 7.02 Suitable native material may be used as backfill where the pipe is installed in non-travelled areas. Backfill in these cases shall be free of large stones, frozen material, organic, or other perishable or objectionable material that would prevent proper consolidation or that might cause subsequent settlement.
- 7.03 Where it is required to replace topsoil (after removal under Clause 4.01 hereof) it shall occupy the upper 12" of the trench and shall be heaped on top to allow for settlement. If the installation is under a developed lawn, the soil shall be fine raked at the appropriate season and sown with a top quality grass seed at the rate of 1-½ ounces of seed per square yard.
- 7.04 Where the trench is on the shoulder or under the travelled portion of the street, including driveway, the surface material shall be cut in neat straight lines at the edges of the trench by means of an asphalt cutting wheel or pneumatic pavement breaker or by other tools approved by the Superintendent of Works. Where the edges of an area requiring repaving extend outside the straight lines cut, further cuts shall be made so that the final patch will have a neat appearance. The excavation will be backfilled with gravel and mechanically compacted in lifts not exceeding 12" in depth. All material excavated from the trench will be removed from the job site. All gravel-filled cuts must be maintained to within 1 - ½" of the original travelled surface until final paving is installed. These cuts shall be permanently restored by the Applicant within three days with the placement of a minimum of 2" thick layer of approved hot-mix asphaltic paving material. If weather conditions do not permit hot-mix asphalt at the time of installation, temporary cold-mix asphalt must be placed within the 3 day period, and be replaced with hot-mix when weather permits. All cuts paved as specified shall be maintained by the Applicant to the level of the original travelled surface for a period of one year after completion of the project. Should excessive settlements occur during the year's maintenance period, the Superintendent of Works may require the Applicant to excavate and restore the trench as per above.

8.0 Manhole, Cleanout and Silt Trap Construction

- 8.01 Standard manholes shall be constructed as shown on Standard Drawings #12 and #13.
- 8.02 Manholes other than standard manholes will be constructed as shown on the approved Design Drawing.
- 8.03 Cast-in-place manholes will be allowed provided that the following criteria are observed:
- (a) Concrete shall attain a minimum strength of 3,000 psi at 28 days;
 - (b) Minimum wall thickness to be 6 inches;
 - (c) Minimum internal dimensions to be as Standard Drawings #12 and #13.
- 8.04 Brick manholes will be allowed only for storm drain purposes provided that the internal dimensions and principles of construction conform with Standard Drawing #13.
- 8.05 The manhole frame shall sit on a maximum of three courses of mortared concrete brick which shall be parged on both sides with a mortar paste composed of one part cement and three parts of sand and only sufficient water for workability.
- 8.06 Heavy duty 8" frames and covers as per Standard Drawing #11 shall be installed on manholes and cleanouts within the road allowance.
- Light duty 4" frames and covers as per Standard Drawing #11A shall be installed on manholes and cleanouts in right-of-ways.

- 8.07 All sanitary sewer manholes shall be constructed so as to be water-tight.
- 8.08 Cleanouts shall be constructed in accordance with the details shown on Standard Drawing #2.
- 8.09 Silt traps shall be constructed as shown on Standard Drawing #6. The area around the silt trap shall be graded so that surface runoff enters the grilled lid. The ditch sides and bottom shall be rip rapped for a minimum of five feet.
- 9.0 Cleaning Up and Testing
- 9.01 The Applicant shall take precautions to prevent debris and mortar droppings from entering any part of the drain or sewer system and shall leave all pipelines, manholes and other appurtenances in a thoroughly clean condition and to the satisfaction of the Superintendent of Works.
- 9.02 The Applicant shall remove excess materials and clean up the area within two weeks of completing the installation of any section of pipe.
- 9.03 The construction shall not be considered complete until the final approval of the Superintendent of Works has been given, this after testing if so required.
- 9.04 Should any test disclose a defect, the Applicant shall have the defect located and repaired. The affected length will be re-tested and not accepted until found satisfactory. The cost of re-testing will be borne by the Applicant.
- 9.05 The attention of the Applicant is directed to the safety regulations of the Workmen's Compensation Board.

All Municipal employees have been instructed not to enter excavations which are not properly braced and, therefore, no approval will be given to installations which cannot be inspected because of unsafe working conditions.

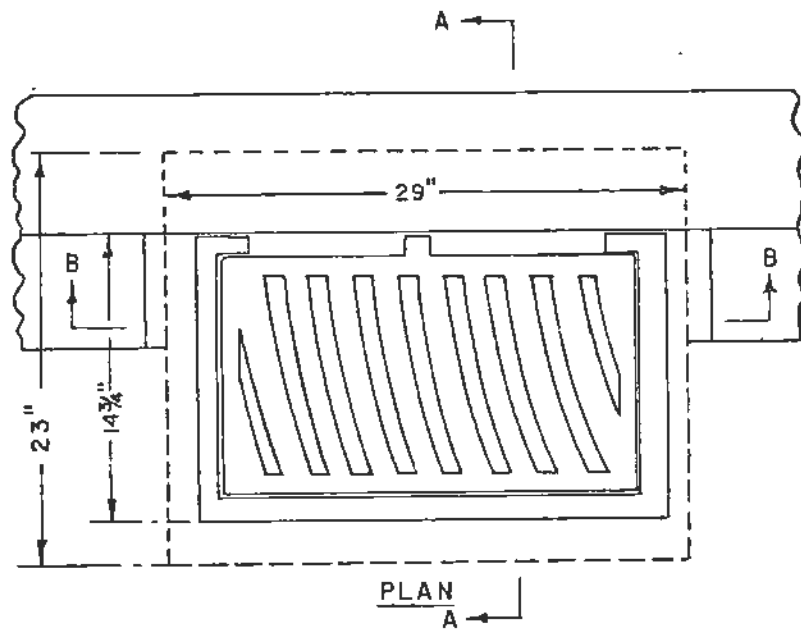


REVISIONS		
Date	Details	Approved

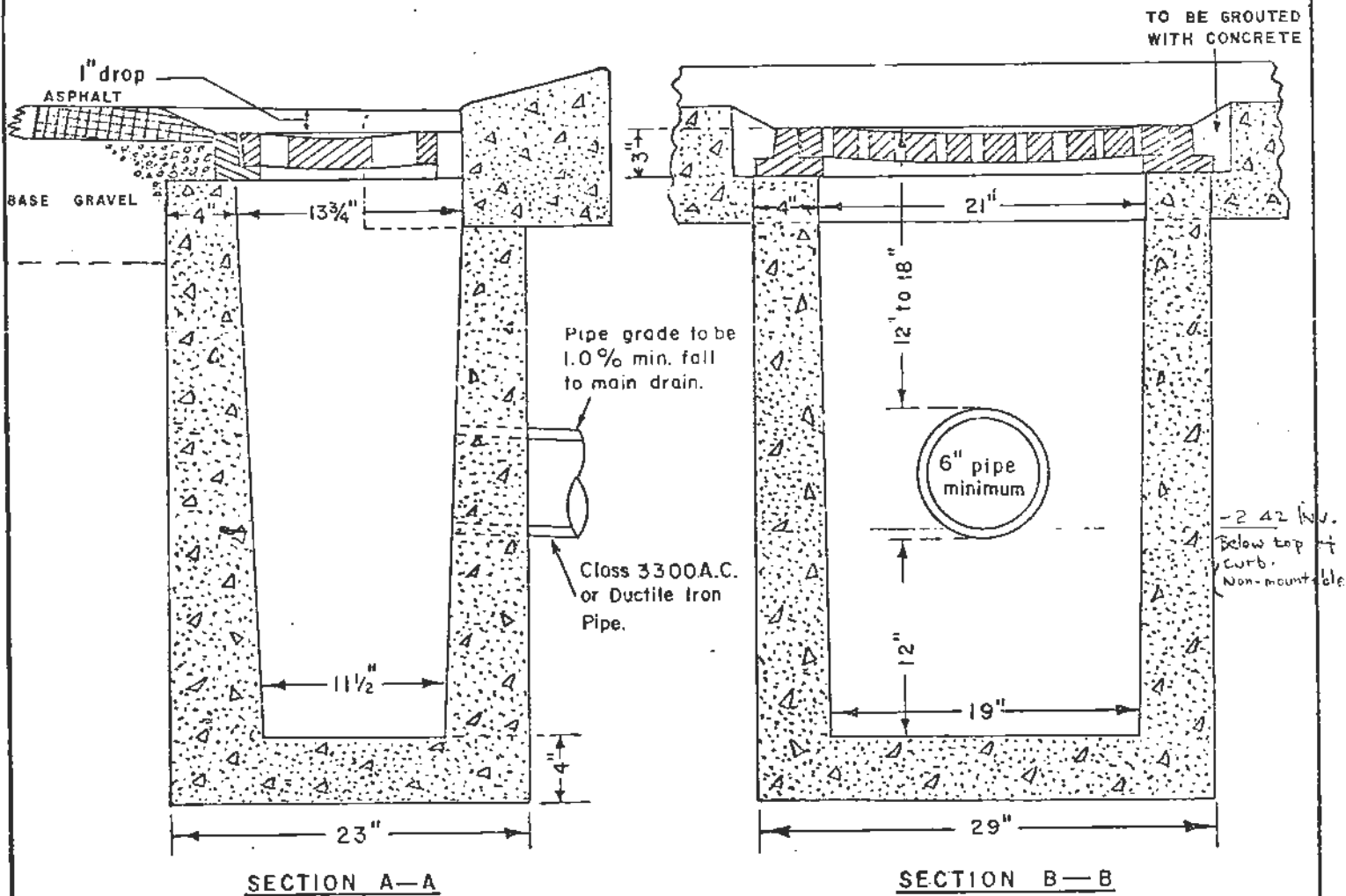
VILLAGE OF GOLD RIVER

SANITARY SEWER AND STORM DRAIN CLEANOUT

Approved <i>[Signature]</i>	P. Eng	Std. Dwg. No.
SCALE 1" = 1'-0"		2
Drawn by		



CONCRETE TO BE
3000 P.S.I. AT 28 DAYS.
MAX. SLUMP 3".



- NOTES:**
1. For details of frame grate see Std. Dwg. Nos. 7 & 7A.
 2. Trenches under travelled portion of road to be backfilled with gravel and compacted.
 3. For details of curbs see Std. Dwg. No. 1.

VILLAGE OF GOLD RIVER

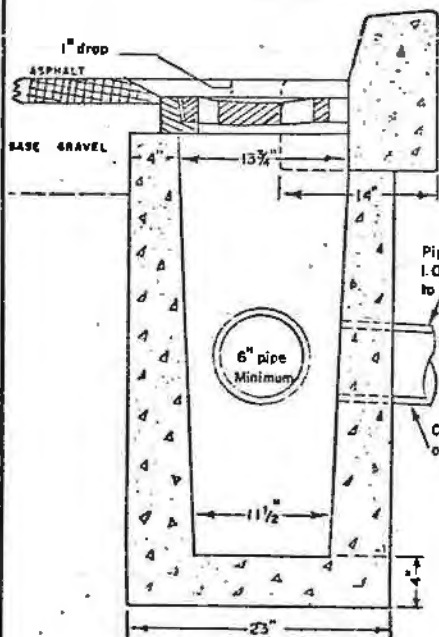
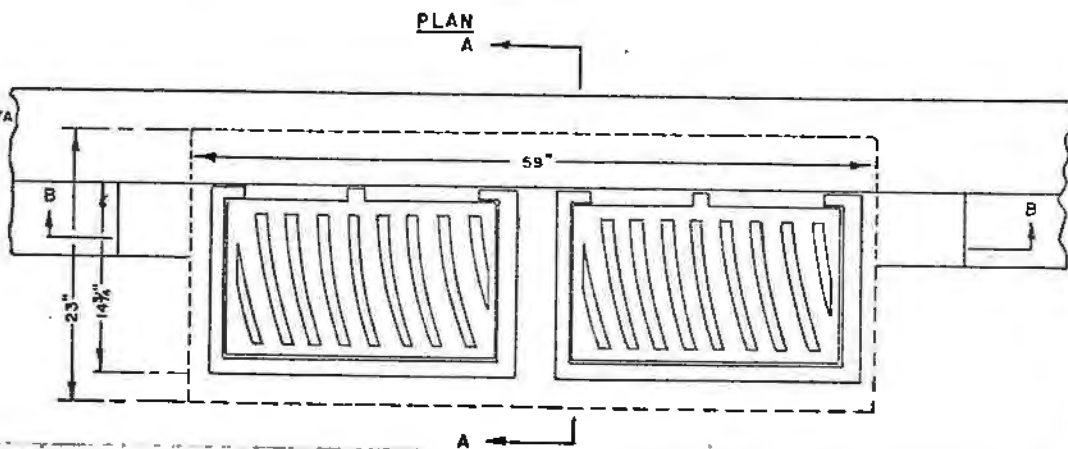
CATCH BASIN

REVISIONS		
Date	Details	Approved

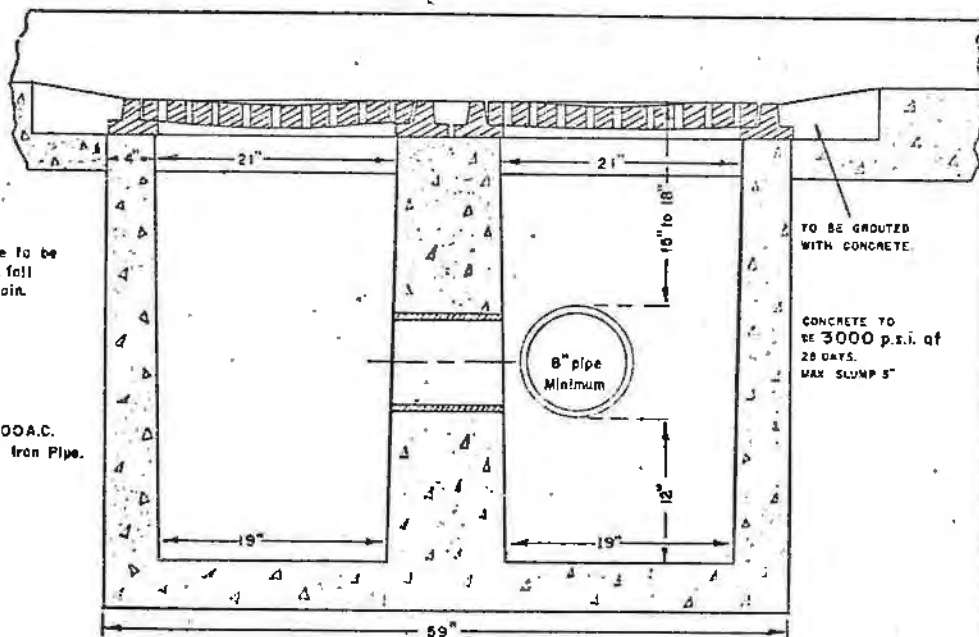
Approved	<i>[Signature]</i>	P. Eng.	Std Dwg No
SCALE	3/32" = 1"		3
Drawn by			

Notes:

1. For details of frame grate see dwg N° 7 B.7A
2. Trenches under travelled portion of road to be backfilled with gravel and compacted.
3. For details of curbs see dwg N° 1



SECTION A-A



SECTION B-B

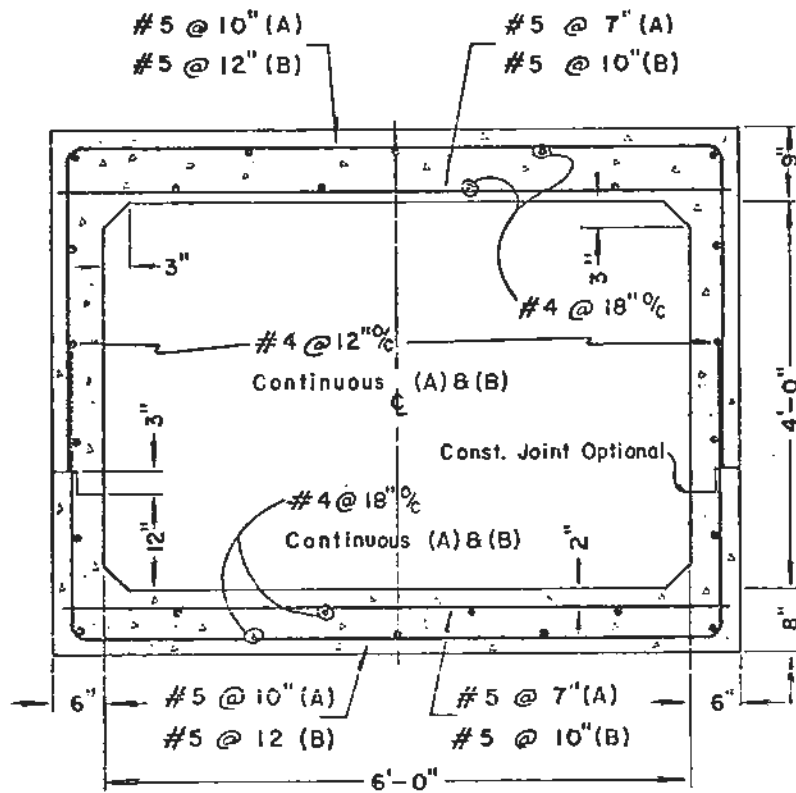
REVISIONS

Date	Details	Approved

VILLAGE OF GOLD RIVER

DOUBLE CATCH BASIN

Approved	<i>[Signature]</i>	P. Eng.	Std. Dwg. No.
SCALE	SKETCH		3A
Drawn by			

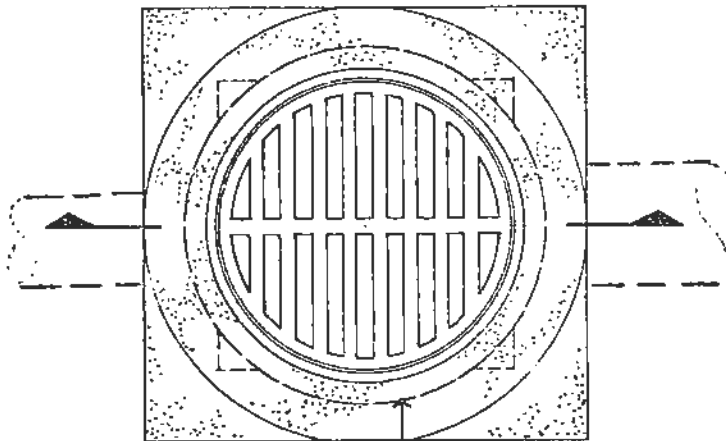


SPECIFICATIONS: Concrete
 3000 psi in 28 days
 Max. slump 3"
 Max. aggregate 1"

REINFORCEMENT
 Deformed bars, intermediate grade
 Type (A) for culverts subjected to H20 highway loading.
 Type (B) for culverts not subjected to H20 highway loading.
 Lap = 30 bar diameters.

- NOTES:** (a) Culvert to be bedded on 4" of gravel.
 (b) Vertical bars may be discontinued above the construction joint provided they are lapped 15".
 (c) All construction joints to be water tight.
 (d) All reinforcement to be protected with not less than 2" of concrete cover.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			4' X 6' CULVERT	
		Approved <i>[Signature]</i>	P. Eng	Std. Dwg. No.
		SCALE 1" = 2'-0"		4
		Drawn by		



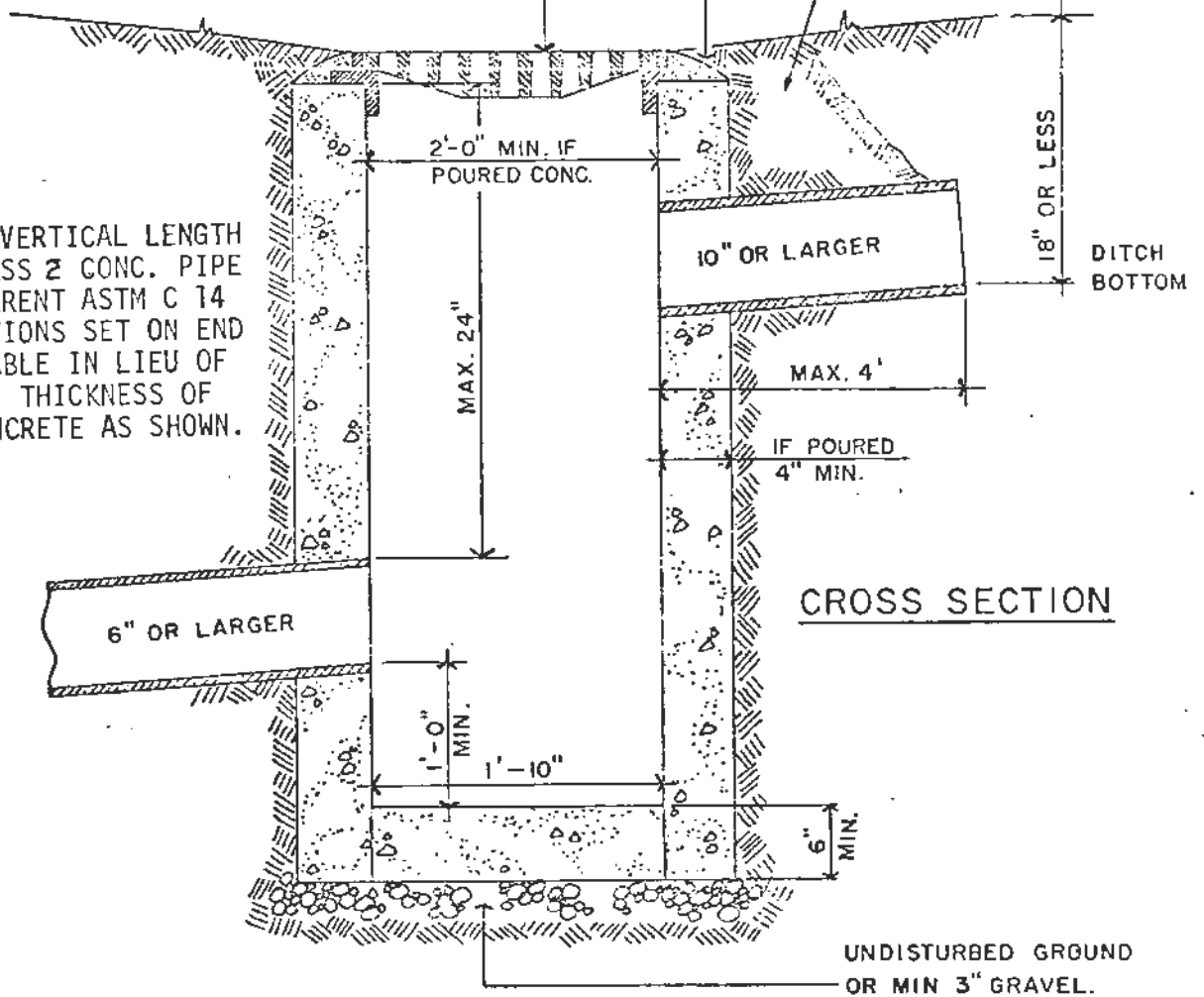
PLAN

CONC. SPECS.
3000 p.s.i. AT 28 DAYS
SLUMP 3"

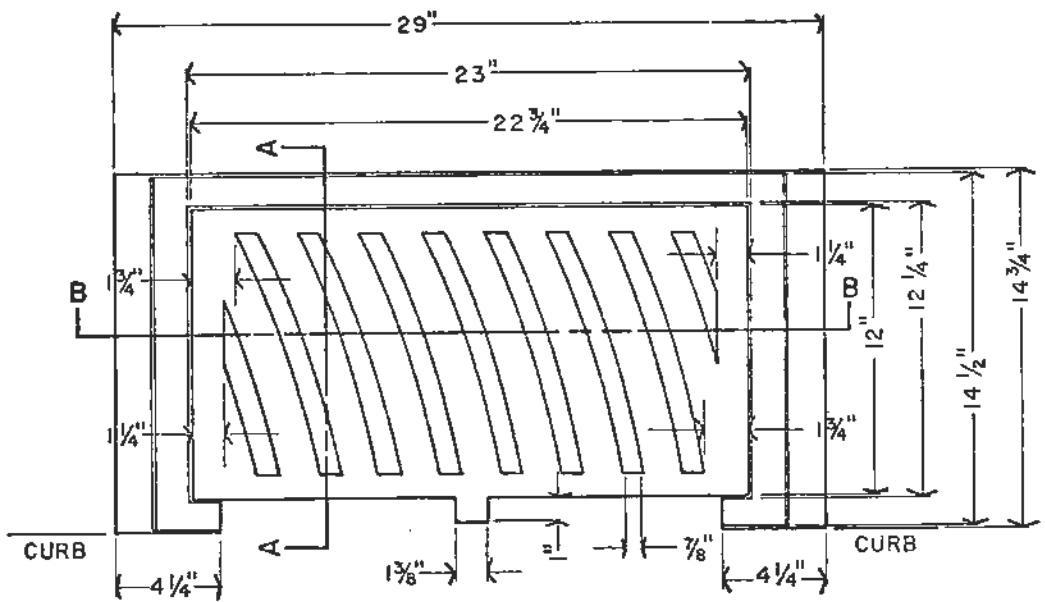
GRILLED LID AND FRAME
VICTORIA FOUNDRIES
N° 20-59 A OR EQUAL
(SEE STD. DWG. No. 11 or 11A)

CONC. FILLET
RIP-RAP AROUND INLET

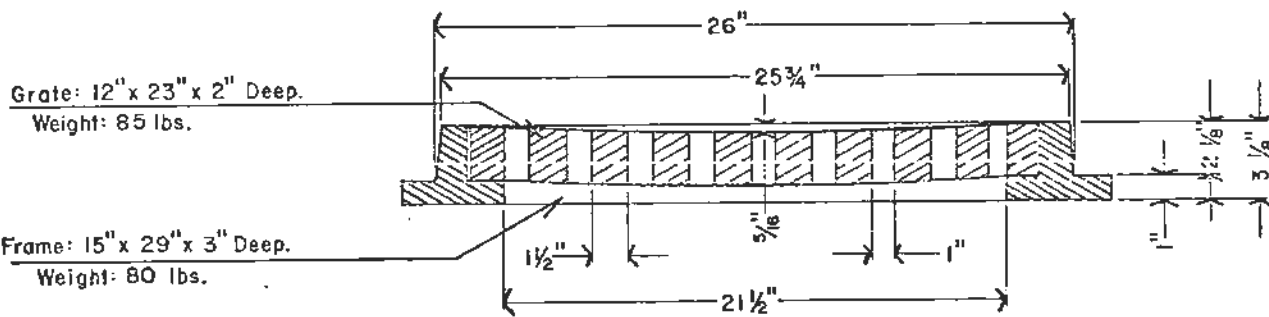
NOTE: A 4' VERTICAL LENGTH
OF 24" CLASS 2 CONC. PIPE
AS PER CURRENT ASTM C 14
SPECIFICATIONS SET ON END
IS ACCEPTABLE IN LIEU OF
MINIMUM 4" THICKNESS OF
POURED CONCRETE AS SHOWN.



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			SILT TRAP POURED IN PLACE OR 24" CLASS 2 NON-REINFORCED CONCRETE	
			Approved <i>[Signature]</i> P. Eng.	Std. Dwg. No.
			SCALE 3/4" = 1'-0"	6
			Drawn by	



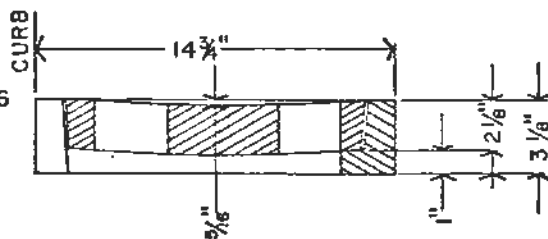
PLAN



SECTION THROUGH B-B

NOTES

1. For use with catch basins in conjunction with curbs & gutters.
2. For details of catch basin see Std. Dwg. No. 3 or 3A.
3. Gutter frame & grate to be Victoria Foundaries Ltd. Model 20-46 or equivalent.



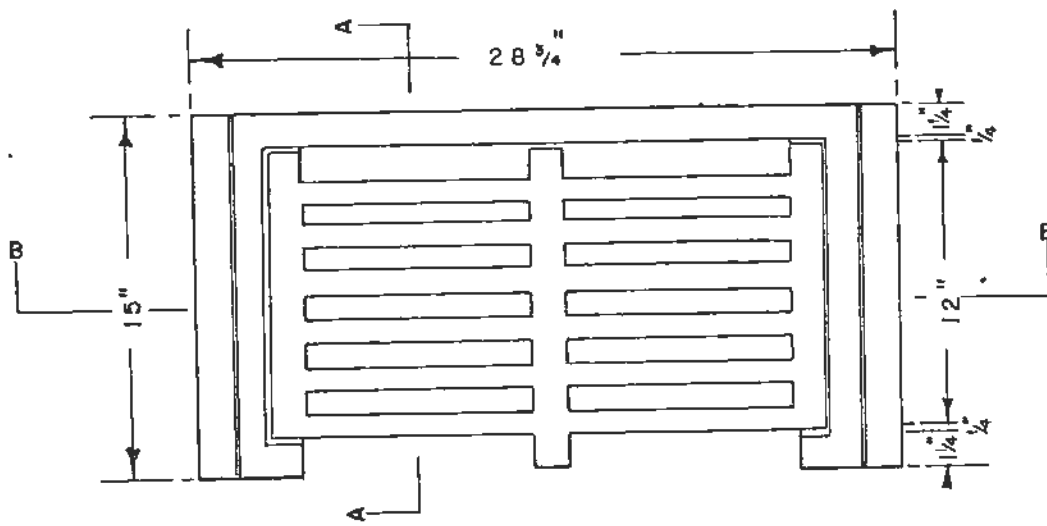
SECTION THROUGH A-A

MATERIAL: CAST IRON

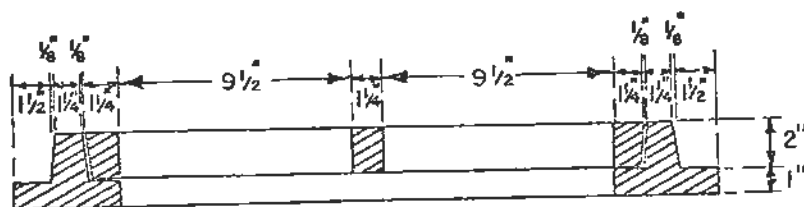
VILLAGE OF GOLD RIVER

REVISIONS		
Date	Details	Approved

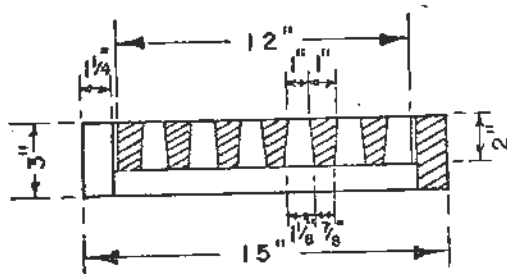
12" x 23" GUTTER GRATE		
Approved	<i>[Signature]</i>	P. Eng
SCALE	1/2" = 1'-0"	Std. Dwg. No.
Drawn by		7



PLAN.



SECTION THROUGH B-B



SECTION THROUGH A-A

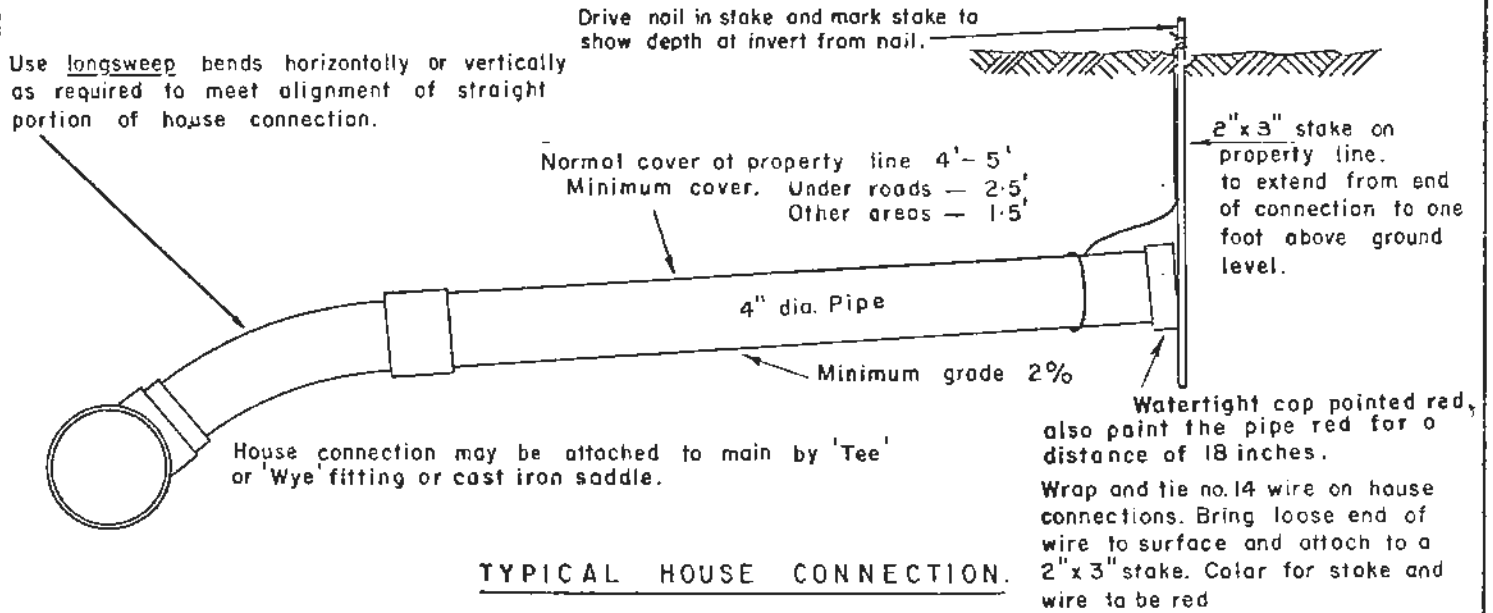
NOTE: For details of catch basin see Std. Dwg. No. 3 & 3A
For use in areas where curb and gutters not used.

VILLAGE OF GOLD RIVER

REVISIONS		
Date	Details	Approved

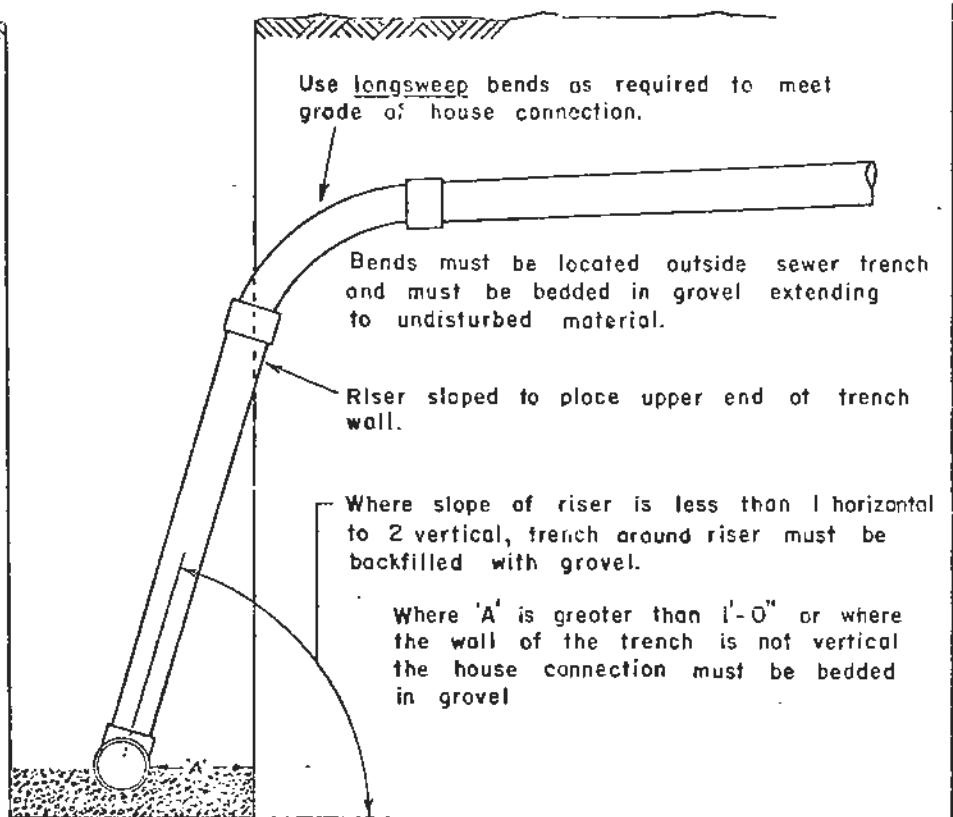
12" x 22" GUTTER GRATE

Approved	<i>[Signature]</i>	P. Eng.	Std. Dwg. No.
SCALE	$1 \frac{1}{2}'' = 1'-0''$		7A
Drawn by			



SKETCH SHOWING A HOUSE CONNECTION IN A DEEP TRENCH.

For connection to concrete trunk refer to Std. Dwg. No 10



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			SANITARY SEWER HOUSE CONNECTION DETAILS	
			Approved <i>[Signature]</i>	P. Eng. Sid Dwg. No.
			SCALE	8
			Drawn by	

Use longsweep bends horizontally or vertically as required to meet alignment of straight portion of house connection.

Stake marked to show depth of invert

Normal cover of property line 4'-5'
 Minimum cover under roads 2-5'
 " " other areas 1-5'

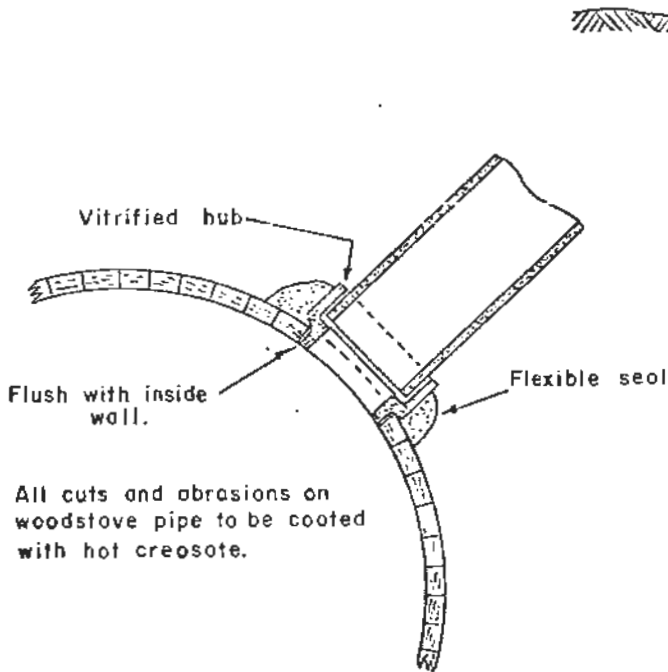
2" x 3" stake on property line to extend from end of connection to \pm one foot above ground level, with marking of depth of pipe invert.

Minimum grade 2.0%

Wrap and tie no. 14 wire on house connections. Bring loose end of wire to surface and attach to a 2" x 3" stake. Color for stake and wire to be red for sewers, green for drains.

House connection may be attached to main by 'Tee' or 'Wye' fitting or cast iron saddle. Subject to the Municipal Engineer's approval, other methods may be used to connect house connections to the main.

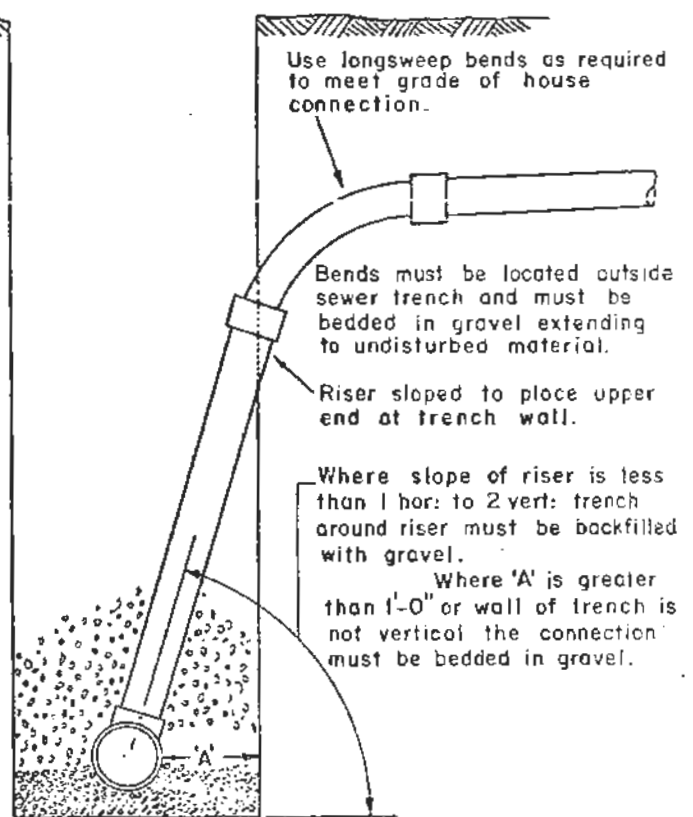
TYPICAL HOUSE CONNECTION



All cuts and abrasions on woodstove pipe to be coated with hot creosote.

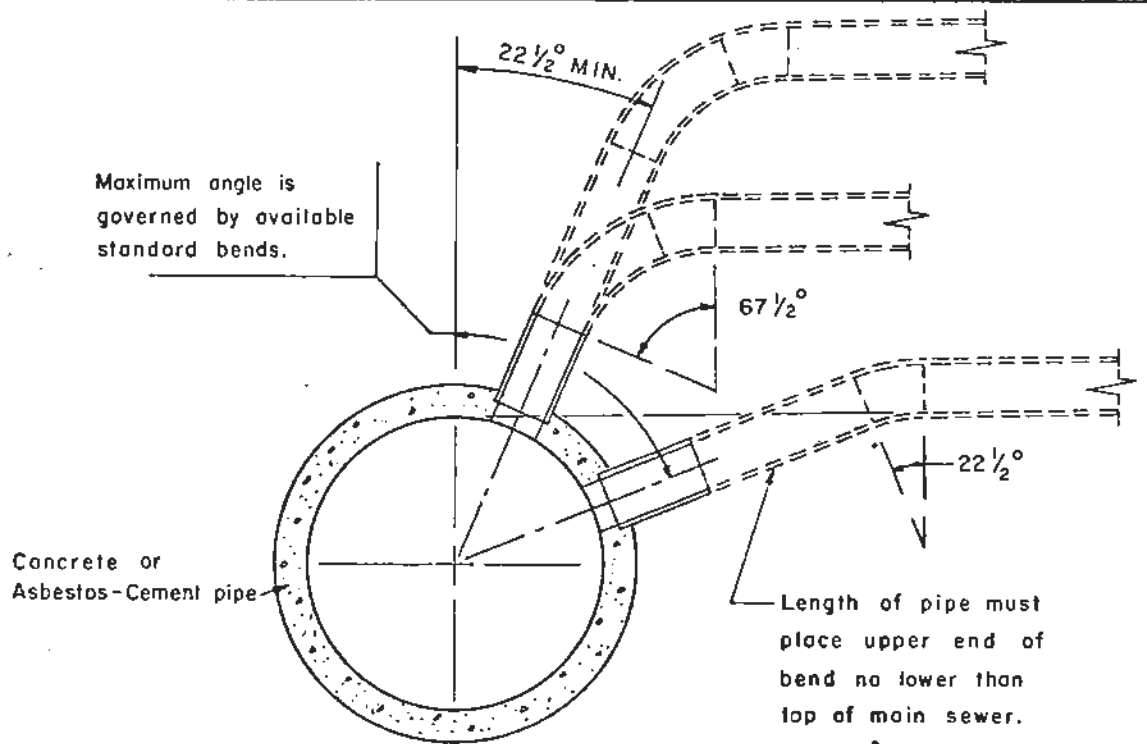
METHOD OF CONNECTION TO WOODSTOVE MAIN

Using Vitrified clay hub

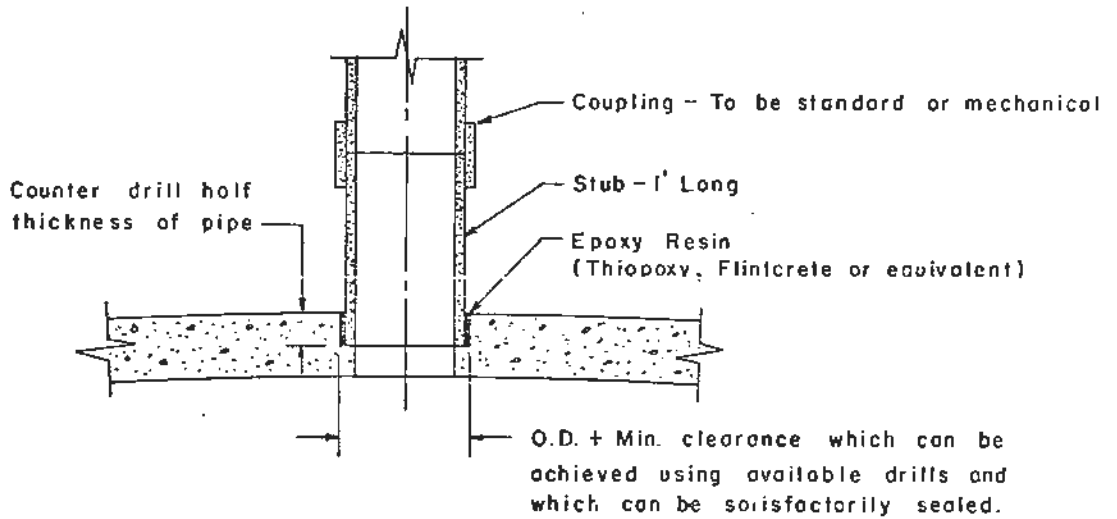


CONNECTION IN A DEEP TRENCH.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			STORM DRAIN CONNECTION DETAILS	
		Approved <i>[Signature]</i>	P. Eng	Std. Des. No.
		SCALE Not to scale		9
		Drawn by		



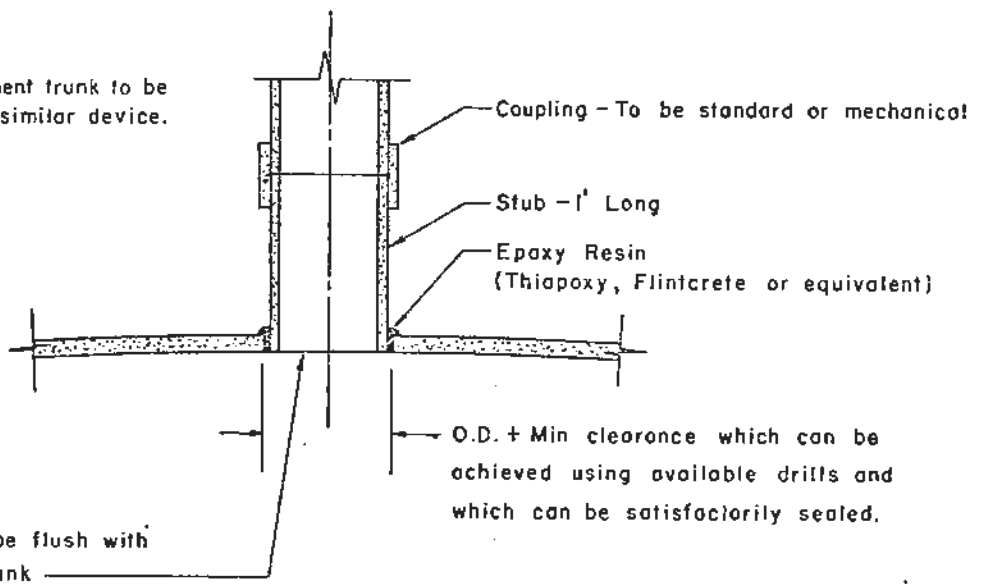
X - SECTION



DETAIL OF LATERAL CONNECTION TO CONCRETE TRUNK

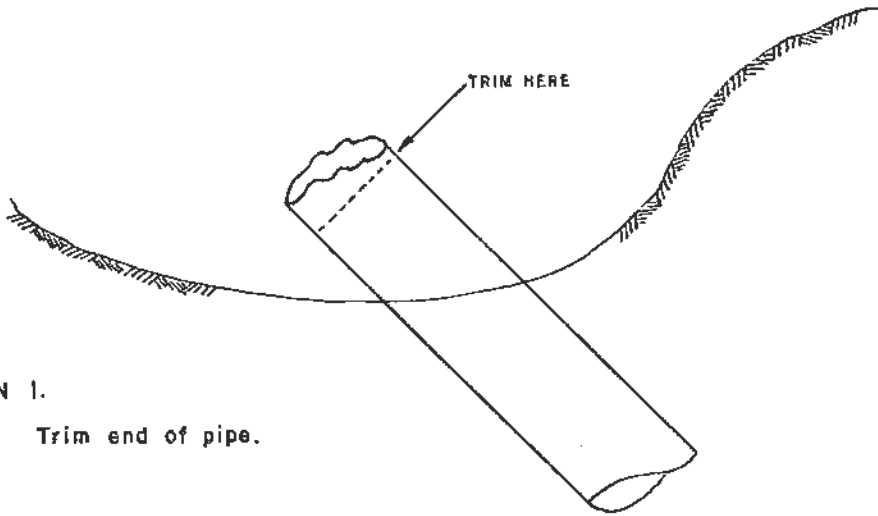
NOTE - All holes in concrete trunk to be diamond drilled.

NOTE - All holes in Asbestos-Cement trunk to be drilled with Pilot A.C. cutter or similar device.

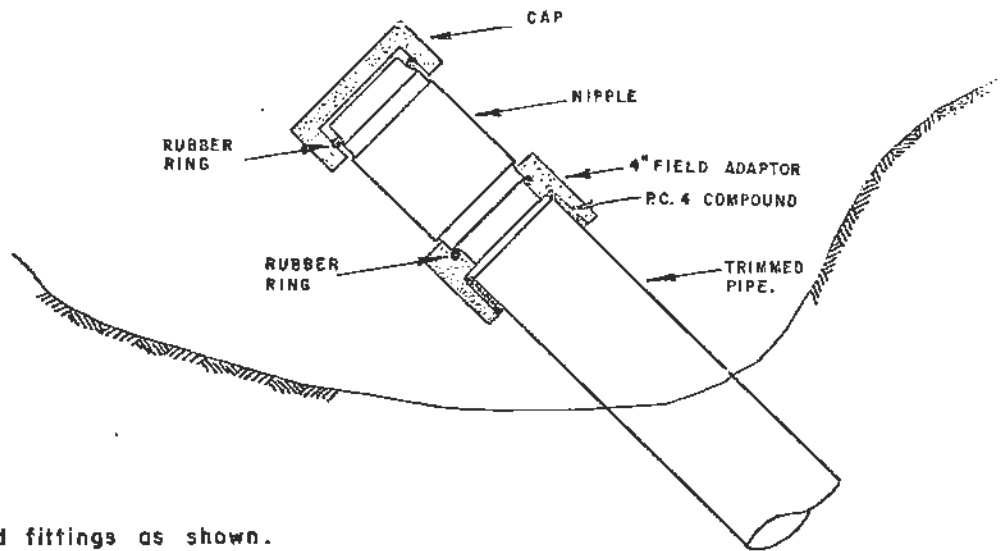


DETAIL OF LATERAL CONNECTION TO ASBESTOS - CEMENT TRUNK

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			METHOD OF INSTALLING LATERAL OR HOUSE CONNECTION TO CONCRETE OR ASBESTOS - CEMENT TRUNK SEWER	
			Approved <i>[Signature]</i> P. Eng.	Std. Des. No.
			SCALE NTS	10
			Drawn by	

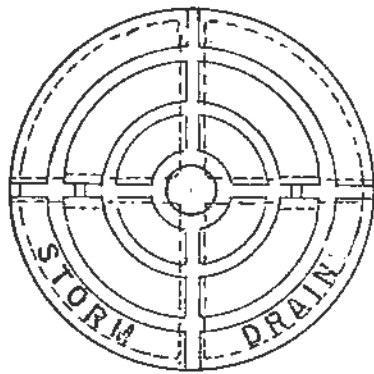


OPERATION 1.
Trim end of pipe.

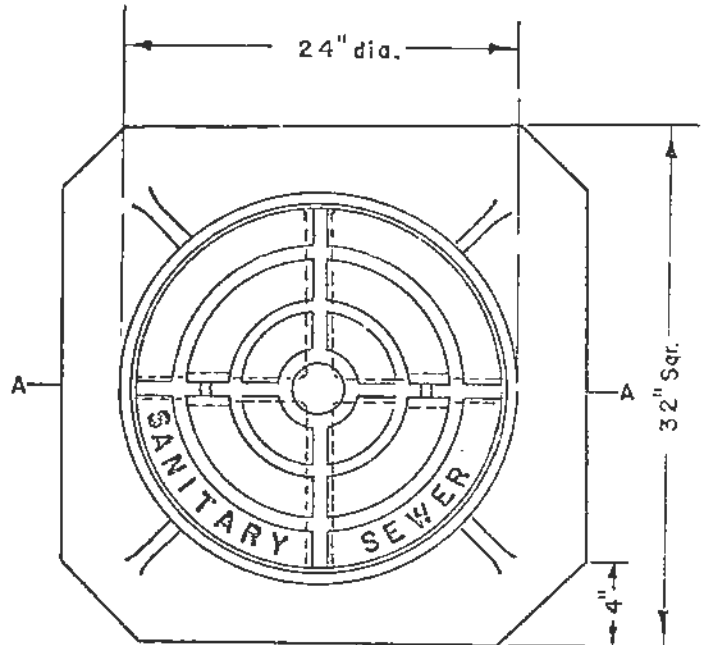


OPERATION 2.
Add fittings as shown.

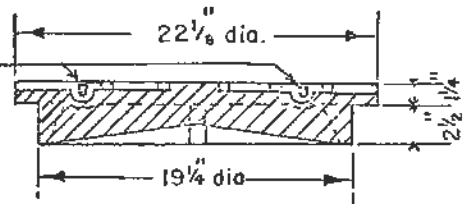
REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			METHOD OF CAPPING BROKEN SEWER CONNECTION	
			Approved <i>[Signature]</i> P. Eng.	10A
			SCALE Not to scale	
			Drawn by	



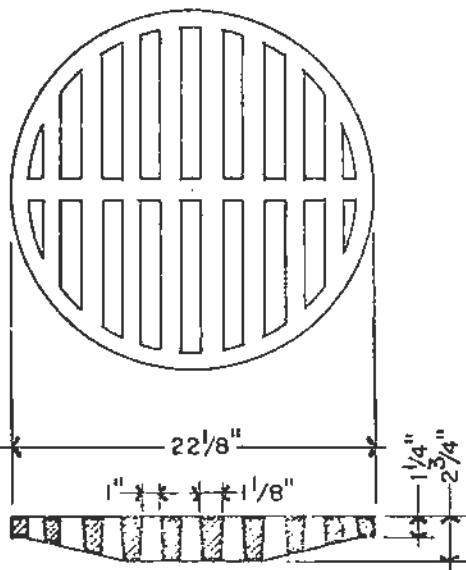
STORM DRAIN LID.
same dimensions as
Sanitary sewers lid.



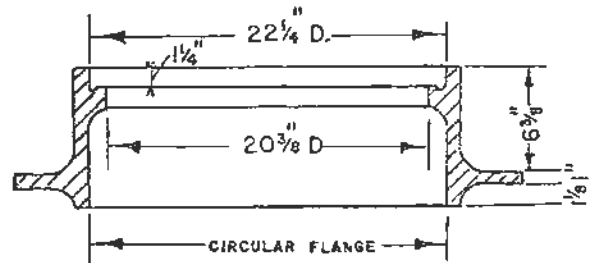
$\frac{3}{4}$ " x 1" lifting pins
with 1" clearance for
lifting hook



Section of lid through A—A



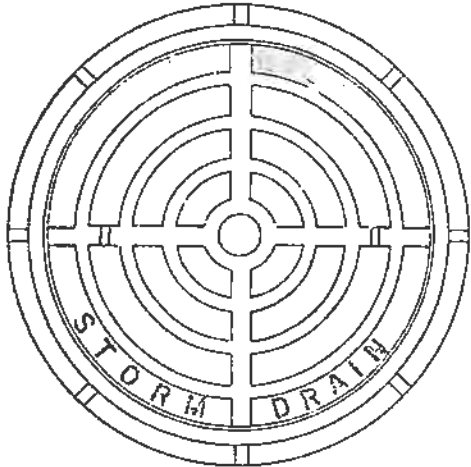
GRADED STORM DRAIN LID



Section of frame through A—A

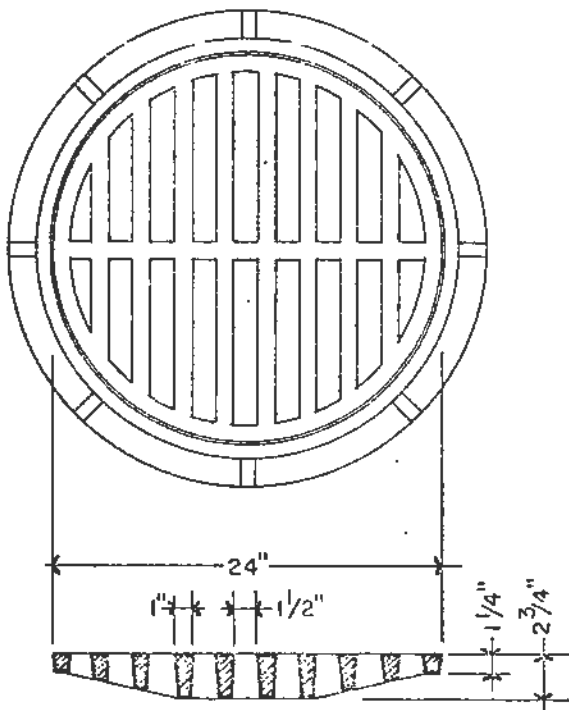
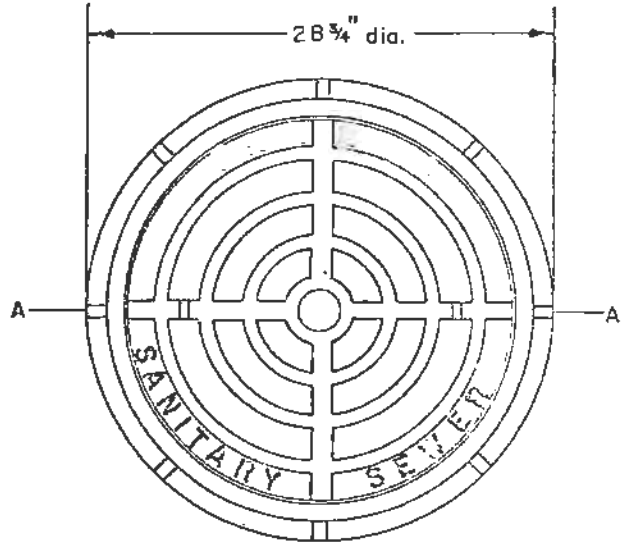
REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			8" MANHOLE COVER & FRAME	
			Approved <i>[Signature]</i> P. Eng	Std Dwg No
			SCALE 1" = 1'-0"	11
			Drawn by	

4" MANHOLE COVER & FRAME.

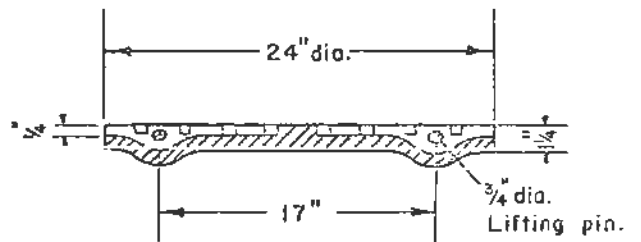


STORM DRAIN MANHOLE

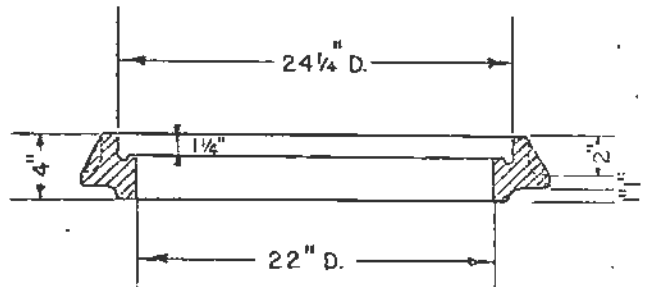
same dimensions as for Sanitary sewers.



GRATED STORM DRAIN LID



Section of lid through A—A.



Section of frame through A—A.

REVISIONS

Date Details Approved

VILLAGE OF GOLD RIVER

4" MANHOLE COVER & FRAME

Approved

[Signature]

P. Eng.

Std. Draw No.

SCALE 1" = 1'-0"

11A

Drawn by

CAST-IN-PLACE CONCRETE

Strength, 3000 psi

Aggregate max. 1"

Slump max 3"

Vitreous piping all joints grouted with oakum and mortar.

Manholes must be watertight

1-3 courses of common cement bricks, face bricks inside and outside with 3-1 mortar, see note 5.

In paved areas backfill with gravel and compact.

Seal joints with cement mortar.

8" Std. M.H. cover and frame on road allowance
4" " " " " off " "

Seat frame on cement mortar.

25"

42" dia.

12"

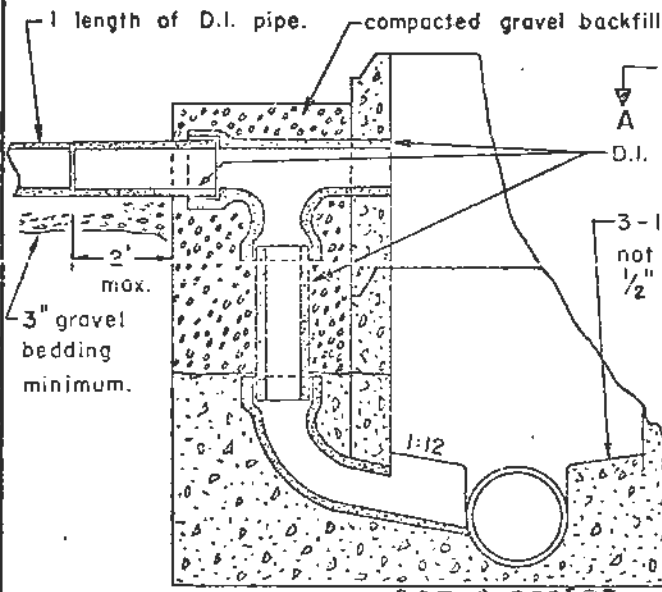
JOINTS NOT TO EXCEED 1/2" GAP.

Cement mortar over flexible sealing compound

6" min.

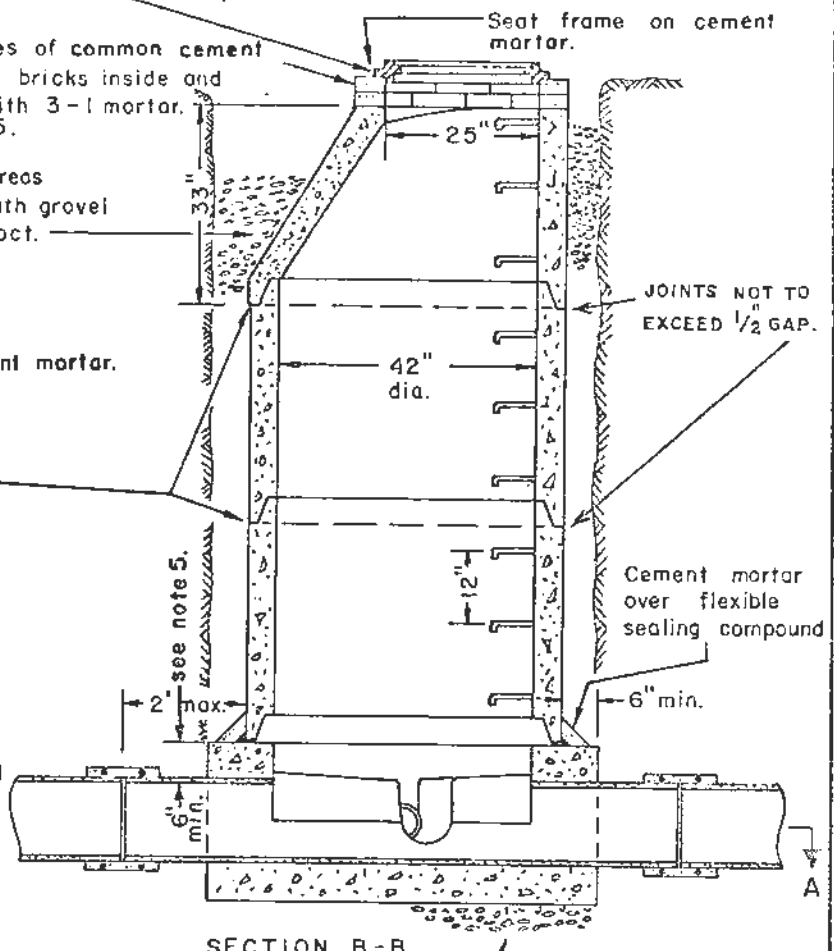
2" max.

see note 5.

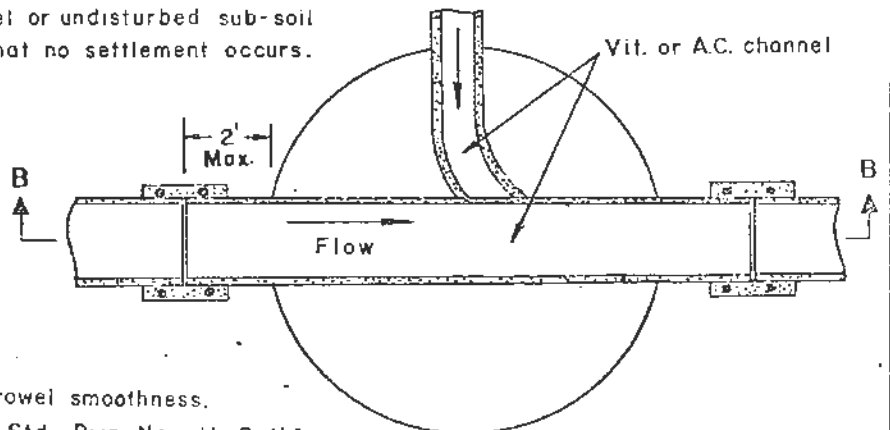


SECTION OF EXTERNAL DROP MANHOLE

Min. 6" concrete base below pipe, base constructed on compacted gravel or undisturbed sub-soil so that no settlement occurs.



SECTION B-B



SECTION A-A

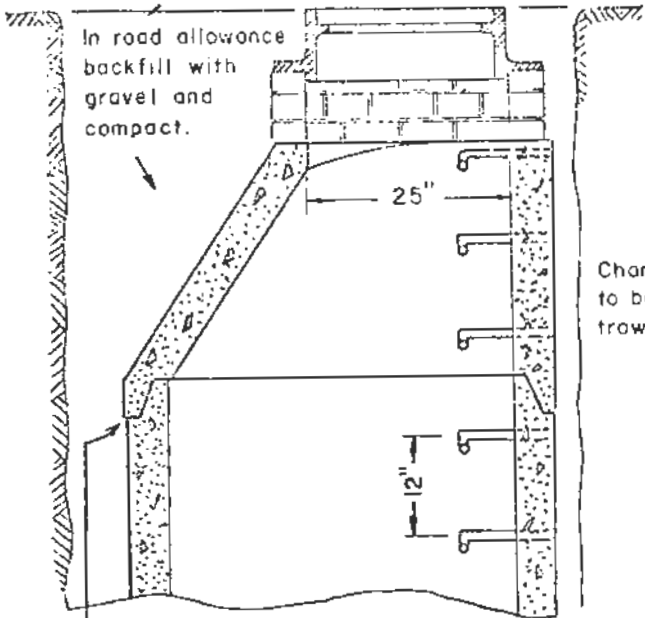
NOTES

- 1 Channelling and benching to be finished to trowel smoothness.
- 2 For details of manhole cover and frame see Std. Dwg. Nos. 11 B 11A.
3. Precast cone or lid and pipe sections to current A.S.T.M. C478.
4. Adjust height at base and brick course.

VILLAGE OF GOLD RIVER

REVISIONS		
Date	Details	Approved
July '74	Drop M.H. revision, added notes.	

SANITARY SEWER MANHOLE		P. Eng	Std. Dwg. No. 12
Approved	SCALE 3/8" = 1'-0"		
Dwg. by			



SECTION SHOWING ECCENTRIC CONE

Joints not to exceed 1/2" gap.

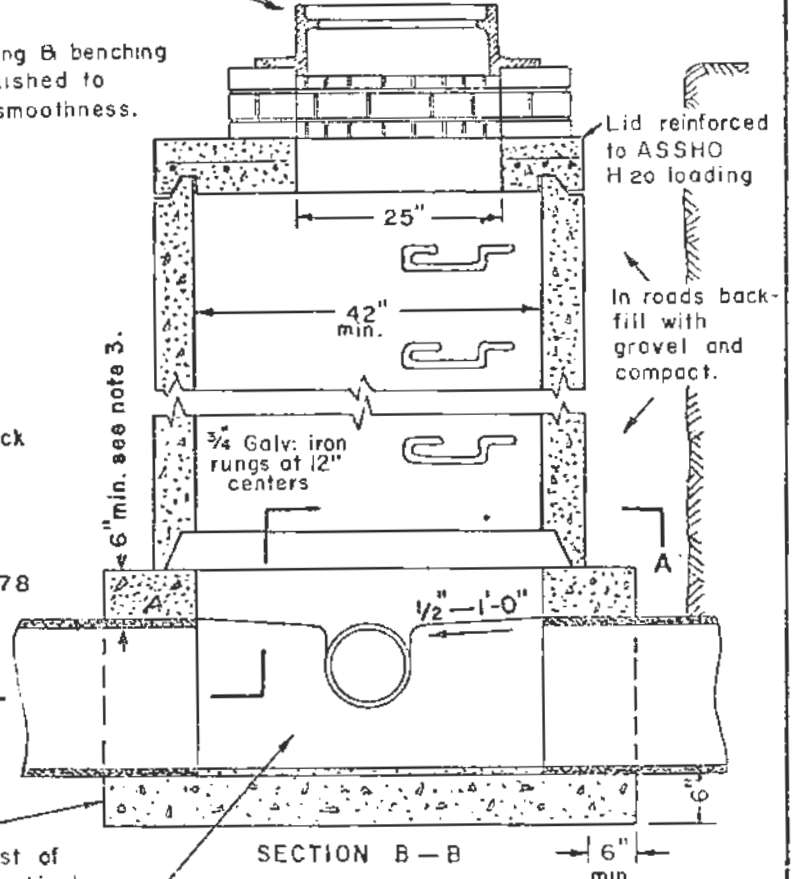
8" Std. Manhole frame and cover on road allowance
4" " " " " " off " "

Channelling & benching to be finished to trowel smoothness.

1-3 courses of brick parged both sides. see note 3.

Precast cone or lid and pipe sections to current A.S.T.M. C.478

Minimum 6" concrete base below pipe, base constructed on compacted gravel or undisturbed sub-soil so that no settlement occurs



SECTION B-B

Channelling to top of pipe to consist of either bottom half of pipe plus vertical walls of concrete, or all of concrete with similar cross section.

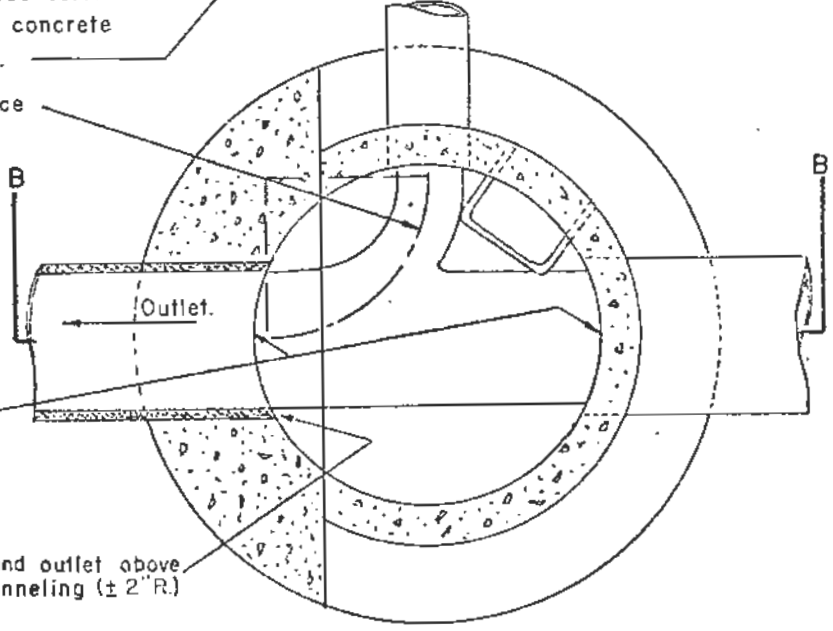
Radius to be not less than twice branch pipe diameter

NOTE

Adjust height at base and brick course.

Trim pipe ends flush with inner wall of manhole.

Round outlet above channelling (± 2" R.)



SECTION A-A

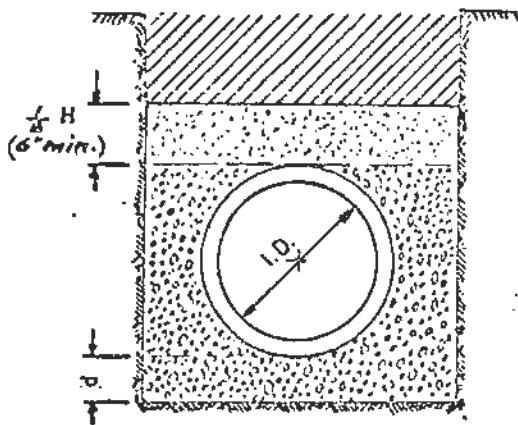
CAST - IN - PLACE CONCRETE

- Strength. 3000 p.s.i.
- Aggregate. 1" max.
- Slump. 3" max.

NOTE.

This standard manhole can be used for pipe up to 16" dia.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			<p style="font-size: 1.2em; margin: 0;">DRAIN MANHOLE</p>	
			Approved	P. Eng. Std Dwg No.
			SCALE 1/2" = 1'-0"	13
			Drawn by	

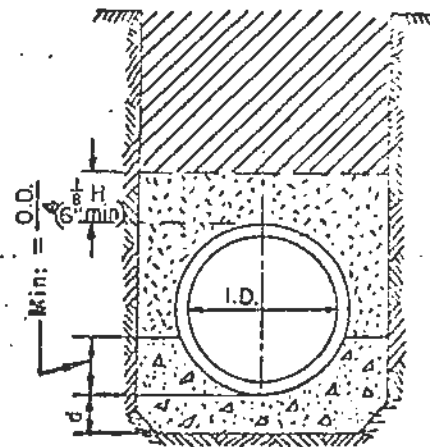


CLASS B
FIRST CLASS BEDDING

Load factor. 1.9

DEPTH OF BEDDING MATERIAL BELOW PIPE

I.D.	d (min.)
≤ 27"	3"
30" - 60"	4"
> 60"	6"



CLASS A
CONCRETE CRADLE

Load factor 2.8

LEGEND.



CONCRETE. 28 day strength to be 3000 p.s.i. or more.



SAND.

In not over 6" layers and compacted by slicing with a shovel.



HAND PLACED BACKFILL.

Finely divided material free from debris, stones, and large lumps.



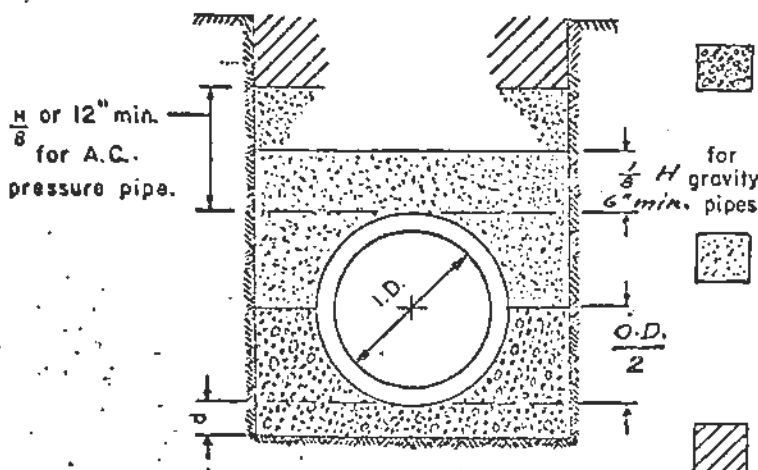
MACHINE PLACED BACKFILL.

Free from debris, large lumps or stones over 3" size.

O.D. - Outside diameter.

I.D. - Inside diameter.

H. - Depth of top of pipe below ground.



CLASS C
ORDINARY BEDDING

Load factor. 1.5

NOTES:-

- Under the travelled portion of the road the trench will be backfilled with pit-run gravel or equal up to ground level.
- For rock or other incompressible materials the trench should be over-excavated a min. of 6" and refilled with granular material.

REVISIONS

Date	Details	Approved

VILLAGE O. O.

CLASSES OF PIPE BEDDING

Approved	<i>[Signature]</i>	P. Eng	Std. Des. No.
SCALE	NOT TO SCALE		14
Drawn by			

THE CORPORATION OF THE VILLAGE OF GOLD RIVER

SPECIFICATION 'D'

1. DESIGN OF WATER MAINS

1.0 Materials

- 1.01 All pipe and fittings shall conform to the current C.S.A., A.W.W.A., or A.S.T.M. specifications for a working pressure of 150 psi.
- 1.02 All pipe shall be approved by the Superintendent of Works.
- 1.03 Cast iron and ductile iron pipe shall have a gasketed push-on joint and a cement mortar lining conforming to current A.W.W.A. specifications.
- 1.04 Gate valves shall be standard, 125 lb. iron body, bronze mounted solid wedge or double disc, parallel seat type with N.R.S. turning clockwise to open with 1- $\frac{1}{4}$ " square operating nut.
- 1.05 A valve box in accordance with Municipal Standard Drawing No. 27 shall be provided with each gate valve and as required for other appurtenances.
- 1.06 Fire hydrants shall be 6", "Terminal City #1" or equivalent.
- 1.07 Double strap service clamps and bushings to match the pipe and connection sizes shall be provided for each proposed water service connection wherever asbestos cement pipe is used.

2.0 Pipe Location

- 2.01 A watermain shall be located such that each lot to be served has at least one side fronting thereon. The watermain shall be extended to the most convenient existing watermain that will provide an adequate supply of water.

Watermains - Design

- 2.02 The pipe shall extend at least 3' beyond the curb line at the extreme end of a designed cul-de-sac, or to the property line at the end of a road which can be further extended.
- 2.03 In locating the watermain, the designed shall make provision for the installation of other services such as drains, sewers, curbs, sidewalks, gas, power and telephone facilities.
- 2.04 The pipe line shall be located within a road allowance unless otherwise approved by the Superintendent of Works.
- 2.05 When located in the boulevard, the main shall be offset a minimum of 3' from the property line.
- 2.06 When the pipe is located in the road, it shall not be within 4' of the curb.
- 2.07 The pipe shall not be located within 3' of any utility pole.
- 2.08 At all intersections the pipe shall connect to existing mains.
- 2.09 Where the final road pattern creates a weak watermain network, a supplementary connection of a minimum of 6" diameter to an existing main shall be required at the discretion of the Superintendent of Works and may necessitate the provision of a 10' right-of-way in favour of the Municipality.
- 2.10 Where it is necessary for the watermain to cross other underground services the crossing shall be made at an angle greater than 20 and the vertical clearance between services at the crossing point shall be not less than 3".

- 2.11 The drawings shall indicate whether the watermain passes over or under other underground services which it is crossing.
- 2.12 On a curve the minimum permissible pipe line radius with either a 13' length of asbestos cement pipe or an 18' length of cast iron or ductile pipe shall be 200'. A shorter radius shall be allowed with shorter pipe lengths provided the radius is not less than the manufacturer's recommended minimum. The design drawing shall indicate where the short pipe lengths are required on curves.

Watermains - Design

3.0 Pipe Size

3.01 The size of the pipe to be used shall be 6 " diameter unless otherwise required by the Superintendent of Works, except that in a cul-de-sac with ultimate length not over 200' shall be a minimum 2" diameter.

4.0 Fire Hydrants

4.01 Hydrants shall be located so that every home is within 400' but with due regard to the location of existing hydrants. Whenever practical, hydrants shall be near the highest and/or lowest point of the watermain.

4.02 Hydrants shall be located in the boulevard and should preferably be located at or near a street intersection; otherwise they may be located on the projection of the property line dividing two lots. In selecting the location for a hydrant, the probable route of the fire engine shall be considered.

4.03 A hydrant shall not be located within 10' of a utility pole or light standard, within 3' horizontally of underground service pipes or open ditches, or within 7' of the curb line.

4.04 The permissible offset of the hydrant from the main shall be as stated on Municipal Standard Drawing no. 26.

4.05 Additional hydrants may be required by the Superintendent of Works at school, apartment, commercial or other high value properties.

4.06 There shall be a gate valve on each fire hydrant as per Drawing No. 26.

5.0 Gate Valves

5.01 Line valves shall be not more than 1,200' apart. For convenience of operations, line valves should be located adjacent to a hydrant if there are no connecting mains within 400'.

5.02 Line valves or hydrant valves shall not be located within 2' of a curb line, in a ditch, or above another service.

5.03 There shall be a line valve of the same diameter as the pipe on each downstream branch of all 'tee' and 'cross' fittings.

5.04 When the new pipe line is connected to more than one existing main the larger existing main shall be considered upstream; in the case of identical size mains, flow direction is optional.

5.05 There shall be a gate valve on the new pipe line at each point of connection to existing mains.

6.0 Fittings

- 6.01 All fittings and appurtenances shall have standard hub ends.
- 6.02 Where practical, all fittings shall be located in respect to each other so that the standard pipe lengths can be used to connect them.
- 6.03 The centre to centre dimension between fittings near each other shall be shown.

7.0 Miscellaneous

- 7.01 Individual domestic water services to properties need not be shown on design plans.
- 7.02 The Municipal Watermain Installation Specifications require that connection of a new pipe line to an existing watermain shall be done by Municipal forces, unless the existing watermain has an acceptable provision for such an extension. This portion of the work shall be so indicated on the plan.

THE VILLAGE OF GOLD RIVER

SPECIFICATION "D"

2. INSTALLATION OF WATERMAINS

1.0 Scope

1.01 This specification shall govern the installation of all water pipe and waterworks appurtenances within the Municipality.

2.0 Location

2.01 The main and appurtenances shall be located to within 3" horizontally of the position shown on the plan approved by the Municipal Superintendent of Works and in accordance with Municipal Design Standards.

3.0 Installation

3.01 The installation, including excavation, jointing, and backfill of all water pipe shall be in accordance with current A.W.W.A. standards and shall also conform to the specifications below.

3.02 Every reasonable precaution against contamination of pipe and fittings must be taken during execution of the Works.

3.03 When the watermain is under construction in a trench, water and debris shall be prevented from entering openings in the pipe line by keeping the excavation sufficiently dewatered and also by capping or plugging such openings with water-tight fittings.

3.04 The ditch excavation shall be deep enough to allow a minimum of 3' of cover material to be placed over the watermain. When the watermain is within the road allowance, it shall in all cases be at least 3' below the final road grade as well. The Municipal Superintendent of Works may require the watermain to be laid deeper in certain areas.

3.05 When excavating in rock, there shall be minimum clearance between the rock and the pipe of 6" both under and one each side of the pipe.

3.06 No blasting may proceed without a valid Municipal Blasting Permit. See also Specification A, Section 9.01.

3.07 There shall be a minimum vertical clearance of 3" where the watermain crosses other underground pipe conduit or conductors.

3.08 All fittings shall be blocked with concrete as per Standard Drawing No. 29.

3.09 Gate valves shall be set on precast concrete. Gate valves shall be adequately blocked or tied to prevent movement under normal working pressure. Concrete used for precast or in place blocks shall have a minimum 3,000 psi compressive strength.

Watermains-Installation

3.10 Bedding for all water pipe shall conform to Class B Bedding as detailed in Standard Drawing No. 14, except for ductile iron which may be bedded to conform to Class C Bedding.

3.11 Where the trench is on the shoulder or under the travelled portion of the street, including driveway, the surface material shall be cut in neat straight lines at the edges of the trench by means of an asphalt cutting wheel or pneumatic pavement breaker or by other tools approved by the Superintendent of Works. Where the edges of an area requiring repaving extend outside the straight lines cut, further cuts shall be made so that the final patch will have a neat appearance. The excavation will be backfilled with gravel and mechanically compacted in lifts not exceeding 12" in depth. All material excavated from the trench will be removed from the job site. All gravel-filled cuts must be maintained to within 1-½" of the original travelled surface until final paving is installed. These cuts shall be permanently restored by the Applicant within three days with the placement of a minimum of 2" thick layer of approved hot-mix asphaltic paving material. If weather conditions do not permit hot-mix asphalt at the time of installation, temporary cold-mix asphalt must be placed within the 3 day period, and be replaced with hot-mix when weather permits. All cuts paved as specified shall be maintained by the Applicant to the level of the original travelled surface for a period of one year after completion of the project. Should excessive settlements occur during the year's maintenance period,

the Superintendent of Works may require the Applicant to excavate and restore the trench as per above.

3.12 The pipe shall not be covered until it has been inspected and approved by the Municipal Superintendent of Works as per Specification B2, Section 3.02.

3.13 At all dead ends, provision shall be made for flushing the completed main prior to filling and testing. Provision shall also be made for expelling air during filling by the installation of main cocks where necessary.

4.0 Testing and Leakage

4.01 The installation shall be tested by Municipal forces and shall meet the requirements for pressure and leakage in accordance with current A.W.W.A. Standards.

5.0 General

5.01 Control of all existing valves shall rest with the Village. Valves and hydrants shall not be opened or closed by unauthorized persons.

5.02 The work must carry on without unreasonable delay.

5.03 Drawings showing the location of the work, as constructed, must be submitted to the Municipal Superintendent of Works as detailed in Specification B 2 for As-Built Drawings.

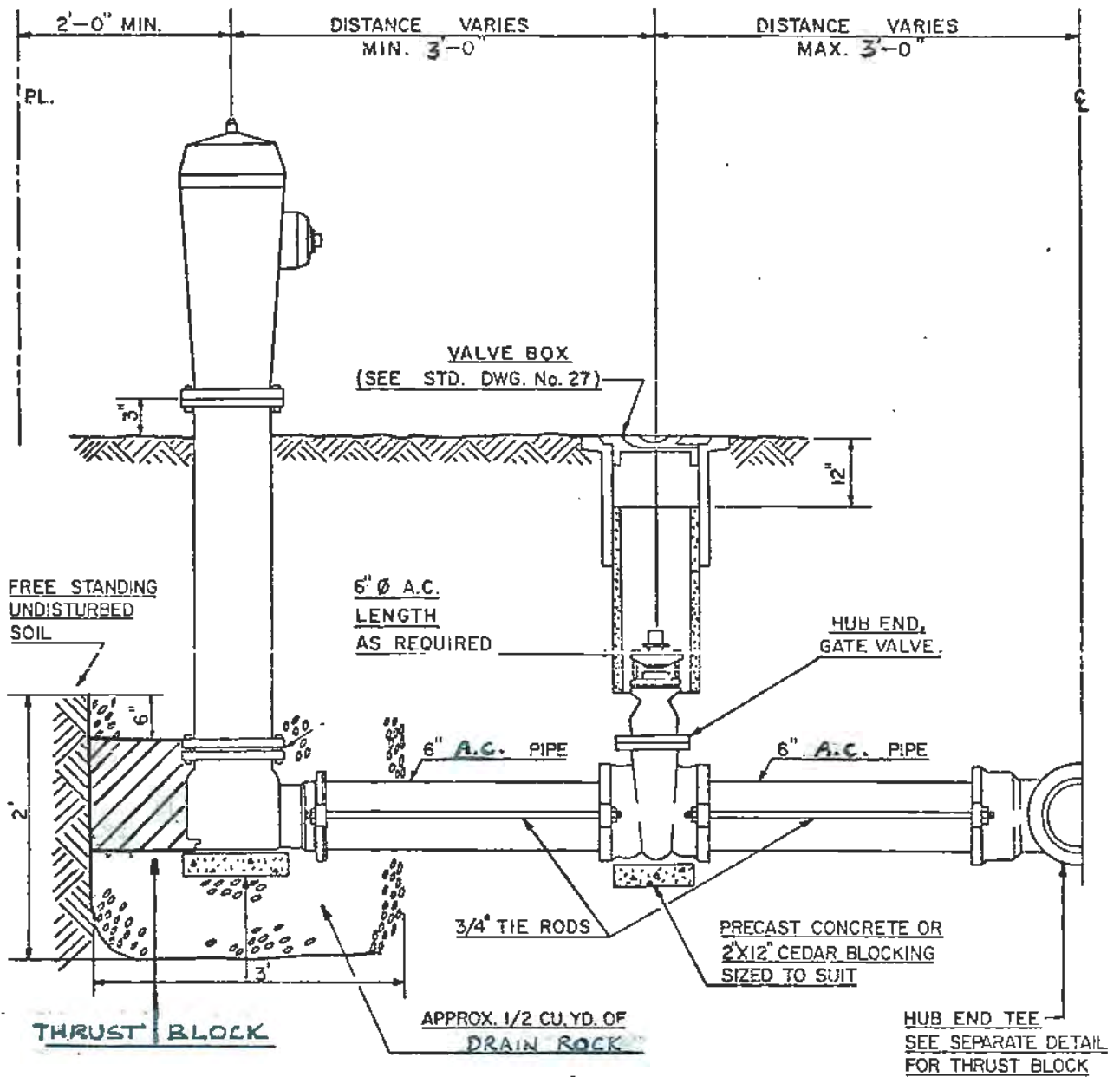
6.0 Disinfection

6.01 The process of chlorinating a newly installed pipe line shall be performed only by Municipal Waterworks personnel and shall be repeated, if necessary, until Provincial Health Department approval is received.

6.02 After installation, a new pipe line shall be chlorinated internally as an assembled unit; the chlorine solution shall remain in the pipe line for a period not less than 24 hours, when it shall be flushed out and refilled with water from a Municipal Main.

6.03 Water samples shall be taken from a watermain by the Public Health Inspector and tested for potability. The installation shall not be accepted unless such tests prove satisfactory.

6.04 A flat rate charge as set by the Council will be made for the initial disinfection and for each time it has to be repeated. Arrangements shall be made with the Superintendent of Works for performance of the work, for which 24 hours notice is required.



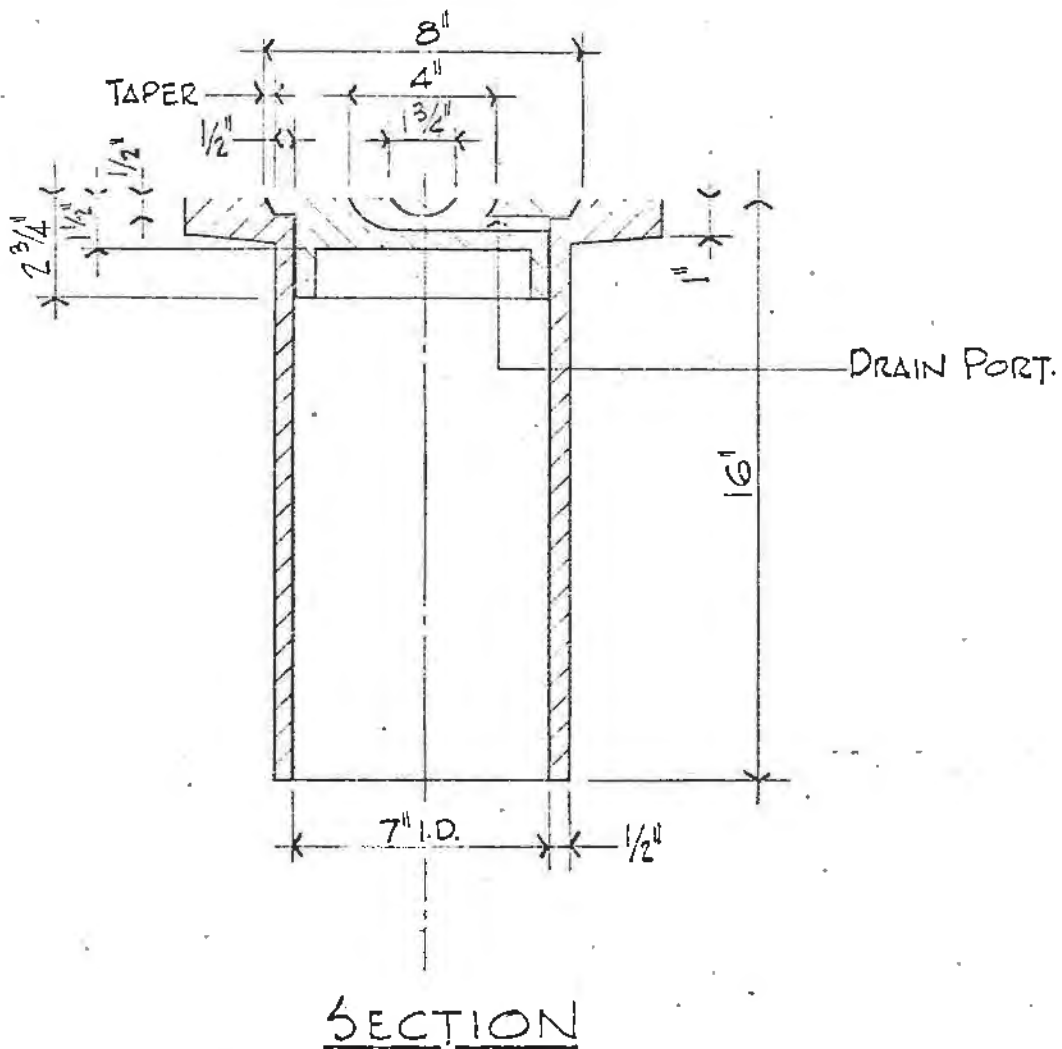
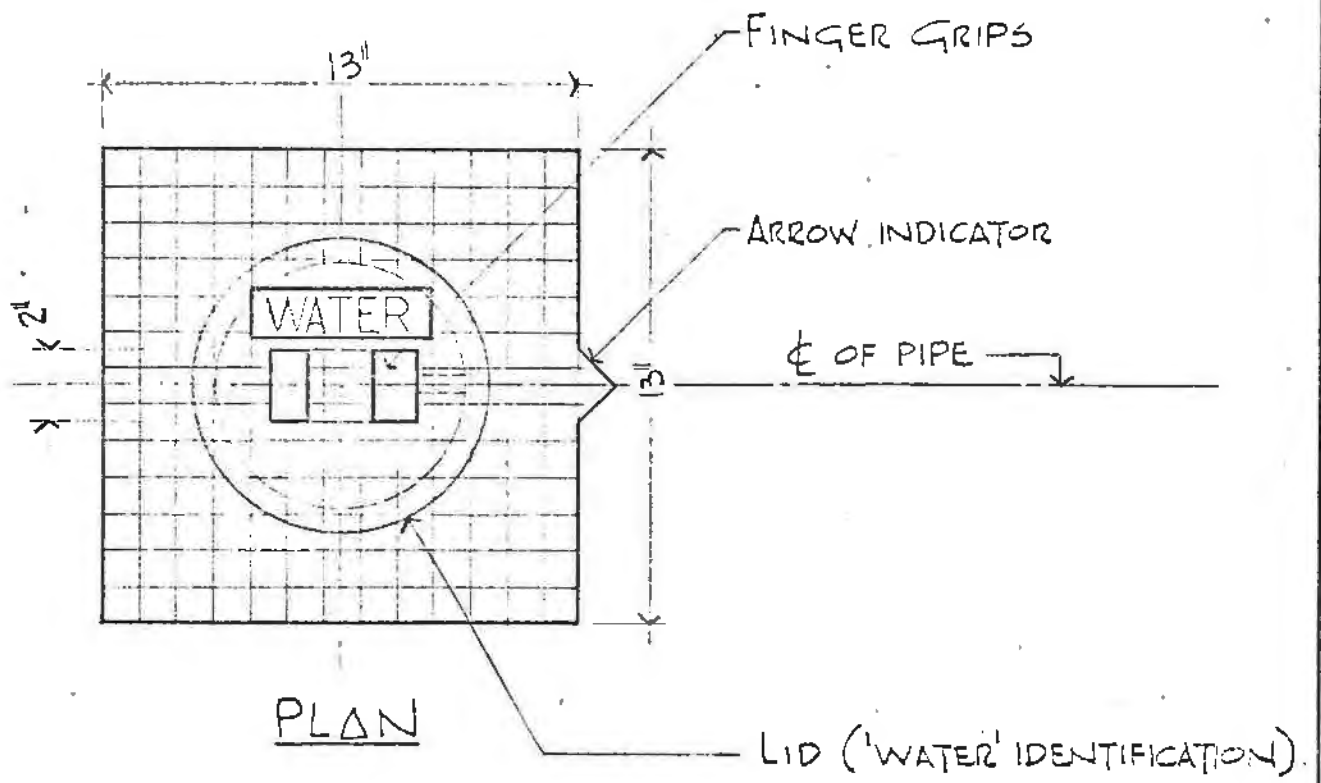
REVISIONS

Date	Details	Approved
NOV. 74	FIRE HYDRANT, BLOCKING, TIE RODS	<i>[Signature]</i>

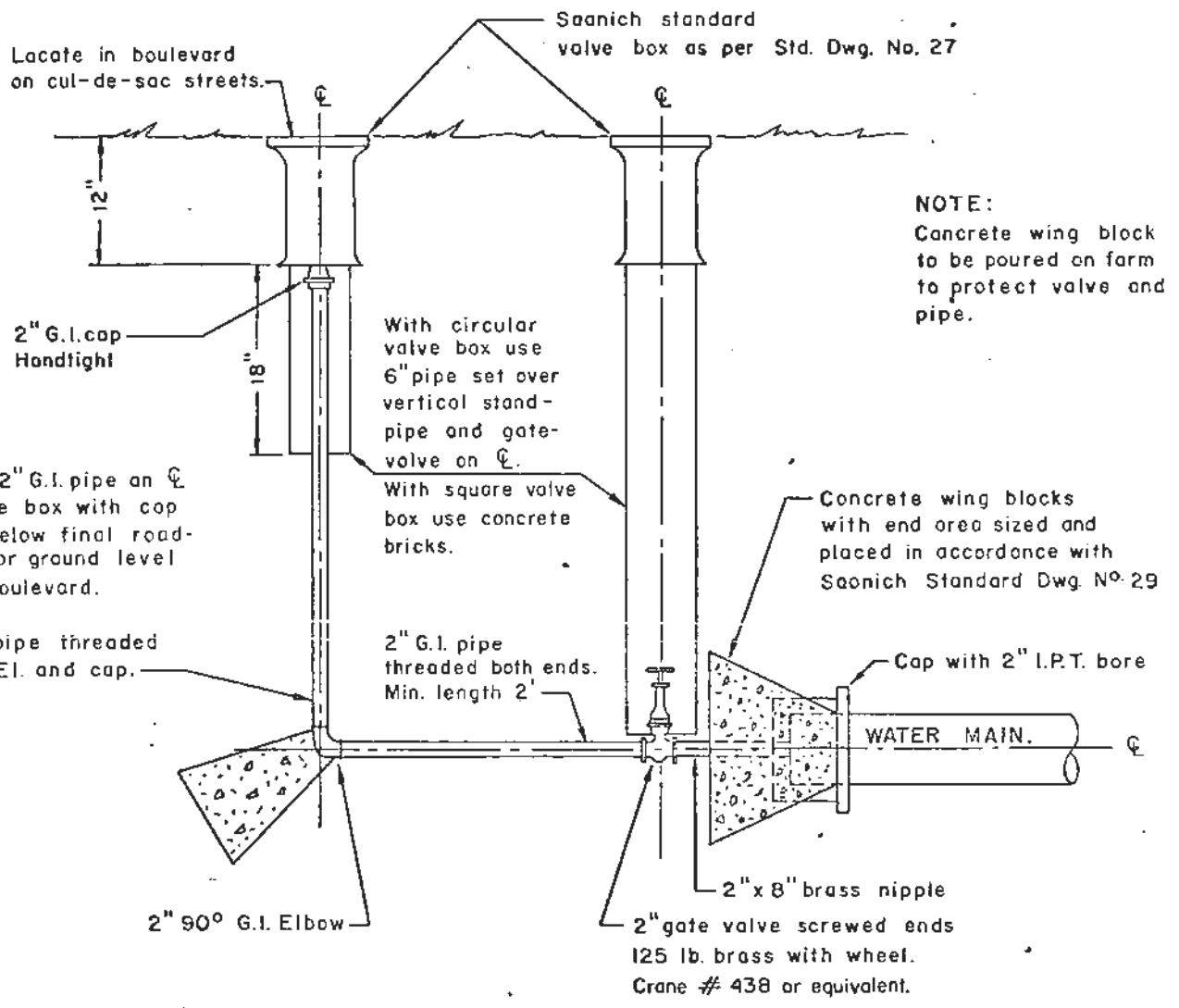
VILLAGE OF GOLD RIVER

DETAILS OF
FIRE HYDRANT ASSEMBLY

Approved <i>[Signature]</i>	P. Eng.	Std. Dwg. No.
Scale	NOT TO SCALE	26
Drawn by		



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			CAST IRON WATER VALVE BOX	
			Approved <i>[Signature]</i> P. Eng	Std. Draw No.
			SCALE 3/8" = 1'-0"	27
			Drawn by	



REVISIONS

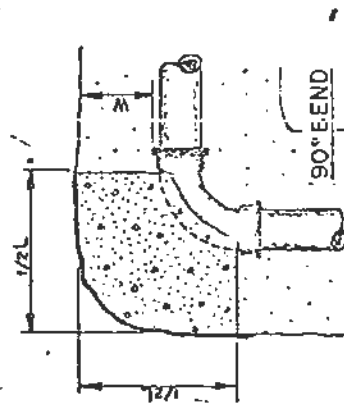
VILLAGE OF GOLD RIVER

Date	Details	Approved

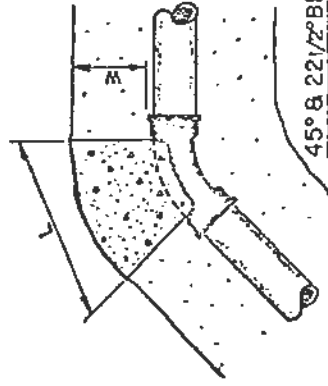
TYPICAL FLUSH VALVE

Approved	<i>C. J. [Signature]</i>	P. Eng.	Std. Dwg. No.
SCALE	NOT TO SCALE		28
Drawn by			

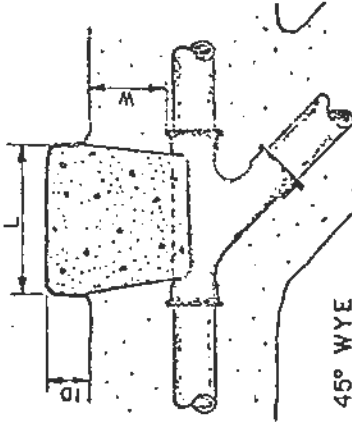
MINIMUM THRUST AREAS			
BASED ON A WATER PRESSURE OF 100 LBS. P.S.I. & A STRENGTH OF 4000 LBS./SQ. FT. (NOT TO BE USED FOR SOFT CLAY, MUCK OR PEAT, ETC.)			
TYPE OF FITTING	DIA. OF FITTING, D	DIA. OF BEARING FACE, W	DISTANCE TO LENGTH
			L
90° BEND	4"	3.00	5.00 x DIA. (D)
	6"	2.00	6.50
	8"	1.75	6.00
45° BEND	4"	3.00	1.50
	6"	2.00	3.50
	8"	1.50	3.50
1/2° BEND	4"	3.00	4.00
	6"	2.00	3.00
	8"	1.75	3.00
TEE	4"	3.00	7.50
	6"	2.00	5.00
	8"	1.75	4.50
45° WYE	4"	3.00	5.00
	6"	2.00	3.50
	8"	1.50	3.50
REDUCER	4"	3.00	5.00
	6"	2.00	3.50
	8"	1.50	2.50
PLUGGED CROSS	4"	3.00	7.50
	6"	2.00	5.00
	8"	1.50	4.50
CAPS & BOLTS WHICH ARE NOT BOLTED	4"	3.00	7.50
	6"	2.00	5.00
	8"	1.75	4.50



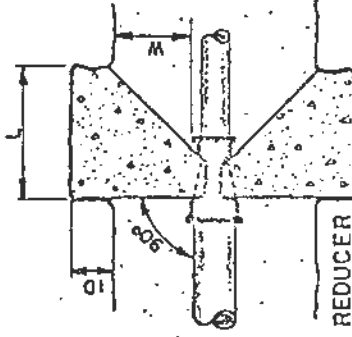
90° BEND



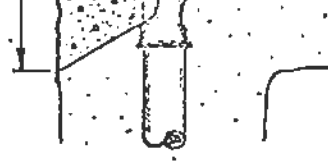
45° B 22 1/2° BEND



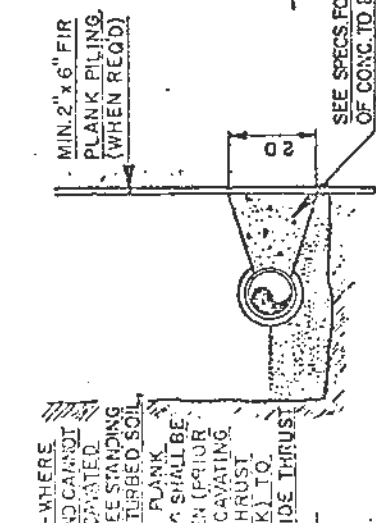
45° WYE



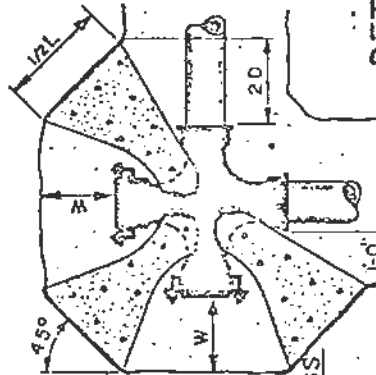
REDUCER



PLUGGED TEE



MIN. 2" x 6" FIR PLANK PILING (WHEN REQ'D)



PLUGGED CROSS



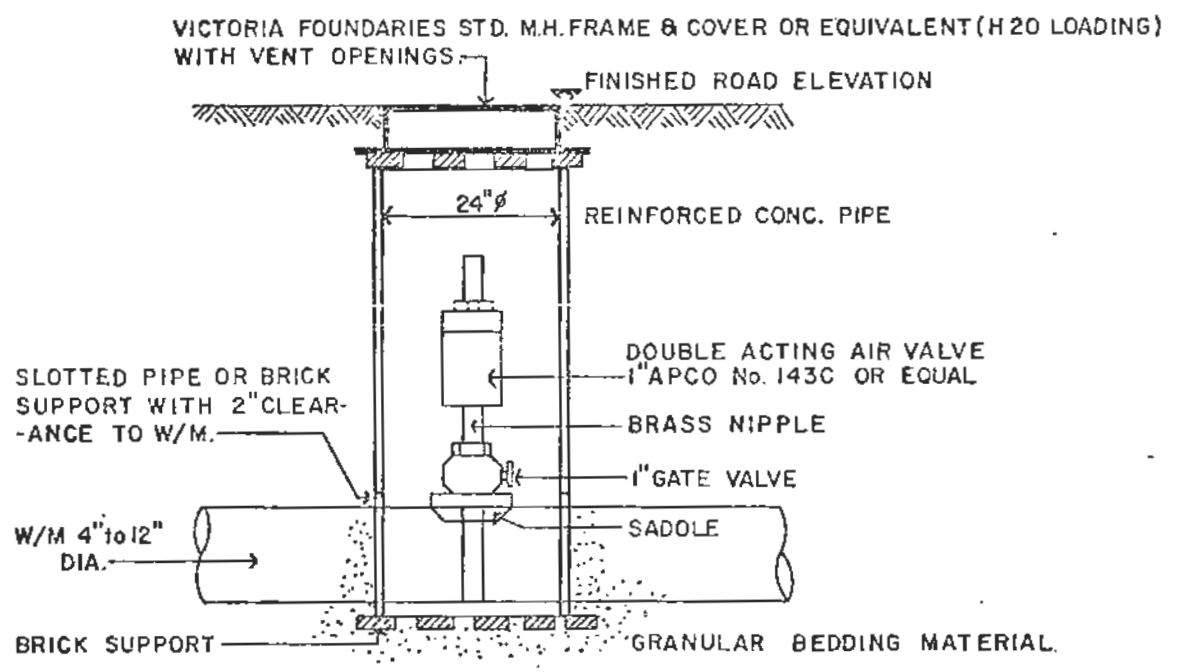
12" x 1/2" x 4" Ply Concrete Block

CAPPED TEE

SEE SPECS. FOR STRENGTH OF CONC. TO BE USED.

DETAILS OF THE

WHERE INDICATED, SHALL BE PLANK PILING (PRIOR TO CASTING) TO BE USED FOR THRUST AREAS.



NOTE - CONSULT WITH ENGINEERING DEPT. WHEN W/M DIA. GREATER THAN 12"

REVISIONS			S# VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			AIR VALVE	
			Approved <i>[Signature]</i>	P. Eng.
			Scale NOT TO SCALE	Std. Dwg. No. 30
			Drawn by	

THE VILLAGE OF GOLD RIVER

SPECIFICATION 'E'

1. DESIGN OF ROADS

1.0 Classification and Width

1.01 Prior to design, the Village of Gold River shall classify and stipulate widths for the particular road under consideration.

1.02	WIDTH	DESIGN SPEED	ROAD ALLOWANCE WIDTH	LANES	
				TRAVEL	PARKING
Residential	28*	30**	55	1	2
Collector	36 or 40	30	66	2	2
Arterial	46	40	80	2 or 4	2 or none

* The width of the pavement from curb face to curb face may be other than 28' as stipulated and provided for in the Subdivision By-law in effect.

** In very rocky areas the design speed may be reduced with the approval of the Superintendent of Works.

*** Subject to the approval of the Approving Officer and where all services are placed underground, road allowances for cul-de-sacs or non-extendable roads not greater than 500 feet in length could be reduced to 50 feet in width.

2.0 Vertical Alignment

2.01 The vertical alignment of the road shall be set to serve adjacent properties with access driveways at a grade not steeper than 15% and conforming to the requirements as shown in our Standard Drawing No. 32.

2.02 The length of a vertical curve shall be calculated using Standard Drawing No. 36.

2.03 Vertical control.

	<u>Desirable</u>	<u>Absolute*</u>
Maximum grade - Residential	10%	15%
- Collector & Arterial	8%	12%
Minimum grade	0.5%	0.3%
Maximum grade on turn-around at a cul-de-sac	5%	8%
Maximum grade at intersection approach **	3%	5%
Crossfall **	3%	5%

* Subject to Superintendent of Works approval.

** At intersections, the crossfall and the grade through the intersection may exceed 5% to blend into the steeper road grade.

2.04 Crossfall - the practice of crossfalling a road shall be considered as a last resort in an endeavour to service adjacent properties or adjacent streets.

2.05 Superelevation - horizontal curves on residential roads are not to be superelevated without the consent of the Superintendent of Works. Collector and arterial roads shall be superelevated if required by the criteria for centerline radius and design speed.

2.06 Transition - the length of a transition from a normal cross-sectioned road to a section of road where there is superelevation or crossfall shall in no case be less than 100 feet for a 30 mph designed road or 125 feet for a 40 mph designed road. In selecting the length of the transition, care and consideration shall be given to drain all of the pavement.

3.0 Horizontal Alignment

3.01 The horizontal alignment of the road shall be within 5 feet of the centerline of the road allowance, taking into consideration the location of all present and foreseeable future services to be installed within the road allowance. Typical locations of services for residential streets are shown on Standard Drawing No. 5.

3.02 Centerline chainage stations shall be referenced and dimensioned from an identifiable iron pin. The degree of curvature shall be relative to the classification of the road and its designed speed.

3.03 Minimum radius of curve and maximum superelevation.

	<u>Design Speed</u>	<u>Minimum Centerline Radius</u>	<u>Maximum Superelevation</u>
Residential	30 mph	90'	0
Collector	30 mph	350'	0.06' per ft.
Arterial	40 mph	500'	0.06' per ft.

3.04 A horizontal curve shall be fully described showing: internal angle, radius, tangent length, and arc.

3.05 Curb returns of 25' radius are required for residential roads. Curb returns located on roads within industrial and commercial districts require a larger radius of facilitate trucks and trailer trucks.

3.06 When a new road with curbs intersects an existing road without curbs the curb returns shall not be constructed. However, curb returns shall be constructed at the intersection of two curbed roads.

4.0 Cross Section

4.01 The cross section of all roads shall be designed in accordance with the dimensions and requirements set out in Standard Drawing No. 33 and must be detailed on every design drawing.

4.02 The subgrade table in fill sections shall extend a minimum of 8 feet beyond the curb face and shall rest on a side slope not steeper than 3 to 1. Fills on steeper side slopes shall rest on horizontal benches cut into the slope. Fill side slopes shall be constructed to a minimum of 2 to 1 slope.

4.03 The subgrade table in cut sections shall extend a minimum of 8 feet beyond the curb face. The cut banks shall be sloped to a minimum of 1-1/2 to 1 in earth, 1/4 to 1 in rock, or retained by some method approved by the Superintendent of Works.

4.04 Where either the top of a fill slope or the top of a cut slope would extend beyond the limits of the road right-of-way, either legal access to construct the works on the adjoining property shall be maintained until the work is completed, or retaining walls constructed to contain such slopes within the limits of the right-of-way.

4.05 Where cut slopes are to be made into ground seepage zones or where the extent of the slope would generate noticeable surface runoff, curtain drains shall be required at the base of the slopes and connected to the road drainage system or other suitable point of discharge.

5.0 Geometric Layout of Turn-arounds

5.01 The alignment of the turn-around in areas with single family dwellings shall conform to Standard Drawing No. 37 'Details of Typical Turn-around'. The dimensions may be increased to meet traffic and vehicular requirements in areas with other zoning, or where the turn-around is skewed. Under special circumstances the Superintendent of Works may permit a "hammer-head" turn-around as per Standard Drawing No. 37.

6.0 Curbs and Sidewalks

6.01 Curbs shall conform to Standard Drawing No. 1.

6.02 Mountable curbs shall be specified for residential streets and non-mountable curbs elsewhere, except as required by the Superintendent of Works.

6.03 Sidewalks, where required, shall be located adjacent to the curb and shall be 4-1/2 feet wide. If poles are located in the sidewalk, the width shall be increased to 5 ft. Sidewalks are normally crossfalled towards the road at 1/4 inch to the foot and shall fall towards the property only where indicated on the design drawing or ordered by the Superintendent of Works. When installed in conjunction with curb and gutter, sidewalks shall be monolithically constructed in accordance with Standard Drawing No. 19.

7.0 Catch Basins

7.01 Catch basins shall be constructed as shown on Standard Drawings No. 3 or 3A.

7.02 The catch basin drains shall be located for ease of maintenance.

7.03 Double catch basins should be installed at locations of high runoff, sag curves, or as required by the Superintendent of Works.

7.04 Catch basins shall be located on the higher branches at the end of the curb returns of intersections, at the lowest point of the sag vertical curves, and at a spacing not greater than the following:

Maximum Spacing of Catch Basins

<u>Road Width</u>	<u>Spacing</u>
28'	300'
36'	250'
46'	200'

On roads with crossfall the maximum spacing shall be one half of the above figures.

Adequate allowance shall be made to handle runoff from turn-arounds.

8.0 Appurtenances

8.01 The designer shall detail on the design drawing the location of all proposed traffic islands, retaining walls, guardrails and, in a location where an acceptable turn-around is not to be constructed, barricades. These structures shall be designed in keeping with good engineering practices.

- 8.02 Side Slopes - Constructed side slopes must be designated at not more than the angle of repose of the material in question and must not be steeper than 1-1/2 to 1. Alternatively, retainer walls may be required. The drawing must show the structural detail and surface finish of the walls.
- 8.03 Ditches - Roadside ditches on roads other than those with curbs and gutter may not be excavated to a depth greater than 18 inches below the travelled surface centerline grade and the sides sloped not steeper than the angle of repose. Deeper ditches shall be culverted unless permission to the contrary is received from the Superintendent of Works.
- 8.04 Utility Poles and Underground Wiring - The drawing must show all utility poles, The designer shall indicate those poles which require relocating prior to road construction. Further, he shall confirm with the utility the feasibility of their relocation prior to design completion. Alternatively, the drawing shall show the location of underground wiring, including the connections to properties.
- 8.05 Shoulders - All roads other than those with curbs shall be constructed with shoulders of a minimum of 3 foot width.

9.0 Structural Design of Road

9.01 The compacted gravel base and asphalt pavement thicknesses for various road classifications are listed in Section 9.02 of this specification. Where special conditions are encountered, however, the base thickness and asphalt pavement shall be designed in accordance with Manual Series No. 1 of the Asphalt Institute. Planned stage construction may be considered in the structural design when a minimum road is initially being built and will later be widened.

9.02	<u>Classification</u>	<u>Minimum Depth of Compacted Gravel Base*</u>	<u>Minimum Compacted Depth of Asphalt</u>
	Residential	9"	2"
	Collector	13"	3"
	Arterial	15"	3"

* The minimum depth of compacted gravel base includes a two inch depth of 3/4" minus crushed gravel with at least one broken face and conforming with Specification E 2, Section 4.02(b).

THE VILLAGE OF GOLD RIVER

SPECIFICATION 'E'

2. CONSTRUCTION OF ROADS

1.0 Clearing

- 1.01 The full width of the roadway and shoulders will be cleared of timber and bush which will be burned or removed unless otherwise specified on the design drawings or by the Superintendent of Works. All topsoil and turf will be removed from at least 8' clear of the curbs. Sufficient topsoil must be retained on the site for 8" of topsoil on the boulevard.
- 1.02 The remaining portion of road allowance will be cleared of stumps, rubble, loose rock and rough graded to the satisfaction of the Superintendent of Works. Finished grading and seeding of grass where required shall be done upon completion of all construction.

2.0 Setting of Grades

- 2.01 Grade hubs will be set at not more than 25' intervals on the opposite sides of the road and at the same chainage points. Hubs will be located so that they are not disturbed by the construction equipment.
- 2.02 On horizontal curves the increased or decreased arc shall be calculated to compensate for the radius so that the hubs on both sides of the road will bear the same center line chainage.
- 2.03 Where the road is to be cross-falld, it may be necessary to calculate the difference in elevation due to the offset of the hub to enable the subbase to be graded. Care should be taken to ensure that this compensated elevation is not used when the concrete curbs are being formed.
- 2.04 Sturdy hubs of sufficient length to give firm footing shall be used with nails driven in the top for fine alignment, and suitably identified with chainage, cut or fill, and offset to curb face. Cuts or fills will be related to the elevation of the tops of curbs.
- 2.05 Cross heads may be erected at a suitable height at every station, clearly marked for the amount of cut or fill required to finish grade. Cuts or fills should be adjusted to even feet above required grade. Grades should be checked with a boning rod by sighting across these cross heads.
- 2.06 Alternate methods of layout may be used providing the curbs or pavement centerline are within .05' of the design elevation and 0.10' of the design horizontal alignment.

3.0 Subgrade Construction

- 3.01 The subgrade, in cuts, is the original soil lying below the gravel subbase and base. In fills, the subgrade is constructed over the native ground up to the bottom of the subbase.
- 3.02 The subgrade, in fills, will be constructed of clay or granular material placed in layers not exceeding 8" and compacted to 90% of the laboratory density obtained by following A.S.T.M. 698, Method C, or latest revision thereof. The subgrade table in a fill section shall extend 8' beyond the curbs unless otherwise shown on the drawing. Backfilling behind the curb shall be graded at a maximum of 1/4 inch to the foot from the top of curb for a minimum of 8'. The bank beyond this point shall be retained on a slope not exceeding 1-1/2 to 1 and the fill shall not encroach on private property beyond the boundary of the road allowance. Alternatively it shall be necessary to construct retaining walls.

- 3.03 In cuts, the top 6" of the subgrade will be compacted to 90% of the laboratory density obtained by following A.S.T.M. 698, Method C, or latest revision thereof, when required by the Superintendent of Works. The subgrade in a cut section shall extend a minimum of 8' beyond the curbs unless otherwise shown on the drawing. The banks beyond this point shall be retained on a slope not exceeding 1-1/2 to 1 by some method approved by the Superintendent of Works.
- 3.04 No topsoil, trees, stumps or any organic matter will be buried in the subgrade.
- 3.05 Rock shall be excavated to 17" below the finished grade of a residential road (i.e. 28' width) and 2' below the finished grade for all other roads. The rock shall also be excavated on the property side of the curbs, for an 8' width and to a depth of 1' below the top of the curb.
- 3.06 See Standard Drawing #33 for typical road cross-section.

4.0 Subbase and Base Construction

- 4.01 The subbase consists of granular material placed between the subgrade and base course. The subbase depth will be determined by the Superintendent of Works when required. Select granular material from road cuts or 6" minus pit run gravel acceptable to the Superintendent of Works may be used as subbase material.
- 4.02 The base course is the granular layer immediately under the wearing surface of the road and must meet the following specifications:
 - (a) Granular base material shall meet the gradation requirements listed below, when tested according to A.S.T.M. Test Procedure C136 or latest revision thereof.

<u>Passing Sieve Size</u>	<u>Percent by Weight</u>
3 inch	100%
#100	0-16%
#200	0-8%

- (b) A minimum of 2" compacted 3/4" minus crushed granular material must be placed on top of the 3" minus material to complete the base. The purpose of the 3/4" minus material is to provide a smooth working surface for paving. The 3/4" minus crushed granular material must meet the gradation requirements listed below when tested according to A.S.T.M. Test Procedure C136 or the latest revision thereof.

<u>Passing Sieve Size</u>	<u>Percent by Weight</u>
3/4 inch	100%
3/8 inch	60-100%
No. 4	40-80%
No. 8	30-60%
No. 16	20-45%
No. 50	8-20%
No. 200	2-9%

Not less than 50%, by weight, of the material retained on the number 4 sieve should have at least one fractured face.

- 4.03 Gravels for the subbase and base course shall be placed in lifts not exceeding 6" and compacted with a pneumatic tired roller or vibratory roller. The material shall be compacted to 100% of the density obtained in the laboratory following A.S.T.M. Test 698, Method D, or the latest revision thereof.
- 4.04 No base gravel shall be placed until all underground services have been installed, unless otherwise approved by the Superintendent of Works.

5.0 Curbs, Catch Basins and Sidewalks

5.01 Materials

- 501.1 Concrete - compressive strength - 3,000 psi @ 28 days
Maximum aggregate size - 1"
slump not to exceed 3"
air entrainment 4% - 6%

Concrete shall be in accordance with C.S.A. Standard A23.1 or the latest revision thereof.

- 5.01.2 Concrete tests shall be performed as designated by the Superintendent of Works, on test cylinders by a qualified laboratory and reports shall be delivered to the Superintendent of Works within 35 days of concrete placement.

- 5.01.3 Should 10% of the test cylinders prove less than 2,500 p.s.i. after 28 days, the Municipality will order the complete removal of all works. However, the applicant may, by taking core samples or other acceptable tests, indicate to the satisfaction of the Superintendent of Works that the faulty concrete is localized in extent and can be replaced in a satisfactory manner.

- 5.01.4 The expansion jointing material shall be manufactured, non-extruding, bituminous fibre material not less than 1/2" thick and extend the full width and depth of the section.

- 5.01.5 Reinforcing steel - new billet stock, intermediate grade, in accordance with A.S.T.M. Specification A/15 or the latest revision thereof.

5.02 Curbs and Catch Basin Construction

- 5.02.1 The alignment of the curbs will be indicated on the design drawings. The curb shall be either mountable or non-mountable as shown on the design drawing and as detailed on Standard Drawing No. 1. Where dissimilar sections join, a uniform gutter grade shall be maintained and a suitable transition effected by adjusting the height of the curb within three feet. Curbs shall be depressed at driveways according to Standard Drawings 1 and 19.

- 5.02.2 Particular care will be taken with form work which shall be substantial and well braced, so that the curbs can be constructed within the tolerances of Section 2.06 of this Specification. The curbs shall have a smooth clean finish free from voids and irregularities in the first instance. Unacceptable sections shall be replaced.

- 5.02.3 Provision shall be made in the curb for the construction of catch basins in the locations shown on the design drawings. Catch basins shall be constructed in accordance with Standard Drawings 3 or 3A.

- 5.02.4 Expansion joints shall be at all curb returns and at 25' intervals. The expansion material shall be formed by placing pre-cast expanding jointing material, 1/2 inches in thickness for the full width and depth of section. Excess expansion joint material shall be trimmed off after the form work has been stripped.

- 5.02.5 Where the curb is constructed on more than 12' of fill, reinforcing steel shall be used as shown on Standard Drawing No. 1.

- 5.02.6 Where the curb is constructed without a designed sidewalk, backfill will be placed behind the curbs, and shall be graded at a maximum of 1/4 inch to the foot from the top of the curb for a minimum of 8 feet as shown on Standard Drawing number 33.

5.03 Sidewalk Construction

- 5.03.1 The sidewalk shall be constructed to the width and thickness as shown on Standard Drawings 1 and 19. Commercial driveway drops shall be a minimum of 6" thick with 6" x 6" steel mesh reinforcing.

- 5.03.2 Where the sidewalk is constructed on more than 12" of fill, reinforcing steel shall be used as shown on Standard Drawings No. 1 and 19.
- 5.03.3 The cross fall shall be 1/4" to the foot towards the road unless otherwise shown on the design drawing or ordered in the field by the Inspector.
- 5.03.4 Expansion jointing material extending the full depth and width of the section shall be placed at 25' intervals. These joints will coincide with curb and gutter expansion joints if abutting. An expansion joint will be installed between the sidewalk and the curb return at inter-sections. Expansion joints shall be required around all telephone or power poles, light standard bases and where work abuts existing buildings or other structures including existing sidewalks. Excess expansion joint material shall be trimmed flush after the form work has been stripped.
- 5.03.5 Dummy joints 1" deep shall be inscribed at 5 foot intervals.
- 5.03.6 The form work shall be substantial, adequately braced and in good condition to give a profile within the limits of Section 2.06 of this Specification. The surface shall be finished with a wood float and steel edging tool at the joints. The work will be carefully completed at manholes, valve boxes, etc.

5.04 Combined Curb and Sidewalk Construction

- 5.04.1 The combined curb and sidewalk shall be constructed as detailed in Sections 5.01 to 5.03 except that the cross section will be as detailed on Standard Drawing No. 19.

5.05 General Requirements

- 5.05.1 The Consulting Engineer shall ensure that property owners are warned prior to the pouring of concrete. He shall also ensure that pedestrian access is provided, and that adequate steps are taken to prevent vehicles crossing concrete work for a period of seven days, unless high-early strength concrete is used. With respect to commercial properties, access must be maintained as directed by the Superintendent of Works.
- 5.05.2 The Consulting Engineer shall program the work to keep the inconvenience to the public at a minimum.
- 5.05.3 Concrete work will be cured by wet burlap or approved curing membrane during hot weather if so directed by the Superintendent of Works. Any necessary precautions shall be taken to prevent vanadism to fresh concrete and should vandalism occur, the rectification shall be done immediately as directed by the Superintendent of Works.

6.0 Paving

- 6.01 All paving shall be tested by a qualified laboratory to assure that the quality of the materials meets the Municipal Specification which is available from the Superintendent of Works. The testing laboratory shall be retained by the Consulting Engineer and shall send reports to the Superintendent of Works within 30 days of the paving being laid. The Consulting Engineer shall ensure that the spreading and compacting of the mixture is done in accordance with Municipal Specifications.
- 6.02 Municipal Specifications for seal coating and for asphalt concrete paving using a bituminous plant mix shall govern the construction of these two types of surfacing.

7.0 Barricades and Railings

- 7.01 Barricades and railings shall be installed when shown on the design drawings and in accordance with Municipal Specifications. See Standard Drawing No. 38 for typical barricade installation.

8.0 Traffic Control and Street Identification

8.01 All signs and pavement markings shall be installed by the Corporation.

9.0 Cul-de-sac Island

9.01 The cul-de-sac island shall be constructed as detailed in Standard Drawing No. 31 "Plan of Typical Cul-de-sac Island."

10.0 Cleaning Up

10.01 All surplus material, tools and temporary structures shall be promptly removed on completion of the construction work. All debris, dirt and rubbish shall be promptly removed. The site shall be left clean and tidy to the satisfaction of the Works Inspector.

11.0 Inspection

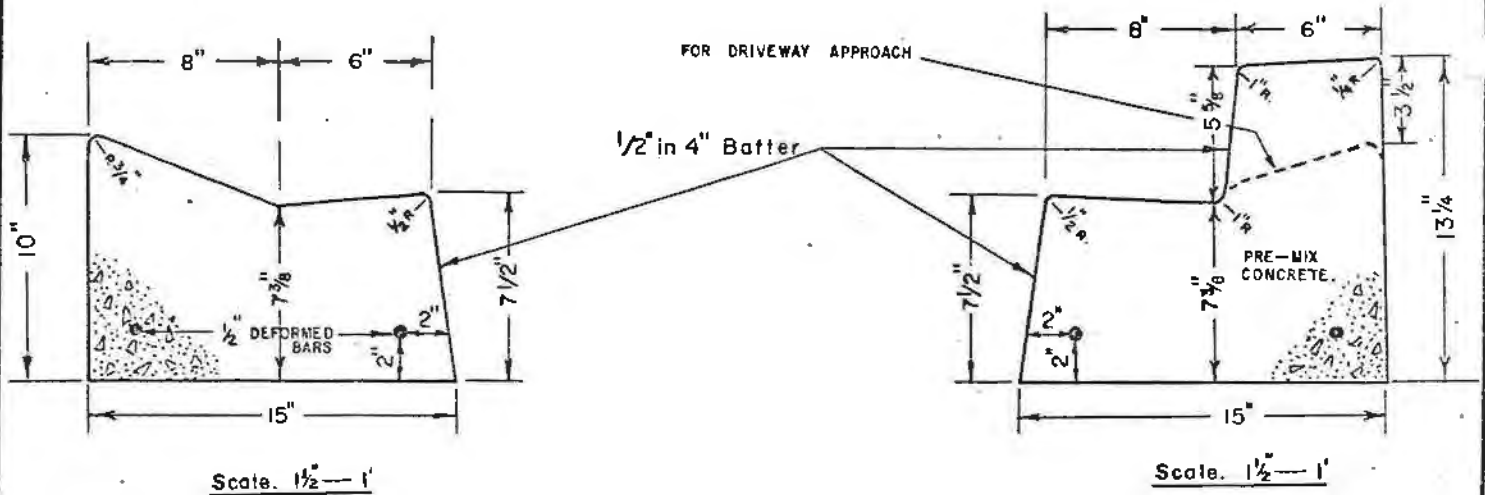
11.01 Each of the above steps is to be approved by the Superintendent of Works before proceeding with the next phase.

SECTION A

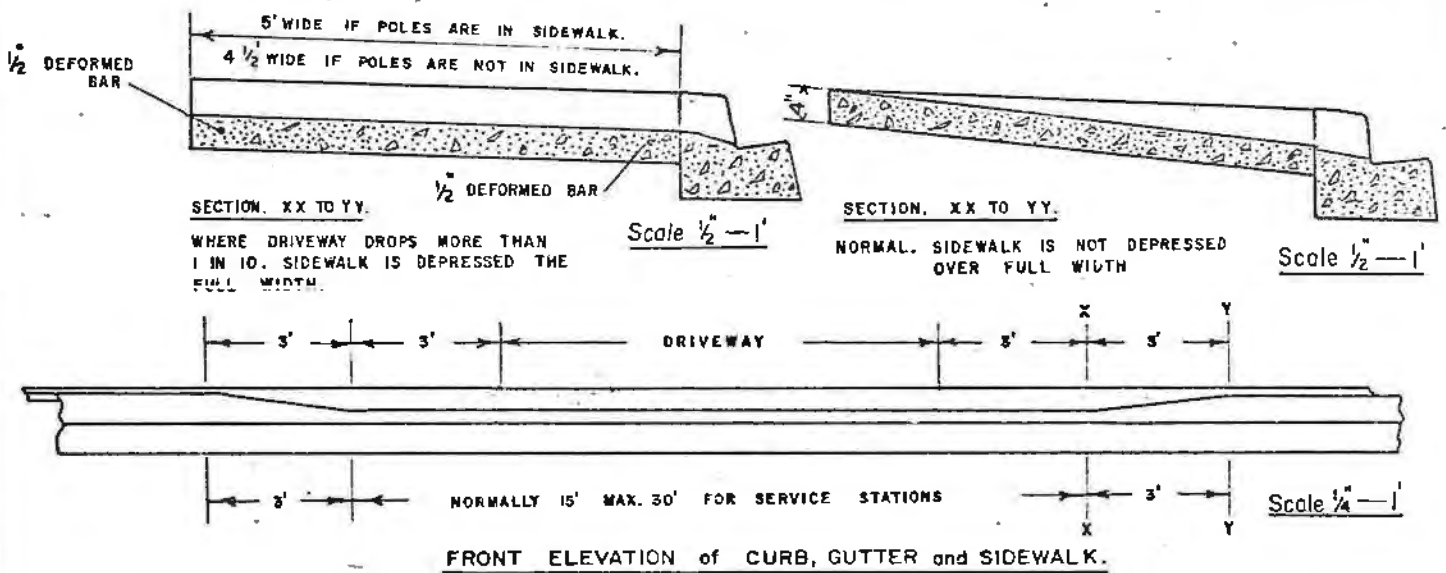
Residential mountable curb & gutter.

SECTION B

Main street curb, also residential curb return.



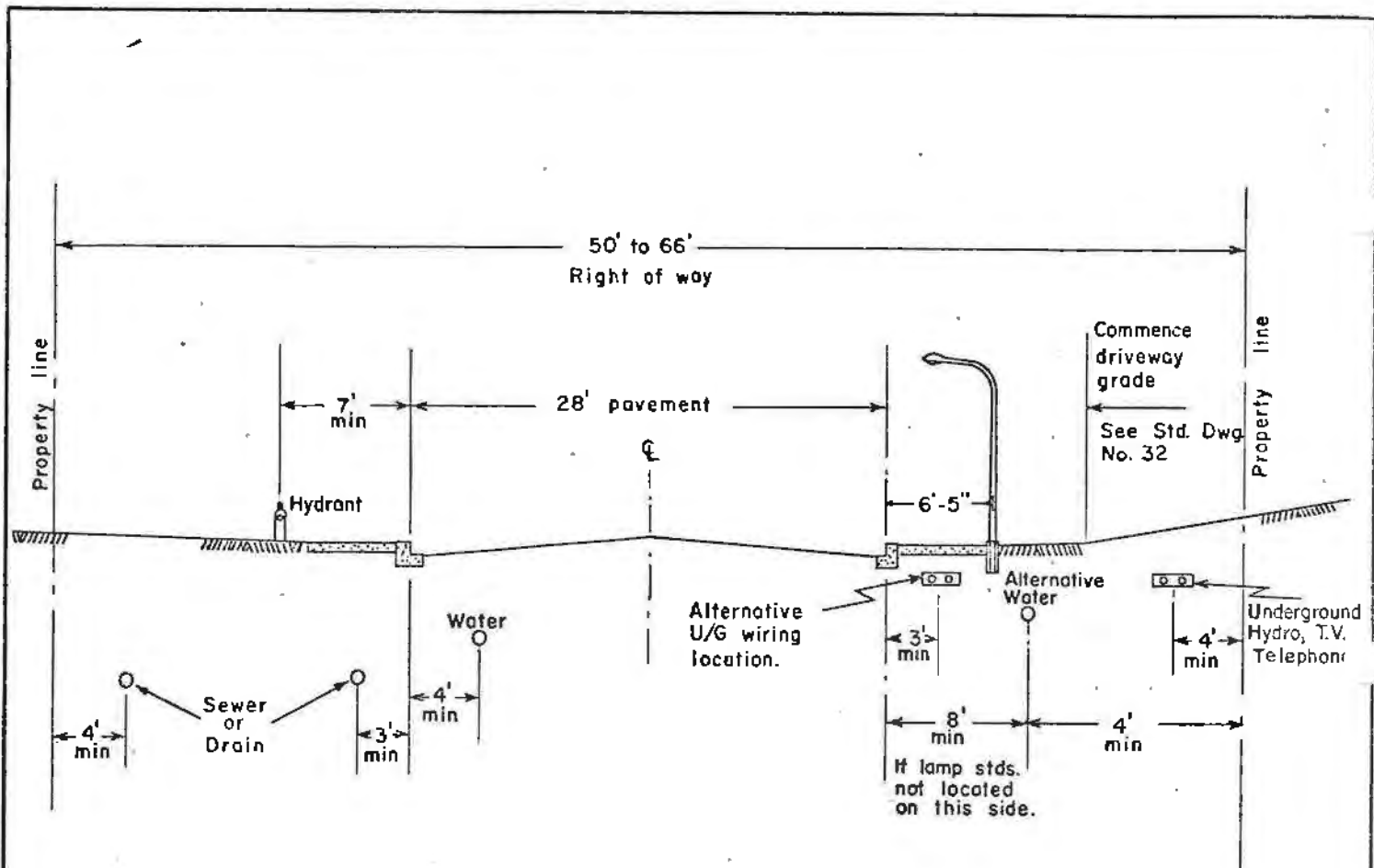
For Combined sidewalk and curb. see Dwg 19.



Notes:

- 1) Two 1/2" deformed bars used when curb is above 12" of fill, position bars 2" clear each way, keep end of bars 3" from the expansion joints.
- 2) Expansion joints 1/2" wide and at 25' intervals.
- 3) Concrete to be 3000 P.S.I. in 28 days, slump 3" max. aggregate 1" max. 4-6% entrained air.
- 4) Approximate quantities for 100' run. CURB-GUTTER Sec. A 3.0 cub.yds. Sec. B 3.7 cub. yds.
SIDEWALK 5' wide 6.2 cub. yds. 6' wide 7.4 cub. yds.
- 5) Sidewalk sidefall to be 1/4" in 1' towards the road unless otherwise authorized.
- 6) Boulevard to be graded behind curb or sidewalk as per Std. Dwg. No. 33.
- 7) Driveway grades behind curb or sidewalk as per Std. Dwg. No. 32.
- 8) For combined sidewalk and curb see Std. Dwg. No. 19.
- 9) Commercial driveways shall be min. 6" thick with 6" x 6" steel mesh reinforcing.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			CURB, MOUNTABLE & NON-MOUNTABLE AND SIDEWALK	
			Approved <i>[Signature]</i>	P. Eng
			SCALE As shown	Std Dwg No
			Drawn by	1



Road - Centreline of pavement to be within 5 feet of centre of road allowance.

Poles - Usually 22 feet off pavement centreline.
 - Allow a minimum of 8 feet from property line to anchor poles on bends.
 - May alternatively be in the sidewalk with the road face of the pole 2"-3" clear of the property side of the curb.

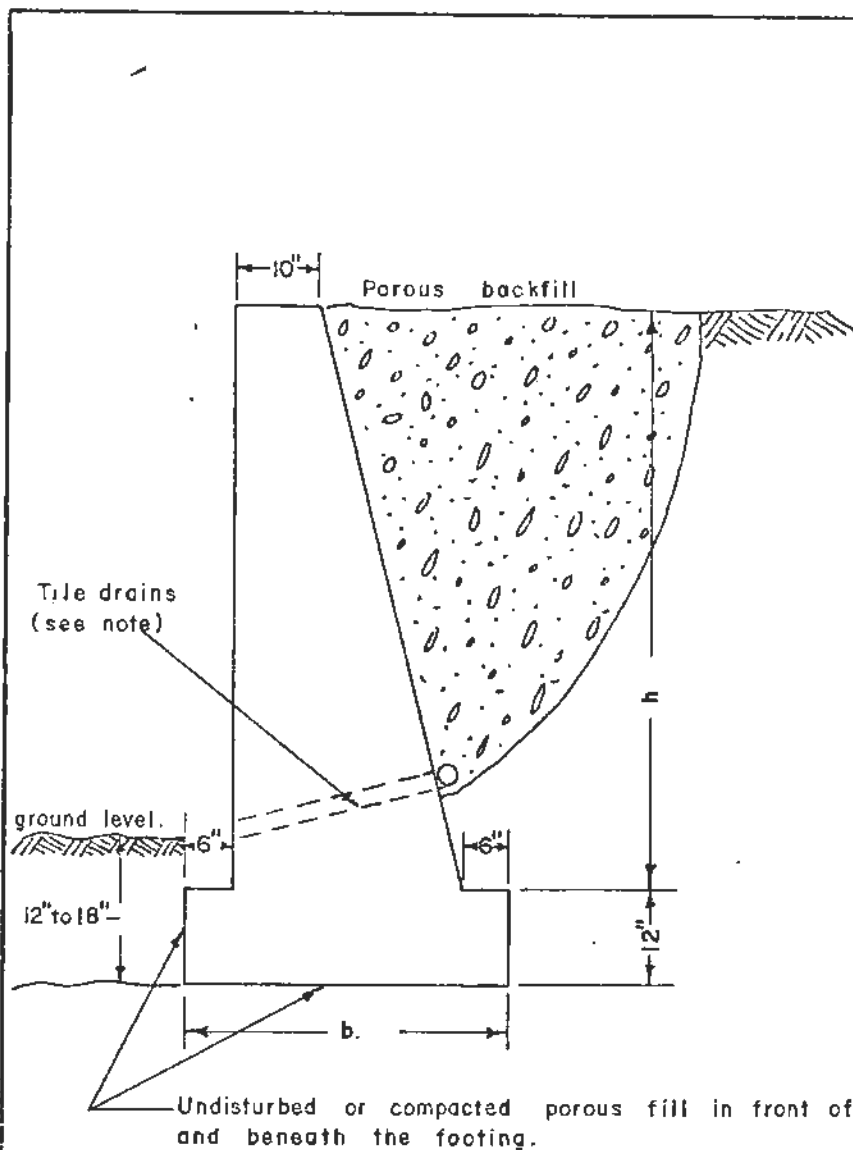
Underground Wiring - May be either under the sidewalk, 3 feet from curb, or 4 feet from the property line.

Sewers and Drains - May be in the same trench if there is a minimum 6 inch lateral clearance between pipes and elevations are similar.
 - Not within 4 feet of poles.
 - May be beneath pavement.

Water - Locations as shown above.
 - Must not be within 5 feet of underground Hydro.
 - Must be 10' clear of sewer.

Lamp Standards - Location as shown above.
 - Watermain must not be within 5 feet of lamp standard bases.
 - Refer to Standard Drawing No. 22.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			TYPICAL LOCATION OF SERVICES ON NEW RESIDENTIAL ROADS	
			Approved	P. Eng
			SCALE	N.T.S.
			Drawn by	Std Dwg No
				5



h	b	Vol. Conc. C.Y. per foot
3'-0"	2'-3"	0.20
4'-0"	2'-7"	0.27
5'-0"	3'-0"	0.37
6'-0"	3'-4"	0.48
7'-0"	3'-9"	0.60
8'-0"	4'-3"	0.76

Concrete 3000 psi in 28 days

Maximum slump 3"

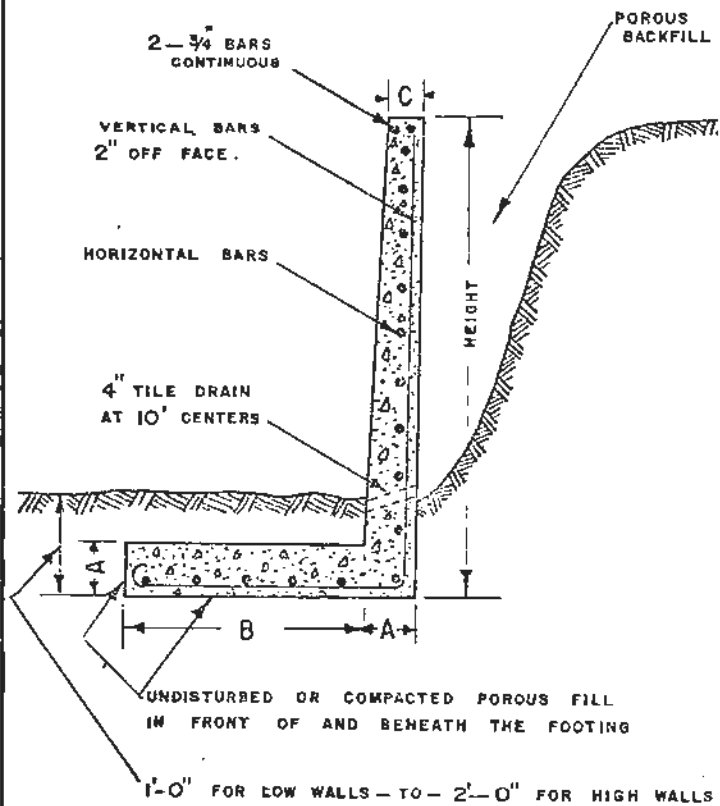
Maximum Aggregate 2"

Undisturbed or compacted porous fill in front of and beneath the footing.

NOTES

- (1) Construction joints at 30' centers. Joint will have a tongue and groove key and will be covered with a strip of waterproof membrane at the back of the wall.
- (2) Vehicular loads if near top of wall, use the dimensions of a wall 1' higher (except the height)
- (3) 4" tile drains will be installed at 10' - 0" centers or along the back of the wall.
- (4) Guard Rail will be installed where required.

REVISIONS			VILLAGE OF 'OLD S. H.	
Date	Details	Approved		
			GRAVITY RETAINER WALL	
		Approved <i>[Signature]</i>	P. Eng.	Std. Dwg. No.
		SCALE 1/2" = 1'-0"		15
		Drawn by		



NOTES :-

1. Concrete. 3000 P.S.I. in 28 days, 3" max. slump. steel, intermediate grade deformed round bars.
2. Alternate vertical bars may be cut at half the wall height.
3. Construction joints at 30' centers, 1/2" expansion joints at 60' centers.
4. Vehicular loads if near top of wall, use the dimensions for a wall 2' higher, (except the height)
5. Guard rail will be installed on top of wall where required.

DIMENSIONS.

Height.	A.	B.	C.
3'	6"	1'-2"	6"
4'	6"	1'-8"	6"
5.	8"	1'-8"	8"
6.	8"	2'-6"	8"
7.	10"	2'-6"	8"
8.	10"	4'-2"	8"
9.	12"	4'-2"	8"
10.	12"	5'-0"	8"
11.	12"	6'-0"	8"
12.	12"	7'-0"	8"

MATERIALS.

Vert steel.	Hor: steel.	Concrete per lineal foot.
3/8" at 15"	4-1/2"	0.077 cub. yds.
3/8" " 14"	6-1/2"	0.105 "
3/8" " 12"	8-1/2"	0.163 "
3/8" " 12"	10-1/2" or 7-5/8"	0.209 "
1/2" " 14"	9-5/8"	0.274 "
3/8" " 10"	11-5/8"	0.353 "
1/2" " 12"	14-5/8" or 10-3/4"	0.438 "
5/8" " 12"	11-3/4"	0.500 "
3/4" " 13"	13-3/4"	0.568 "
3/4" " 10"	14-3/4"	0.635 "

REVISIONS

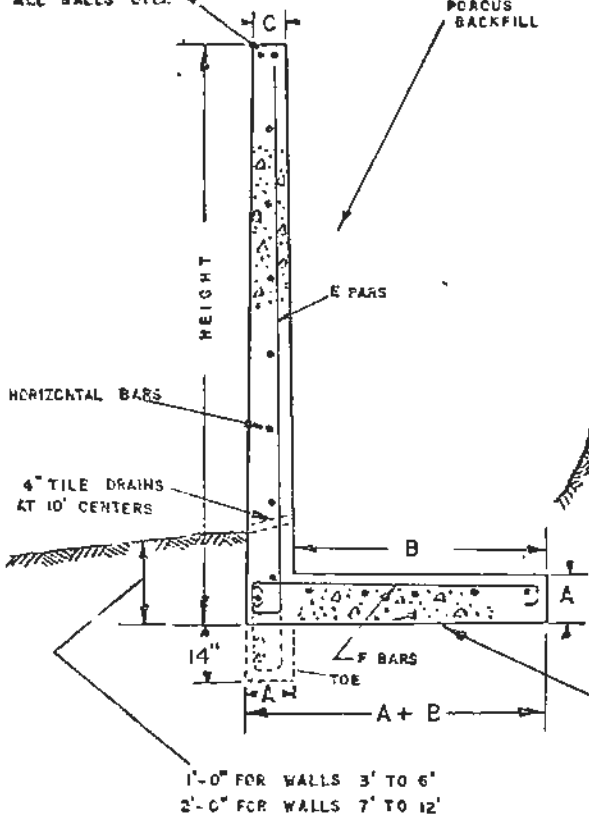
Date	Details	Approved

VILLAGE OF GOLD RIVER

RETAINER WALL TYPE A

Approved	<i>[Signature]</i>	P. Eng.	514 Dwg No.
SCALE	1/4" = 1'-0"		16
Drawn by			

ADD 1 EXTRA BAR IN ALL WALLS OVER



NOTES :-

1. Concrete. 3000 P.S.I. in 28 days, 3" max slump. steel, intermediate grade deformed round bars.
2. Alternate vertical bars may be cut at half the wall height.
3. Construction joints at 30' centers, 1/2" expansion joints at 60' centers.
4. Vehicular loads if near top of wall, use the dimensions for a wall 2' higher, (except the height)
5. Guard rail will be installed on top of wall where required.

DIMENSIONS.

MATERIALS.

Height.	A.	B.	C.	E bars	F bars	Nº OF AND DIA OF Hor: steel.	Concrete per lined foot.
+ 3'	6"	1'-4"	6"	†	†	4-1/2"	0.083' cub.yds.
+ 4'	6"	1'-8"	6"	†	†	6-1/2"	0.129 "
5.	8"	2'-1"	8"	3/8" @ 12"	3/8" @ 12"	8-1/2"	0.175 "
6.	8"	2'-7"	8"	3/8" @ 12"	3/8" @ 12"	10-1/2"	0.212 "
7.	8"	3'-2"	8"	3/8" @ 9"	3/8" @ 8"	12-1/2"	0.251 "
8.	12"	3'-7"	8"	3/8" @ 11"	3/8" @ 8"	9-5/8"	0.386 "
9.	12"	4'-0"	8"	1/2" @ 14"	1/2" @ 10"	10-5/8"	0.432 "
10.	12"	4'-7"	8"	1/2" @ 10"	3/8" @ 11"	12-5/8"	0.485 "
# 11.	12"	5'-2"	8"	5/8" @ 10"	3/4" @ 12"	13-5/8"	0.580 "
# 12.	12"	5'-9"	8"	3/4" @ 12"	7/8" @ 12"	14-5/8"	0.632 "

† = Replace E and F bars with a single 3/8" bar using a simple bend and 12" centers.
 # = Construct toe and extend steel 14" deeper.

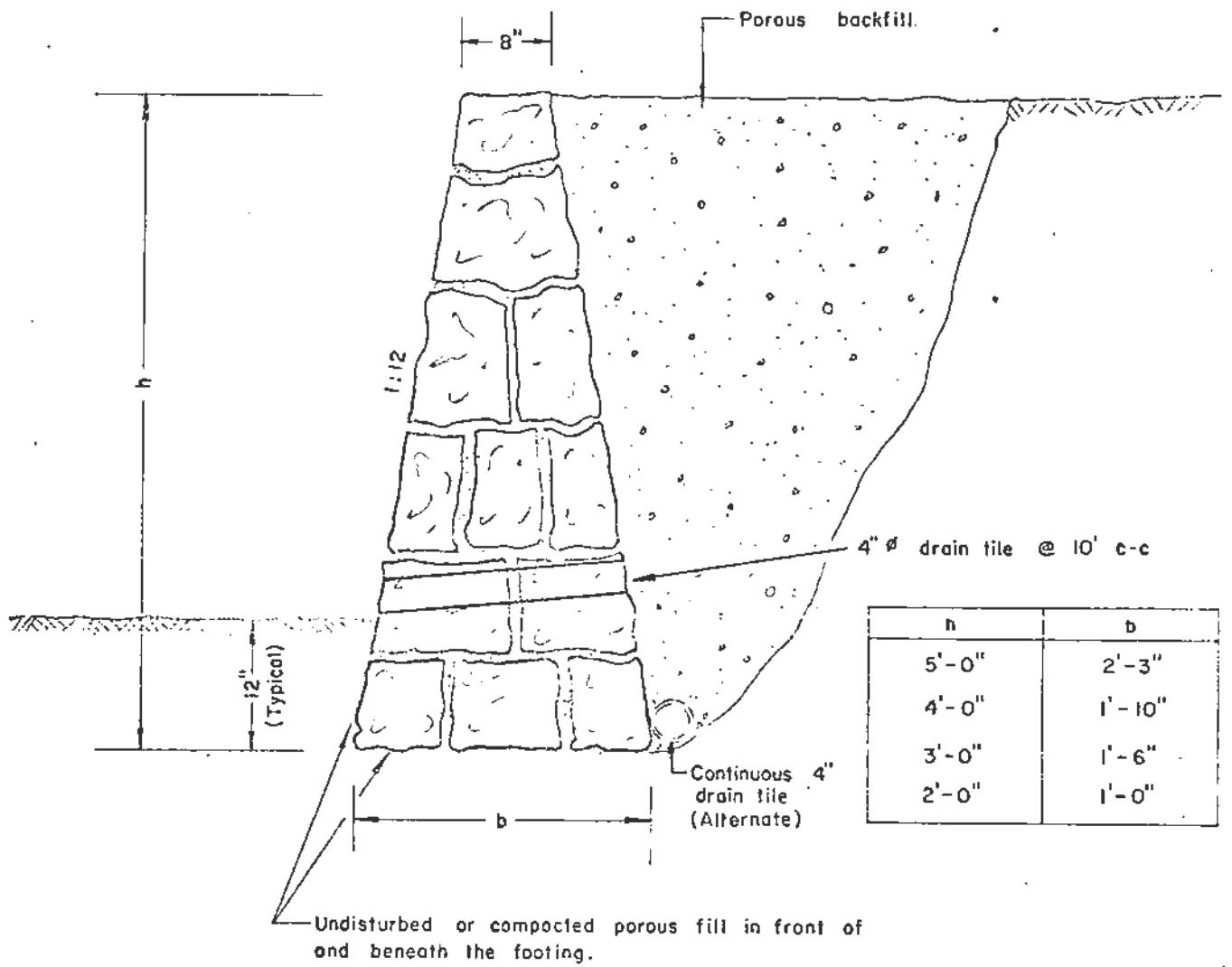
REVISIONS

Date	Details	Approved

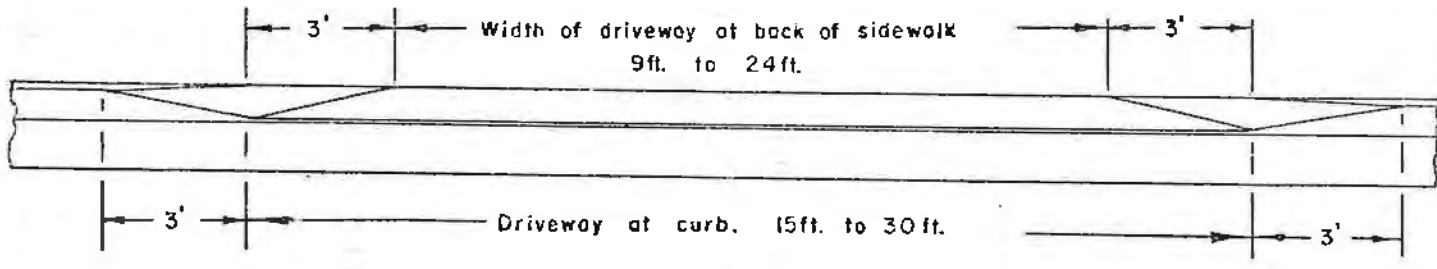
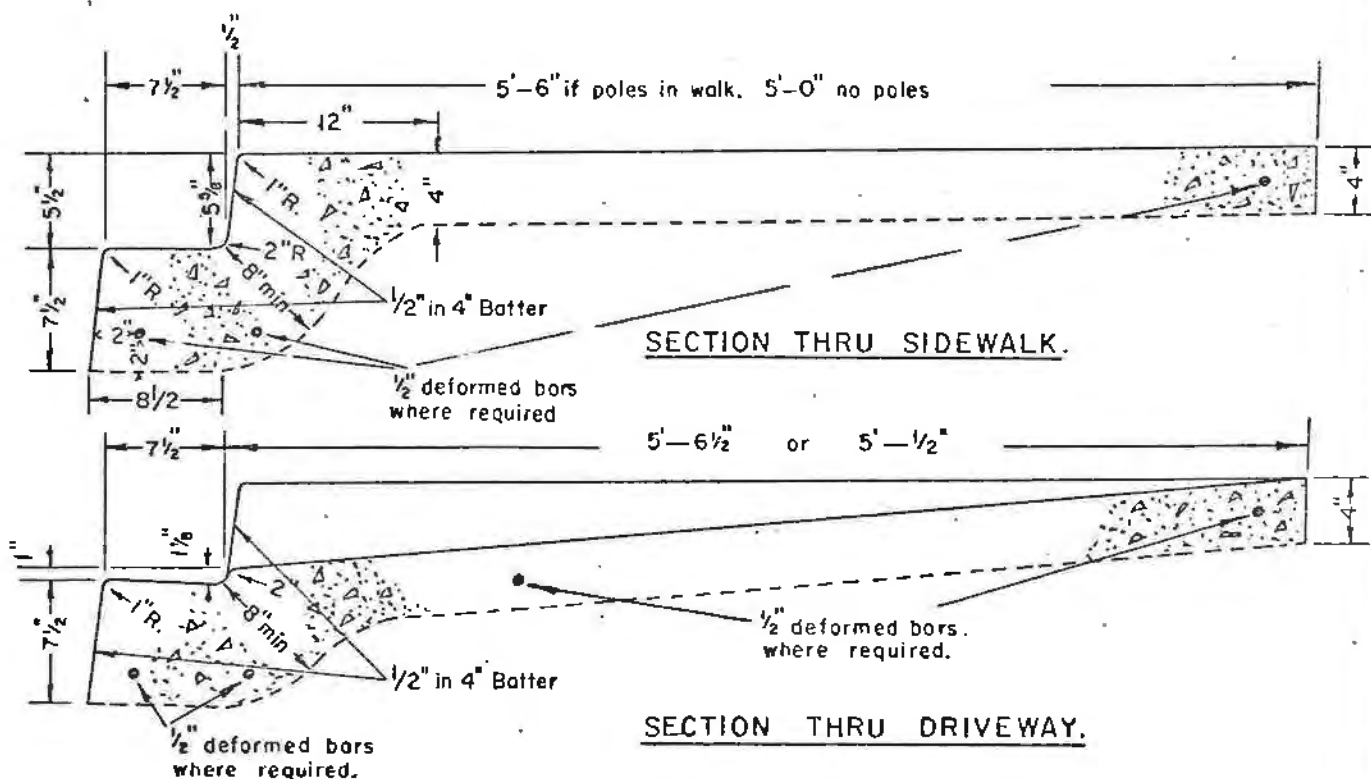
VILLAGE OF GOLD RIVER

RETAINER WALL TYPE B

Approved: *[Signature]* P. Eng. Std. Draw No. 17
 SCALE 1/4" = 1'-0"
 Drawn by



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			ROCK RETAINING WALL	
		Approved	<i>[Signature]</i>	P. Eng.
		Scale	3/4" = 1'-0"	
		Drawn by		
			Sta Eng No 10	

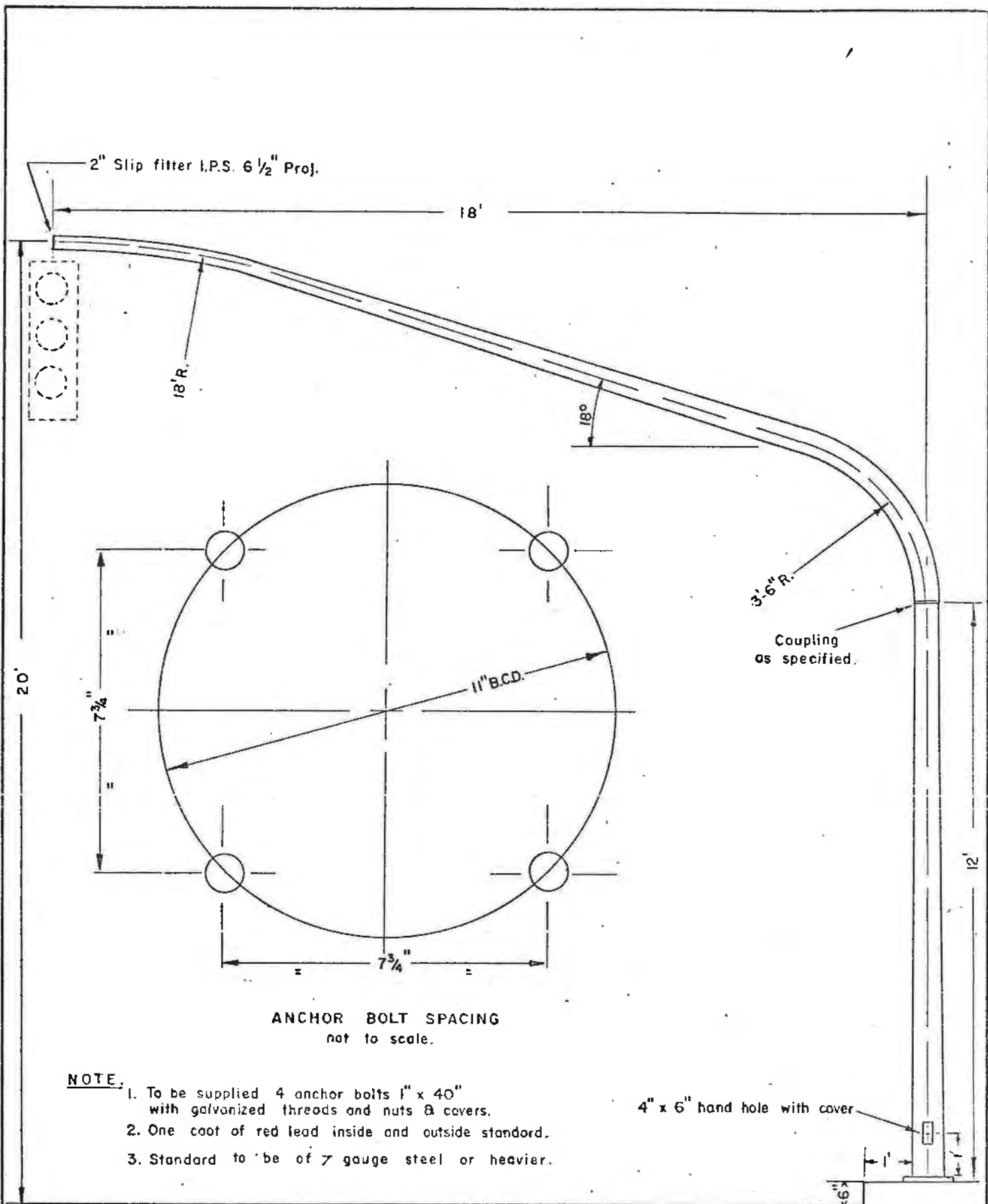


FRONT ELEVATION.

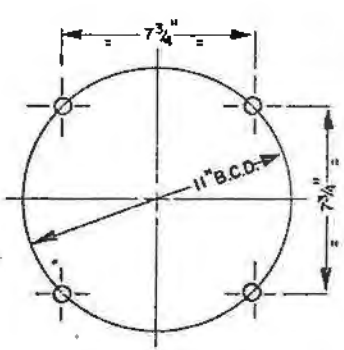
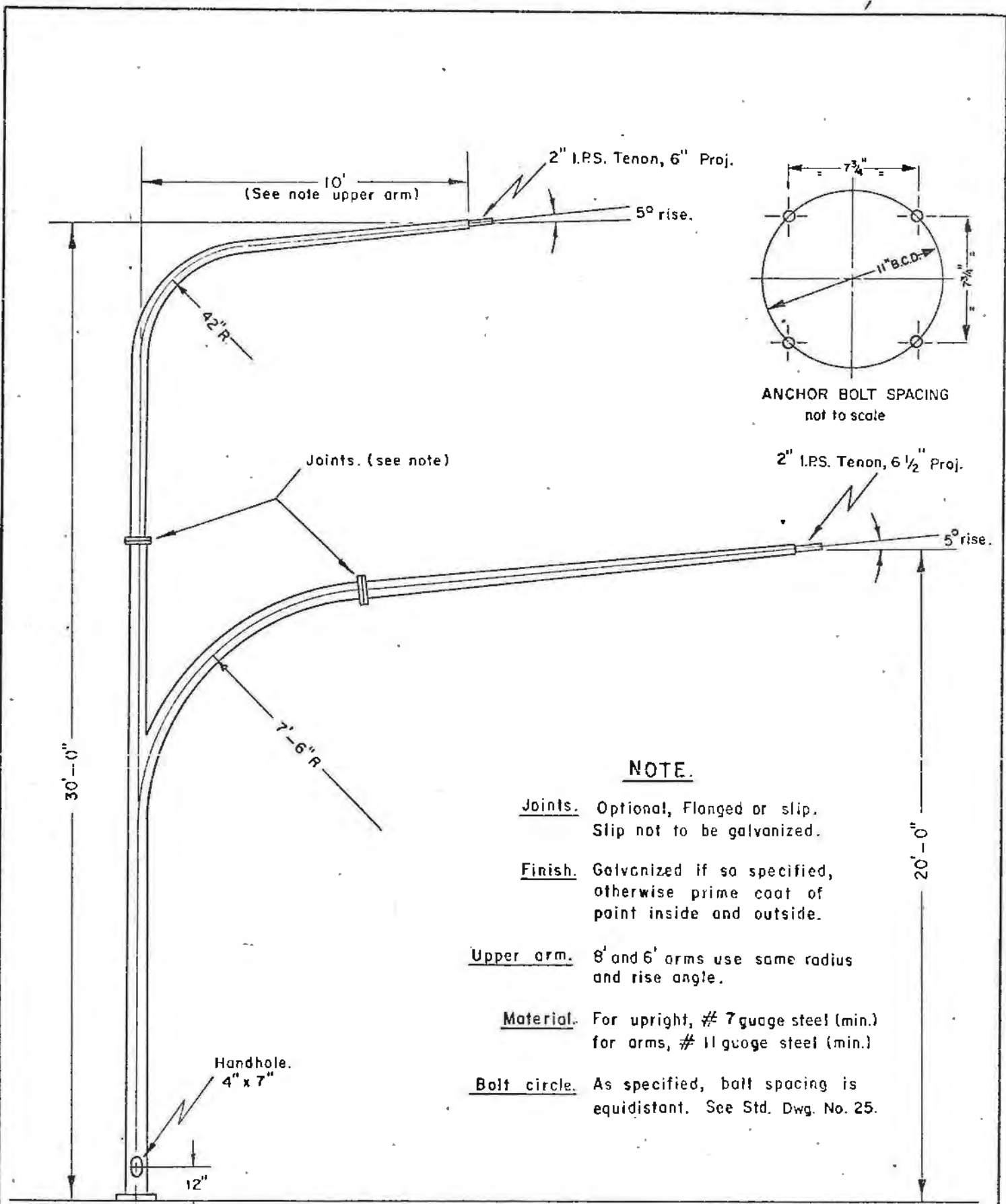
- Note.**
- Half inch deformed bars used when curb and sidewalk is above 12" of fill, position bars 2" clear of edge, and 3" from expansion joints, Expansion joints 1/2" wide and at 25' intervals.
 - Sidewalk sidefall. to be 1/4" in 12" towards the road unless otherwise authorized.
 - Concrete to be 3000 R.S.L. in 28 days, slump 3" max., aggregate 1" max., 4-6% entrained air. approximately 9-6 cub. yds. per 100' run.
 - Commercial driveways: Minimum 6" thick, with 6" x 6" steel mesh reinforcing.
 - Grades behind sidewalk as per Std. Dwg. No. 33

For Curb, mountable and non mountable, and sidewalk. see Dwg. I.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			COMBINED SIDEWALK AND CURB	
			Approved	P. Eng.
			SCALE	Std. Dwg. No.
			Drawn by	19



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			<p>PROPOSED STANDARD FOR TRAFFIC SIGNAL</p> <p>Approved <i>[Signature]</i> P. Eng. Std. Des. No. SCALE 3/8" = 1'-0" Drawn by</p>	
				20



ANCHOR BOLT SPACING
not to scale

NOTE.

Joints. Optional, Flanged or slip.
Slip not to be galvanized.

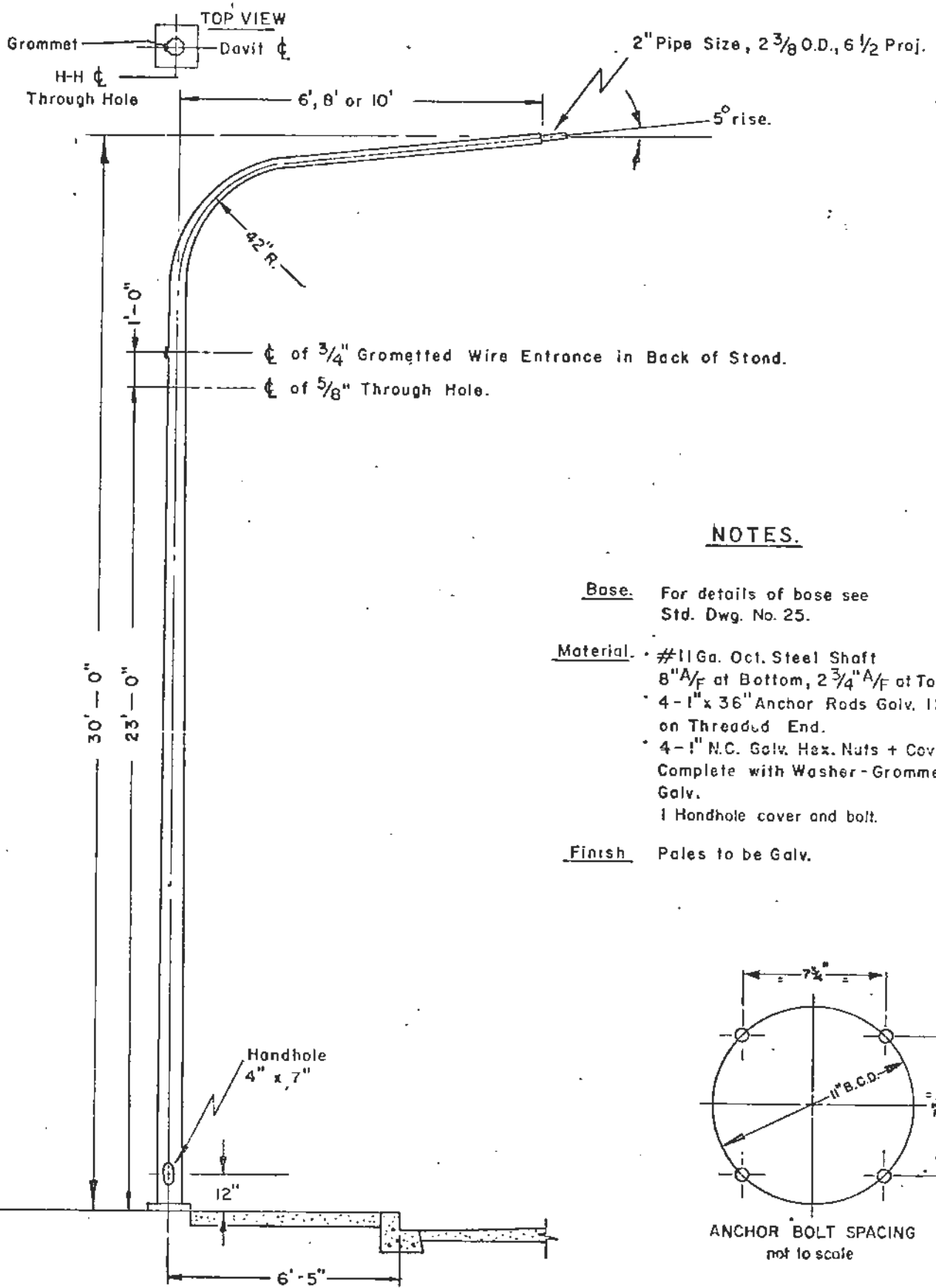
Finish. Galvanized if so specified,
otherwise prime coat of
paint inside and outside.

Upper arm. 8' and 6' arms use same radius
and rise angle.

Material. For upright, # 7 guage steel (min.)
for arms, # 11 guage steel (min.)

Bolt circle. As specified, bolt spacing is
equidistant. See Std. Dwg. No. 25.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			COMBINATION STANDARD STREET LIGHT and TRAFFIC SIGNAL	
			Approved <i>[Signature]</i> P. Eng.	Std Dwg No
			SCALE 1/4" = 1'-0"	21
			Drawn by <i>[Signature]</i>	



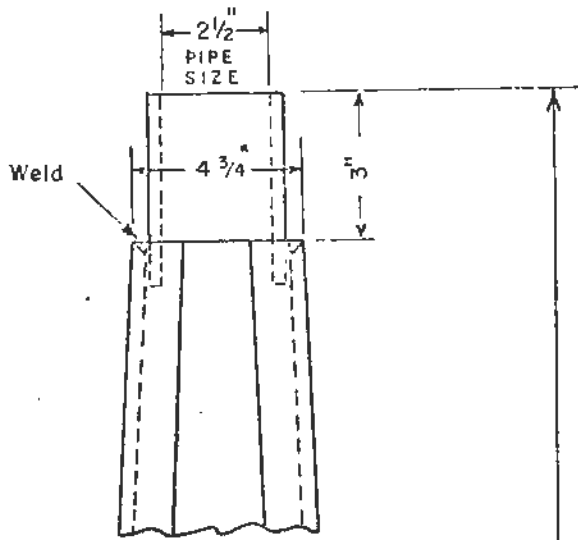
NOTES.

Base. For details of base see
Std. Dwg. No. 25.

Material. #11 Ga. Oct. Steel Shaft
8" A_F at Bottom, 2 $\frac{3}{4}$ " A_F at Top
4-1" x 36" Anchor Rods Galv. 12"
on Threaded End.
4-1" N.C. Galv. Hex. Nuts + Covers
Complete with Washer - Grommets
Galv.
1 Handhole cover and bolt.

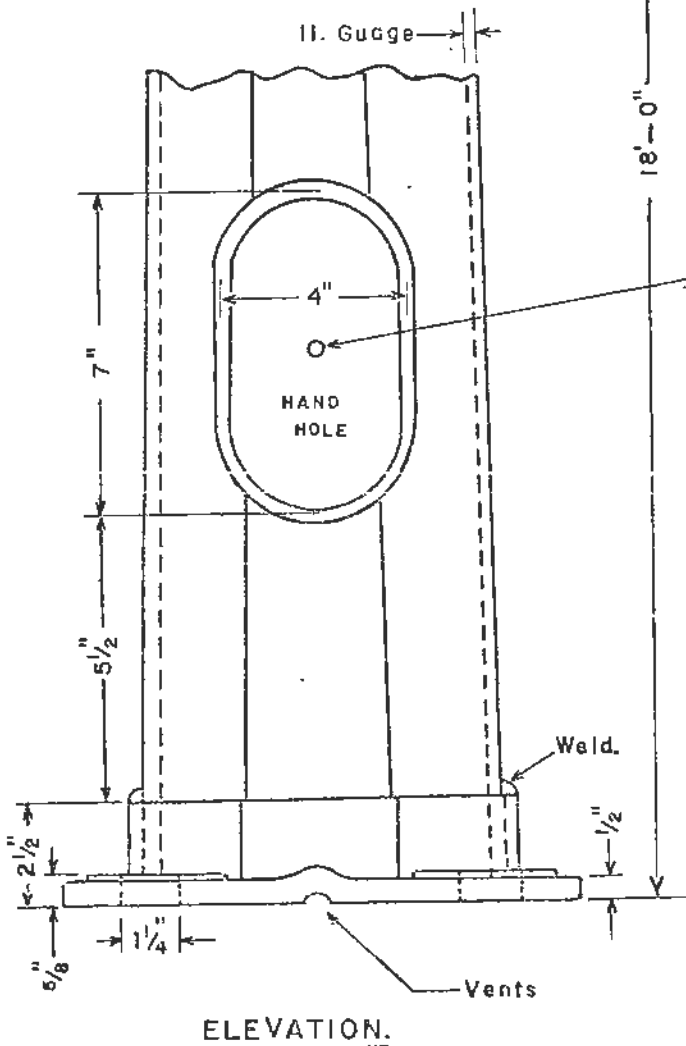
Finish Pales to be Galv.

REVISIONS			VILLAGE OF GOLF RIVER	
Date	Details	Approved		
			STREET LIGHT STANDARD	
			Approved <i>[Signature]</i> P. Eng	Std Dwg No
			SCALE $\frac{1}{4}" = 1'-0"$	22
			Drawn by	

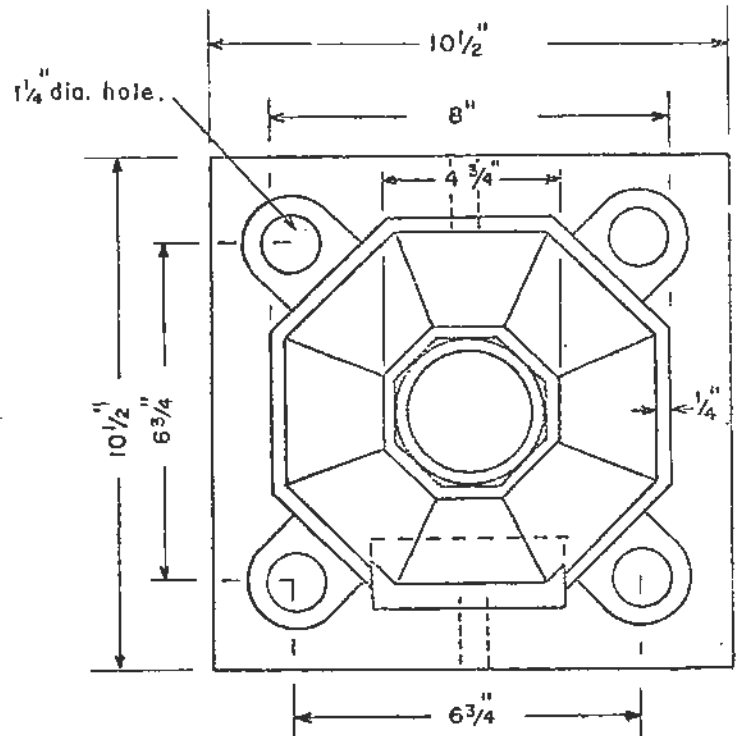


SUPPLIED WITH THE FOLLOWING:-

- 1. Hand hole cover.
- 4. Anchor rods 1" x 36" galvanized 12" at threaded end.
- 4. N.C. Hex: nuts for above.
- Nut covers, Shims, and washers.
- Painted inside and outside, one primer coat.

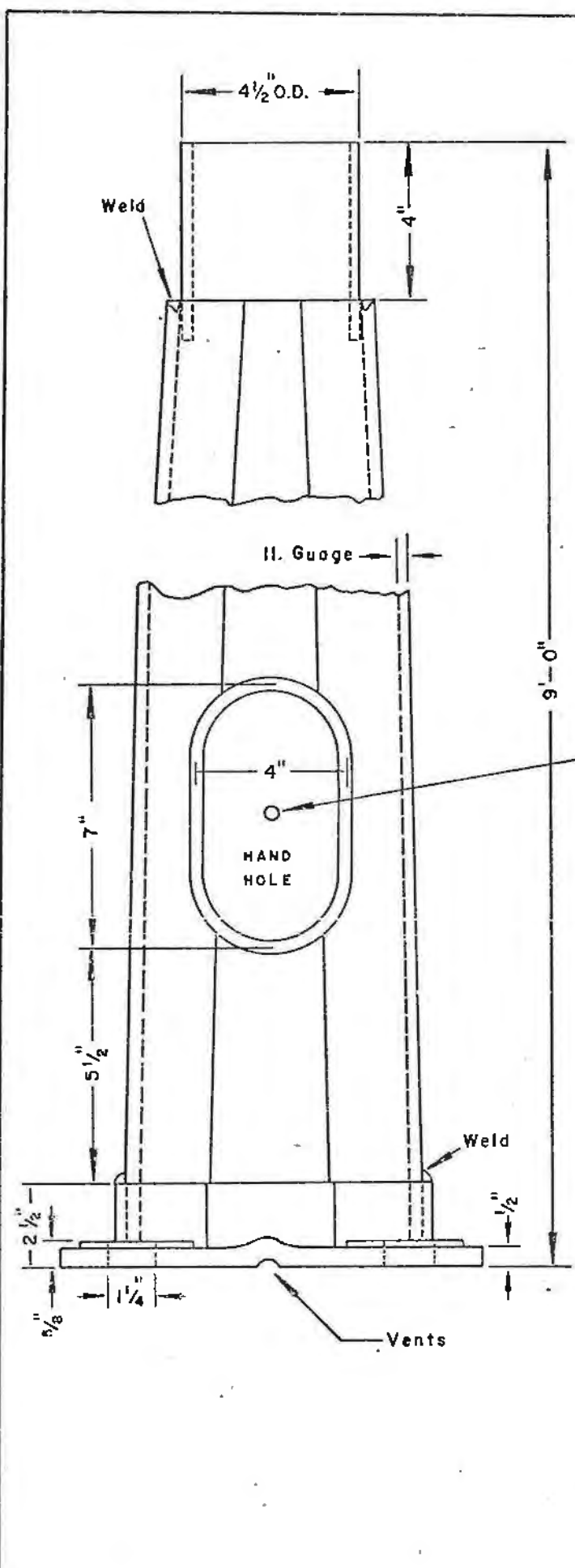


Ground bolt. 5/16" x 1 1/4" welded.



PLAN.

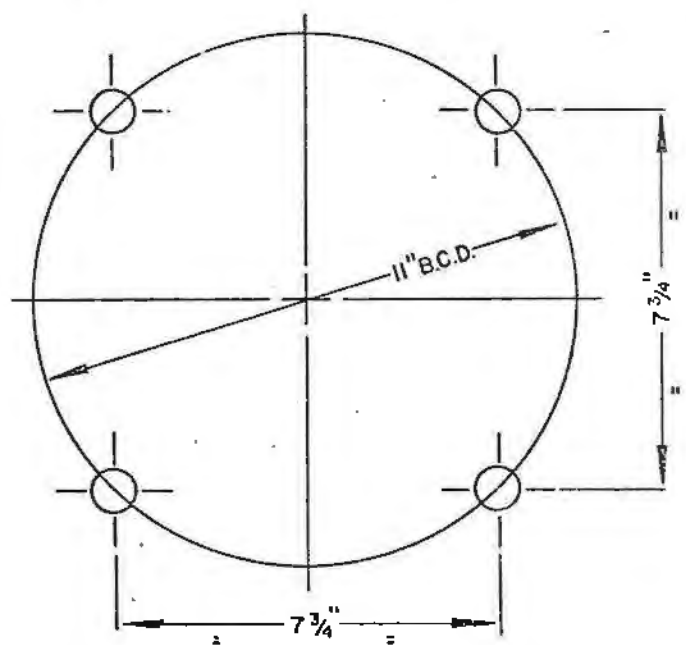
REVISIONS			VII	
Detd	Details	Approved		
			STREET LIGHTING POST TOP STANDARD DETAILS 18' MODEL	
			Approved	P. Eng
			SCALE 3" = 1'-0"	Std. Des. No.
			Drawn by	23



SUPPLIED WITH THE FOLLOWING :-

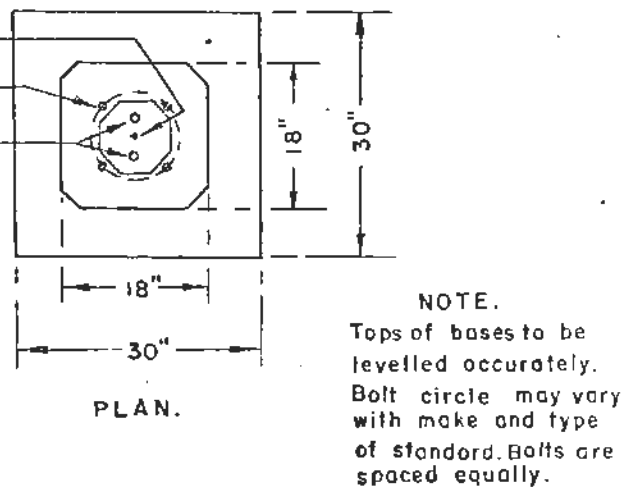
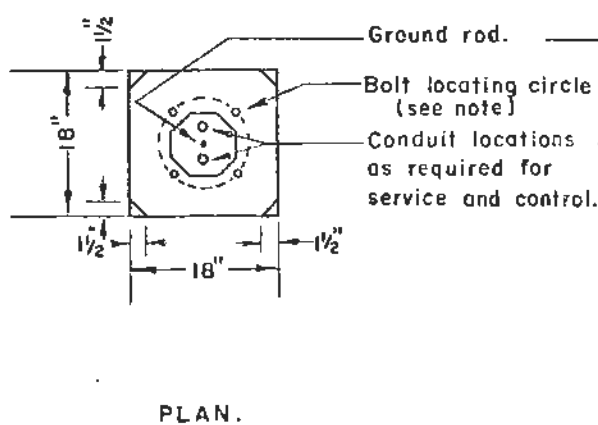
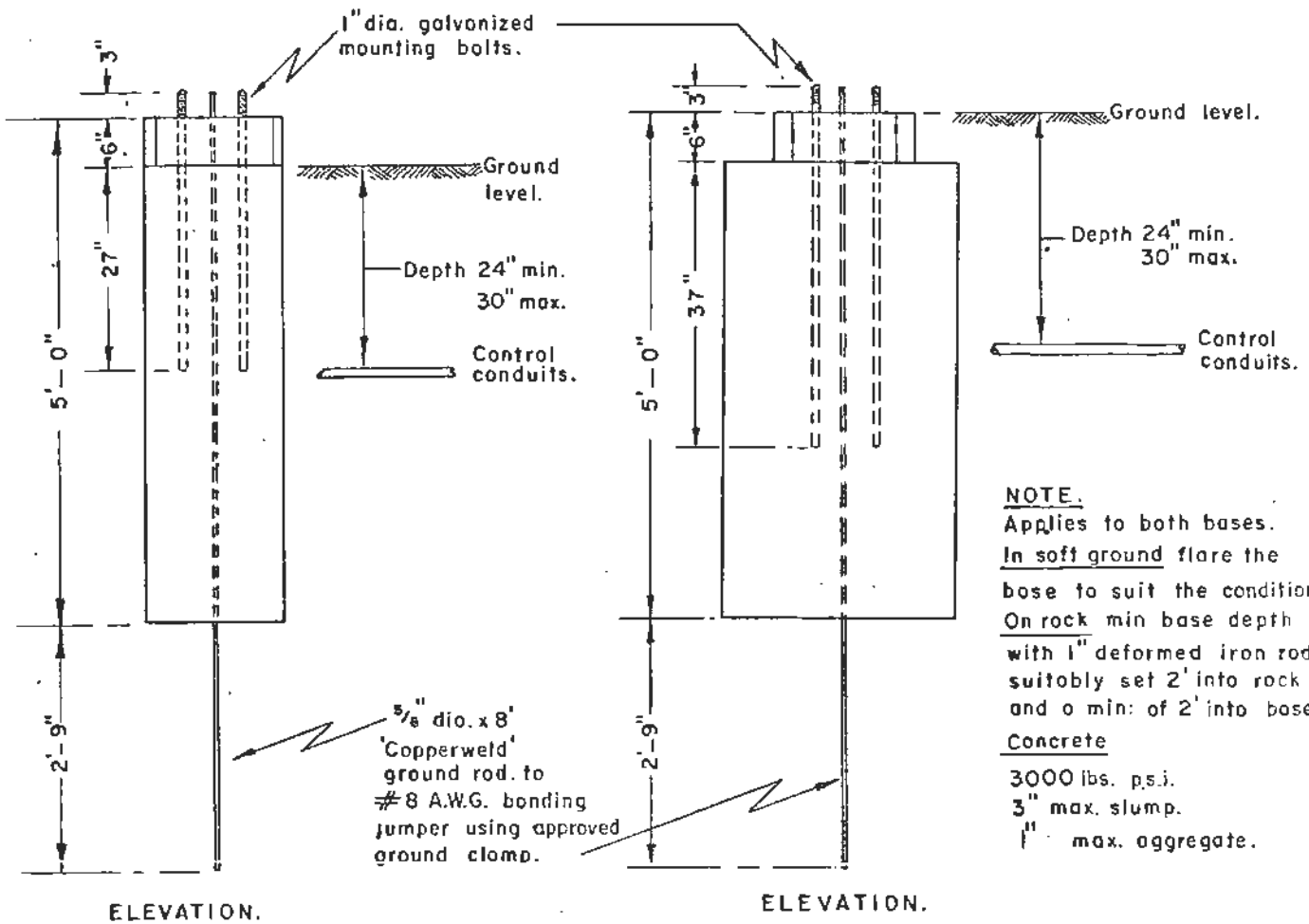
- 1. Hand hole cover.
 - 4. Anchor rods 1" x 36" galvanized 12" at threaded end
 - 4. N.C. Hex: nuts for above.
 - Nut covers, Shims, and washers.
- Painted inside and outside, one primer coat or galvanized.

Ground bolt . 5/16" x 1 1/4" welded.



ANCHOR BOLT SPACING

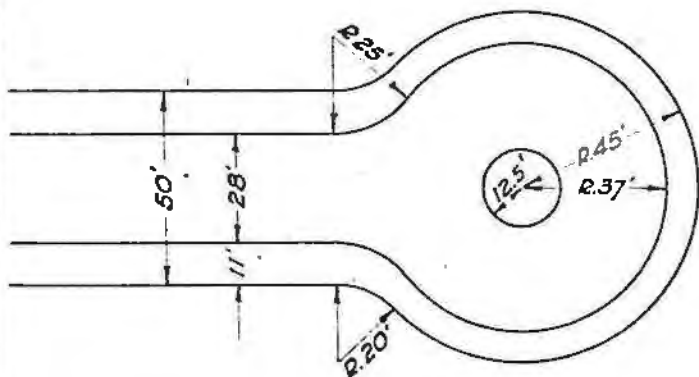
REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			TRAFFIC SIGNAL POST 9' MODEL	
			Approved <i>[Signature]</i> P. Eng	Std Dwg No
			SCALE 3" = 1'-0"	24
			Drawn by	



ST. LIGHTING STANDARD BASE

TRAFFIC SIGNAL STANDARD BASE.

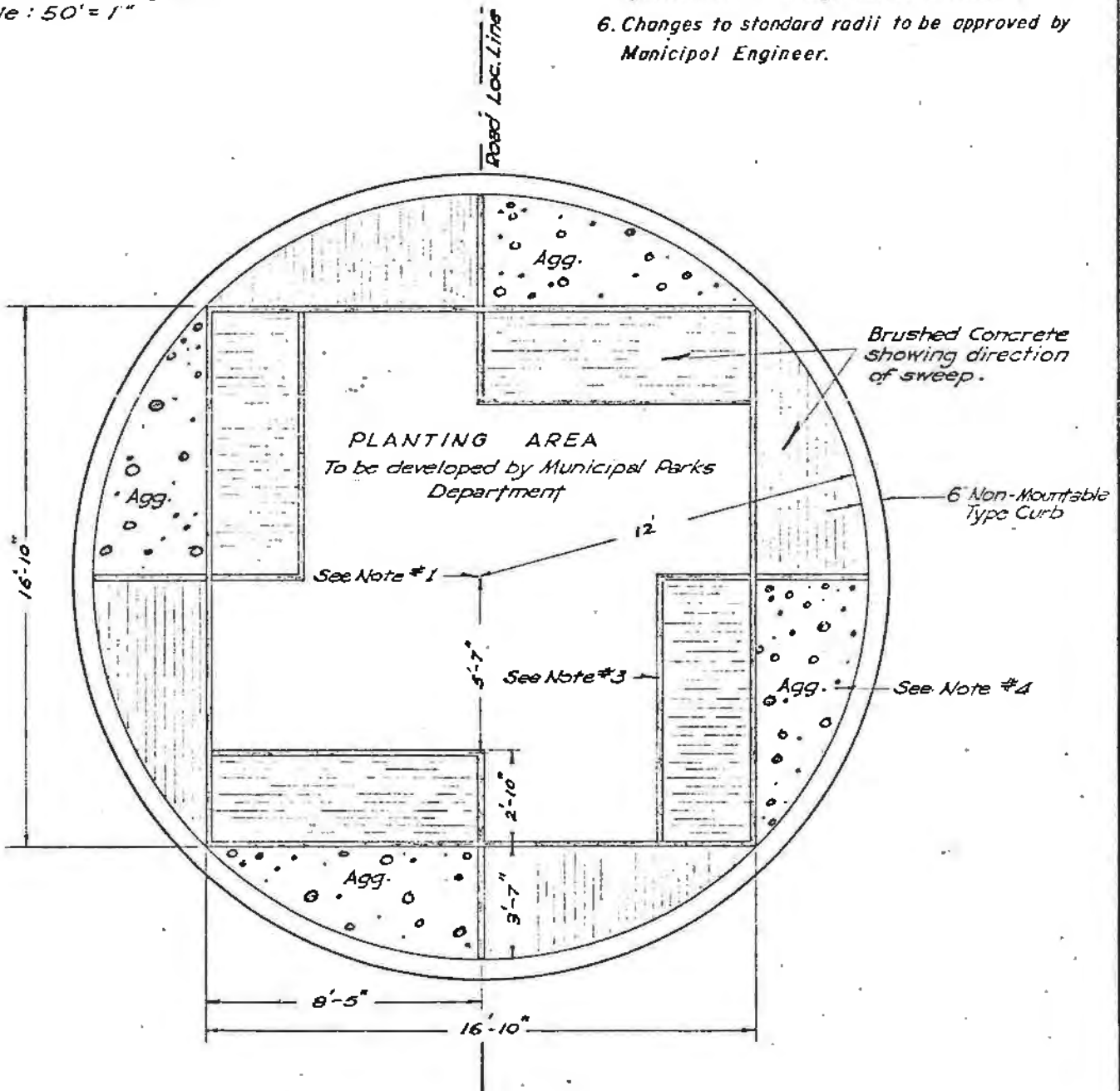
REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			STANDARD BASES	
			Approved <i>P. J. [Signature]</i> P. Eng.	Std. Des. No.
			SCALE 1/2" = 1'-0"	25
			Drawn by	



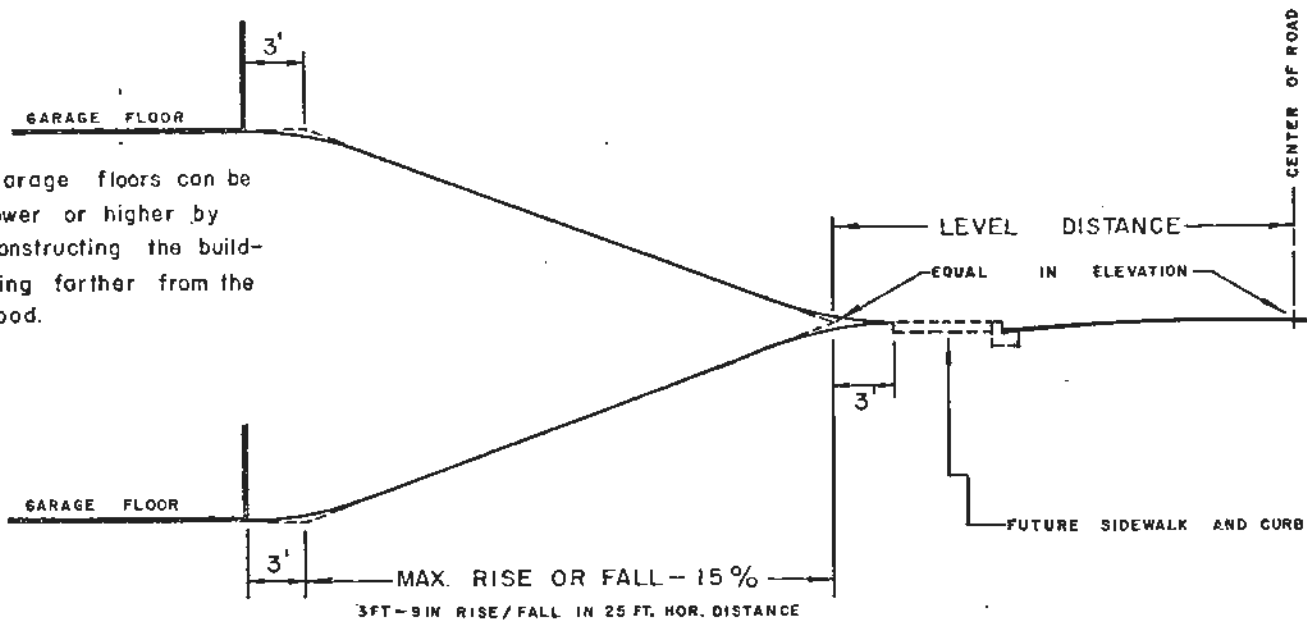
CUL-DE-SAC WITH ISLAND
Scale : 50' = 1"

NOTE :

1. When Post Top Luminaire is to be used, standard base to be constructed as per standard drawing # 25 together with necessary U/G wiring.
2. Watering Facilities — $\frac{1}{2}$ " ϕ W/S to be provided & a valve installed within planting area.
3. Partition Material to be $1\frac{5}{8}$ " x $3\frac{5}{8}$ " standard construction grade cedar, stained dark brown.
4. All aggregate to be $\frac{3}{4}$ " Minus — $\frac{1}{8}$ " Exposure.
5. Design details must conform to municipal specification 'E' design and construction of roads.
6. Changes to standard radii to be approved by Municipal Engineer.



REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			<p>PLAN OF TYPICAL CUL-DE-SAC ISLAND</p> <p>Approved <i>C. J. [Signature]</i> P. Eng. Std Dwg No SCALE NOT TO SCALE 31 Drawn by</p>	



Garage floors can be lower or higher by constructing the building farther from the road.

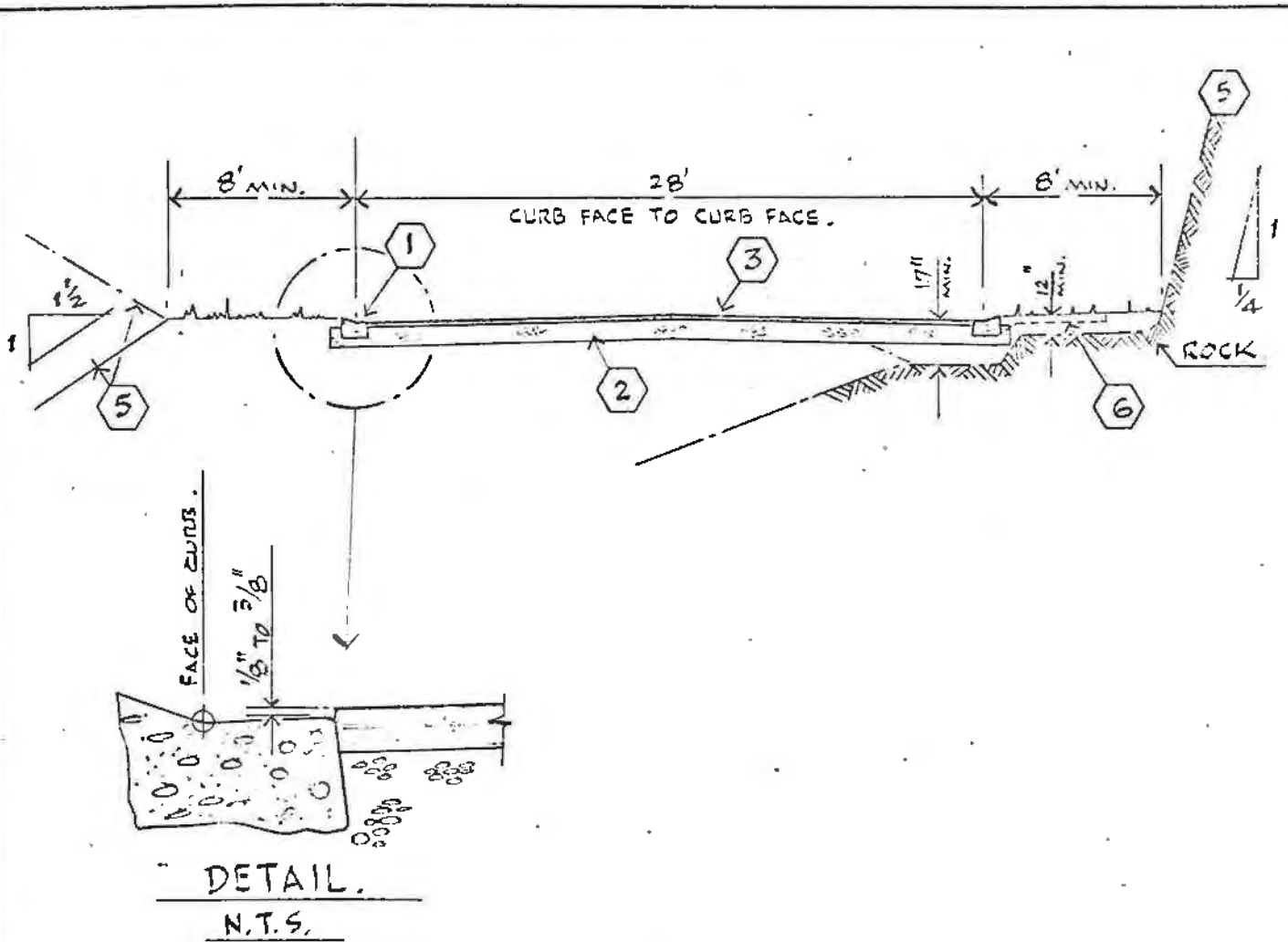
NOTES

- To allow for future road widening and sidewalk construction, the driveway and finished boulevard grade must be at the same elevation as the center of the existing road surface at the following level distance from the pavement centerline:

	<u>Minimum Level Distance</u>
<input type="checkbox"/> Residential Roads	22'
<input type="checkbox"/> Collector or Arterial Roads	30'

- The maximum grade of driveway is 15% (3' 9" rise or fall in 25').
- Where the center of the existing road surface is more than 5' off the center of the road allowance, measure the level distance from the center of the road allowance.
- Exceptions to these standards will be allowed only at the discretion of the Municipal Engineer.

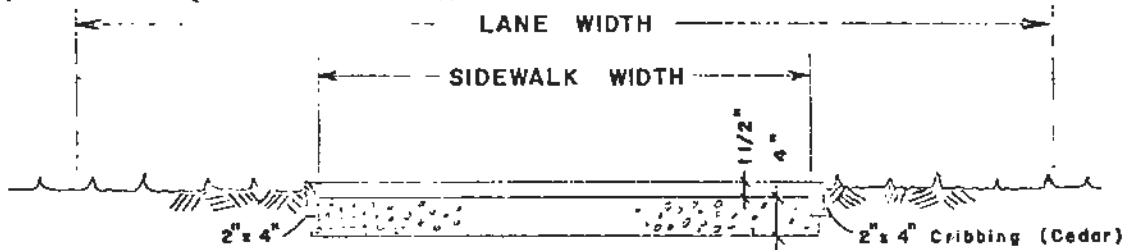
REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved	DRIVEWAY GRADES	
			Approved <i>[Signature]</i>	P. Eng
			SCALE	NOT TO SCALE
			Drawn by	Std. Draw No. 32



Notes:

1. Mountable curb (Std. Dwg. No. 1).
2. Base course consists of:
7 inches depth of 3" minus pit run gravel;
2 inch depth of 3/4" minus crushed gravel;
2 inches of asphalt paving;
3. See Specification E - Construction of Roads for cross-section dimensions.
4. Boulevards graded with topsoil, maximum 1/4" per foot slope towards curb, and seeded with No. 1 quality grass seed.
5. Maximum slope of banks as shown. Retaining walls (Std. Dwgs. 15, 16, 17 and 18) and/or guardrails will be required by Municipal Engineer in certain locations.
6. Typical sidewalk location.
7. For details of turnarounds, see Std. Dwg. No. 37.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			TYPICAL CROSS-SECTION RESIDENTIAL ROAD	
			Approved <i>[Signature]</i> P. Eng.	Std Dwg No
			FGALE 1/8" = 1'-0"	33
			Drawn by	

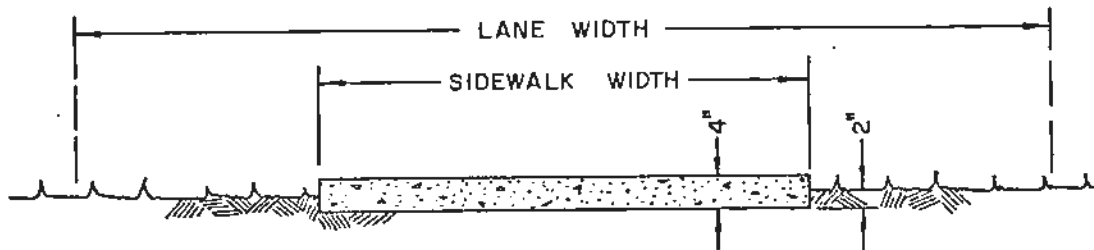


CROSS SECTION DETAIL

NOTE:

1. Sidewalk shall be installed to grades and alignment as laid out by design drawing. Minimum grade 0.30%, sidefall 1/2" in 12" unless otherwise specified.
2. Remove all sod and organic materials from proposed sidewalk. Apply weed-killer liberally prior to installation of gravel in excavation. Backfill any low areas with pitrun sand or gravel.
3. Install hotmix asphalt sidewalk 1 1/2" thick by dimension shown on plan.
4. Where practical keep sidewalk slightly above natural ground.
5. Base to be a minimum of 4" depth composed of 3" minus compacted gravel.
6. Use 2" x 4" cedar cribbing along edges of sidewalk.
7. Grading and seeding is required for remaining lane width.

REVISIONS			VILLAGE OF GOLD RIVER	
Date	Details	Approved		
			LANE SIDEWALKS ASPHALT	
			Approved <i>C. J. Moore</i> P. Eng.	Sid Dwg No
			SCALE 1/2" = 1'-0"	35
			Drawn by	



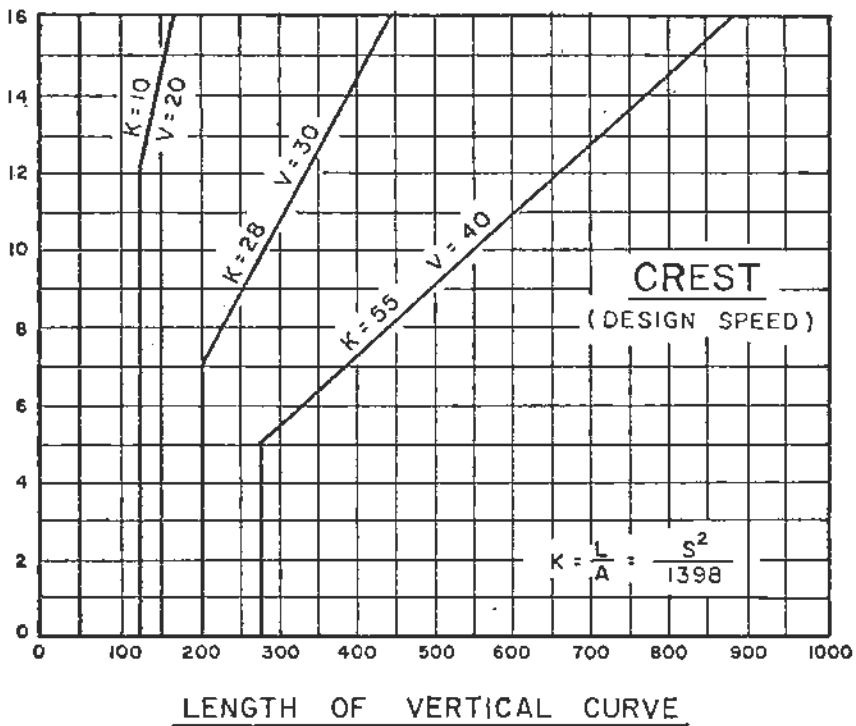
CROSS SECTION DETAIL

NOTES

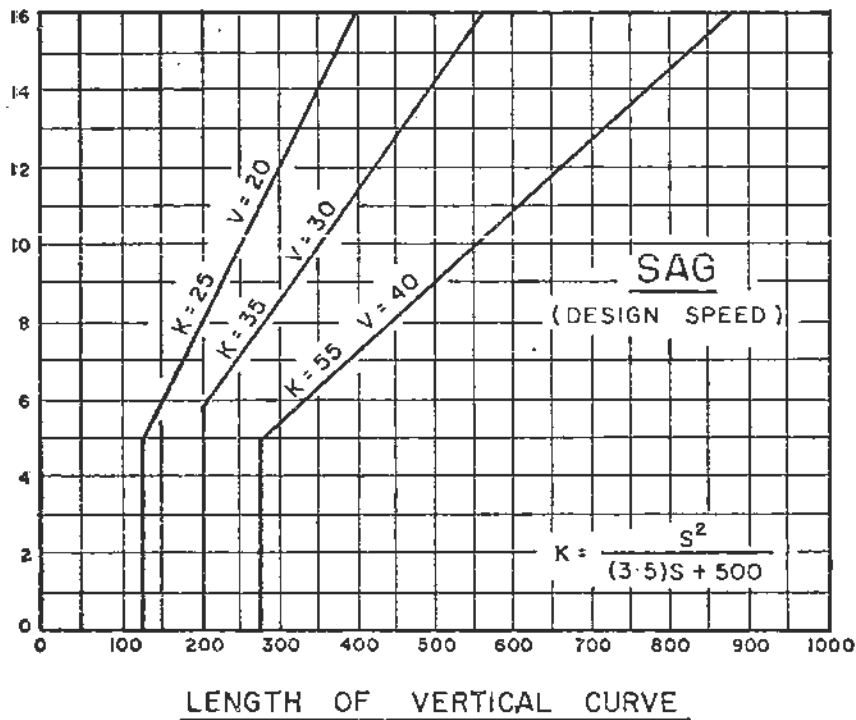
1. Sidewalk shall be installed to grades and alignment as shown on design drawing. Min. longitudinal grade 0.30%. Sidefall 1/4" in 12" unless otherwise specified.
2. Remove all sod and organic materials from proposed sidewalk. Apply weed killer liberally prior to installation of gravel in excavation. Backfill any low areas with pitrun sand or gravel.
3. Install concrete sidewalk 4" thick by dimension shown on plan. Concrete to be 3000 psi in 28 days, 3" max. slump, 1" maximum aggregate and 4-6% entrained air.
4. Expansion joints shall be formed by placing approved precast expansion joint material @ 25 foot intervals, one-half (1/2) inch in thickness, for the full width and depth of the sidewalk. Dummy joints at 5 foot intervals.
5. Where practical keep sidewalk approximately 2" above natural grounds.
6. Grading and seeding is required for remaining lane width.
7. Reinforcing steel required where sidewalk is constructed over 12" of fill.

REVISIONS			BRIDGE OF GOLD RIVER	
Date	Details	Approved		
			LANE SIDEWALKS CONCRETE	
		Approved	<i>[Signature]</i>	P. Eng.
		SCALE	1/2" = 1'-0"	
		Drawn by		
			Std. Draw No. 35A	

ALGEBRAIC DIFFERENCE IN GRADES



ALGEBRAIC DIFFERENCE IN GRADES



DESIGN SPEED V (m.p.h.)	STOPPING SIGHT DISTANCE S (ft.)	CREST	SAG
		K	K
20	125	10	25
30	200	28	35
40	275	55	55

REVISIONS

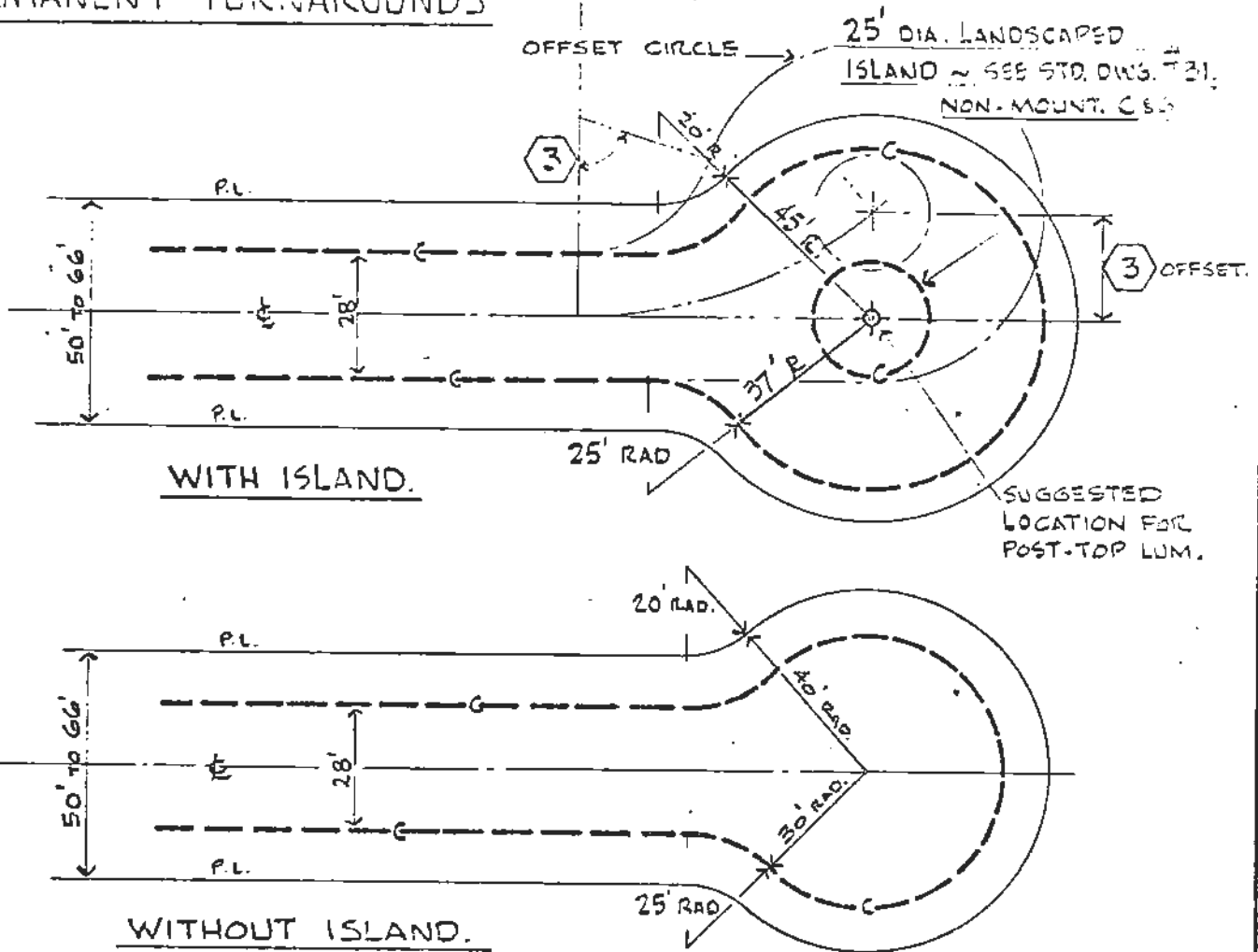
Date Details Approved

SILVE... ..

VERTICAL CURVES FOR MIN.
STOPPING SIGHT DISTANCE

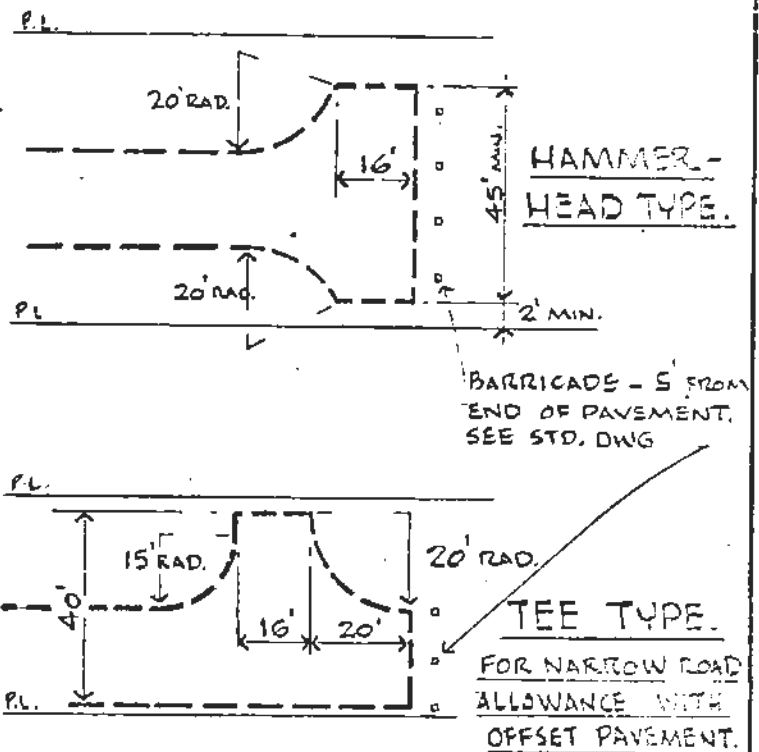
Approved *[Signature]* P. Eng. Std. Proj. No. 36
SCALE NOT TO SCALE
Drawn by

PERMANENT TURNAROUNDS



General Notes:

1. These standards apply to turn-arounds on residential roads for single family dwellings.
2. Chainage for profile to be along centre line. If cross-fall exists in turn-around, show spot elevations for top of curbs as well as centre line profile.
3. Where circle turn-arounds are offset more than 5', radius of inside curb return to be increased to 30'.
4. All turn-arounds to be fully water controlled.



TEMPORARY TURNAROUNDS

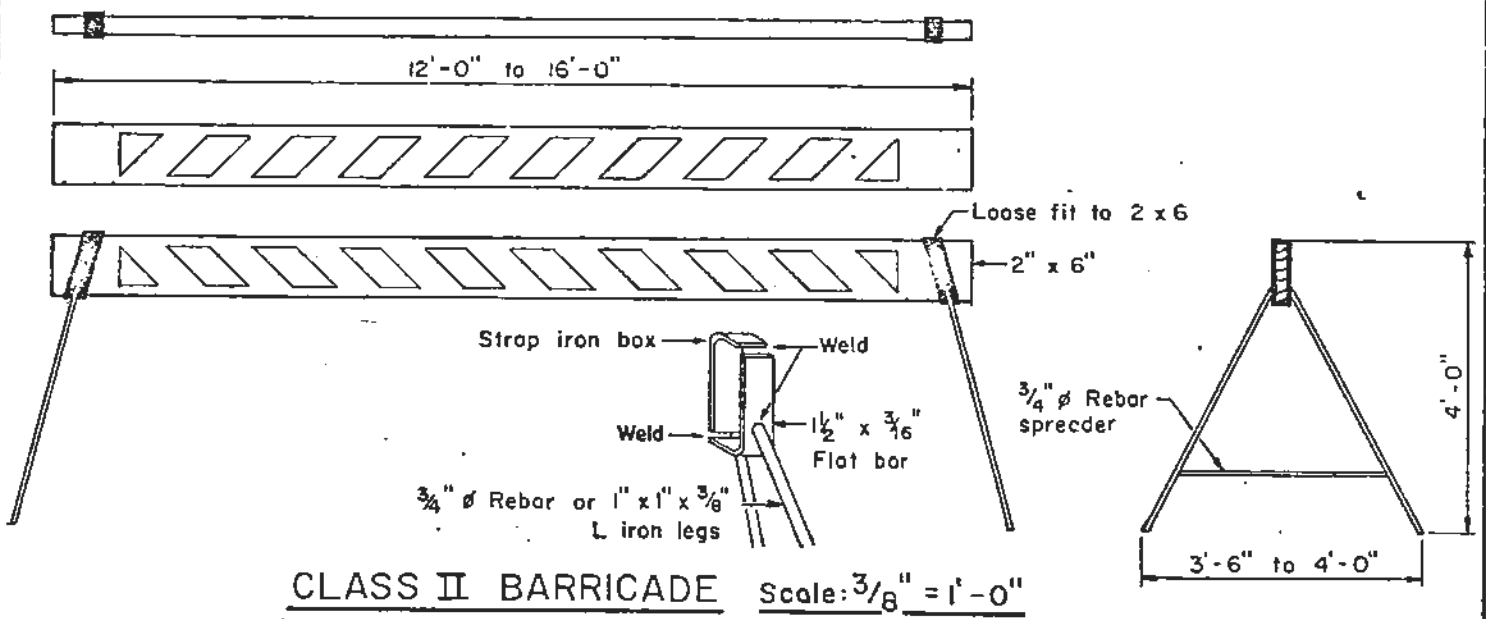
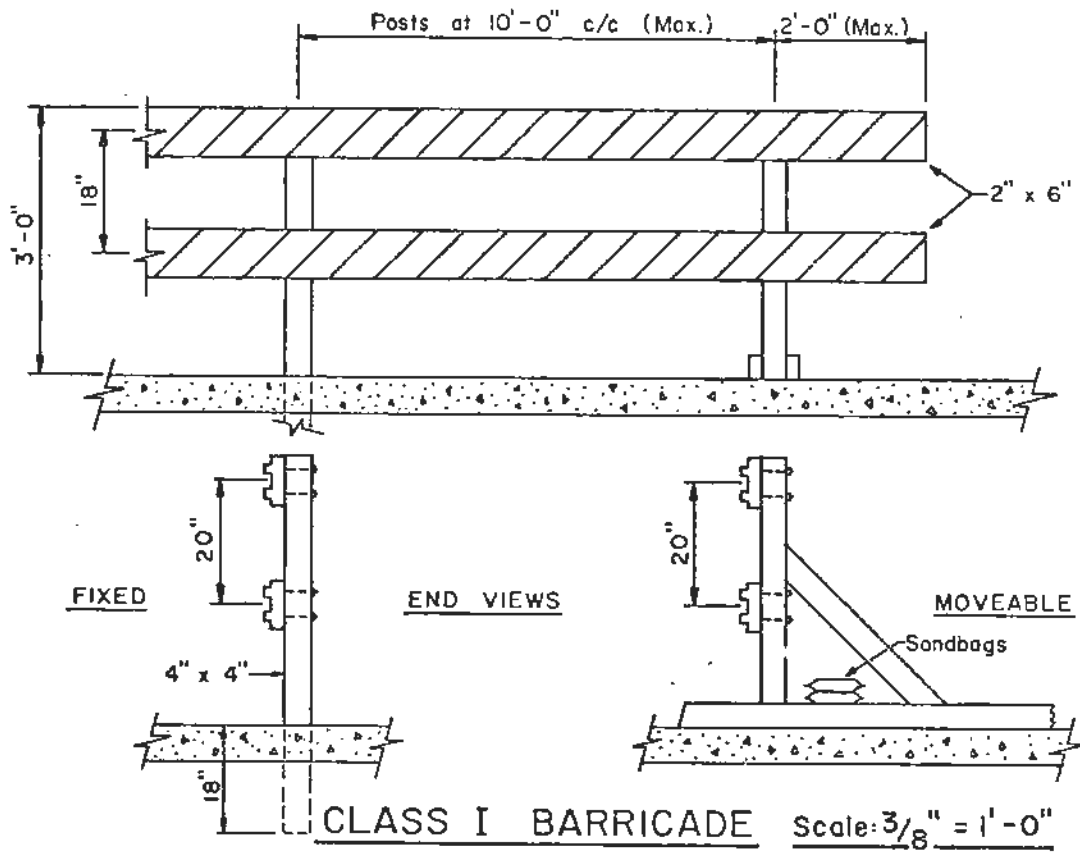
REVISIONS

Date	Details	Approved

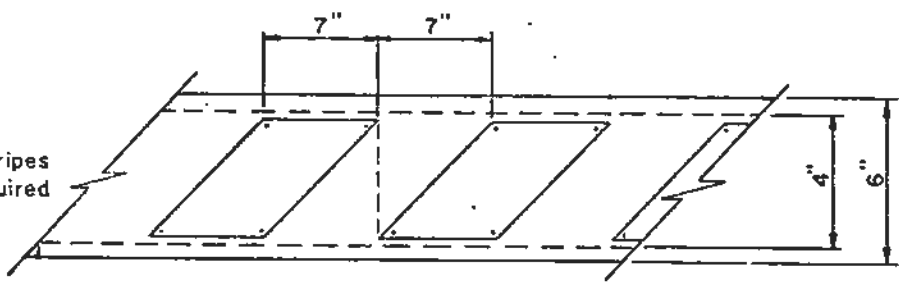
DETAILS OF TYPICAL TURN-AROUNDS

Approved	<i>[Signature]</i>	P. Eng	Std Dwg No
SCALE	1" = 40'-0"		37
Drawn by			

NOTE: Where feasible barricade length should be equal to or greater than pavement width.



Yellow board
Black screened angle stripes
Reflective added as required



REVISIONS			BARRICADES	
Date	Details	Approved	Approved	Std. Dwg No.
			<i>[Signature]</i>	38
			SCALE As shown	
			Drawn by	

VILLAGE OF GOLD RIVER

SPECIFICATION 'F'

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

*Installation Specifications - Electrical Distribution
Residential & Miscellaneous Underground Structures*

SPECIFICATION 'F'

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SPECIFICATION 'F'

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SPECIFICATION F

1. GENERAL

The following clauses shall form a part of any Specifications of work or drawings to which they are attached.

2. DEFINITIONS

Contractor - Shall be a person, company, municipality or subdivider employed by B.C. Hydro to perform all civil works and duct installation at their cost as a contribution towards the cost of underground wiring.

Engineer - Shall be a person designated by B.C. Hydro to be responsible for a project or his delegate.

3. WORK INCLUDED

The Contractor is required to furnish all supervision, labour, materials, tools, trucks and special equipment as may be required to install an underground electric distribution plant in accordance with issued plans and specifications.

The Contractor shall, at his own expense, transport all materials supplied by B.C. Hydro from B.C. Hydro's stores to the job site, and similarly return surplus materials to stores.

4. WORK NOT INCLUDED

B.C. Hydro will furnish the Contractor with precast concrete or plastic service boxes, conduit and fittings, ground rods plus associated connectors and wire, manhole frames and covers and sump castings. All such materials shall be listed and shall be properly accepted by the Contractor.

Any materials furnished in excess of the amount required to complete the work shall be returned by the Contractor to the yards or storage houses of B.C. Hydro in good order as directed by the Municipal Superintendent of Works. All material returned shall be listed on a Credit Requisition and receipt of the respective items shall be acknowledged by B.C. Hydro's Storekeeper.

5. DRAWINGS

B.C. Hydro shall issue copies of the design drawing and standard typical structure drawings associated with the project.

6. ADDITIONAL INSTRUCTIONS

B.C. Hydro may issue additional drawings or written instructions for clarification as they are required.

7. CONSTRUCTION FACILITIES

The Contractor shall provide at his own expense all construction facilities required to complete the work.

8. SAFETY PRECAUTIONS

The Contractor shall erect and maintain all necessary boardings, covers, and fences and take all precautions necessary and in conformity with the Worker's Compensation Board regulations, also Control Safety Committee approved recommendations to ensure the safe prosecution of the work.

The Contractor shall exercise all possible caution to protect existing utility installations from damage. The Superintendent of Works shall be consulted before any work is started near existing installations.

9. FIELD SURVEY

The Contractor's consultant shall set all stakes for running lines and grades for the underground structures to the satisfaction of the Superintendent of Works prior to any excavation. The survey shall be done in the following manner:-

- (a) The main line trench shall have stakes at 25 foot intervals on curves and major grade changes. Straight sections shall be staked at 50 foot intervals.
- (b) Road crossings shall have one stake at the property line on the opposite side of the road from the main trench.
- (c) All grade stakes for trenching shall be placed, where practical, at a 5 foot offset from the centre line of the trench.
- (d) All grade stakes for service boxes, pull boxes and transformer pads shall be set in near proximity to each installation to provide for ease of grading during installation. These grade stakes shall be set after excavation work is completed.
- (e) The Contractor shall check the final grade of each service box, pull box, and transformer pad. He shall issue to B.C. Hydro a written certification that the installation is in accordance with the design. Any corrections for errors in grade or line will be charged to the Contractor.

10. INSPECTION

B.C. Hydro will provide inspection for the project.

The inspector will ensure that all work is done to Hydro requirements. This will include:-

- (a) Pre-job conference on the job site prior to commencement of construction.
- (b) Inspection of:
 - layout survey
 - completed sections of trenching
 - completed sections of sand bedding
 - installation of forms for conduit, transformer pads, pilasters, pull boxes, etc.
 - installation of conduits and service boxes
 - all concrete pours
 - sand cover and backfill placement
- (c) Recording of information for "As Constructed Drawings".

The inspector will not be required to assist the contractor in place of a shortage of workmen.

11. EXCAVATION

11.01 General

The Contractor shall make all machine and hand excavations necessary for the trenching, transformer pads, service boxes and pull boxes which, in their progress and completion, shall correspond with the lines and levels given by the Contractor's Consultant.

The drawings have been marked with a minimum of information as to the type and location of surface and subsurface structures and utilities as needed for design purposes. Neither the accuracy nor the completeness of this information is guaranteed. B.C. Hydro will not expose subsurface structures for the Contractor nor will B.C. Hydro accept responsibility for damage to subsurface structures resulting from the Contractor's operations.

11.02 Proving Route

Grades of the trench shall be proven far enough along the route in advance of conduit laying that any relocation or redesign necessitated by unforeseen obstacles may be carried out.

11.03 Removal of Obstructions

After obstructions have been proven or after the trench is opened and all pipes and other obstructions are exposed, the Contractor shall notify the Superintendent of Works that the trench is ready for examination. Should the Superintendent of Works decide any pipes or other structures including pavement at the same elevation as the trench require moving, the Contractor will have no charge against B.C. Hydro, nor shall the Contractor be held responsible for any delay in completion of the work due solely to the above cause. If the Contractor desires to temporarily remove, disconnect, or relocate service pipes crossing the excavation to facilitate conduit construction, he shall make his own arrangements with the owners of the service pipes and shall bear all costs of such temporary work. B.C. Hydro will neither guarantee that such temporary work may be done nor bear any cost of such temporary work.

Disconnected or abandoned utilities shall not be removed or salvaged without the permission of the Superintendent of Works.

11.04 Extra Excavation

If, after obstructions have been proven or after any trench had been excavated, the Superintendent of Works should decide to change the form or location of the conduit, service box, pull boxes or transformer pads, the Contractor will do any necessary extra excavation and provide materials, according to the terms of the Contract.

11.05 Adjacent Structure and Properties

Prior to excavation, the Contractor shall consult and co-operate with owners of buildings or retaining walls which may be endangered, or whose gardens and shrubs require protection or alteration during construction, to eliminate future dispute and litigation over that which may already be in a damaged condition. Under no circumstances shall the Contractor permit his forces, materials, and/or equipment to encroach on private properties adjacent to the work, without the express consent of the Superintendent of Works.

11.06 Drainage and Shoring

The Contractor shall construct such temporary drains or do such dewatering as may be necessary to keep all water away from any concrete work during pouring and until the concrete had thoroughly set. At no time shall the concrete be used to move water or mud along the trench.

All excavations containing sand embedded conduit shall likewise be kept dry during the installation of the conduit and the sand.

The Contractor shall provide and place adequate shoring as required by the Worker's Compensation Board and as required to protect adjacent paving and structures.

11.07 Blasting

When blasting, the Contractor shall carefully cover the rock with heavy timber or a mat approved by the Superintendent of Works so as to prevent damage to property or injury to persons. The Contractor shall observe all Federal, Provincial and Municipal ordinances relative to the storage, transportation and use of explosives.

11.07 Blasting - Continued

Should the rock be intercepted by gas, oil or water pipe or electrical or telephone conductors, the rock at this point shall be removed without blasting.

If Municipal or Provincial authorities will not permit rock to be blasted, or if, in the opinion of the Superintendent of Works, blasting would create a hazard to property or persons, the Contractor shall employ other acceptable means to remove the rock.

11.08 Excavation Material

All material excavated shall be classed as "Rock Excavation" or "Common Excavation", as defined in the following paragraphs:

11.081 Rock Excavation

The term "rock" is hereby defined as:

- 1) Solid formations of dense homogeneous sedimentary or igneous material which requires in the judgement of the Superintendent of Works continuous blasting, drilling or wedging for its removal.
- 2) Individual boulders of any type measuring at least one and one half cubic yards.

The breaking and removing of road or sidewalk pavements or frozen material, regardless of thickness, will in no case be taken as rock excavation.

11.082 Common Excavation

Common excavation will include such material as are commonly called earth, loam, clay, muck, sand, gravel, gumbo, boulders each less than one and one half cubic yards, angular rock fragments, hardpan, pavement, and all other materials of every description not specially classified in paragraph 11.081 foregoing.

12 INSTALLATION

12.01 Underground Conduits, Handholes and Transformer Pads

The location, number and arrangement of conduits, handholes, transformer pads, service boxes shall be as shown on the drawings. The size and route of conduits between terminations may be varied according to space available in the street or alley or obstructions encountered as may be determined after the trench is excavated. None of the above mentioned alterations will be made without prior approval of the Superintendent of Works.

12.02 Protection of Foreign Utilities

In the prosecution of the work, care shall be taken not to move any structure without consent of the proper parties, and in crossing or running parallel with said structures they shall be secured in place until the work is completed. Any damage to structures of any kind, caused by neglect to attend to such structures, shall be paid by the Contractor.

12.03 Installation Procedure

- 1) No grade change or changes to number and arrangements of conduits, pull boxes, transformer pads or service boxes, are to be made without prior written approval of the Superintendent of Works.

12.03 Installation Procedure - Continued

- 2) Batter boards shall be used during trenching to ensure a uniform grade.
- 3) Three inches of sand bedding shall be installed in the bottom of each trench.

All sand used to encase conduits is to be fine granule devoid of debris, rocks or small stones.

- 4) It is recommended that conduit sections be installed commencing from fixed installations such as pilasters, service boxes, transformer pads, pull boxes or building service stubs.

The conduit shall be either direct buried in sand or encased in concrete as shown on the drawings. All joints shall be cemented and jointed in an approved manner. Conduit runs entering service boxes or pull boxes shall be terminated with formed bell ends. The caps installed on permanent stubbed off conduits shall be cemented.

Conduits terminating in transformer pads shall be secured to the form work. A ground rod shall be driven and the area under the pad shall be filled with compacted sand. The compaction shall be done in six inch lifts with hand tools.

- 5) Set service boxes in the trench at an elevation which will bring the top of the total unit flush with final grade. A ground rod shall be driven adjacent to each service box. A ground wire shall be connected to the rod and brought into the box through one of its openings.
- 6) Transformer pad forms shall be staked in place at proper grade.
- 7) The Contractor shall ensure that all users of any common trench have their respective equipment installed prior to commencing installation of sand cover and backfill material.

The Contractor shall install all portions of his own street lighting circuit conduits which emanate from B.C. Hydro service boxes to either the bases of the lighting standards or clear of all B.C. Hydro conduits.

- 8) A minimum of six inches of sand shall be placed over the conduits for the full width of the trench.
- 9) Backfill all trenches with the exception of locations where concrete encasement is required.
- 10) Form pilaster at terminal pole.
- 11) Pour concrete consecutively for pilasters, transformer pads, conduit encasement and pull boxes.

All concrete shall be formed. The Forms shall be adequately braced to prevent bulging or movement. All conduit concrete shall have a wood float finish on top. Forms shall not be removed for at least 24 hours and backfilling shall not commence for at least 36 hours from the time that the pouring was completed. Backfilling will not commence without the approval of the B.C. Hydro Inspector.

- 12) Upon completion of all civil work associated with the project the Contractor shall mandrell all primary and secondary conduits. He shall, at the discretion of B.C. Hydro's inspector, mandrell the stubbed-off service conduits. The mandrells will be supplied by the B.C. Hydro inspector and shall be pulled through each section of conduit. All mandrelling shall be done with the B.C. Hydro inspector present. A B.C. Hydro supplied pull string will be left in each section of conduit, as directed by the inspector.

12.03 Installation Procedure - Continued

- 12) Where mandrelling is to be done in conduits feeding from an energized installation, B.C. Hydro will supply a "stand-by" lineman at no cost to the Contractor.

13. BACKFILL

After the conduits and cables in the trench have been covered with a minimum of 6 inches of fine sand the Contractor shall backfill in the following manner:

Phase 1

Continue backfilling with excavated material from which stones larger than 6 inches in diameter have been removed, and thoroughly tamp in 6" lifts. If, in the opinion of the Superintendent of Works, the excavated material is not suitable for Phase 1 and 2 of the backfill, the Contractor shall supply and place sand or pit-run gravel as directed by the Superintendent of Works. Moistening of backfill during tamping shall be done only at the direction of the Superintendent of Works.

Should the Contractor remove from the site without the consent of the Superintendent of Works excavated material which is suitable for backfill, he shall replace at his own expense an equivalent amount of backfill material which is of equal or better quality than that which he so removed. Any material so replaced shall be treated as if it were native material. The whole of the work so performed shall be in accordance with these specifications and to the complete satisfaction of the Superintendent of Works.

Phase 2

Backfill the top of the excavation with 12 inches of pit-run gravel where the excavation is situated on a paved or travelled road, 2 inches of 1½" minus crushed gravel fill where the excavation is situated on a travelled road shoulder, 2 inches of crushed rock screenings where the excavation is situated on a single-panel concrete or screenings sidewalk, 6 inches of 1½" minus crushed gravel fill where the excavation is situated in a multipanel sidewalk, 6 inches of black loam where the excavation is situated on a developed grass boulevard, and material as in Phase 1 elsewhere. All shall be thoroughly tamped.

Phase 3

In all locations where road paving or part of a multipanel sidewalk has been removed for the excavation of the trench, the Contractor shall, unless otherwise directed, also supply and place a temporary tamped cold asphalt patch to facilitate the movement of traffic and pedestrians until permanent repairs are done by others, Compacted thickness shall be 2 inches for roads and 1 inch for sidewalks.

Phase 4

In all locations where trench construction is situated on developed grass boulevards, the Contractor shall neatly cut the grass and sod and store in a suitable location. After construction is complete and backfilled, the black loam shall be levelled off, and raked clear of stones and debris before replacing the grass sod. If the Contractor damages the adjacent boulevard or does not keep the grass sod growing, he shall re-seed the boulevard to its original level. If in the opinion of the Superintendent of Works, the season of the year is not suitable for re-seeding, the Contractor shall leave the boulevard graded and ready for seeding and shall provide the owner or tenant of the adjacent property with sufficient first quality grass seed and fertilizer to sow the damaged areas of the boulevards at a later date. This shall also apply to drain trenches.

All tamping shall be done with approved power tampers except on the sides of the duct bank and for the first 8" above the duct bank. In both these locations the material shall be rammed by hand to the satisfaction of the Superintendent of Works.

13.01 Responsibility for Backfill

Although all backfilling and tamping shall be done to the satisfaction and acceptance of the Superintendent of Works, and subject to his inspection at all times, the Contractor shall maintain the backfilled excavation at his own expense until all settlement has ceased, except as noted in the following paragraph.

13.02 Backfill Maintenance on Paved Streets

Following completion of the backfill in sections of the work where concrete, asphalt or other paved surfaces only have been broken, the Contractor shall notify B.C. Hydro in writing when backfilling is complete. Where the backfilled trench exceeds two city blocks in length, notification shall be given by the Contractor as each two-block section is completed.

To ensure the protection of the public until such time as the Municipality is able to effect permanent repairs, the Contractor shall maintain the backfilled trenches until B.C. Hydro relieves the Contractor of the responsibility.

Normally the Municipality will effect permanent repairs within 45 days after completion of backfill.

13.02 Liability

In accepting the responsibility for maintenance of backfill, the Contractor shall be fully responsible for any damage or accident to persons and/or property resulting from the condition of the backfilled trench.

14. PLAIN AND REINFORCED CONCRETE AND MORTAR

14.01 Applicable Standard Specifications

Except as otherwise specified or shown on drawings, concrete shall comply with the current A-23 Canadian Standard for concrete and reinforced concrete; A-23.1 concrete materials and methods of concrete construction and A-23.2 methods of test for concrete.

14.02 Gravel

Stone or gravel used in concrete for underground construction shall include all the aggregate too large to pass through a No. 4 mesh and that which will pass through a 3/4 inch mesh. Stone or gravel shall be clean, hard, durable and well graded.

14.03 Concrete

All concrete shall be proportioned to have a compressive strength not less than 2500 lbs per sq. in. at 28 days. All concrete shall have a maximum slump of 2" unless otherwise specified by the B.C. Hydro Inspector.

14.04 Mortar

Mortar shall be composed of one part cement and three parts sand, and water, all as previously specified. Mortar that has been mixed over one-half hour or that has commenced to set shall not be used. The mortar shall be as dry as practicable to obtain adhesion. Not more than 5% of a mason's hydrated lime shall be added to the mortar.

14.05 Admixtures

The use and choice of concrete admixtures including calcium chloride will be subject to the approval of the Superintendent of Works, but the expense of using the same shall be borne by the Contractor. Air-extraining admixtures, if used, shall conform to the requirements of A.S.T.M. designation C-260-Current. A cement dispersant may be used at the option of the supplier, with the approval of the Superintendent of Works,

14.06 Concrete Inspection

At discretion of the Superintendent of Works, concrete tests will be conducted by a firm of Testing Engineers appointed and paid for by B.C. Hydro.

15. B.C. TELEPHONE COMPANY, CABLE TELEVISION AND STREET LIGHTING INSTALLATIONS

15.01 Co-operation

When B.C. Telephone and cable television plant is to be installed jointly, in the same trench with the B.C. Hydro's electric plant, it is a prime responsibility of the Contractor that the utmost co-operation is maintained with the Telephone Company's installing crews to ensure that this plant is in place properly before any backfilling takes place.

15.02 Installation

The placing of cables, conduits, splice boxes, service pedestals, etc. required for the B.C. Telephone and cable television plant shall be installed in accordance with their drawings and specifications.

15.03 Street Lighting

Street lighting conduit connections into B.C. Hydro service boxes shall be approved by B.C. Hydro.

The wiring shall not be installed by the Contractor into energized service boxes without the attendance of a B.C. Hydro wiring crew.

16 MUNICIPAL REGULATIONS

16.01 Utilization of Streets

The scope and extent to which public streets may be utilized or occupied by the Contractor for the purpose of carrying out the work under this contract will be determined by the Municipality who will also control the manner in which such streets may be used for such purposes and where tunnelling will have to resorted to in order to cause the least possible inconvenience to vehicular and pedestrian traffic on the streets, lanes and sidewalks affected.

16.02 Liaison With Municipality

Before commencing operations, the Contractor shall determine from the Municipality the extent to which streets may be utilized or occupied by the Contractor for the work specified. The Contractor shall notify B.C. Hydro two days in advance of the time of any consultation with the Municipality as required to determine the use of streets so that B.C. Hydro may, if considered desirable, have their representative attend the meeting. B.C. Hydro will not entertain claims by the Contractor for any additional costs incurred as a result of Municipal requirements or changes in Municipal requirements.

16.03 Barriers, Bridging, etc.

Barriers, bridging, signs, lights and parking meter hoods shall be supplied and maintained at all times by the Contractor during construction to the satisfaction of the Municipality, and the Superintendent of Works.

16.04 Order of Street Openings

The laying of conduit will be dependant upon the ability of B.C. Hydro to obtain permits for opening streets. The Superintendent of Works will designate the order in which streets shall be opened and the amount of openings at any time.

16.05 Protection of Pavements

As all repaving will be done by the Municipality unless otherwise specified, the repaving of the trench will become a direct charge against the Contractor and, therefore, the Contractor shall keep all excavations to a minimum size, which, in the opinion of the Superintendent of Works, will allow the Construction work to be done. In addition, pavement drill holes shall be spaced close enough that subsequent excavation will not undercut or otherwise damage paving on the sides of the excavation.

Also the Contractor shall take all precautions to ensure that unnecessary damage will not occur to roads, curbs, sidewalks and other street appurtenances. The use of equipment having cleated or flanged tracks or wheels will not be permitted, unless street surfaces are protected at all times from such wheels or tracks by means of mats or heavy planks. The driving of trucks or other equipment over curbs or sidewalks, without adequate protection, will be strictly prohibited.

If in the opinion of the Superintendent of Works, the Contractor is causing excessive damage to the Municipal streets, the Superintendent of Works shall have the right to stop or diminish the work until such time as the Contractor alters his methods of operation to the satisfaction of the Superintendent of Works. Any losses incurred by the Contractor, due to such stoppages or diminishment of work, shall be borne by the Contractor.

16.06 Provincial Jurisdiction

Where conduits, service boxes, pull boxes for transformers pads are to be constructed on streets or highways under the Jurisdiction of the Province of British Columbia, the work shall also be done to the satisfaction of the Department of Highways of the Province of British Columbia.

16.07 Subdivider's Roads

A firm mutual understanding as to the condition of roads, boulevards, ditches or lanes, shall be reached between the principals, or agents of the subdivision developers and the Contractor before a start is made with trench excavation. This will provide a basis for reaching agreement in restoring the project site to its original state when the installation has been completed.

17 WORKMANSHIP

The Contractor shall guarantee all workmanship for a period of one year from the date of B.C. Hydro's acceptance of his work. The Contractor will at his expense replace any conduit which is blocked, damaged, or improperly installed.

The Contractor shall employ ample, qualified workmen plus any mechanical aids on the job at all times during the complete conduit installation.

The Contractor shall proceed with sufficient speed to complete the total installation in accordance with prearranged completion date.

18 INJURY, DAMAGE, INFRINGEMENT AND INDEMNITY

18.01 The Contractor and his agent and employees shall at all times use due care that no person is injured or killed, no property (including property of the B.C. Hydro) is damaged or lost, and no rights are infringed in, or arising out of, the Work.

18.02 All blasting operations shall be screened and the occupants of all adjacent buildings shall be warned before any blasting or falling is done.

- 18.03 If through negligence or otherwise howsoever any injury (including death) to persons or damage or injurious affection to, or loss or, property (including property of B.C. Hydro) occurs, in, about or arising out of the Work, or if any right is infringed, the Contractor shall be responsible therefore in every respect (except to the degree that such injury, damage, loss or infringement may be caused by B.C. Hydro, and its agents and employees) and shall indemnify and hold harmless B.C. Hydro against all claims, demands, actions, liabilities, costs, losses, assessments, damages, fees, and expenses whatsoever which may in any way arise therefrom or in respect thereof.
- 18.04 In the case of damage to property, the Contractor shall notify the owner or custodian and make or arrange to make full restitution and shall submit a report of the accident to B.C. Hydro and to the Superintendent of Works.

In the case of injury or death to any person the Contractor shall report immediately to the Superintendent of Works and submit a written report to B.C. Hydro detailing all pertinent facts relating to the injury or death.